

FEASIBILITY STUDY

Mount Auburn Street (Route 16) Corridor Watertown, MA

March 7, 2011

Prepared for:

**Town of Watertown
149 Main Street
Watertown, MA 02472**

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1.0 INTRODUCTION

WorldTech Engineering, LLC has been retained by the Town of Watertown Department of Public Works to provide professional engineering services necessary for investigation, analysis, design, and preparation of construction bid documents for improvements to existing safety conditions and traffic operations along the Mount Auburn Street (Route 16) corridor in the Town of Watertown, Massachusetts, including reducing the roadway from four to two basic travel lanes. The proposed study area includes the length of Mount Auburn Street beginning east of the intersection with Summer Street and continuing east, ending at the Cambridge city line. The study area also includes a section of Arlington Street beginning north of its intersection with Mount Auburn Street and continuing south through the intersection with Grove Street and terminating at Merrifield Avenue.

This feasibility study examines existing traffic volumes and operating conditions along roadways encompassing the project site. Traffic projections are made to a 2030 future design year based on background traffic growth expected to be added to the study area network. Anticipated future traffic volume levels are evaluated with respect to roadway system capacity to determine any anticipated system deficiencies. Finally, various design alternatives to accommodate future traffic volumes and improve operational and safety conditions are presented and evaluated.

The scope of services currently envisioned for this project will be completed in the following phases:

- Phase I – Traffic and Safety Study
- Phase II – Engineering Design Services
- Phase III – Construction Phase Services

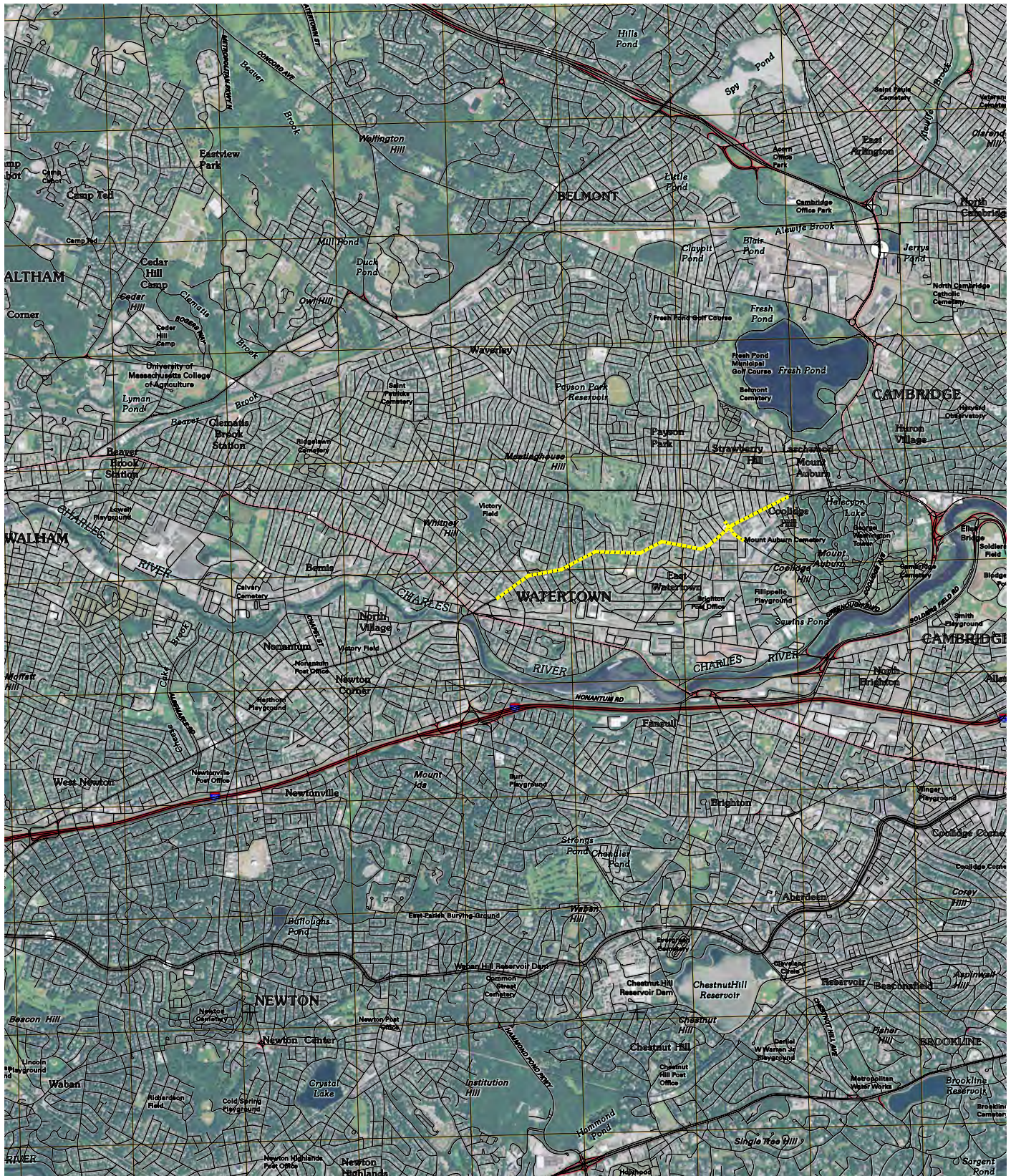
This document represents the completion of all tasks outlined in Phase I. Phase I presents the recommended conceptual design alternatives (geometric alignment and traffic controls) based on the analyses of existing and future (projected) traffic volumes. The proposed improvements are presented on preliminary plans suitable to define the scope of work and to compile a budgetary cost estimate. The following sections detail the work and findings of the Traffic and Safety Study. The proposed improvements are intended to enhance traffic operations, pedestrian and vehicular safety at the project locations.

The study area for the traffic impact analysis includes the critical intersections and roadways within the area. Specifically, the study area includes the following roadway intersections:

- Route 16 at Marshall Street
- Route 16 at Phillips Street
- Route 16 at Parker Street
- Route 16 at Common Street
- Route 16 at Bates Road East and Walnut Street

- Route 16 at Boylston Street
- Route 16 at Winthrop Street
- Route 16 at Chauncey Street
- Route 16 at School Street
- Route 16 at Upland Road and Dexter Avenue
- Route 16 at Melendy Avenue
- Route 16 at Lloyd Road
- Route 16 at Elton Avenue
- Route 16 at Irma Avenue
- Route 16 at Kimball Road and Bigelow Avenue
- Route 16 at Templeton Parkway
- Route 16 at Arlington Street
- Arlington Street at Grove Street
- Grove Street at the Tufts Medical Center driveway
- Arlington Street at Wells Avenue
- Arlington Street at Merrifield Avenue

The project site location map with respect to the local roadway system is shown in Figure 1.



PREPARED FOR:



**MOUNT AUBURN STREET (ROUTE 16)
CORRIDOR FEASIBILITY STUDY**

Project Location



DATE:

1-19-2011

SCALE:

1"=4000'

PREPARED BY:



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Figure 1

2.0 EXISTING CONDITIONS

In this section, existing conditions such as roadway and intersection geometrics, traffic volumes, crash history, and parking are examined in detail. The existing conditions analysis is based on field visits conducted by WorldTech Engineering, LLC, traffic counts conducted by Transdata Services and traffic data provided by the Massachusetts Department of Transportation (MassDOT). Information was collected regarding roadway geometric conditions, traffic control, traffic volumes, and peak period traffic operations. The results of these investigations are described below.

2.1 Study Area Description

The study area consists of the Mount Auburn Street (Route 16) and Arlington Street corridors and the intersections along Route 16 from east of Summer Street to the Cambridge city line, and along Arlington Street between Mount Auburn Street and Merrifield Avenue. The classification and jurisdictional responsibility of the critical study area roadways is listed in Table 1.

TABLE 1
Road Classification and Jurisdiction

<i>Roadway Section</i>	Classification	JURISDICTION
Mount Auburn Street (Route 16)	Urban Principal Arterial	Town of Watertown
Arlington Street	Urban Collector	Town of Watertown

Roadways

The following section provides a description of the major study area roadways.

Mount Auburn Street (Route 16)

Mount Auburn Street (Route 16) traverses the study area in a general east-west direction providing access to Route 2 and Route 3 to the east; and to Interstate 90 (via Centre Street in Newton), Route 20, and Arsenal Street to the west. It is a four-lane, urban principal arterial roadway under the jurisdiction of the Town of Watertown. Route 16, within the study area, provides two travel lanes per direction separated by a double-yellow centerline. Additional turning lanes are provided at the intersection with Arlington Street. Within the study area, sidewalks are provided along both sides of Route 16. Parking is permitted along the south side of Route 16, except at bus stop locations, throughout the study area, and parking is permitted on

both sides of Route 16 between Baptist Walk and Summer Street and between Lloyd Road and Arlington Street. The posted speed limit on Route 16 is 30 miles per hour (mph). Land use along Route 16 consists of residential and commercial uses and areas of open space.

Arlington Street

Arlington Street traverses the study area in a general north-south direction and is a two-lane roadway under the jurisdiction of the Town of Watertown. Within the study area, Arlington Street is classified as an urban collector and provides one travel lane per direction separated by a double-yellow centerline with no marked edge-lines. Additional turning lanes are provided at the intersection with Mount Auburn Street (Route 16). Within the study area, sidewalks are provided along both sides of Arlington Street. The posted speed limit on Arlington Street is 30 miles per hour (mph). Land use along Arlington Street consists of residential and commercial uses and areas of open space.

Intersections

The following section provides a description of the study area intersections. Unless otherwise noted, Route 16 provides two general purpose travel lanes which are separated by a double-yellow centerline. In addition, sidewalks are provided along both sides of all roadways.

Route 16 at Phillips Street

Phillips Street intersects Route 16 from the south to form this three-legged, unsignalized intersection. The Phillips Street northbound approach consists of a general purpose travel lane which accommodates two-way traffic, although a centerline is not provided. Stop-signs and stop-lines are provided along the Phillips Street approach. A marked crosswalk is provided across Phillips Street. Land use in the vicinity of this intersection consists of retail and residential uses.

Route 16 at Marshall Street

Marshall Street intersects Route 16 from the north to form this three-legged, unsignalized intersection. The Marshall Street northbound approach consists of a general purpose travel lane which accommodates two-way traffic, although a centerline is not provided. Stop-signs and stop-lines are provided along the Marshall Street approach. A marked crosswalk is provided across Marshall Street. Land use in the vicinity of this intersection consists of retail and residential uses.

Route 16 at Parker Street and Common Street

Parker Street intersects Route 16 from the south and Common Street intersects Route 16 from the north to form two three-legged signalized intersections, offset by approximately 100 feet. The two intersections are controlled by a single signal controller. The Parker Street northbound approach consists of a general purpose travel lane which accommodates two-way traffic, although a centerline is not provided. The southbound Common Street approach consists of a southbound left turn lane and a southbound right turn lane, separated from a single northbound

departure lane by a double yellow center line. Stop lines are provided along all three approaches at both intersections. Marked crosswalks and pedestrian signal heads are provided across Parker Street, Common Street, Route 16 west of Parker Street, and Route 16 east of Common Street. Parking is permitted along the south side of Route 16 and along both sides of Parker Street. Land use in the vicinity of this intersection consists of retail, residential, and cemetery uses, and the Phillips School is located approximately 300 feet north of the intersection on Common Street.

Route 16 at Bates Road East and Walnut Street

Walnut Street intersects Route 16 from the south and Bates Road East intersects Route 16 from the north to form a four-legged signalized intersection. The Walnut Street northbound approach consists of one northbound general purpose lane and one southbound departure lane separated by a double yellow center line. The Bates Road East southbound approach consists of a general purpose travel lane which accommodates two-way traffic, although a centerline is not provided. Route 16 consists of two eastbound and two westbound general purpose lanes separated by a double yellow center line; additionally, along the eastbound approach, the parking lane functions as an exclusive right turn lane during peak periods. Stop lines are provided along all approaches. Marked crosswalks and pedestrian signal heads are provided across all approaches. Parking is permitted along the south side of Route 16 and along the west side of Bates Road East. Land use in the vicinity of this intersection is residential.

Route 16 at Boylston Street

Boylston Street intersects Route 16 from the south to form a three-legged unsignalized intersection. The Boylston Street approach consists of a general purpose travel lane which accommodates two-way traffic, although a centerline is not provided. A stop sign and stop line are provided for the Boylston Street approach. A marked crosswalk is provided across Boylston Street, and a marked crosswalk and pedestrian signal are provided across Route 16 approximately 300 feet east of the intersection. Parking is permitted along the south side of Route 16 and along the west side of Boylston Street. Land use in the vicinity of this intersection is residential, and the Hosmer Elementary School is located southeast of the intersection.

Route 16 at Winthrop Street

Winthrop Street intersects Route 16 from the south to form a three-legged unsignalized intersection. The Winthrop Street approach consists of a general purpose travel lane which accommodates two-way traffic, although a centerline is not provided. A stop sign and stop line are provided for the Winthrop Street approach. Marked crosswalks are provided across Winthrop Street and across the eastern Route 16 leg of the intersection. Parking is permitted along the south side of Route 16 and along both sides of Winthrop Street. Land use in the vicinity of this intersection is residential, and the Hosmer Elementary School is located south of the intersection.

Route 16 at School Street

School Street intersects Route 16 to form a four-legged signalized intersection. The northbound School Street approach consists of one northbound general purpose lane and one southbound departure lane separated by a double yellow center line. The southbound School Street approach consists of one northbound general purpose lane and one southbound departure lane separated by

a concrete island. Route 16 consists of two eastbound and two westbound general purpose lanes separated by a double yellow center line; additionally, the westbound right turn movement is channelized. Stop lines are provided along all approaches. Marked crosswalks and pedestrian signal heads are provided across all approaches. Parking is permitted along the south side of Route 16 and along the west side of Bates Road East. Land use in the vicinity of this intersection is residential.

Route 16 at Upland Road and Dexter Avenue

Upland Road and Dexter Avenue intersect Route 16 from the north and south to form this four-legged, unsignalized intersection. The Upland Road and Dexter Avenue southbound and northbound approaches consist of a general purpose travel lane and accommodate two directions of traffic although a centerline is not painted along either roadway. Stop signs and stop lines are provided along both the Upland Road and Dexter Avenue approaches. Marked crosswalks are provided across Upland Road and Dexter Avenue. Land use in the vicinity of this intersection consists of retail and residential uses.

Route 16 at Melendy Avenue

Melendy Avenue intersects Route 16 from the south to form this three-legged, unsignalized intersection. The Melendy Avenue northbound approach consists of a general purpose travel lane which accommodates two-way traffic, although a centerline is not provided. Stop-signs and stop-lines are provided along the Melendy Avenue approach. A marked crosswalk is provided across Melendy Avenue. Land use in the vicinity of this intersection consists of retail and residential uses.

Route 16 at Lloyd Road

Approximately 10 yards east of Melendy Avenue, Lloyd Road intersects Route 16 from the northwest to form this three-legged, unsignalized intersection. The Lloyd Road southeast bound approach consists of a general purpose travel lane which accommodates two-way traffic, although a centerline is not provided. Stop-signs and stop-lines are provided along the Lloyd Road approach. Marked crosswalks are provided across Lloyd Road and across the eastbound approach of Route 16. Land use in the vicinity of this intersection consists of retail and residential uses.

Route 16 at Elton Avenue

Approximately 10 yards east of Lloyd Road, Elton Avenue intersects Route 16 from the southeast to form this three-legged, unsignalized intersection. Elton Avenue is a one-way southeast bound (away from the intersection) roadway. A marked crosswalk is provided across Elton Avenue. Land use in the vicinity of this intersection consists of retail and residential uses.

Route 16 at Irma Avenue

Irma Avenue intersects Route 16 from the northwest to form this three-legged, unsignalized intersection. The Irma Avenue southeast bound approach consists of a general purpose travel lane which accommodates two-way traffic, although a centerline is not provided. Stop-signs and

stop-lines are provided along the Irma Avenue approach. A marked crosswalk is provided across Irma Avenue. Land use in the vicinity of this intersection consists of retail uses.

Route 16 at Bigelow Avenue and Kimball Road

Bigelow Avenue and Kimball Road intersect Route 16 from the south and northwest to form this four-legged, signalized intersection. The Bigelow Avenue northbound approach consists of a general purpose travel lane and accommodates two directions of traffic divided by a double-yellow centerline. Entering traffic along Bigelow Avenue is divided by way of a raised delta island. The Kimball Road southwest bound approach consists of a general purpose travel lane which accommodates two-way traffic, although a centerline is not provided. Marked crosswalks are provided across each leg of the intersection. Land use in the vicinity of this intersection consists of retail and residential uses.

Route 16 at Templeton Parkway

Templeton Parkway intersects Route 16 from the northwest to form this three-legged, unsignalized intersection. The Templeton Parkway southeast bound approach consists of a general purpose travel lane which accommodates two-way traffic, although a centerline is not provided. Stop signs and stop lines are provided along the Templeton Parkway approach. A marked crosswalk is provided across Templeton Parkway. Land use in the vicinity of this intersection consists of retail uses.

Route 16 at Arlington Street

Arlington Street intersects Route 16 from the north and south to form this four-legged, signalized intersection. The Route 16 east and westbound approaches consist of an exclusive left-turn lane, an exclusive through lane, and a shared through/right-turn lane. The directions of travel along Route 16 are separated by a double yellow centerline. The Arlington Street north and southbound approaches consist of two general purpose travel lanes and accommodate two directions of traffic by way of a double-yellow centerline. Marked crosswalks are provided across each leg of the intersection. Land use in the vicinity of this intersection consists of retail, commercial and residential uses.

Arlington Street at Grove Street

Grove Street intersects Arlington Street from the south at a skewed angle to form this three-legged, unsignalized intersection. The Arlington Street southbound approach consists of a through lane and a right-turn slip-ramp. The Arlington Street northeast bound approach consists of a left-turn lane and a right-turn channel. The directions of travel along Arlington Street are separated by a double yellow centerline. The Grove Street northbound approach consists of a general purpose travel lane and accommodates two directions of traffic by way of a double yellow centerline. A marked crosswalk is provided across Grove Street. Land use in the vicinity of this intersection consists of commercial and residential uses.

Grove Street at the Tufts Medical Center driveway

The Tufts Medical Center driveway intersects Grove Street from the east to form this three-legged, unsignalized intersection. The Grove Street north and southbound approaches consist of

a general purpose travel lane and accommodates two-way traffic by way of a double yellow centerline. The Tufts Medical Center driveway westbound approach consists of an exclusive left-turn lane and an exclusive right-turn lane. Traffic along the Tufts Medical Center driveway is divided by way of a raised island. A stop line is provided along the Tufts Medical Center driveway approach; however a stop sign is not provided. There are no marked crosswalks provided at this intersection. Land use in the vicinity of this intersection consists of commercial uses.

Arlington Street at Wells Street

Wells Street intersects Arlington Street from the west to form this three-legged, unsignalized intersection. The Arlington Street north and southbound approaches consist of a general purpose travel lane and accommodates two-way traffic by way of a double yellow centerline. Wells Street is a one-way westbound (away from the intersection) roadway. No marked crosswalks are provided at this intersection. Land use in the vicinity of this intersection consists of commercial and residential uses.

Arlington Street at Merrifield Avenue

Merrifield Avenue intersects Arlington Street from the west to form this three-legged, unsignalized intersection. The Arlington Street north and southbound approaches consist of a general purpose travel lane and accommodates two-way traffic by way of a double yellow centerline. The Merrifield Avenue eastbound approach consists of a general purpose travel lane which accommodates two-way traffic, although a centerline is not provided. Stop signs and stop lines are also not provided along the Merrifield Avenue approach. No marked crosswalks are provided at this intersection. Land use in the vicinity of this intersection consists of commercial and residential uses.

2.2 Traffic Volumes

In order to quantify existing traffic volume conditions in the project study area, automatic traffic recorder (ATR) counts and manual turning movement counts (TMC) were conducted in June 2010 to supplement data collected in May 2007 for the Reconstruction of Coolidge Square project. ATR counts were conducted along Route 16 and Arlington Street for a 24- to 48-hour period to record hourly traffic volumes within the study area for an extended period. TMCs were conducted at the study area intersections during the normal weekday morning peak period (7:00 to 9:00 AM) and weekday evening peak period (4:00 to 6:00 PM).

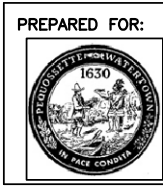
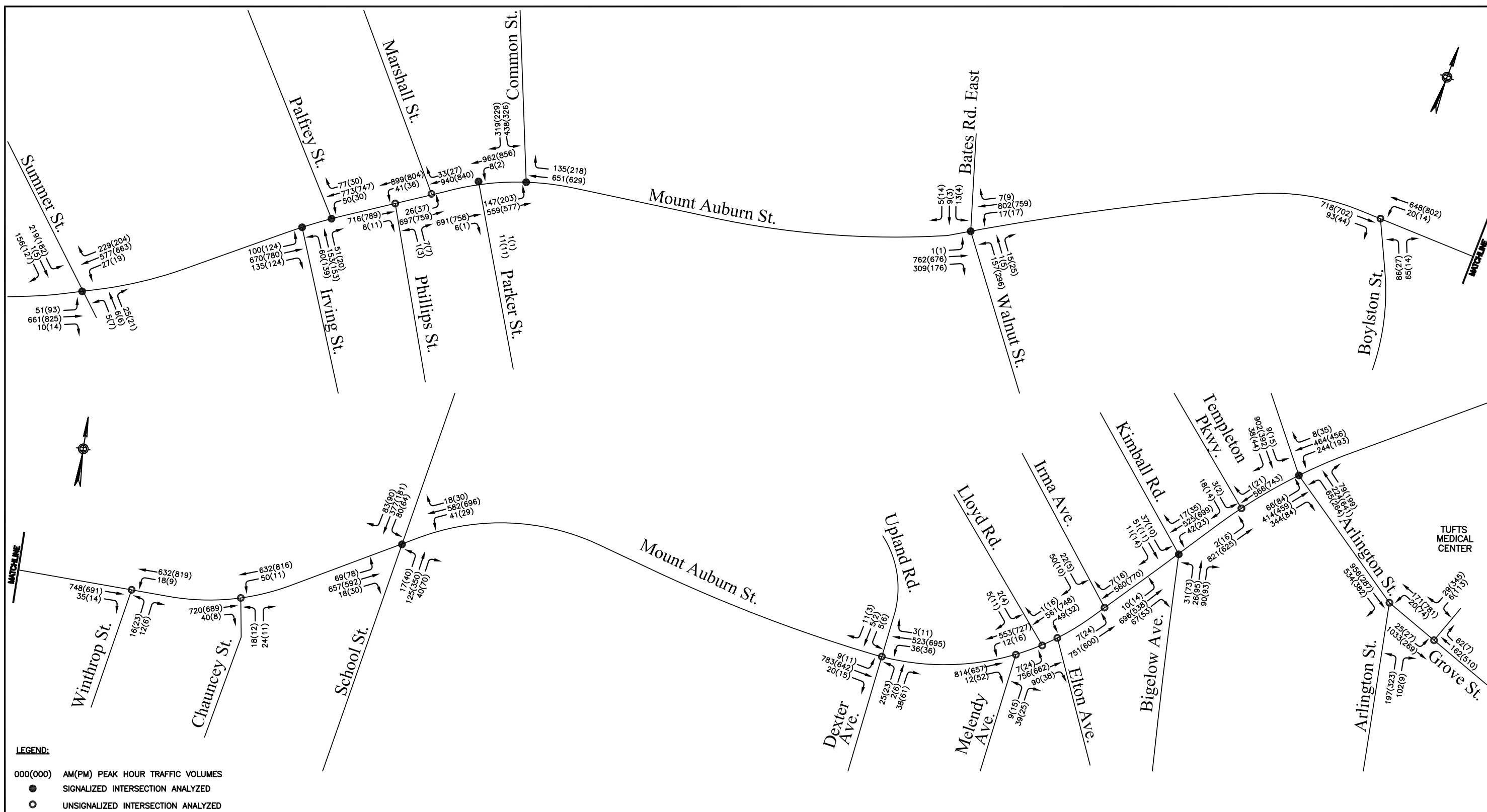
Evaluation of the peak period traffic counts indicates that the weekday morning peak hour generally from 7:45 to 8:45 AM and the weekday evening peak hour generally occurs from 5:00 to 6:00 PM. It should be noted that the individual peak hour traffic volumes at each intersection were used to provide a conservative analysis scenario. The traffic count data is provided in the *Technical Appendix*.

In order to analyze current 2010 roadway conditions, the 2007 traffic volumes were adjusted upwards by 0.5 percent per year to account for background traffic growth in the past three years. An explanation of the traffic growth rate can be found in *Section 3: Future Conditions*.

Seasonal Adjustment

Traffic on a given roadway typically fluctuates throughout the year depending on the area and the type of roadway. To determine if the data should be adjusted to account for this fluctuation, traffic volume data from MassDOT was researched. The most recent seasonal adjustment rates available from MassDOT show that for a roadway of this class, Group 6 - Urban Arterials, Collectors and Rural Arterials, the seasonal adjustment factors for May 2007 and June 2009 (2010 data is not yet available) were 0.91 and 0.90, respectively. This signifies that the average traffic volumes during the months of data collection are approximately 9% higher than the average yearly volumes for similar roadways. Recognizing this, in order to provide a slightly conservative analysis traffic volumes were not decreased by 9%. The seasonal adjustment calculations have been included in the *Technical Appendix*.

The existing weekday morning and evening peak hour traffic volumes are summarized in Table 2 and shown on Figure 2.



PREPARED FOR:
MOUNT AUBURN STREET (ROUTE 16) CORRIDOR FEASIBILITY STUDY
 2010 Existing Traffic Volumes

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 FAX: 781.933.4801

DATE:
 1-11-2011
 SCALE:
 1" = 250'

Figure 2

TABLE 2
2010 Existing Traffic Volumes

<i>Location</i>	DAILY Volume	Peak Hour Volume	K Factor (%)	Directional Distribution
Route 16, east of Common Street Weekday	23,379	AM: 1,783 PM: 1,750	7.63% 7.49%	55.9% EB 51.6% EB
Route 16, east of Walnut Street Weekday	20,284	AM: 1,616 PM: 1,490	7.97% 7.35%	51.1% WB 52.7% WB
Route 16, east of Oakley Road Weekday	19,563	AM: 1,423 PM: 1,574	7.27% 8.05%	55.6% EB 56.4% WB
Route 16, east of School Street Weekday	18,995	AM: 1,431 PM: 1,519	7.53% 8.00%	54.3% EB 52.2% WB
Route 16, west of Irma Avenue Weekday	19,170	AM: 1,368 PM: 1,405	7.14% 7.33%	55.4% EB 55.5% WB
Route 16, east of Arlington Street Weekday	17,434	AM: 1,290 PM: 1,357	7.40% 7.78%	55.5% WB 50.4% WB
Arlington Street, north of Route 16 Weekday	14,781	AM: 1,247 PM: 1,751	8.43% 11.85%	68.1% SB 56.6% SB
Arlington Street, south of Wells Street Weekday	11,536	AM: 842 PM: 798	7.30% 6.92%	60.5% SB 53.3% SB

K Factor: Proportion of daily traffic volume occurring during the specified peak hour.

Directional Distribution: Proportion of vehicles traveling in the peak direction.

NB = northbound; SB = southbound; EB = eastbound; WB = westbound

2.3 Crash History

Crash data was obtained from the MassDOT Crash Database for crashes occurring within the study area over the most recent three-year period available, 2006 through 2008. Crash data for a given location is ordinarily broken down into categories of information. Typical categories include severity (property damage only, injury or fatality) and collision type. A summary of this crash data is shown in Table 3. A total of 214 crashes occurred within the study area roadways,

12 of which occurred at an undetermined location. A review of the crash data indicates ten or more crashes each occurred at the intersections of Route 16 with Irving Street/Palfrey Street, Parker Street, School Street, Upland Road/Dexter Avenue, Lloyd Road/Elton Avenue, Kimball Road/Bigelow Avenue, and Arlington Street, which combined account for 96 crashes. Approximately 55 percent of the crashes at these seven locations were either angle collisions or rear end crashes, indicating turning conflicts with through movements or failures to yield.

A total of 12 crashes involving pedestrians or bicycles occurred within the study area over the three year period. One crash, at the intersection of Route 16 with School Lane, involved a pedestrian fatality. Six of the 12 accidents resulted in personal injury to either the pedestrian or the operator of the vehicle in trying to avoid the pedestrian.

TABLE 3
Crash Data Summary

Location	Number of Crashes		Crash Rate	Severity			Type					
	Total	Avg per Year		PD ^a	PI ^b	F ^c	CM ^d	RE ^e	SS ^f	HO ^g	Ped ^h	Other
Route 16 at Patten St	4	1.33	0.13	3	1	0	3	1	0	0	0	0
Route 16 at Irving/Palfrey Sts	15	5.00	0.45	6	9	0	6	5	2	1	0	1
Route 16 at Phillips St	1	0.33	0.04	0	1	0	0	1	0	0	0	0
Route 16 at Marshall St	1	0.33	0.04	0	1	0	0	0	1	0	0	0
Route 16 at Parker St	10	3.33	0.22	6	4	0	2	4	1	1	0	2
Route 16 at Common St	7	2.33	0.22	5	2	0	0	5	1	0	0	1
Route 16 at Chester St	3	1.00	0.12	1	2	0	0	2	0	0	0	1
Route 16 at Russell Ave	8	2.67	0.27	4	4	0	1	3	1	0	1	2
Route 16 at Bates Rd East/Walnut St	2	0.67	0.07	1	1	0	0	0	0	0	1	1
Route 16 at Garfield St	1	0.33	0.04	1	0	0	0	0	1	0	0	0
Route 16 at Bailey Rd	1	0.33	0.04	1	0	0	1	0	0	0	0	0
Route 16 at Spruce St	3	1.00	0.13	2	1	0	0	0	1	0	0	2
Route 16 at Amherst Rd	1	0.33	0.04	1	0	0	0	0	0	0	1	0
Route 16 at Boylston St	3	1.00	0.12	3	0	0	1	0	0	0	0	2
Route 16 at Stearns Rd	2	0.67	0.09	2	0	0	0	0	2	0	0	0
Route 16 at Oakley Rd	3	1.00	0.14	2	1	0	0	1	0	0	0	2
Route 16 at Richards Rd	2	0.67	0.09	1	1	0	0	2	0	0	0	0
Route 16 at Winthrop St	3	1.00	0.14	1	2	0	1	1	0	0	1	0
Route 16 at Adams Ave	1	0.33	0.05	0	1	0	0	0	0	1	0	0
Route 16 at School St	13	4.33	0.42	12	1	0	5	4	1	3	0	0
Route 16 at Winsor Ave	1	0.33	0.05	1	0	0	0	0	1	0	0	0
Route 16 at Langdon Ave	4	1.33	0.19	4	0	0	1	0	2	0	0	1

TABLE 3
Crash Data Summary (Continued)

Location	Number of Crashes		Crash Rate	Severity			Type					
	Total	Avg per Year		PD ^a	PI ^b	F ^c	CM ^d	RE ^e	SS ^f	HO ^g	Ped ^h	Other
Route 16 at Hillside Rd/ Boylston St	4	1.33	0.20	2	2	0	3	0	0	0	0	1
Route 16 at Adams St	5	1.67	0.26	5	0	0	1	2	1	0	0	1
Route 16 at Upland Rd/ Dexter Ave	10	3.33	0.32	7	3	0	2	1	0	1	1	1
Route 16 at Melendy Ave	7	2.33	0.31	5	1	0	3	1	0	0	0	3
Route 16 at Lloyd Rd/Elton Ave	10	3.33	0.44	7	3	0	0	4	2	0	3	1
Route 16 at Irma Ave	5	1.67	0.23	4	1	0	2	0	1	0	0	2
Route 16 at Kimball Rd/ Bigelow Ave	21	7.00	0.85	16	5	0	1	7	8	0	2	3
Route 16 at Templeton Pkwy	2	0.67	0.09	2	0	0	0	0	0	0	0	2
Route 16 at Arlington St	17	5.67	0.38	12	5	0	4	6	4	1	0	2
Route 16 at Prentiss St/Tufts Medical Center Driveway	1	0.33	0.05	1	0	0	1	0	0	0	0	0
Route 16 at Keenan St	3	1.00	0.15	2	1	0	0	2	0	0	0	1
Route 16 at School Ln	2	0.67	0.10	1	0	1	1	0	0	0	1	0
Route 16 at Francis St	1	0.33	0.05	0	1	0	0	0	0	0	0	1
Route 16 at Norseman Ave	1	0.33	0.05	1	0	0	0	1	0	0	0	0
Route 16 at St. Mary St	2	0.67	0.10	2	0	0	0	0	1	0	0	1
Route 16 at Pietri Terrace	2	0.67	0.10	2	0	0	1	1	0	0	0	0
Route 16 at Cottage St	3	1.00	0.15	1	2	0	0	1	0	0	1	0
Route 16 at Belmont St	3	1.00	0.08	3	0	0	0	0	0	0	0	3
Arlington St at Grove St	8	2.67	0.27	4	4	0	4	1	2	0	0	1
Arlington St at Wells Ave	2	0.67	0.15	1	1	0	1	1	0	0	0	0
Arlington St at Merrifield Ave	4	1.33	0.29	2	2	0	1	1	0	0	0	2
Mount Auburn Street – Unknown Location	12	4	--	12	0	0	1	7	3	0	0	1
Total	214	71.33	--	149	63	1	47	65	36	8	12	41

^aProperty Damage Only; ^bPersonal Injury; ^cFatality; ^dCross Movement (or angle); ^eRear End; ^fSideswipe; ^gHead-on; ^hPedestrian/Bicycle

To evaluate the crashes at an intersection effectively, the number of crashes must relate or be compared to the traffic volumes entering the intersection. A procedure used for this purpose is the calculation of an intersection crash rate, which is a measure of the frequency of crashes compared to the intersection traffic volumes. The crash rate is based on crashes per million

entering vehicles (C/MEV). MassDOT releases official Statewide and District rates that can be used as an effective tool to compare safety hazards at a specific intersection. The latest Statewide and District 4 rates for unsignalized intersections are 0.62 and 0.59 C/MEV, respectively. For signalized intersections, the Statewide and District 4 rates are 0.82 and 0.78 C/MEV, respectively. Crash rates higher than these averages could indicate a potential safety issue. The crash rate worksheets have been provided in the *Technical Appendix*. The results over the three year review period indicate the crash rates at one intersection within the study area, Route 16 at Kimball Road and Bigelow Avenue, experienced a crash rate greater than the Statewide and District 4 averages for signalized intersections.

2.4 Traffic Signal Warrants

A traffic signal warrants analysis was conducted for each of the study area unsignalized intersections using traffic volume data collected for this study. A traffic signal warrants analysis is used to help determine if a traffic signal installation is justified at an intersection. Traffic signal warrants are defined in the Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition published by Federal Highway Administration. The MUTCD specifies minimum requirements for any of eight (8) different warrants under which a traffic signal may be installed at an intersection. Traffic control signals should not be installed unless one or more of the warrants in the MUTCD are satisfied. The satisfaction of a warrant or warrants is not in itself justification for a signal installation. It also needs to be determined that a traffic signal will improve the overall safety and/or operation of the intersection.

Detailed traffic signal warrant analyses were conducted based on existing traffic volumes at each of the unsignalized study area intersections. Based on the analyses, the Route 16 intersection with Boylston Street and the Arlington Street intersections with Grove Street and the Tufts Medical Center driveway all meet Warrant 3 (peak hour) under Existing traffic volume conditions. Therefore traffic signals installation may be warranted at these locations and consequently, traffic signal control shall be investigated as part of the alternatives analysis for this report. The warrant analysis worksheets are provided in the *Technical Appendix*.

2.5 Public Transportation

The Massachusetts Bay Transportation Authority (MBTA) operates a trackless trolley route (Route 71, Watertown Square – Harvard Station via Mount Auburn Street) along Route 16 between Watertown Square and the Harvard MBTA Rapid Transit station in Cambridge. As of Fall 2006, the most recent data available, this route has an average weekday daily ridership of 5,378 (2,734 inbound and 2,644 outbound), and an average Saturday daily ridership of 2,501 (1,252 inbound and 1,249 outbound). Average weekday boardings at each stop within the study area are given in Table 4. Schedule, fare, and ridership information is provided in the *Technical Appendix*.

TABLE 4
Existing MBTA Route 71 Ridership

Trolley Stop	Inbound			Outbound		
	Boardings	Alightings	Total	Boardings	Alightings	Total
Summer Street/Patten Street						
Weekday	111	5	116	5	139	144
Saturday	83	2	85	0	76	76
Marshall Street/Parker Street						
Weekday	146	10	156	5	162	167
Saturday	75	5	80	2	65	67
Russell Avenue/Franklin Street						
Weekday	97	9	106	5	79	84
Saturday	42	1	43	1	32	33
Bates Road East/Walnut Street						
Weekday	68	9	77	6	69	75
Saturday	17	1	18	1	18	19
Bailey Road/Lincoln Street						
Weekday	13	2	15	1	27	28
Saturday	11	4	15	3	8	11
Amherst Road/Boylston Street						
Weekday	59	20	79	7	42	49
Saturday	31	11	42	12	17	29
Oakley Road						
Weekday	20	7	27	14	42	56
Saturday	7	2	9	3	12	15
Adams Avenue/Chauncey Street						
Weekday	73	18	91	10	47	57
Saturday	15	5	20	6	28	34
Winsor Avenue/School Street						
Weekday	106	55	161	26	99	125
Saturday	72	8	80	10	62	72
Upland Road/Adams Street						
Weekday	150	51	201	29	90	119
Saturday	69	23	92	10	34	44
Lloyd Road						
Weekday	--	--	--	47	86	133
Saturday	--	--	--	22	44	66
Kimball Road/Bigelow Avenue						
Weekday	290	73	363	41	230	271
Saturday	160	39	199	44	120	162
Keenan Street						
Weekday	182	35	217	32	143	175
Saturday	30	1	31	9	40	49
St. Marys Street/Ralph Pietri Terrace						
Weekday	70	30	100	26	32	58
Saturday	18	26	44	3	14	17
<i>Total</i>						
<i>Weekday</i>	<i>1,385</i>	<i>324</i>	<i>1,709</i>	<i>254</i>	<i>1,287</i>	<i>1,541</i>
<i>Saturday</i>	<i>630</i>	<i>128</i>	<i>758</i>	<i>126</i>	<i>570</i>	<i>696</i>

It is important to note that the trackless trolley provides service via suspended wires located along Route 16. These wires provide the electricity necessary to operate the trolley bus and, as such, play a critical role in any reconstruction alternatives. Bearing this in mind all geometric improvements suggested within this corridor have taken this very specific constraint into account.

Additionally, Route 71 is one of fifteen routes identified by the MBTA as a “Key Bus Route.” These routes are characterized by high ridership and high service frequency seven days a week. Under its Key Bus Route Improvement Program, the MBTA plans on implementing Bus Rapid Transit (BRT) elements to service along Route 71, potentially including transit signal priority, queue jump lanes, stop consolidation, curb extensions, and accessibility enhancements. Coordination with MBTA will be crucial to ensure the proposed roadway reconstruction will accommodate potential transit improvements.

2.6 Pedestrian Accommodations

Crosswalks are marked across all stop-controlled street approaches throughout the study area, and at least one crosswalk is provided to cross Mount Auburn Street at each signalized intersection in the study area. Additionally, two signalized mid-block pedestrian crossings are provided between Stearns Road and Oakley Road and between Ralph Pietri Terrace and Cottage Street, and crosswalks are marked across Mount Auburn Street at the unsignalized intersections with Russell Avenue, Winthrop Street, Winsor Avenue, Adams Street, Lloyd Road/Elton Ave, and Keenan Street. The crosswalk at Lloyd Road/Elton Ave is a standard (MUTCD) crosswalk with solid red-toned paving material. This crosswalk has a “Yield Here to Pedestrians” sign (MUTCD R1-5) in the center of Mount Auburn Street to warn drivers of pedestrians crossing the roadway. All signalized pedestrian crossings are equipped with pedestrian push buttons, pedestrian signal heads, and an exclusive pedestrian phase for all crossings.

2.7 Parking

Within the Coolidge Square area east of Hillside Road, most of the parking is posted for short term use, for visitors and patrons of local businesses. There is a smaller demand for long term parking for employees and citizens. The Town expressed great concern over the availability of parking in Coolidge Square and its impact on business. On-street metered parking in the Coolidge Square area currently provides fifty-six parking spaces. Currently, metered parking is provided along the south side of Route 16 from Boylston Street/Hillside Road to Arlington Street and along the north side from Lloyd Road to Kimball Road. One hour unmetered parking is permitted between the hours of 7:00 AM and 7:00 PM along both sides of Arlington Street from Wells Avenue to Merrifield Avenue.

Similarly, on-street metered parking is provided along both sides of Route 16 in the Watertown Square area between Baptist Walk/Taylor Street and Summer Street and along the south side of

Route 16 between Summer Street and Patten Street for businesses in the Watertown Square area. Within the study area east of Summer Street, two metered parking spaces are provided along the south side of Route 16 with a time limit of two hours.

Between Patten Street and Hillside Road, parking is generally permitted along the south side of Route 16. Based on observations of existing parking regulation signs, parking is unrestricted except at the following locations:

- Parker Street to Otis Street, one hour
- Otis Street to Walnut Street, two hours
- Lincoln Street to Spruce Street, two hours
- Adams Avenue to Chauncey Street, one hour
- School Street to Boylston Street/Hillside Road, one hour.

None of the conceptual alternatives developed as a part of this feasibility study would negatively impact parking in the study area. Therefore, a detailed parking inventory was not performed as a part of this study.

3.0 FUTURE CONDITIONS

In this section, existing traffic volumes are projected to a future design year and then evaluated under alternative conditions to arrive at proposed optimal improvements. The development and analysis of these future traffic flows are described in the following sections.

3.1 Traffic Volume Projections

In order to assess the potential traffic impacts occurring within the future, existing traffic volumes were projected to a future design year. A twenty-year (2030) traffic projection was utilized on the study area roadways. Traffic increases along the study area roadways are associated with normal traffic growth patterns as well as other currently planned development projects.

Traffic growth on area roadways is a function of the expected land development in the immediate area, as well as the surrounding region. Several methods are used to estimate this growth. To develop the twenty-year forecast, two components of traffic growth were considered; traffic generated by both background growth and planned projects.

First, an annual-average traffic-growth percentage was determined. Based on a review of MassDOT historical traffic volume data at several locations within the Town of Watertown, traffic volumes over a ten year period were shown to decrease at a rate of 4.7 percent per year. To present a conservative analysis, a 0.5 percent per year compounded annual growth rate was used to account for general background traffic growth.

Second, any planned or approved specific developments were included that would generate a significant volume of traffic on study area roads within the next five years. Based on discussions with officials from the Town of Watertown, there are several projects planned that will add traffic to the study area in the near future:

- Coolidge School Residential Development, Watertown, MA. This project is comprised of the construction of a 38-unit residential apartment development. Traffic volumes associated with this project were assumed to be accounted for by the background growth rate.
- Potential Aggregate Site Residential Development, Watertown, MA. This potential project is consists of the construction of a residential development located off Grove Street. At this time, no formal plans have been generated for this development. Therefore traffic volumes associated with this project were assumed to be accounted for by the background growth rate.

- Potential Natalia Building Redevelopment, Watertown, MA. This potential project is consists of the redevelopment of the currently vacant Natalia Building. Again, no formal plans have been generated for this development, traffic volumes associated with this project were assumed to be accounted for by the background growth rate.

The 2030 Future Year peak-hour traffic flow networks are represented on Figure 3 for the weekday morning and evening peak hours.

3.2 Traffic Operations and Queue Analysis

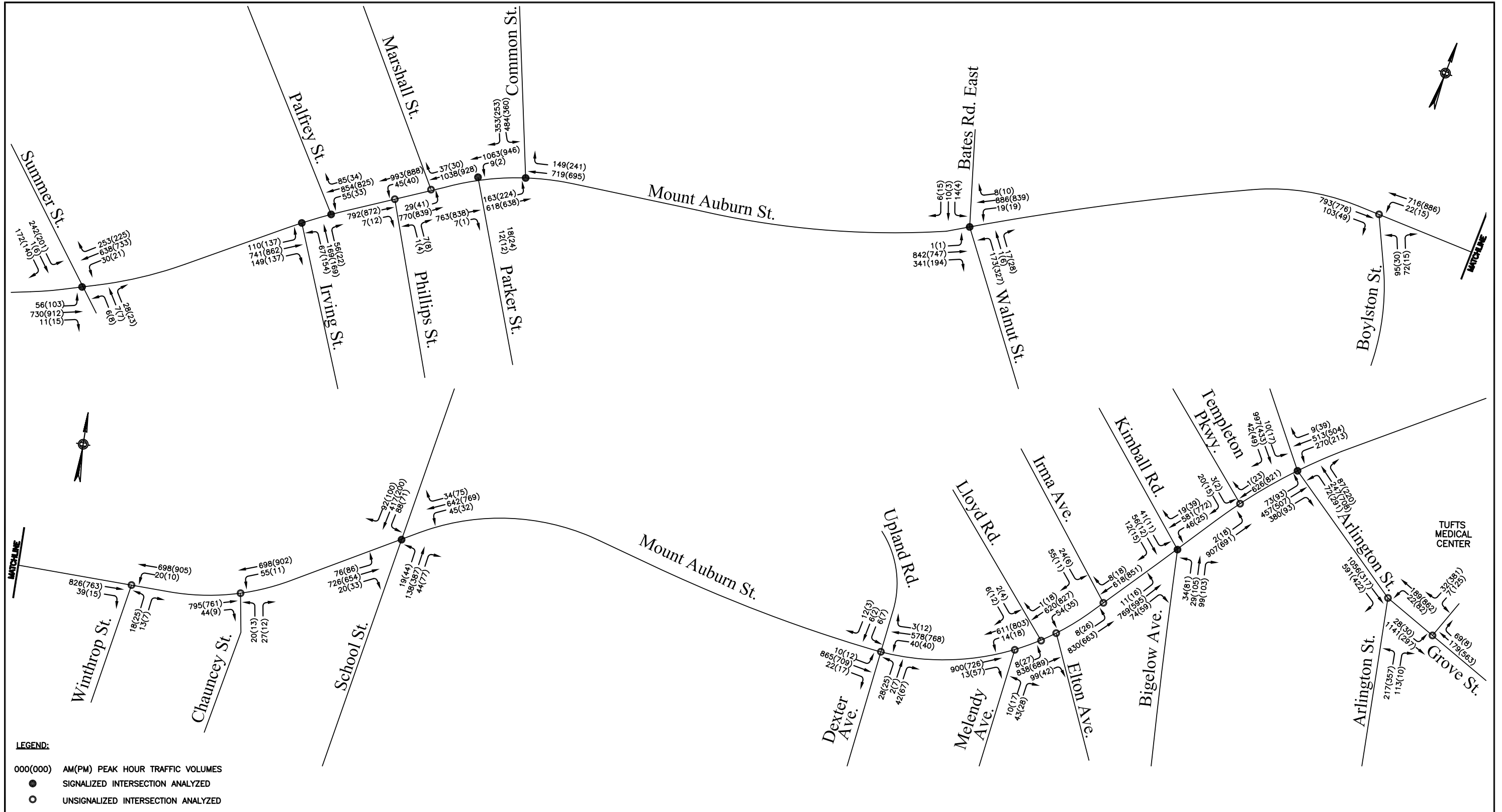
Existing peak hour traffic operations in the traffic study area were assessed from both a quantitative and qualitative perspective. The qualitative analysis is based on field observations made during peak traffic periods, while the quantitative analysis is based on calculated intersection operating levels of service as described in greater detail below.



Capacity Analysis Methodology

The capacity analysis methodology is based on the concepts and procedures described in the “Highway Capacity Manual” (HCM), 2000, Transportation Research Board, Washington, DC. A capacity analysis is used to assess the quality of traffic operations on a roadway or intersection as a result of traffic volume demands placed on the respective facility. The primary result of a capacity analysis is a level of service (LOS) assignment to the traffic operations of the respective facility. A LOS analysis results in assigning a letter index of A through F to describe the quality of traffic operations at a facility in terms of such factors as speed, traffic interruptions, freedom to maneuver, comfort, convenience and safety. The six letter designations of A through F define the operating conditions from best to worst, respectively. In general, a LOS C is used as the minimum design criteria although D is acceptable at urban, high volume locations.

LOS for either signalized or unsignalized intersections can be computed by the described methodology. LOS for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption and lost travel time. The delay experienced by a motorist is made of factors that relate to intersection control, geometrics and traffic volumes. This delay is called “control delay” or “signal delay”. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. Specifically, LOS criteria at an intersection with traffic signals are stated in terms of the average control delay per vehicle.

The LOS for an unsignalized intersection (two-way stop control) is defined for each minor movement, not for the intersection as a whole. The LOS criteria for the unsignalized intersections are somewhat different from the criteria for the signalized intersections. The primary reason for the difference is that motorists expect different levels of performance from the two facilities. Due to these expectations, the control delay threshold for any given LOS is less for an unsignalized intersection than it is for a signalized intersection. Table 5 summarizes the LOS criteria associated with the letter index and the relationship between signalized and



PREPARED FOR: 	MOUNT AUBURN STREET (ROUTE 16) CORRIDOR FEASIBILITY STUDY 2030 Design Year Traffic Volumes		PREPARED BY:  300 TRADE CENTER, SUITE 5580 WOBURN, MASSACHUSETTS 01801 PHONE: 781.933.4800 FAX: 781.933.4801	DATE: 1-11-2011	Figure 3
				SCALE: 1" = 250'	

unsignalized intersections. The LOS delay criteria may be applied to individual lane groups, to individual intersection approaches or to the entire signalized or unsignalized intersections.

TABLE 5
Intersection Level of Service Criteria ¹

Level of Service	Average Stopped Delay per Vehicle (seconds)	
	Signalized Intersection	Unsignalized Intersection
A	0 - 10	0 - 10
B	>10 - 20	>10 - 15
C	>20 - 35	>15 - 25
D	>35 - 55	>25 - 35
E	>55 - 80	>35 - 50
F	>80	>50

¹ 2000 *Highway Capacity Manual*, Transportation Research Board, Washington, DC.

Level of Service Analyses

Level of Service (LOS) analyses were performed for the study area intersections under various conditions to arrive at proposed optimal improvements. The unsignalized and signalized intersection methodology was used to evaluate the various alternatives. To reiterate, the unsignalized intersection methodology evaluates only the conflict movements, that is, the major street left turns and the minor street approaches. It does not assign a LOS to the intersection as a whole.

Existing Queues

In addition to level of service, a review of the 95th percentile queue lengths was performed during each of the peak hours under existing conditions. While an intersection may show acceptable levels of service, extensive queue lengths may exist that impede operations elsewhere by extending into adjacent intersections or other conflict areas. A description of the critical queues at each intersection location is presented below.

Volume-to-Capacity Ratio

In addition to LOS, another factor to take into consideration when discussing operation is the “volume-to-capacity” ratio. The volume-to-capacity (v/c) ratio is the ratio of the volume travelling in a lane group to the capacity of the same lane group, a percentage of the lane group’s capacity being utilized. As with delay, this measure can be utilized for either the individual approach or the intersection as a whole. As opposed to delay there is no standard gauge to provide a specific point of reference for a certain volume-to-capacity ratio; however a lower volume-to-capacity ratio indicates that backups are less likely. As the v/c ratio approaches 1.0, the operation worsens since the facility is reaching capacity. A volume-to-capacity ratio of 1.0 or greater indicates traffic volumes are exceeding capacity. Generally speaking, a volume-to-capacity ratio under 1.0 is considered acceptable.

The various conditions and results are discussed below. The analysis work sheets are provided in the Appendix.

3.3 Existing Conditions Analyses

Tables 6 and 7 summarize the results of the Existing 2010 and Design Year 2030 traffic operational analysis assuming existing roadway and intersection geometry. For future conditions, it was assumed that existing signal equipment and phasing would remain, but signal timing would be optimized and pedestrian intervals would be adjusted to comply with the latest MUTCD standards.

With the existing roadway and intersection geometry, all of the unsignalized study area intersections are operating at acceptable levels of service under both existing and future traffic volumes with the exceptions of the Route 16 intersections with Boylston Street and Upland Road/Dexter Avenue and the Grove Street intersections with Arlington Street and the Tufts Medical Center driveway. Under existing conditions, the signalized study area intersections are operating at acceptable levels of service under existing conditions with the exception of the Route 16 intersections with Common Street, School Street, and Arlington Street. Under future 2030 conditions, six of the eight study area signalized intersections – Route 16 at Summer Street, Irving Street/Palfrey Street, Parker Street, Kimball Road/Bigelow Avenue, and Arlington Street - would have at least one movement operating at an unacceptable level of service. Due to improvements in signal timing that were assumed in the future conditions analysis, the Route 16 intersections at Common Street and School Street would operate at acceptable levels of service in design year 2030. A detailed description of present and future operations at each study area intersection follows.

At the Route 16 intersection with Common Street, all movements operate at acceptable levels of service during the morning peak hour under Existing 2010 traffic conditions, although v/c ratios are close to 1.0 along the eastbound and westbound approaches, indicating near-capacity conditions, and 95th percentile vehicle queues range from 331 to 563 feet (13 to 23 vehicles) along each approach, blocking adjacent intersections along Route 16. During the evening peak hour, the westbound approach operates at LOS E with a v/c ratio of 0.95, indicating near-capacity conditions, and 95th percentile vehicle queues on all approaches range from 358 to 409 feet (14 to 16 vehicles). Under future 2030 traffic volumes, the eastbound and westbound approaches would worsen to LOS E during the morning peak hour, with 95th percentile queues extending 490 feet (approximately 20 vehicles) along the eastbound approach and 403 feet (approximately 16 vehicles) along the westbound approach. The southbound approach would operate at acceptable LOS D, but 95th percentile queues would extend up to 631 feet (approximately 25 vehicles). All approaches operate with acceptable levels of service during the evening peak hour under Existing 2010 and future 2030 traffic conditions.

At the Route 16 intersection with Boylston Street, the northbound approach operates at LOS F during the morning peak hour under Existing 2010 traffic conditions, with the v/c ratio

exceeding 1.0 and 95th percentile vehicle queues of 421 feet (approximately 17 vehicles). Under future 2030 traffic volumes, the northbound approach would continue to operate at LOS F during the morning peak hour, with 95th percentile queues extending 554 feet (approximately 22 vehicles). All approaches operate with acceptable levels of service during the evening peak hour under Existing 2010 and future 2030 traffic conditions.

At the Route 16 intersection with School Street, the southbound approach operates at LOS F during the morning peak hour under Existing 2010 traffic conditions, with the v/c ratio exceeding 1.0 and 95th percentile vehicle queues of 645 feet (approximately 26 vehicles). During the evening peak hour, all movements operate at acceptable LOS, but the northbound and southbound School Street approaches have 95th percentile vehicle queues of 534 feet and 390 feet (approximately 21 and 16 vehicles), respectively. Under future 2030 traffic volumes, the southbound approach would continue to operate at LOS F during the morning peak hour, with 95th percentile queues extending 736 feet (approximately 30 vehicles), and both the northbound and southbound approaches operate at LOS E during the evening peak hour, with v/c ratios of 1.00 and 0.99 and 95th percentile queues of 613 feet and 459 feet (25 and 18 vehicles), respectively. The eastbound and westbound Route 16 approaches operate at acceptable LOS during the peak hours under Existing 2010 and future 2030 traffic volumes.

At the Route 16 intersection with Upland Road and Dexter Avenue, all approaches are operating with acceptable levels of service under Existing 2010 traffic conditions. Under future 2030 traffic volumes, the northbound approach operates at LOS E during the morning peak hour and the southbound approach operates at LOS E during the evening peak hour. Under existing and future conditions, 95th percentile vehicle queues at this location are relatively short (two to three vehicles) and v/c ratios are less than 0.50 on all four approaches during both peak hours, indicating available capacity.

The Route 16 signalized intersection with Arlington Street operates at poor levels of service under Existing 2010 conditions. During the morning peak hour, the westbound left-turn movement and southbound approach each operate at LOS F with v/c ratios exceeding 1.0. During the evening peak hour, all northbound and southbound movements operate at LOS F with v/c ratios exceeding 1.0. Under future 2030 conditions, intersection operations are expected to worsen, with the eastbound shared through/right-turn lane also operating at LOS F during the morning peak hour.

At the Arlington Street intersection with Grove Street, the Arlington northeast-bound approach is under stop-control. Under Existing 2010 and future 2030 traffic volume conditions, this approach operates with poor levels of service (LOS E/F) during the morning and evening peak hours. Operations are particularly poor during the evening peak hour where the v/c ratio far exceeds 1.0 and vehicle queues extend beyond available storage, backing past adjacent intersections. This is expected with high left-turn volumes (more than 300 during the evening peak hour) turning onto Arlington Street and few gaps available in the opposing Arlington Street/Grove Street through traffic.

At the Grove Street intersection with the Tufts Medical Center driveway, the Medical Center driveway westbound approach operates poorly (LOS E/F) during the evening peak hour during existing and future analysis scenarios. Under both scenarios, the westbound right-turn queues exceed available capacity at the driveway and the v/c ratio exceeds 1.0. The poor operations at this location are due to the low peak hour factor during the evening peak hour, most likely due to employees leaving the facility at the same time.

TABLE 6
Unsignalized Intersection Level of Service Summary

Intersection/Peak Period/Movement	2010 Existing Conditions				2030 Design Year Conditions			
	v/c ^a	Delay ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue
Route 16 at Phillips Street								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB TR	0.32	0.0	A	0	0.35	0.0	A	0
Route 16 WB LT	0.38	1.6	A	4	0.41	1.7	A	4
Phillips Street NB LR	0.02	10.2	B	1	0.02	9.9	A	1
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB TR	0.32	0.0	A	0	0.35	0.0	A	0
Route 16 WB LT	0.34	1.5	A	3	0.38	1.6	A	4
Phillips Street NB LR	0.04	10.5	B	3	0.04	10.5	B	3
Route 16 at Marshall Street								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB LT	0.31	1.7	A	3	0.34	1.7	A	4
Route 16 WB TT	0.39	0.0	A	0	0.43	0.0	A	0
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB LT	0.31	1.7	A	4	0.34	1.8	A	4
Route 16 WB TR	0.36	0.0	A	0	0.40	0.0	A	0
Route 16 at Boylston Street								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB TR	0.31	0.0	A	0	0.34	0.0	A	0
Route 16 WB LT	0.27	1.1	A	1	0.30	1.1	A	2
Boylston Street NB LR	1.26	179.7	F	421	1.44	254.8	F	541
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB TR	0.28	0.0	A	0	0.31	0.0	A	0
Route 16 WB LT	0.34	0.6	A	1	0.37	0.7	A	1
Boylston Street NB LR	0.22	23.8	C	20	0.26	26.2	D	25

TABLE 6
Unsignalized Intersection Level of Service Summary (Continued)

Intersection/Peak Period/Movement	2010 Existing Conditions				2030 Design Year Conditions			
	v/c ^a	Delay ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue
Route 16 at Winthrop Street								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB TR	0.31	0.0	A	0	0.34	0.0	A	0
Route 16 WB LT	0.27	1.0	A	2	0.29	1.1	A	2
Winthrop Street NB LR	0.18	22.0	C	16	0.22	24.0	C	20
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB TR	0.28	0.0	A	0	0.31	0.0	A	0
Route 16 WB LT	0.35	0.4	A	1	0.39	0.5	A	1
Winthrop Street NB LR	0.13	31.0	C	11	0.16	23.1	C	14
Route 16 at Chauncey Street								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB TR	0.31	0.0	A	0	0.35	0.0	A	0
Route 16 WB LT	0.26	2.6	A	6	0.28	2.9	A	7
Chauncey Street NB LR	0.26	23.0	C	26	0.33	27.3	D	35
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB TR	0.28	0.0	A	0	0.30	0.0	A	0
Route 16 WB LT	0.36	0.5	A	1	0.40	0.5	A	1
Chauncey Street NB LR	0.10	17.1	C	8	0.12	18.8	C	10
Route 16 at Upland Road/Dexter Avenue								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB LTR	0.26	0.3	A	1	0.29	0.3	A	1
Route 16 WB LTR	0.16	1.6	A	4	0.18	1.6	A	4
Dexter Avenue NB LTR	0.36	28.2	D	40	0.38	27.4	D	42
Upland Road SB LTR	0.12	23.3	C	11	0.15	24.8	C	13
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB LT	0.21	0.4	A	1	0.23	0.5	A	1
Route 16 WB LT	0.22	1.3	A	3	0.25	1.4	A	4
Dexter Avenue NB LTR	0.34	23.5	C	37	0.29	18.5	C	30
Upland Road SB LTR	0.13	32.6	D	11	0.11	25.9	D	9
Route 16 at Melendy Avenue								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB TR	0.34	0.0	A	0	0.38	0.0	A	0
Route 16 WB LT	0.23	0.8	A	1	0.25	0.9	A	2
Melendy Avenue NB LR	0.13	15.2	C	11	0.16	16.8	C	14
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB TR	0.28	0.0	A	0	0.31	0.0	A	3
Route 16 WB LT	0.31	0.8	A	2	0.34	0.9	A	2
Melendy Avenue NB LR	0.12	16.2	C	10	0.15	18.2	C	13

TABLE 6
Unsignalized Intersection Level of Service Summary (Continued)

Intersection/Peak Period/Movement	2010 Existing Conditions				2030 Design Year Conditions			
	v/c ^a	Delay ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue
Route 16 at Lloyd Road								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB LT	0.35	0.4	A	1	0.39	0.4	A	1
Route 16 WB TR	0.23	0.0	A	0	0.26	0.0	A	0
Lloyd Road SB LR	0.04	15.1	C	3	0.04	15.3	C	3
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB LT	0.27	1.3	A	3	0.30	1.6	A	4
Route 16 WB TR	0.30	0.0	A	0	0.33	0.0	A	0
Lloyd Road SB LR	0.08	15.0	C	6	0.09	16.2	C	7
Route 16 at Elton Avenue								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB TR	0.32	0.0	A	0	0.36	0.0	A	0
Route 16 WB LT	0.23	2.7	A	5	0.25	3.0	A	7
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB TR	0.25	0.0	A	0	0.28	0.0	A	0
Route 16 WB LT	0.32	1.4	A	3	0.35	1.5	A	3
Route 16 at Irma Avenue								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB LT	0.32	0.1	A	1	0.35	0.3	A	1
Route 16 WB TR	0.25	0.0	A	0	0.28	0.0	A	0
Irma Avenue SB LR	0.25	14.1	B	20	0.25	15.4	C	25
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB LT	0.25	1.3	A	2	0.25	1.3	A	3
Route 16 WB TR	0.34	0.0	A	0	0.37	0.0	A	0
Irma Avenue SB LR	0.05	13.8	B	4	0.07	15.6	C	5
Route 16 at Templeton Parkway								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB LT	0.36	0.1	A	0	0.40	0.1	A	0
Route 16 WB TR	0.23	0.0	A	0	0.26	0.0	A	0
Templeton Parkway SB LR	0.03	9.6	A	3	0.03	9.6	A	3
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB LT	0.26	0.8	A	1	0.29	0.9	A	2
Route 16 WB TR	0.31	0.0	A	0	0.35	0.0	A	0
Templeton Parkway SB LR	0.03	10.4	B	2	0.03	10.1	B	2

TABLE 6
Unsignalized Intersection Level of Service Summary (Continued)

Intersection/Peak Period/Movement	2010 Existing Conditions				2030 Design Year Conditions			
	v/c ^a	Delay ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue
<i>Arlington Street at Grove Street</i>								
<i>Weekday Morning Peak Hour:</i>								
Arlington Street EB T	0.60	0.0	A	0	0.67	0.0	A	0
Arlington Street EB R	0.34	0.0	A	0	0.37	0.0	A	0
Grove Street WB L	0.04	12.2	B	3	0.06	14.0	B	0
Grove Street WB T	0.11	0.0	A	0	0.12	0.0	A	0
Arlington Street NB L	2.13	591.2	F	560	3.49	*	F	#
Arlington Street NB R	0.55	35.7	E	77	0.78	68.1	F	135
<i>Weekday Evening Peak Hour:</i>								
Arlington Street EB T	0.20	0.0	A	0	0.22	0.0	A	0
Arlington Street EB R	0.26	0.0	A	0	0.29	0.0	A	0
Grove Street WB L	0.07	8.1	A	6	0.09	8.3	A	7
Grove Street WB T	0.57	0.0	A	0	0.63	0.0	A	0
Arlington Street NB L	3.64	*	F	#	5.17	*	F	#
Arlington Street NB R	0.02	9.8	A	1	0.02	10.1	B	1
<i>Grove Street at Tufts Medical Center Driveway</i>								
<i>Weekday Morning Peak Hour:</i>								
Grove Street EB LT	0.03	0.9	A	2	0.03	1.2	A	0
Grove Street WB TR	0.16	0.0	A	0	0.17	0.0	A	0
Tufts Medical Center driveway SB L	0.07	42.0	E	5	0.13	68.4	F	10
Tufts Medical Center driveway SB R	0.05	10.3	B	4	0.05	10.5	B	4
<i>Weekday Evening Peak Hour:</i>								
Grove Street EB LT	0.32	0.03	A	2	0.04	1.2	A	3
Grove Street WB TR	0.32	0.0	A	0	0.35	0.0	A	0
Tufts Medical Center driveway SB L	0.62	36.2	E	94	0.78	57.3	F	142
Tufts Medical Center driveway SB R	0.97	58.2	F	322	1.15	114.7	F	502

^aVolume to Capacity Ratio

^bAverage Delay Time in Seconds

^cLevel-of-Service

^dQueue Length in Feet.

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound;

L = Left Turn; T = Through; R = Right Turn; LT = Shared Left-turn/Thorough; TR Shared Through/Right-turn; LR = Shared Left/Right-turn; LTR = Shared Left/Through/Right-turn.

NC = No Capacity

* - Delay not calculated

- 95th percentile volume exceeds capacity; reported queues may not be accurate

Bold/Italic Type indicates v/c ≥ 0.90, LOS E or F, 95th percentile volume exceeds capacity

TABLE 7
Signalized Intersection Level of Service Summary

Intersection/Peak Period/Movement	2010 Existing Conditions				2030 Design Year Conditions			
	v/c ^a	Delay ^b	LOS ^c	Queue ^d 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th
Route 16 at Irving Street/Palfrey Street								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB LTR	0.61	10.8	B	114/265	0.77	17.5	B	187/457#
Route 16 WB LTR	0.49	9.0	A	98/223	0.59	12.4	B	147/322
Irving Street NB LTR	0.75	36.7	D	151/276#	0.75	38.3	D	189/385#
Overall	0.65	13.7	B	--	0.77	18.4	B	--
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB LTR	0.75	16.9	B	204/535#	0.88	28.9	C	417/733#
Route 16 WB LTR	0.43	10.6	B	273/175	0.48	14.1	B	197/322
Irving Street NB LTR	0.75	40.0	D	305/368	0.81	57.3	E	376/651#
Overall	0.75	18.5	B	--	0.86	28.4	C	--
Route 16 at Parker Street								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB TR	0.58	25.6	C	211/234	0.54	29.1	C	312/321
Route 16 WB LT	0.49	2.3	A	6/30	0.48	1.1	A	7/22
Parker Street NB LR	0.24	50.0	D	10/29	0.70	145.7	F	17/52#
Overall	0.51	13.5	B	--	0.51	16.3	B	--
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB TR	0.50	24.0	C	177/233	0.56	21.6	C	136/293
Route 16 WB LT	0.43	2.2	A	5/30	0.54	3.1	A	5/m38
Parker Street NB LR	0.21	48.1	D	8/36	0.12	37.2	D	6/38
Overall	0.44	12.8	B	--	0.48	12.0	B	--
Route 16 at Common Street								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB LT	0.99	39.5	D	326~/365#	0.97	34.4	C	223~/61#
Route 16 WB TR	0.90	48.7	D	255/331	0.77	48.5	D	410/492
Common Street SB L	0.76	37.7	D	238/563#	0.82	53.3	D	423/840#
Common Street SB R	0.63	33.1	C	164/408#	0.68	45.4	D	289/597#
Overall	0.88	41.5	D	--	0.84	44.0	D	--
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB LT	0.83	20.2	C	172~/376#	0.63	22.7	C	134/303#
Route 16 WB TR	0.95	55.1	E	277/358#	0.96	49.6	D	235/528#
Common Street SB L	0.58	30.9	C	171/409#	0.87	47.2	D	172/452#
Common Street SB R	0.46	28.5	C	114/277#	0.70	34.2	C	115/308#
Overall	0.78	36.7	D	--	0.87	38.5	D	--

TABLE 7
Signalized Intersection Level of Service Summary (Continued)

Intersection/Peak Period/Movement	2010 Existing Conditions				2030 Design Year Conditions			
	v/c ^a	Delay ^b	LOS ^c	Queue ^d 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th
Route 16 at Bates Road East/Walnut Street								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB LT	0.60	13.3	B	72/275#	0.61	14.6	B	102/289#
Route 16 EB R	0.53	14.7	B	40/232#	0.53	15.5	B	52/243#
Route 16 WB LTR	0.62	13.5	B	72/281#	0.63	14.9	B	102/312#
Walnut Street NB LTR	0.61	17.8	B	107/295	0.70	25.4	C	66/173#
Bates Road East SB LTR	0.08	12.9	B	5/24	0.08	16.2	B	7/34
Overall	0.55	14.0	B	--	0.66	15.9	B	--
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB LT	0.45	14.2	B	82/248	0.56	18.7	B	120/271
Route 16 EB R	0.26	13.0	B	26/121	0.31	16.8	B	37/128
Route 16 WB LTR	0.57	15.7	B	107/324#	0.70	21.5	C	158/388#
Walnut Street NB LTR	0.79	28.7	C	253/295	0.81	29.6	C	132/386#
Bates Road East SB LTR	0.03	14.9	B	2/14	0.03	14.8	C	2/16
Overall	0.62	17.3	B	--	0.75	21.5	C	--
Route 16 at School Street								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB LTR	0.63	17.4	B	135/280	0.90	46.3	D	358/600#
Route 16 WB LTR	0.49	15.1	B	101/227	0.68	33.2	C	253/433
School Street NB LTR	0.45	24.4	C	81/163	0.36	27.4	C	135/222
School Street SB LTR	1.07	85.2	F	264~/645#	0.89	50.8	D	461/893#
Overall	0.80	33.9	C	--	0.89	41.6	D	--
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB LTR	0.56	16.4	B	105/240	0.72	28.3	C	221/461#
Route 16 WB LTR	0.56	16.0	B	133/282	0.63	24.8	C	265/479
School Street NB LTR	0.89	44.3	D	213/534#	0.87	46.7	D	351/699#
School Street SB LTR	0.83	41.7	D	144/390#	0.84	46.8	D	239/516#
Overall	0.69	25.7	C	--	0.78	33.5	C	--
Route 16 at Kimball Road/Bigelow Avenue								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB LTR	0.49	10.8	B	126/285	0.54	12.9	B	181/393
Route 16 WB LTR	0.37	9.4	A	80/203	0.42	6.9	A	57/m85
Bigelow Avenue NB LTR	0.78	54.8	D	141/171	0.86	72.5	E	194/201
Kimball Road SB LTR	0.51	41.3	D	76/120	0.60	51.7	D	105/142
Overall	0.56	17.4	B	--	0.61	20.3	C	--
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB LTR	0.40	13.8	B	102/195	0.43	16.3	B	153/332
Route 16 WB LTR	0.46	14.5	B	131/244	0.50	13.9	B	156/208
Bigelow Avenue NB LTR	0.71	39.0	D	192/296#	0.88	67.1	E	293/326
Kimball Road SB LTR	0.08	27.4	C	15/34	0.10	37.2	D	21/38
Overall	0.55	19.1	B	--	0.62	25.1	C	--

TABLE 7
Signalized Intersection Level of Service Summary (Continued)

Intersection/Peak Period/Movement	2010 Existing Conditions				2030 Design Year Conditions			
	v/c ^a	Delay ^b	LOS ^c	Queue ^d 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th
Route 16 at Arlington Street								
<i>Weekday Morning Peak Hour:</i>								
Route 16 EB L	0.37	39.8	D	39/82	0.45	46.7	D	58/m90
Route 16 EB TR	0.89	54.6	D	207/315#	1.12	117.5	F	376~/497#
Route 16 WB L	1.28	190.2	F	150~/313#	1.16	145.9	F	221~/404#
Route 16 WB TR	0.42	28.5	C	132/178	0.46	35.4	D	188/243
Arlington Street NB L	0.44	29.1	C	32/65	0.60	39.6	D	40/75
Arlington Street NB TR	0.52	28.9	C	167/257	0.48	29.6	C	218/312
Arlington Street SB LTR	1.26	167.3	F	483~/612#	1.01	73.2	E	564~/701#
Overall	1.19	96.6	F	--	1.02	78.5	E	--
<i>Weekday Evening Peak Hour:</i>								
Route 16 EB L	0.31	28.8	C	39/103	0.62	53.1	D	80/m111
Route 16 EB TR	0.47	28.9	C	136/237	0.90	58.4	E	278/302
Route 16 WB L	0.52	17.8	B	65/192#	0.69	38.1	D	136/ 497#
Route 16 WB TR	0.31	16.7	B	93/196	0.44	31.7	C	188/307
Arlington Street NB L	1.12	124.3	F	167~/348#	0.72	27.1	C	165/234
Arlington Street NB TR	1.50	270.6	F	864~/1109#	1.07	82.3	F	990~/1255#
Arlington Street SB LTR	1.07	101.1	F	195~/301#	0.63	36.7	D	210/276
Overall	0.89	117.7	F	--	0.96	52.9	D	--

^aVolume to Capacity Ratio

^bAverage Delay Time in Seconds

^cLevel-of-Service

^dQueue Length in Feet.

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound;

L = Left Turn; T = Through; R = Right Turn; LT = Shared Left-turn/Thorough; TR Shared Through/Right-turn; LR = Shared Left/Right-turn; LTR = Shared Left/Through/Right-turn

~/# = 50th/95th percentile volume exceeds capacity; reported queues may not be accurate

m = 95th percentile volume metered by upstream signal

Bold/Italic Type indicates v/c≥0.90, LOS E or F, 50th/95th percentile volume exceeds capacity

3.4 Alternatives Development and Analyses

Three alternatives were developed to potentially reconstruct the Route 16 corridor to provide a more contextual environment, including enhanced pedestrian and bicycle facilities, improved access to businesses along the corridor, and reduced vehicular delays. Each alternative involved providing a single through lane in each direction along Route 16 between Common Street and the Cambridge incorporation limits. West of Common Street, Route 16 carries higher traffic volumes and would retain four travel lanes (two lanes in each direction) under each alternative. Results of the level of service analysis for each alternative with Design Year 2030 traffic, compared with levels of service for Design Year 2030 traffic on existing geometry, is given in Tables 8 and 9 at the conclusion of this section, and detailed analysis results are provided in the *Technical Appendix*.

Although the analysis indicates that some movements would operate at unacceptable levels of service, these are primarily low-volume movements that would cause minor inconveniences but would not affect system operations and/or are movements that would operate less efficiently with existing geometry. Additionally, each alternative was simulated in the SimTraffic microsimulation program to ensure that Design Year 2030 traffic operations would be adequate.

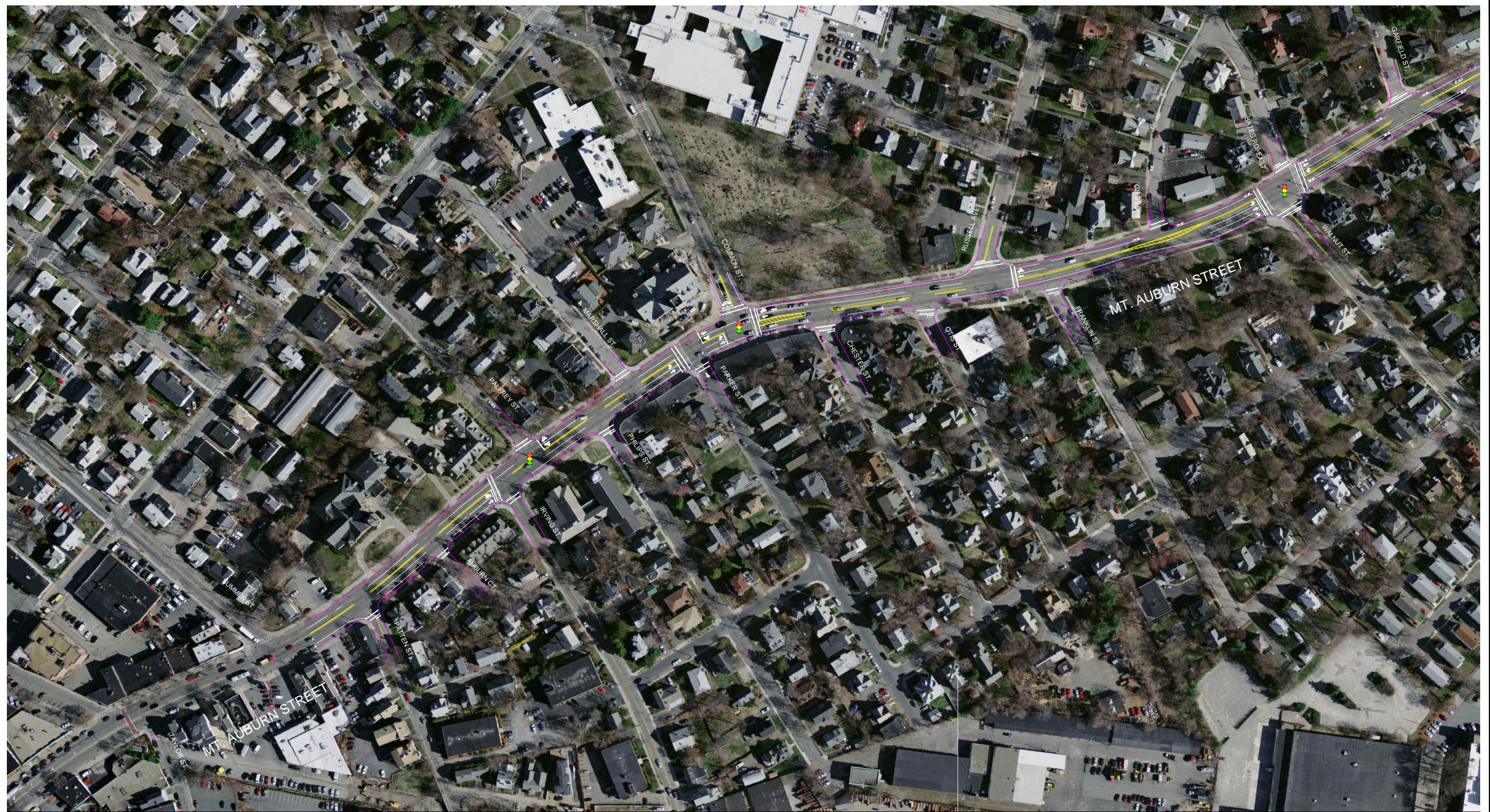
Alternative 1 – Single Through Lane with Left-Turn Pockets

Alternative 1 investigates providing a safer environment for motorists, pedestrians, and bicycles, as well as improving traffic operations for turning movements and minor-street approaches, by restriping Route 16 east of Common Street to consist of one vehicular travel lane and one bicycle lane in each direction with additional turn lanes at key intersections. Also under this alternative, a new traffic signal would be provided at the intersection of Arlington Street with Grove Street, new pedestrian signals would be provided at the intersections of Route 16 with Boylston Street and with Dexter Avenue/Upland Road, and each existing traffic signal would be upgraded or optimized. Curb extensions would be provided at crosswalks wherever possible, and all exclusive pedestrian signal phases would be retimed to comply with the latest MUTCD guidelines for walk, pedestrian clearance, and buffer intervals. West of Common Street, four lanes of travel are required to accommodate Design Year traffic volumes; therefore this segment would remain in its current configuration.

Eliminating one travel lane in each direction improves safety for pedestrians by shortening the crossing distance across Route 16 and improves vehicle safety by allowing left-turning vehicles traveling along Route 16 to be removed from the mainline traffic stream. The specific geometric improvements at each of the study area intersections are described below and depicted on Figures 4a through 4c. The future 2030 peak hour traffic volumes resulting from changes to the roadway network are shown on Figure 5.

Route 16 at Parker Street - This intersection currently operates under signal control. Under Alternative 1, Parker Street would change from a two-way street to one-way southbound, away from Route 16, eliminating the need for a signal. The existing crosswalk across Route 16 would

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TITLE:

Mount Auburn Street Corridor Study Alternative 1 - Two Way Cross Section (Sheet 1 of 3)



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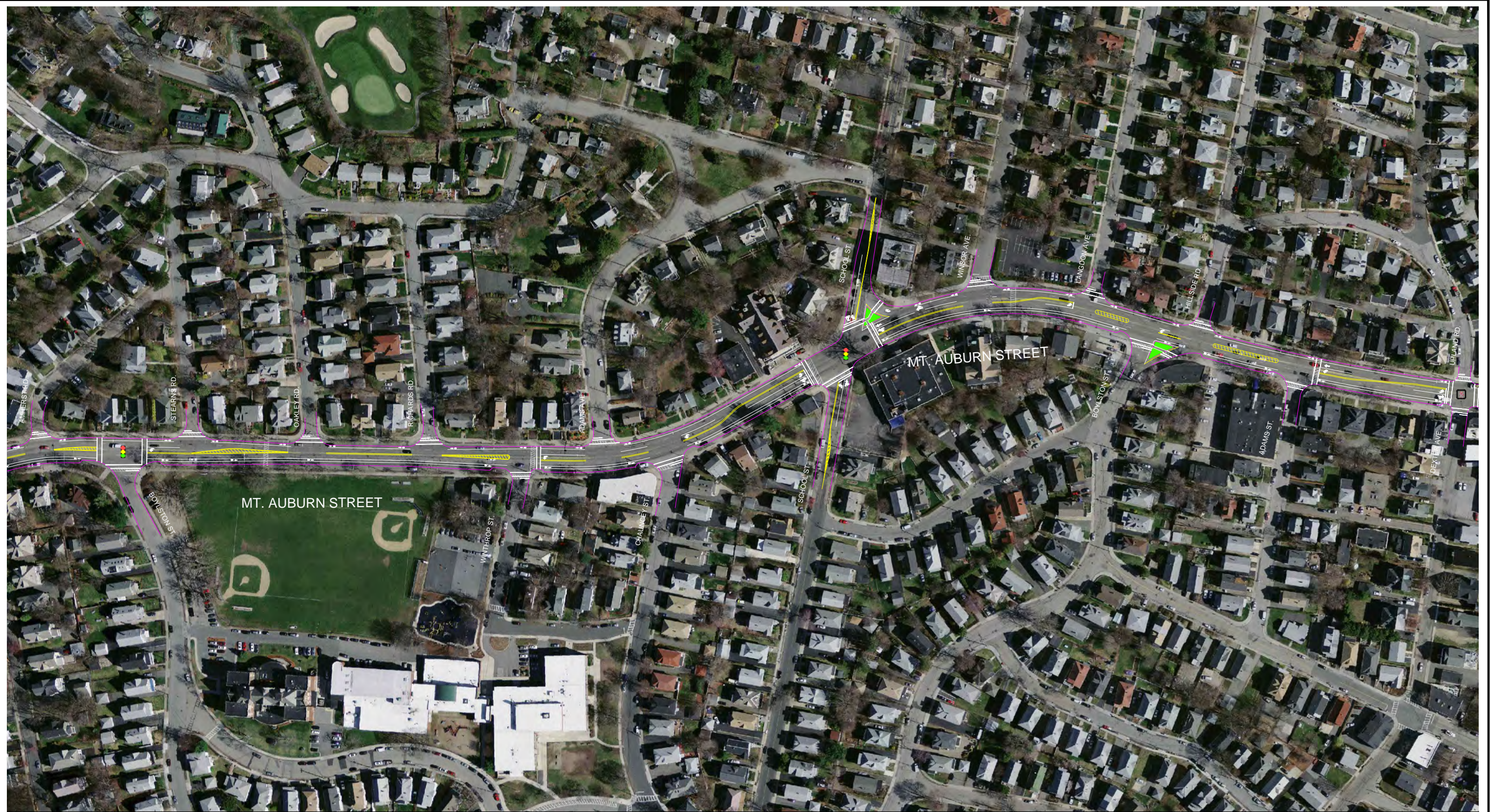
DATE:

1-11-2011

SCALE:

1" = 200'

Figure 4a



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Mount Auburn Street Corridor Study

Alternative 1 - Two Way Cross Section (Sheet 2 of 3)



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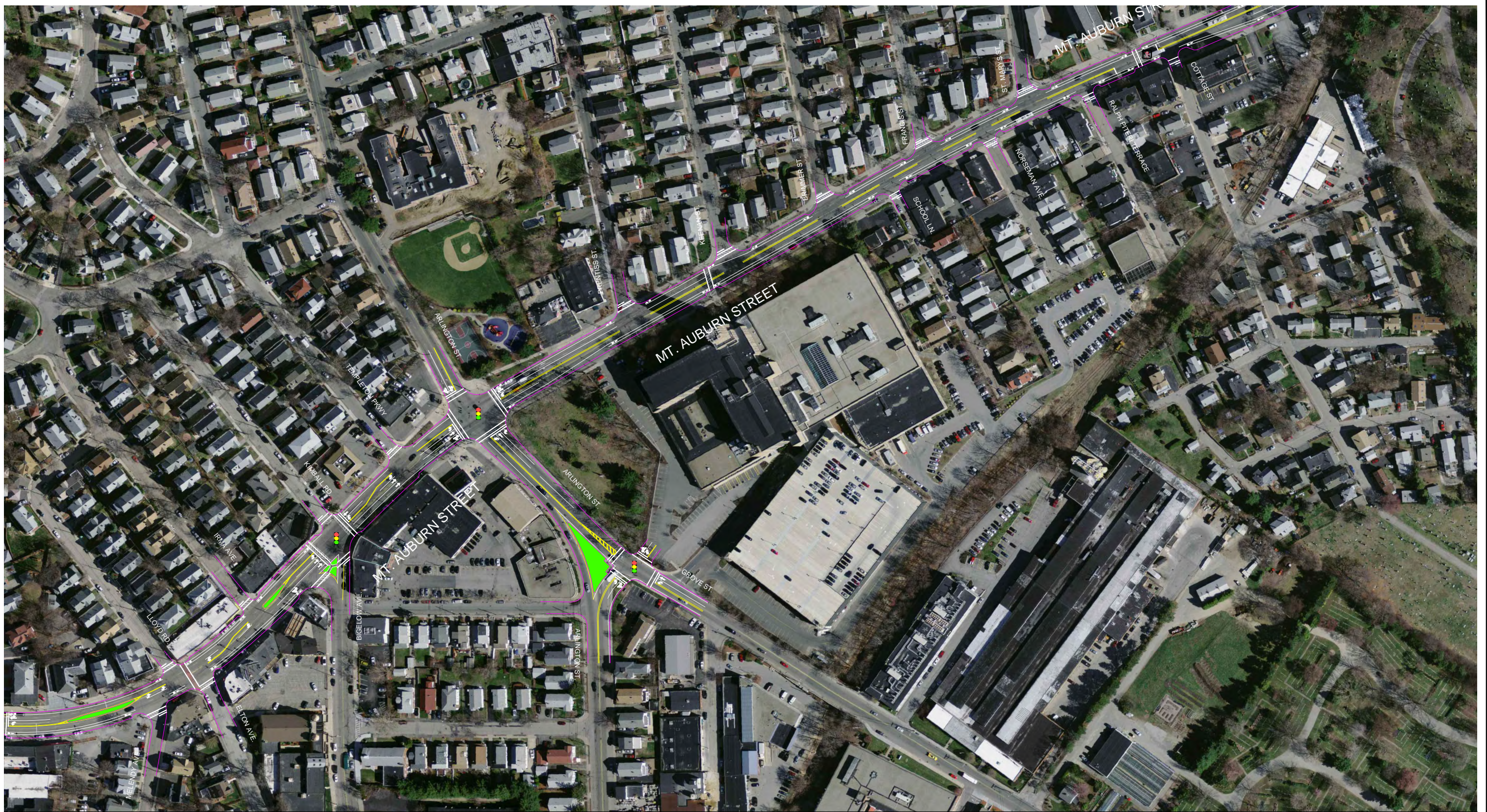
1-11-2011

SCALE:

1" = 200'

Figure 4b

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TITLE:

Mount Auburn Street Corridor Study Alternative 1 - Two Way Cross Section (Sheet 3 of 3)

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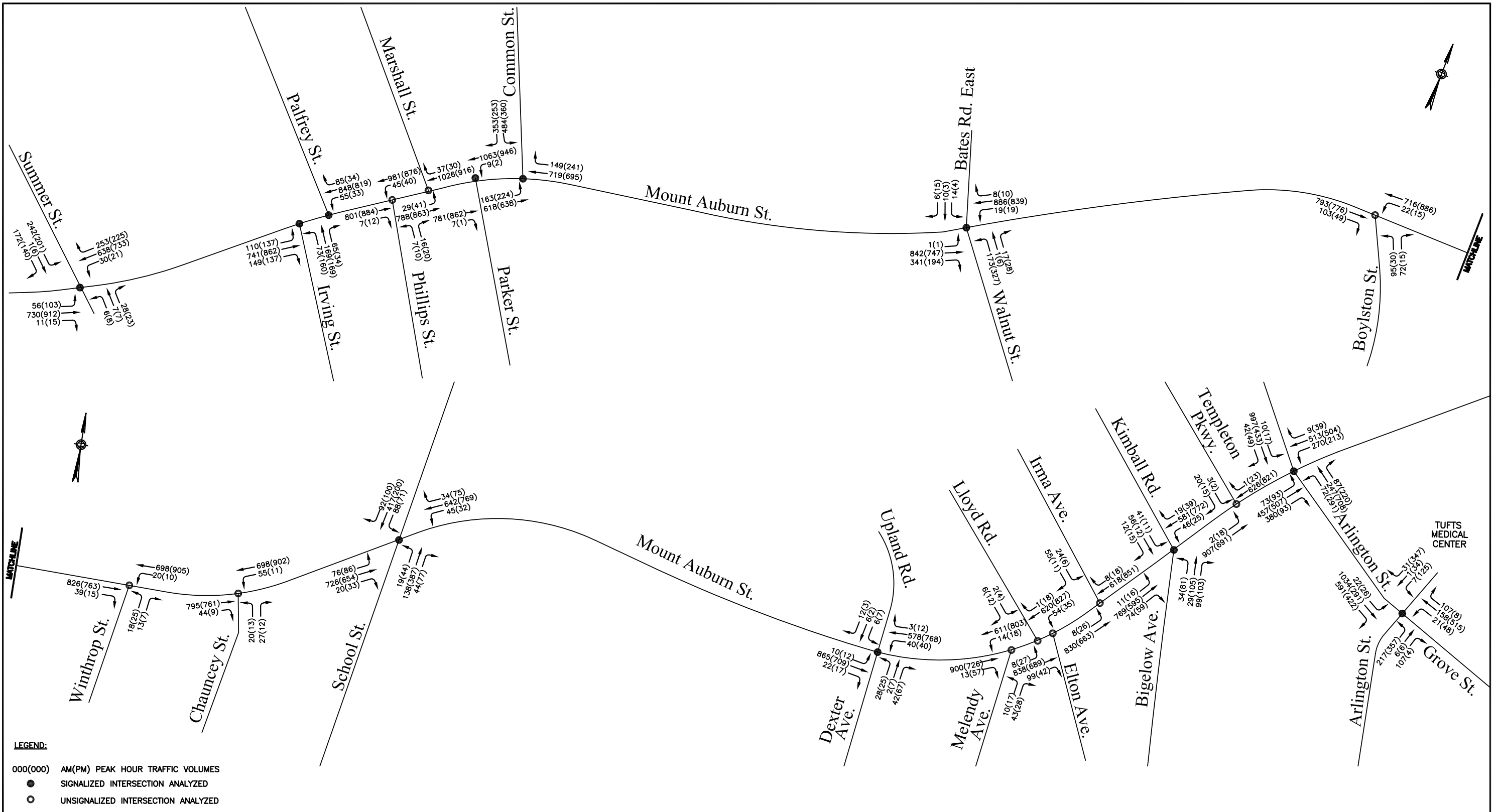
DATE:

1-11-2011

SCALE:

1" = 200'

Figure 4c



PREPARED FOR: **TITLE:**
Mount Auburn Street Corridor Study
2030 Traffic Volumes - Alternatives 1 and 2

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 11-15-2010
 SCALE:
 1" = 250'

Figure 5

be eliminated, and pedestrians would cross at the Common Street signal. Route 16 would continue to carry two general purpose lanes in each direction with parking along the south side of the roadway. All movements at this intersection would operate at LOS A during the peak hours under Alternative 1.

Route 16 at Common Street - This intersection currently operates under signal control. Under Alternative 1, Route 16 eastbound would remain in its current four-lane configuration, with the eastbound left lane designated exclusively for left turns. East of Common Street, Route 16 would carry one basic travel lane in each direction; however, to maintain efficient operations at Common Street the westbound approach would widen to two general purpose lanes at the intersection of Route 16 with Russell Avenue. The existing signal heads at Parker Street would be removed. At Common Street, a southbound right-turn overlap would be added to the eastbound protected left-turn phase, and the signal would be interconnected with the nearby signals at Irving Street/Palfrey Street and Common Street to provide coordinated operation. During the morning peak hour, all movements would operate at LOS D or better under Alternative 1. During the evening peak hour, the southbound left-turn movement from Common Street would operate at LOS E

Route 16 at Bates Road East and Walnut Street - This intersection currently operates under signal control. Under this alternative, the eastbound Route 16 approach would consist of one left-turn lane with 75 feet of storage, one through lane, one right-turn lane with 100 feet of storage, and one bicycle lane. The westbound Route 16 approach would consist of one left-turn lane with 75 feet of storage, one shared through/right-turn lane, and one bicycle lane. Parking would continue to be provided along the south side of Route 16, although approximately eight parking spaces would be eliminated to create the eastbound right-turn lane. The northbound Walnut Street approach and southbound Bates Road East approach would remain in their existing configuration, and no changes would be made to the existing signal phasing. Each movement at this intersection would operate at LOS D or better during the peak hours with the implantation of this alternative.

Route 16 at Boylston Street – This intersection currently operates under stop control. Under Alternative 1, the existing signalized pedestrian crossing across Route 16 between Stearns Road and Oakley Road is proposed to be removed and replaced with a new fully actuated traffic signal at the intersection with Boylston Street. Route 16 would be restriped through the intersection to provide a single shared through/right-turn lane, a bicycle lane, and a parking lane in the eastbound direction, and an exclusive left-turn lane with 75 feet of storage, a single through lane, and a bicycle lane in the westbound direction. The northbound Boylston Street approach would provide one general purpose lane. Under Alternative 1, each movement would operate at LOS D or better during the peak hours.

Route 16 at Winthrop Street – This intersection currently operates under stop control. Under Alternative 1, Route 16 would be restriped through the intersection to provide a single general purpose lane and a bicycle lane in each direction and a parking lane in the eastbound direction. The northbound Winthrop Street approach would provide one general purpose lane. Under

Alternative 1, the northbound Winthrop Street approach would operate at LOS F during the morning and evening peak hours as fewer gaps in the mainline traffic are available in a single travel lane; however, this approach carries low peak hour traffic volumes, and 95th percentile queues would not exceed four vehicles.

Route 16 at Chauncey Street – This intersection currently operates under stop control. Under Alternative 1, Route 16 would be restriped through the intersection to provide a single shared through/right-turn lane, a bicycle lane, and a parking lane in the eastbound direction, and an exclusive left-turn lane with 75 feet of storage, a single through lane, and a bicycle lane in the westbound direction. The northbound Chauncey Street approach would provide one general purpose lane. Under Alternative 1, the northbound Chauncey Street approach would operate at LOS F during the morning and evening peak hours as fewer gaps in the mainline traffic are available in a single travel lane; however, this approach carries low peak hour traffic volumes, and 95th percentile queues would not exceed five vehicles.

Route 16 at School Street – This intersection currently operates under signal control. Under Alternative 1, Route 16 would be restriped through the intersection to provide an exclusive left-turn lane with 100 feet of storage, a shared through/right-turn lane, and a bicycle lane in each direction. The westbound right-turn channel would remain, and parking would continue to be provided along the south side of Route 16. The existing concrete median on School Street would be removed, and the northbound and southbound School Street approaches would each provide an exclusive left-turn lane with 75 feet of storage and a shared through/right-turn lane. A permitted-plus-protected phase would be provided for the eastbound and southbound left-turn movements.

This intersection would operate at LOS D overall during the morning peak hour under Alternative 1, with each movement except the westbound left-turn operating at LOS D or better. The westbound left-turn movement would operate at LOS E, but with a v/c ratio of 0.73, indicating excess capacity for the movement. During the PM peak hour, the eastbound left-turn movement is projected to operate at LOS F with a v/c ratio of 1.50, indicating oversaturated conditions. However, the peak hour volume is relative low (86 vehicles), and SimTraffic simulation indicates maximum queues of six vehicles (150 feet), which would be fully accommodated by the proposed 100 foot storage bay and 75 foot taper. Overall, the intersection is projected to operate at LOS D during the evening peak hour under this alternative.

Route 16 at Dexter Avenue and Upland Road – This intersection currently operates under stop control. Under Alternative 1, a new pedestrian signal is proposed to be installed at this intersection. When the pedestrian phase is not actuated, the signal heads facing Route 16 would display flashing yellow indications and the signal heads facing Dexter Avenue and Upland Road would display flashing red indications. The eastbound and westbound Route 16 approaches would each consist of one exclusive left-turn lane with 75 feet of storage, one shared through/right-turn lane, and one bicycle lane, and parking would continue to be permitted along the south side of Route 16. The northbound Dexter Avenue and southbound Upland Road approaches would each consist of a single general purpose lane.

During the morning peak hour, the northbound Dexter Avenue approach would operate at LOS F and the southbound Upland Road approach would operate at LOS E in Design Year 2030 under Alternative 1. However, the v/c ratios for these approaches would be 0.69 and 0.24, respectively, indicating excess capacity, and 95th percentile queues would be four vehicles along the northbound Dexter Avenue approach and one vehicle along the southbound Upland Road approach.

Route 16 at Melendy Avenue, Route 16 at Lloyd Road, Route 16 at Irma Avenue, and Route 16 at Templeton Parkway – Under this alternative, Route 16 is proposed as providing a single travel lane in each direction between Upland Road and Arlington Street. The Route 16 eastbound and westbound approaches at each of the four unsignalized intersections would provide one general purpose travel lane, one bicycle lane, and a parking lane. East of Irma Avenue, Route 16 eastbound would widen to two general purpose travel lanes to provide adequate capacity at the signalized intersections at Kimball Road/Bigelow Avenue and Arlington Street. Each minor street approach would provide one general purpose lane with the exception of Elton Avenue, which will continue to provide one-way southbound travel.

The southbound Irma Avenue approach at Route 16 is expected to operate at LOS E during the evening peak hour as fewer gaps in the mainline traffic are available in a single travel lane. However, the 95th percentile queue is expected to be one vehicle, and the v/c ratio during the evening peak hour is expected to be 0.20, indicating excess capacity along the approach. All other movements at these unsignalized intersections would operate at LOS D or better during the peak hours in Design Year 2030 with the implementation of Alternative 1.

Route 16 at Kimball Road and Bigelow Avenue - This intersection currently operates under signal control. Under Alternative 1, the Route 16 eastbound approach would consist of an exclusive left-turn lane with 75 feet of storage, one through lane, one shared through/right-turn lane beginning immediately east of Irma Avenue, a bicycle lane, and a parking lane. The Route 16 westbound approach would consist of an exclusive left-turn lane with 75 feet of storage, one shared through/right-turn lane, a bicycle lane, and a parking lane. The northbound Bigelow Avenue and southbound Kimball Road approaches would retain their existing configuration of one general purpose travel lane. The existing channelization island for the eastbound right-turn would be reconstructed to increase the curb radius and shorten the length of the crosswalk across the channel, improving pedestrian safety. The traffic control signal would be interconnected with the nearby signal at Arlington Street to provide coordinated operation.

Each movement would operate at LOS D or better during the morning peak hour under Alternative 1. During the evening peak hour, the northbound Bigelow Avenue approach would operate at LOS E. 95th percentile queues would be approximately 14 vehicles, and SimTraffic simulation indicates that all vehicles on the approach would pass through the intersection during one cycle. Overall, the intersection would operate at LOS C during the evening peak hour.

Route 16 at Arlington Street - This intersection currently operates under signal control. Under Alternative 1, the northbound Arlington Street approach will be widened to provide an exclusive left-turn lane, a through lane, and an exclusive right-turn lane. The eastbound Route 16 approach would retain its current configuration of one exclusive left-turn lane, one through lane, and one shared through/right-turn lane, and would taper back to a single lane east of the intersection. The westbound Route 16 approach would widen from a single lane to an exclusive left-turn lane and a shared through/left-turn lane immediately west of the Keenan Street intersection. The northbound and westbound left-turn movements would retain their existing permitted/protected phase, and an overlapping northbound right-turn phase would be added. The signal is proposed to be interconnected with the signal at Kimball Road/Bigelow Avenue to provide coordinated operation.

During the morning peak hour, the southbound Arlington Street approach would operate at LOS E with a v/c ratio of 1.04, indicating oversaturated conditions. The 95th percentile volume would exceed capacity and queues are unpredictable. However, intersection operations would improve considerably over Design Year 2030 conditions with existing geometry, in which the Route 16 eastbound shared through/right-turn movement and westbound left-turn movement would each operate at LOS F with v/c ratios greater than 1.0. All movements except the southbound approach would operate at LOS D or better under Alternative 1. Overall intersection operations would improve from LOS E with a v/c ratio of 1.02 in the future with existing geometry to LOS D with a v/c ratio of 0.87 under Alternative 1.

During the evening peak hour, the Arlington Street northbound left-turn and through movements, as well as the southbound approach, would operate at LOS E with v/c ratios in excess of 0.90, indicating near-capacity conditions.

Arlington Street at Grove Street - This intersection is proposed to operate under signal control. The northbound Arlington Street approach would be realigned to intersect with Grove Street at approximately a 90-degree angle and widened to provide a northbound left-turn lane, shared left/through/right-turn lane, and southbound departure lane. The Tufts Medical Center driveway would be relocated to oppose the Arlington Street northbound approach. The existing southbound right-turn channel would remain and would operate under yield control.

Alternative 2 – Two-Way Left Turn Lane

Like Alternative 1, Alternative 2 aims to improve the Route 16 corridor to provide a safer and more contextual environment for motorists, pedestrians, and bicycles by reducing the traveled way from four to two basic lanes. Under Alternative 2, a two-way left-turn lane (TWLTL) would be provided along Route 16 between Chester Street and Dexter Avenue/Upland Road. The two-way left-turn lane improves operational safety by allowing left-turning vehicles to wait in the median for gaps in oncoming traffic while removing them from the mainline traffic stream. In addition, operations from the side streets are improved by allowing left-turning vehicles to cross one lane of traffic and wait in the left-turn median for gaps in the adjacent traffic stream,

effectively creating a two-stage left turn movement. As in Alternative 1, a bicycle lane would be provided in each direction along Route 16, and additional turn lanes at key intersections.

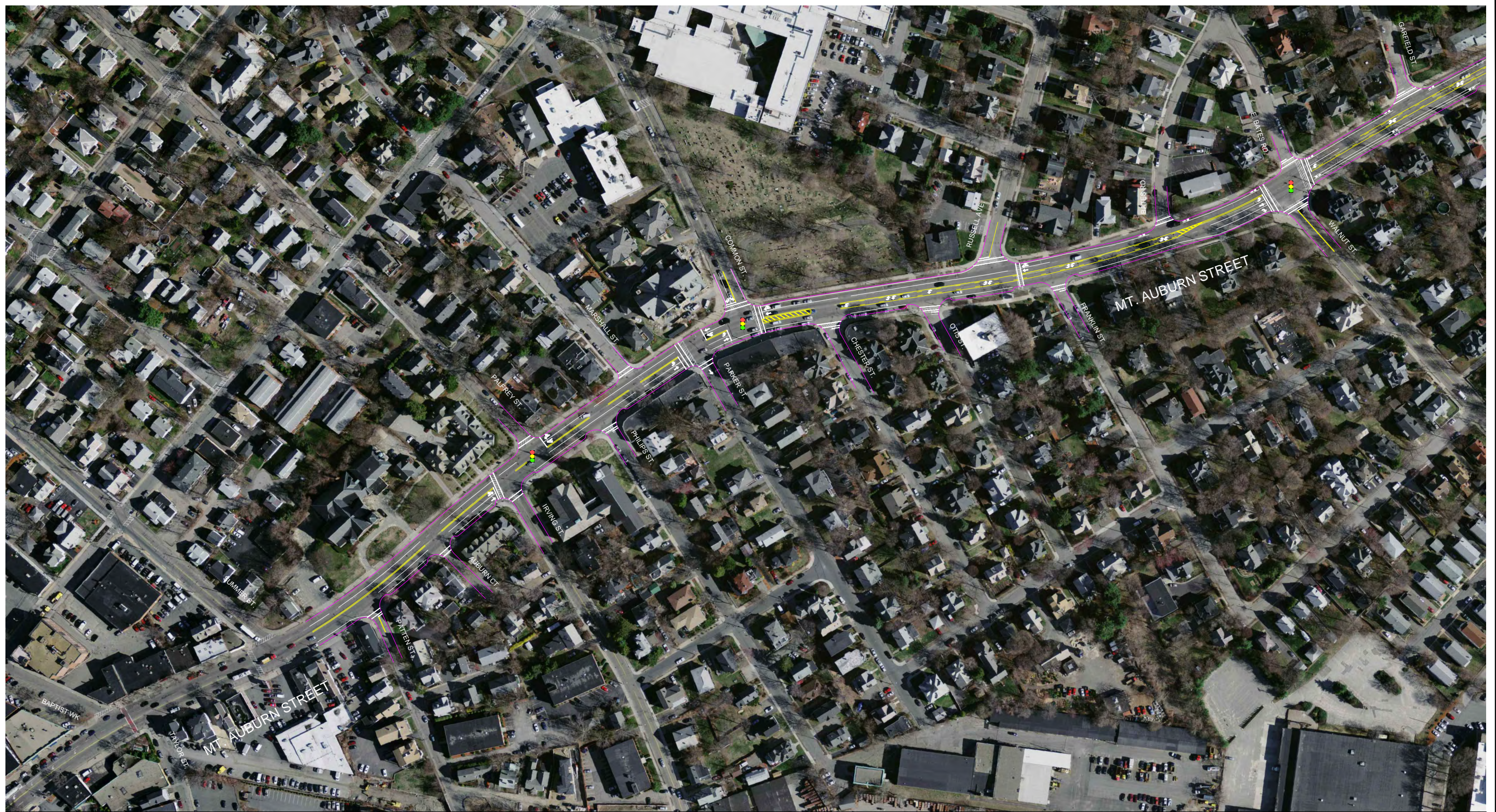
The specific geometric improvements at each of the study area intersections are depicted on Figures 6a through 6c. Intersection improvements proposed under Alternative 2, including number of lanes, crosswalks, signalization, and parking, are the same as Alternative 1 described above. Design year 2030 traffic volumes under Alternative 2 remain unchanged from Alternative 1 and are shown on Figure 5 in the previous section.

Traffic operations at signalized intersections under Alternative 2 would be identical to operations under Alternative 1. At the unsignalized intersections of Route 16 with Winthrop Street and Chauncey Street, the northbound approaches would each operate at LOS C during the morning and evening peak hours under Alternative 2, compared with LOS F under Alternative 1. At the intersection of Route 16 with Upland Road and Dexter Avenue, the northbound and southbound approaches would each operate at LOS C during the morning and evening peak hours under Alternative 2, compared with LOS F and LOS E along the northbound and southbound approaches, respectively, during the morning peak hour under Alternative 1. Traffic operations along all other movements would be comparable to Alternative 1.

Alternative 3 – Raised Median

Alternative 3 suggests virtually the same geometric changes as Alternative 2, with the proposed two-way left-turn lane replaced with a raised median between the Common Street and Upland Road/Dexter Avenue intersections. Breaks would be provided at key locations to allow left turns and u-turns. The proposed median would have a calming effect on traffic by narrowing the width of the traveled way, would reduce vehicle conflicts by controlling access to Route 16, and would provide a refuge for pedestrians crossing the roadway. The departure lanes along Route 16 at each median break would have sufficient width to allow u-turns to access driveways and local streets at which left-turns would be restricted. The proposed geometric improvements to the Route 16 corridor with the proposed median are shown on Figures 7a through 7c. The Design Year 2030 traffic volumes at study area intersections due to the resulting left-turn restrictions are given on Figure 8.

Vehicle delays at study intersections between Common Street and Upland Road/Dexter Avenue would be slightly higher, particularly along left-turn movements, due to the addition of u-turn traffic at median breaks. At the intersection of Route 16 with School Street, the westbound left-turn movement would operate at LOS F with a v/c ratio of 0.90 in the morning peak hour under Alternative 3, compared with LOS E with a v/c ratio of 0.90 under Alternatives 1 and 2, and the eastbound left-turn movement would operate at LOS F with a v/c ratio of 1.59 during the evening peak hour under Alternative 3, compared with LOS F with a v/c ratio of 1.50 under Alternatives 1 and 2.



PREPARED FOR:



TITLE:

Mount Auburn Street Corridor Study Alternative 2 - Two-way Left Turn Lane (Sheet 1 of 3)



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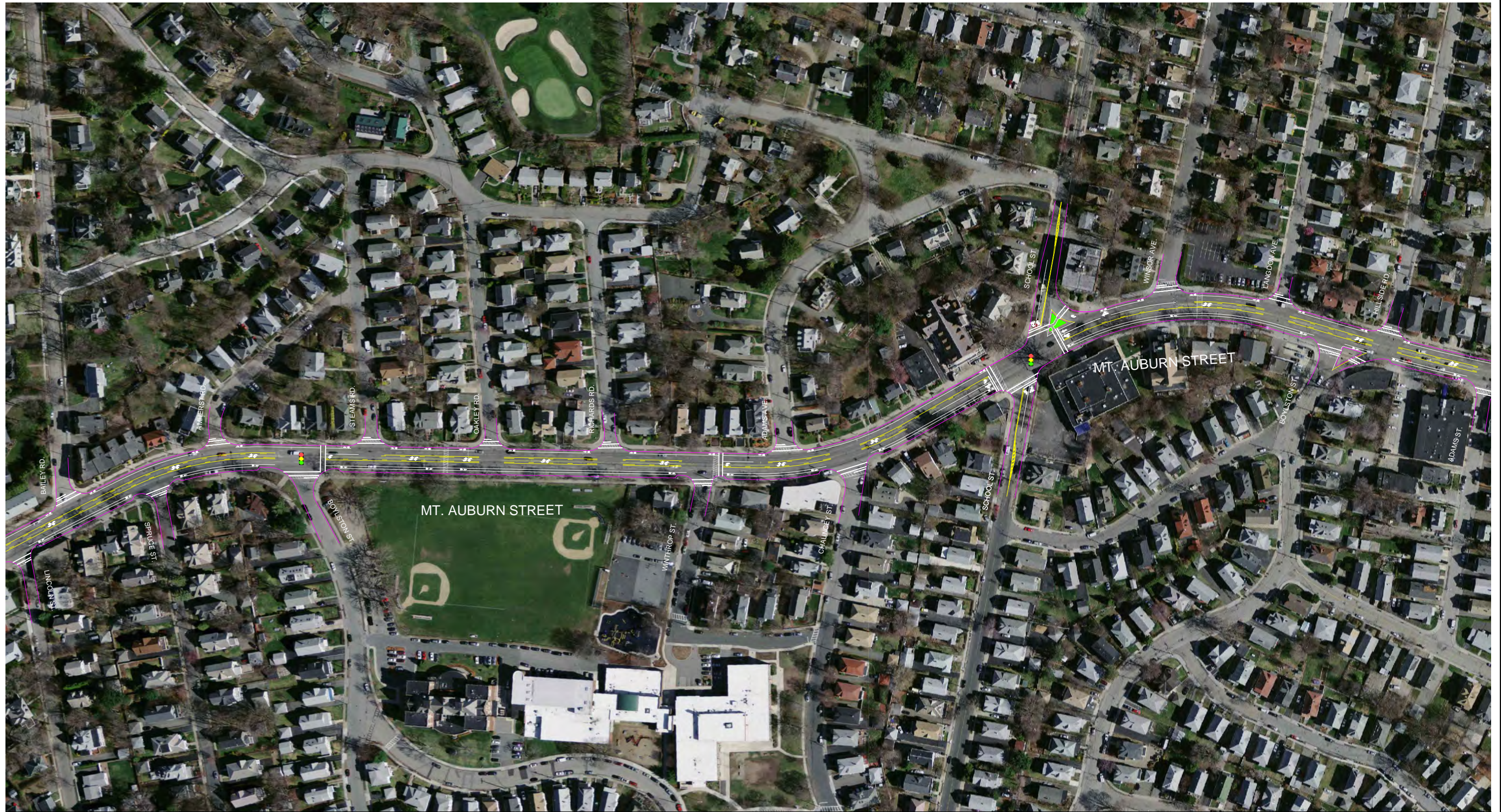
DATE:

1-11-2011

SCALE:

1" = 200'

Figure 6a



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Mount Auburn Street Corridor Study

Alternative 2 - Two-way Left Turn Lane (Sheet 2 of 3)

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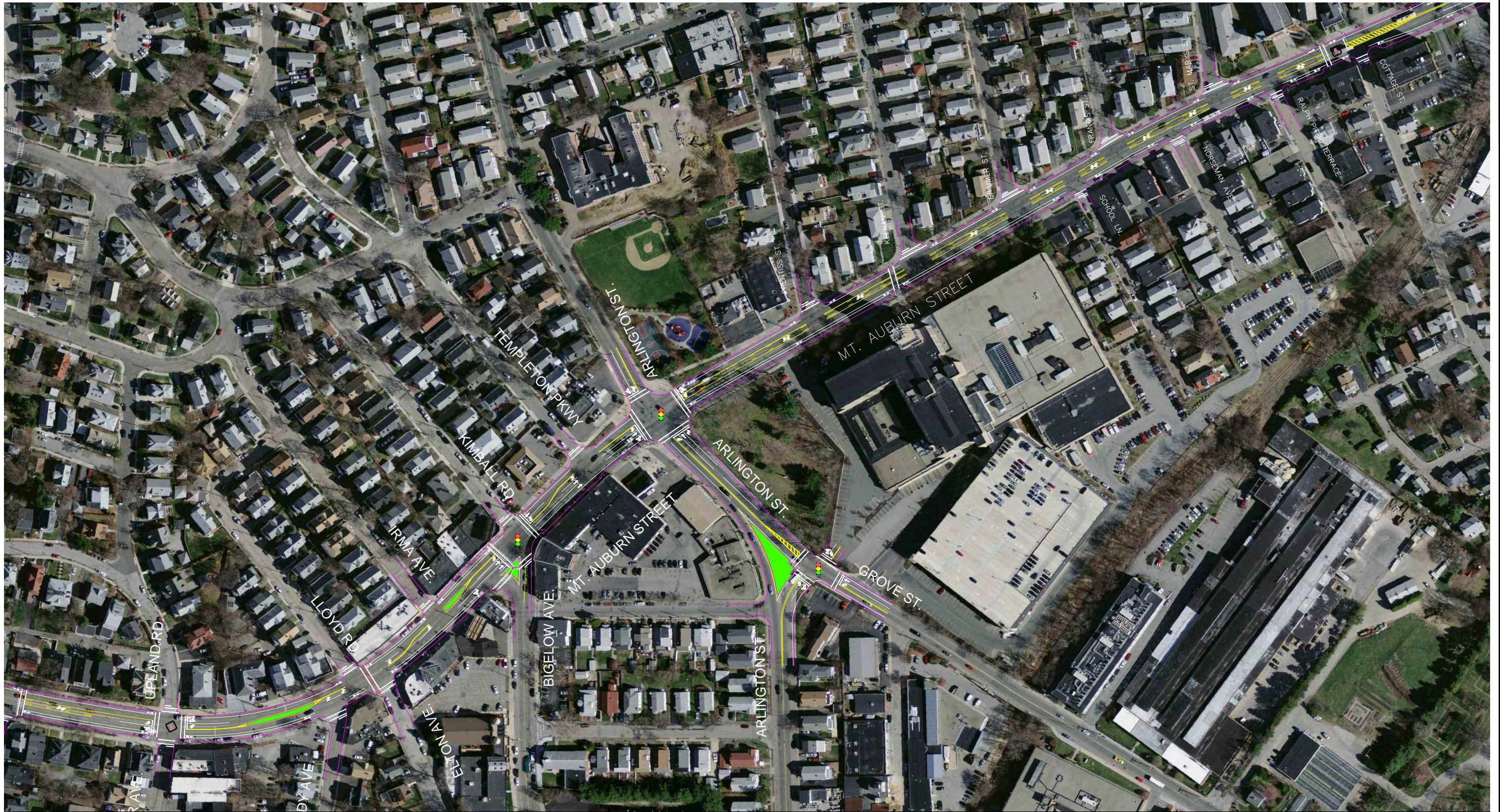
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1-11-2011

SCALE:

1" = 200'

Figure 6b



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Alternative 2 - Two-way Left Turn Lane (Sheet 3 of 3)

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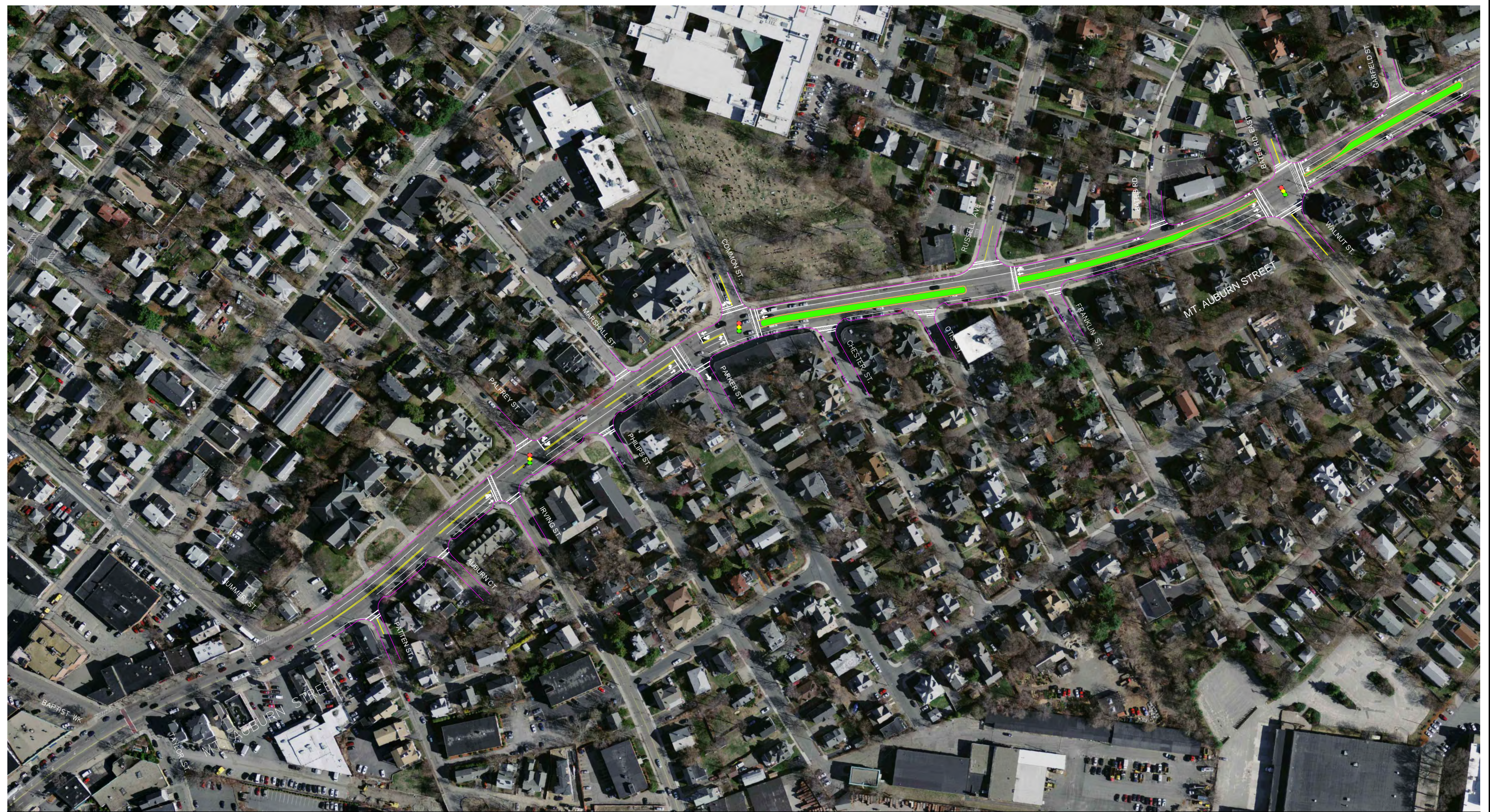
1-11-2011

SCALE:

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Figure 6c

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Mount Auburn Street Corridor Study Alternative 3 - Raised Median (Sheet 1 of 3)



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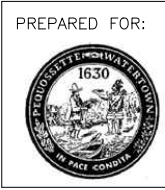
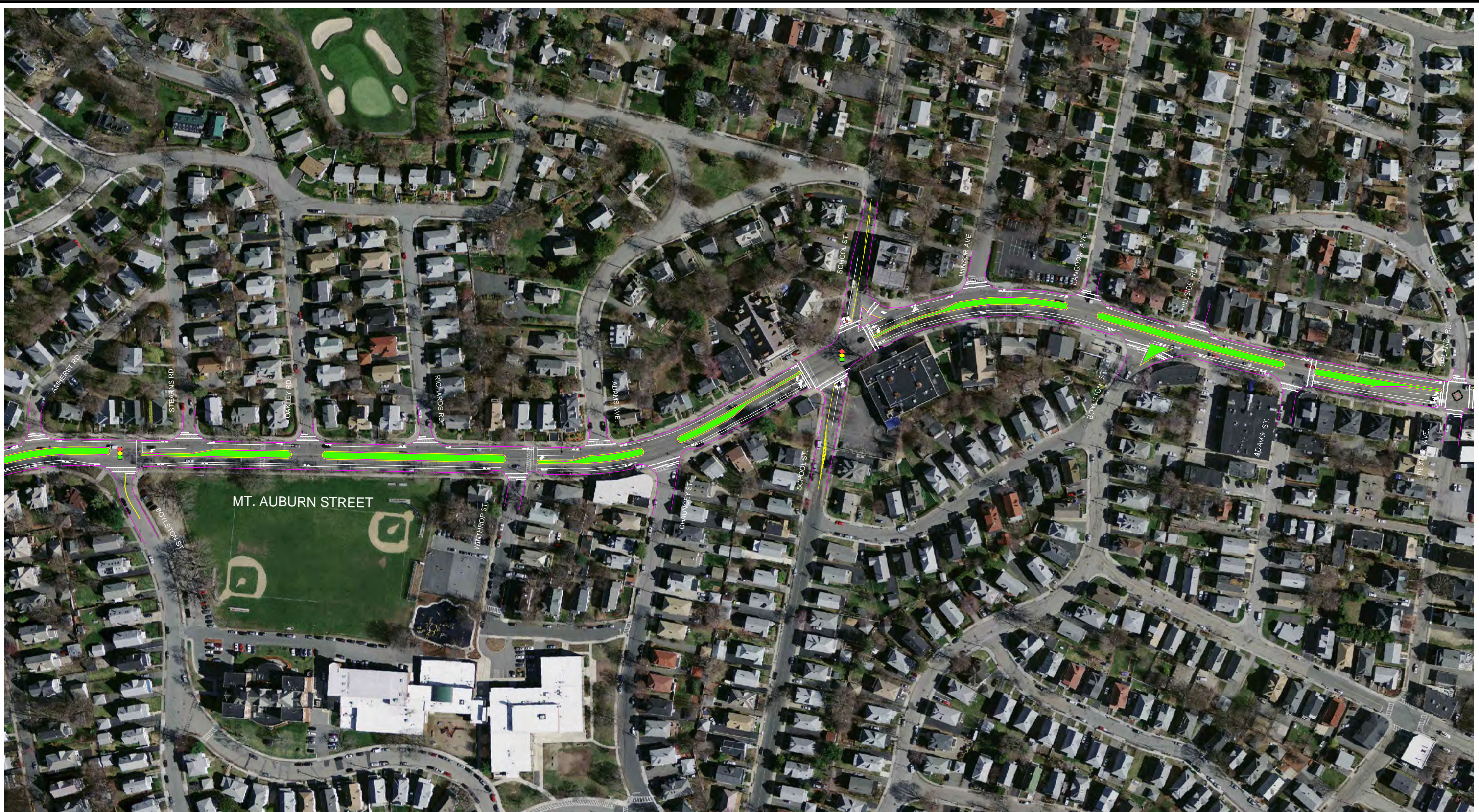
1-11-2011

SCALE:

1" = 200'

Figure 7a

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Alternative 3 - Raised Median (Sheet 2 of 3)

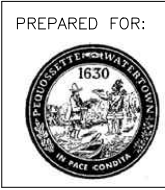
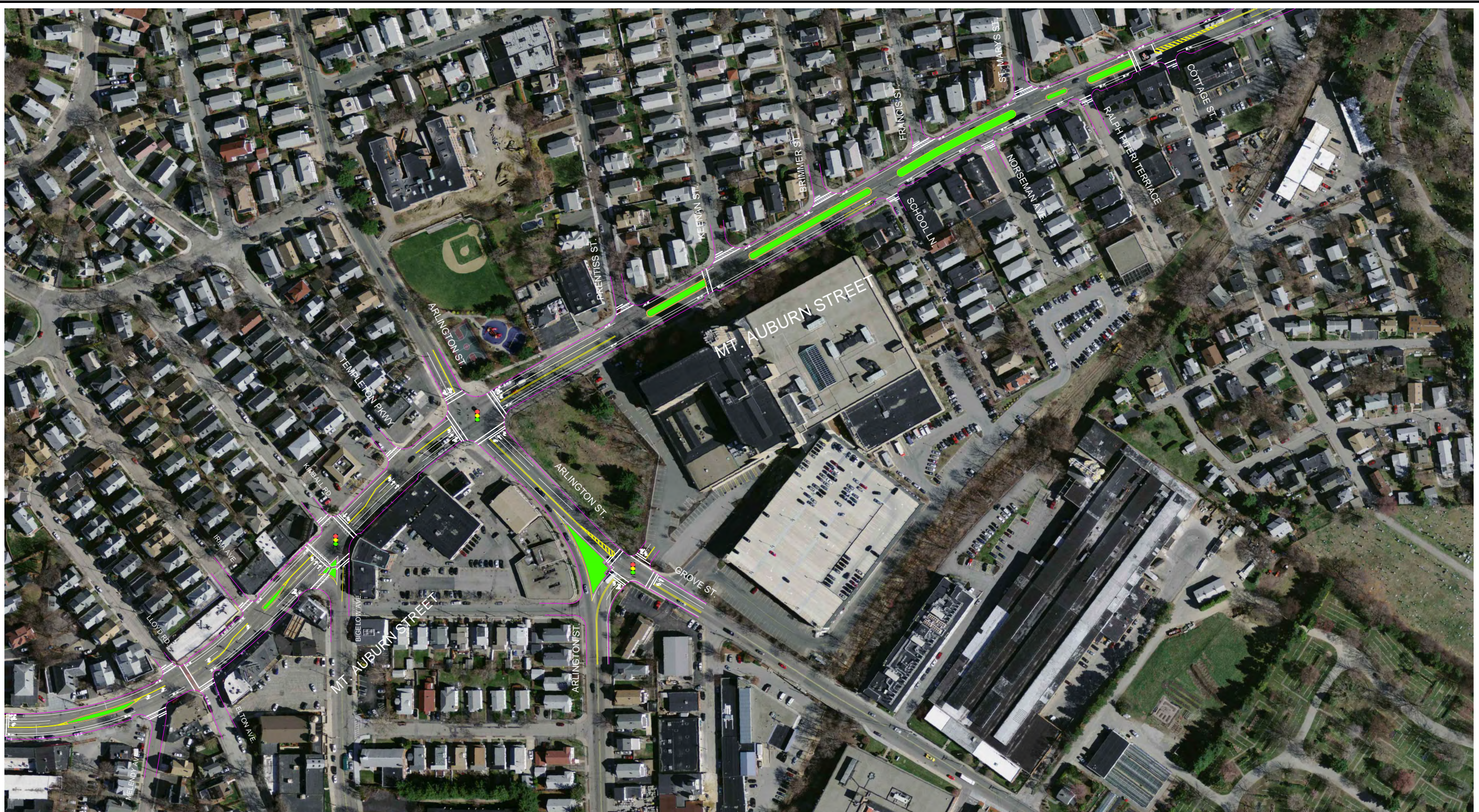


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DATE:
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SCALE:
1" = 200'

Figure 7b

Filename: J:\10-034 Watertown - Mt. Auburn Street\ACAD\Planning\Xref\Concept 3 - Raised Median.dwg



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Mount Auburn Street Corridor Study
Alternative 3 - Raised Median (Sheet 3 of 3)

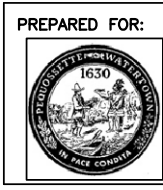
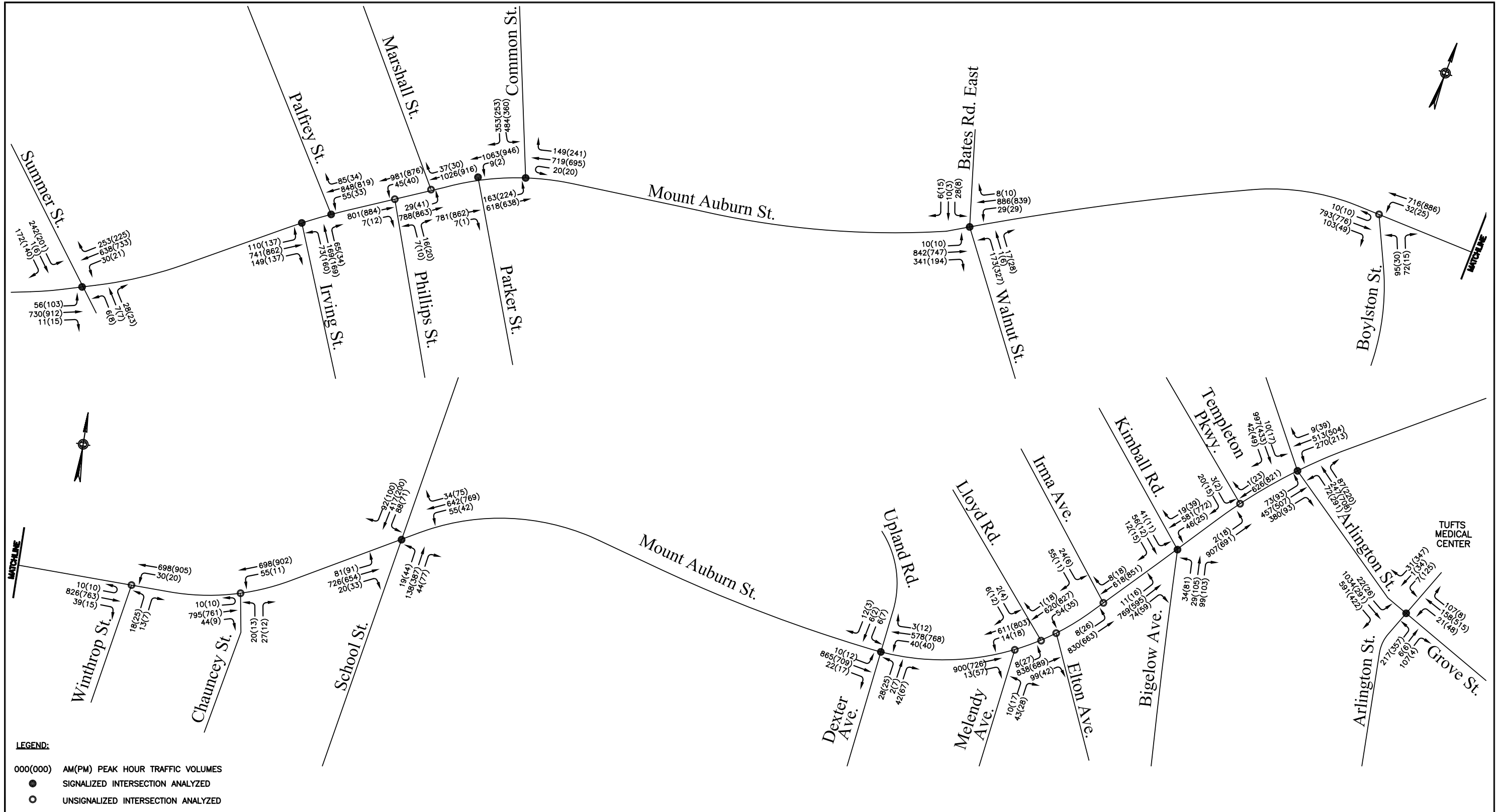


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DATE:
1-11-2011
SCALE:
1" = 200'

Figure 7c

Filename: j:\10-034 Watertown - Mt. Auburn Street\Traffic\Reports and figures\10-034 Traffic Volumes.dwg



PREPARED FOR: **Mount Auburn Street Corridor Study**
2030 Traffic Volumes - Alternative 3

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DATE: 1-11-2011
 SCALE: 1" = 250'

Figure 8

TABLE 8

Unsignalized Intersection Level of Service Summary with Alternatives

Intersection/Peak Period/Movement	2030 Design Year Conditions, Existing Geometry			2030 Design Year Conditions, Alt. 1 – Single Thru Lane			2030 Design Year Conditions, Alt. 2 – TWLTL			2030 Design Year Conditions, Alt. 3 – Raised Median						
	v/c ^a	Delay ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue
Route 16 at Phillips Street																
<i>Weekday Morning Peak Hour:</i>																
Route 16 EB TR	0.35	0.0	A	0	0.35	0.0	A	0	0.35	0.0	A	0	0.35	0.0	A	0
Route 16 WB LT	0.41	1.7	A	4	0.41	1.7	A	4	0.41	1.7	A	4	0.41	1.7	A	4
Phillips Street NB LR	0.02	9.9	A	1	0.06	11.3	B	5	0.06	11.3	B	5	0.02	9.9	A	1
<i>Weekday Evening Peak Hour:</i>																
Route 16 EB TR	0.35	0.0	A	0	0.36	0.0	A	0	0.36	0.0	A	0	0.36	0.0	A	0
Route 16 WB LT	0.38	1.6	A	4	0.37	1.7	A	4	0.37	1.7	A	4	0.37	1.7	A	4
Phillips Street NB LR	0.04	10.5	B	3	0.13	11.4	B	11	0.13	11.4	B	11	0.13	11.3	B	11
Route 16 at Marshall Street																
<i>Weekday Morning Peak Hour:</i>																
Route 16 EB LT	0.34	1.7	A	4	0.34	1.5	A	4	0.35	1.5	A	4	0.34	1.7	A	4
Route 16 WB TR	0.43	0.0	A	0	0.43	0.0	A	0	0.43	0.0	A	0	0.43	0.0	A	0
<i>Weekday Evening Peak Hour:</i>																
Route 16 EB LT	0.34	1.8	A	4	0.35	1.7	A	4	0.35	1.7	A	4	0.35	1.7	A	4
Route 16 WB TR	0.40	0.0	A	0	0.39	0.0	A	0	0.39	0.0	A	0	0.39	0.0	A	0
Route 16 at Parker Street (Signalized in Existing Conditions)																
<i>Weekday Morning Peak Hour:</i>																
Route 16 EB TR	0.54	29.1	C	321	0.38	0.0	A	0	0.38	0.0	A	0	0.57	0.0	A	0
Route 16 WB LT	0.48	1.1	A	22	0.45	0.4	A	1	0.45	0.4	A	1	0.02	0.8	A	1
Parker Street NB LR	0.70	145.7	F	52#	--	--	--	--	--	--	--	--	--	--	--	--
<i>Weekday Evening Peak Hour:</i>																
Route 16 EB TR	0.56	21.6	C	293	0.34	0.0	A	0	0.34	0.0	A	0	0.34	0.0	A	0
Route 16 WB LT	0.54	3.1	A	m38	0.41	0.0	A	0	0.41	0.0	A	0	0.41	0.0	A	0
Parker Street NB LR	0.12	37.2	D	38	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 8

Unsignalized Intersection Level of Service Summary with Alternatives (Continued)

Intersection/Peak Period/Movement	2030 Design Year Conditions, Existing Geometry			2030 Design Year Conditions, Alt. 1 – Single Thru Lane			2030 Design Year Conditions, Alt. 2 – TWLTL			2030 Design Year Conditions, Alt. 3 – Raised Median						
	v/c ^a	Delay ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue
Route 16 at Winthrop Street																
<i>Weekday Morning Peak Hour:</i>																
Route 16 EB TR	0.34	0.0	A	0	0.54	0.0	A	0	0.54	0.0	A	0	0.54	0.0	A	0
Route 16 WB L	0.29	1.1	A	2	0.04	11.4	B	3	0.04	11.4	B	3	0.05	11.4	B	4
Route 16 WB T					0.44	0.0	A	0	0.44	0.0	A	0	0.44	0.0	A	0
Winthrop Street NB LR	0.22	24.0	C	20	0.19	21.0	C	71	0.16	18.3	C	14	0.18	20.1	C	16
<i>Weekday Evening Peak Hour:</i>																
Route 16 EB TR	0.31	0.0	A	0	0.47	0.0	A	0	0.47	0.0	A	0	0.47	0.0	A	0
Route 16 WB L	0.39	0.5	A	1	0.01	10.0	A	1	0.01	10.0	A	1	0.03	10.0	B	2
Route 16 WB T					0.59	0.0	A	0	0.59	0.0	A	0	0.59	0.0	A	0
Winthrop Street NB LR	0.16	23.1	C	14	0.23	33.2	D	21	0.14	19.7	C	12	0.17	23.7	C	15
Route 16 at Chauncey Street																
<i>Weekday Morning Peak Hour:</i>																
Route 16 EB TR	0.35	0.0	A	0	0.55	0.0	A	0	0.55	0.0	A	0	0.55	0.0	A	0
Route 16 WB L	0.28	2.9	A	7	0.10	12.1	B	7	0.10	12.2	B	7	0.10	11.9	B	8
Route 16 WB T					0.42	0.0	A	0	0.42	0.0	A	0	0.42	0.0	A	0
Chauncey Street NB LR	0.33	27.3	D	35	0.32	25.7	D	127	0.27	21.4	C	26	0.32	25.7	D	33
<i>Weekday Evening Peak Hour:</i>																
Route 16 EB TR	0.30	0.0	A	0	0.46	0.0	A	0	0.46	0.0	A	0	0.46	0.0	A	0
Route 16 WB L	0.40	0.5	A	1	0.02	10.0	A	1	0.02	10.0	A	1	0.03	10.0	B	2
Route 16 WB T					0.60	0.0	A	0	0.60	0.0	A	0	0.60	0.0	A	0
Chauncey Street NB LR	0.12	18.8	C	10	0.20	31.0	D	18	0.11	18.6	C	10	0.14	21.5	C	12

TABLE 8

Unsignalized Intersection Level of Service Summary with Alternatives (Continued)

Intersection/Peak Period/Movement	2030 Design Year Conditions, Existing Geometry			2030 Design Year Conditions, Alt. 1 – Single Thru Lane			2030 Design Year Conditions, Alt. 2 – TWLTL			2030 Design Year Conditions, Alt. 3 – Raised Median		
	v/c ^a	Delay ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue
Route 16 at Upland Road/Dexter Avenue^e												
<i>Weekday Morning Peak Hour:</i>												
Route 16 EB L	0.29	0.3	A	1	0.02	8.8	A	7	0.02	8.8	A	7
Route 16 EB TR					0.60	3.3	A	445	0.60	3.3	A	445
Route 16 WB L	0.18	1.6	A	4	0.09	11.6	B	19	0.09	11.6	B	19
Route 16 WB TR					0.38	1.9	A	199	0.38	1.9	A	199
Dexter Avenue NB LTR	0.38	27.4	D	42	0.69	73.4	F	97	0.35	24.8	C	38
Upland Road SB LTR	0.15	24.8	C	13	0.24	41.3	E	23	0.12	20.7	C	10
<i>Weekday Evening Peak Hour:</i>												
Route 16 EB L	0.23	0.5	A	1	0.02	10.1	B	8	0.02	10.1	B	8
Route 16 EB TR					0.48	2.4	A	289	0.48	2.4	A	289
Route 16 WB L	0.25	1.4	A	4	0.07	9.9	A	18	0.07	9.9	A	18
Route 16 WB TR					0.51	2.5	A	323	0.51	2.5	A	323
Dexter Avenue NB LTR	0.29	18.5	C	30	0.37	23.9	C	41	0.31	20.0	C	33
Upland Road SB LTR	0.11	25.9	D	9	0.12	28.7	D	10	0.08	20.9	C	7
Route 16 at Melendy Avenue												
<i>Weekday Morning Peak Hour:</i>												
Route 16 EB TR	0.38	0.0	A	0	0.57	0.0	A	3	0.57	0.0	A	3
Route 16 WB LT	0.25	0.9	A	2	0.02	0.7	A	2	0.02	0.7	A	2
Melendy Avenue NB LR	0.16	16.8	C	14	0.22	22.2	C	20	0.22	22.2	C	20
<i>Weekday Evening Peak Hour:</i>												
Route 16 EB TR	0.31	0.0	A	3	0.50	0.0	A	3	0.50	0.0	A	3
Route 16 WB LT	0.34	0.9	A	2	0.03	0.7	A	2	0.03	0.7	A	2
Melendy Avenue NB LR	0.15	18.2	C	13	0.25	29.1	D	23	0.25	29.1	D	23

TABLE 8

Unsignalized Intersection Level of Service Summary with Alternatives (Continued)

Intersection/Peak Period/Movement	2030 Design Year Conditions, Existing Geometry			2030 Design Year Conditions, Alt. 1 – Single Thru Lane			2030 Design Year Conditions, Alt. 2 – TWLTL			2030 Design Year Conditions, Alt. 3 – Raised Median		
	v/c ^a	Delay ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue
Route 16 at Lloyd Road												
<i>Weekday Morning Peak Hour:</i>												
Route 16 EB LT	0.39	0.4	A	1	0.01	0.4	A	1	0.01	0.4	A	1
Route 16 WB TR	0.26	0.0	A	0	0.38	0.0	A	0	0.38	0.0	A	0
Lloyd Road SB LR	0.04	15.3	C	3	0.05	16.9	C	4	0.05	16.9	C	4
<i>Weekday Evening Peak Hour:</i>												
Route 16 EB LT	0.30	1.6	A	4	0.05	1.6	A	4	0.05	1.6	A	4
Route 16 WB TR	0.33	0.0	A	0	0.51	0.0	A	0	0.51	0.0	A	0
Lloyd Road SB LR	0.09	16.2	C	7	0.17	27.6	D	15	0.17	27.6	D	15
Route 16 at Elton Avenue												
<i>Weekday Morning Peak Hour:</i>												
Route 16 EB TR	0.36	0.0	A	0	0.60	0.0	A	0	0.60	0.0	A	0
Route 16 WB LT	0.25	3.0	A	7	0.09	2.6	A	8	0.09	2.6	A	8
<i>Weekday Evening Peak Hour:</i>												
Route 16 EB TR	0.28	0.0	A	0	0.44	0.0	A	0	0.44	0.0	A	0
Route 16 WB LT	0.35	1.5	A	3	0.04	1.2	A	3	0.04	1.2	A	3
Route 16 at Irma Avenue												
<i>Weekday Morning Peak Hour:</i>												
Route 16 EB LT	0.35	0.3	A	1	0.01	0.3	A	1	0.01	0.3	A	1
Route 16 WB TR	0.28	0.0	A	0	0.42	0.0	A	0	0.42	0.0	A	0
Irma Avenue SB LR	0.25	15.4	C	25	0.39	24.7	C	45	0.39	24.7	C	45
<i>Weekday Evening Peak Hour:</i>												
Route 16 EB LT	0.25	1.3	A	3	0.05	1.3	A	4	0.05	1.3	A	4
Route 16 WB TR	0.37	0.0	A	0	0.57	0.0	A	0	0.57	0.0	A	0
Irma Avenue SB LR	0.07	15.6	C	5	0.20	41.9	E	17	0.20	41.9	E	17

TABLE 8

Unsignalized Intersection Level of Service Summary with Alternatives (Continued)

	2030 Design Year Conditions, Existing Geometry		2030 Design Year Conditions, Alt. 1 – Single Thru Lane		2030 Design Year Conditions, Alt. 2 – TWLTL		2030 Design Year Conditions, Alt. 3 – Raised Median					
	v/c ^a	Delay ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue
<i>Route 16 at Templeton Parkway</i>												
<i>Weekday Morning Peak Hour:</i>												
Route 16 EB LT	0.40	0.1	A	0	0.40	0.1	A	0	0.40	0.1	A	0
Route 16 WB TR	0.26	0.0	A	0	0.39	0.0	A	0	0.39	0.0	A	0
Templeton Parkway SB LR	0.03	9.6	A	3	0.07	14.1	B	6	0.07	14.1	B	6
<i>Weekday Evening Peak Hour:</i>												
Route 16 EB LT	0.29	0.9	A	2	0.29	1.1	A	2	0.29	1.1	A	2
Route 16 WB TR	0.35	0.0	A	0	0.53	0.0	A	0	0.53	0.0	A	0
Templeton Parkway SB LR	0.03	10.1	B	2	0.06	17.8	C	5	0.06	17.8	C	5

^aVolume to Capacity Ratio

^bAverage Delay Time in Seconds

^cLevel-of-Service

^dQueue Length in Feet.

^eA new pedestrian signal is proposed at the Route 16 and Upland Road/Dexter Avenue intersection. LOS analysis results are the more conservative of the unsignalized and signalized analyses at this location.

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound;

L = Left Turn; T = Through; R = Right Turn; LT = Shared Left-turn/Thorough; TR Shared Through/Right-turn; LR = Shared Left/Right-turn; LTR = Shared Left/Through/Right-turn.

NC = No Capacity

* - Delay not calculated

- 95th percentile volume exceeds capacity; reported queues may not be accurate

Bold/Italic Type indicates v/c ≥ 0.90, LOS E or F, 95th percentile volume exceeds capacity

TABLE 9

Signalized Intersection Level of Service Summary with Alternatives

Intersection/Peak Period/Movement	2030 Design Year Conditions, Existing Geometry			2030 Design Year Conditions, Alt. 1 – Single Thru Lane			2030 Design Year Conditions, Alt. 2 – TWLTL			2030 Design Year Conditions, Alt. 3 – Raised Median		
	v/c ^a	Delay ^b	LOS ^c	Queue ^d 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th
Route 16 at Irving Street/Palfrey Street												
<i>Weekday Morning Peak Hour:</i>												
Route 16 EB LTR	0.77	17.5	B	187/457#	0.75	12.2	B	124/m295#	0.75	12.2	B	124/m295#
Route 16 WB LTR	0.59	12.4	B	147/322	0.57	10.2	B	133/237	0.57	10.2	B	133/237
Irving Street NB LTR	0.75	38.3	D	189/385#	0.80	49.2	D	253/464#	0.80	49.2	D	253/464#
Overall	0.77	18.4	B	--	0.76	17.0	B	--	0.76	17.0	B	--
<i>Weekday Evening Peak Hour:</i>												
Route 16 EB LTR	0.88	28.9	C	417/733#	0.88	30.0	C	355/623#	0.88	30.0	C	355/623#
Route 16 WB LTR	0.48	14.1	B	197/322	0.52	15.7	B	204/304	0.52	15.7	B	204/304
Irving Street NB LTR	0.81	57.3	E	376/651#	0.71	48.1	D	300/600#	0.71	48.1	D	300/600#
Overall	0.86	28.4	C	--	0.83	27.4	C	--	0.83	27.4	C	--
Route 16 at Common Street												
<i>Weekday Morning Peak Hour:</i>												
Route 16 EB L	0.97	34.4	C	223~/61#	0.44	19.1	B	37/m94	0.44	19.1	B	37/m94
Route 16 EB T					0.76	11.0	B	192/176	0.76	11.0	B	192/176
Route 16 WB TR	0.77	48.5	D	410/492	0.65	28.5	C	273/366	0.65	28.5	C	273/366
Common Street SB L	0.82	53.3	D	423/840#	0.90	54.8	D	327/503#	0.90	54.8	D	327/503#
Common Street SB R	0.68	45.4	D	289/597#	0.42	18.8	B	150/205	0.42	18.8	B	150/205
Overall	0.84	44.0	D	--	0.81	26.5	C	--	0.81	26.5	C	--
<i>Weekday Evening Peak Hour:</i>												
Route 16 EB L	0.63	22.7	C	134/303#	0.63	25.2	C	80/140	0.63	25.2	C	80/140
Route 16 EB T					0.70	29.1	C	396/797#	0.70	29.1	C	396/797#
Route 16 WB TR	0.96	49.6	D	235/528#	0.65	35.9	D	381/620#	0.65	35.9	D	381/620#
Common Street SB L	0.87	47.2	D	172/452#	0.89	73.8	E	358/521#	0.89	73.8	E	358/521#
Common Street SB R	0.70	34.2	C	115/308#	0.43	35.4	D	170/170	0.43	35.4	D	170/170
Overall	0.87	38.5	D	--	0.75	38.9	D	--	0.75	38.9	D	--

TABLE 9

Signalized Intersection Level of Service Summary with Alternatives (Continued)

Intersection/Peak Period/Movement	2030 Design Year Conditions, Existing Geometry			2030 Design Year Conditions, Alt. 1 – Single Thru Lane			2030 Design Year Conditions, Alt. 2 – TWLTL			2030 Design Year Conditions, Alt. 3 – Raised Median		
	v/c ^a	Delay ^b	LOS ^c	Queue ^d 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th
Route 16 at Bates Road East/Walnut Street												
<i>Weekday Morning Peak Hour:</i>												
Route 16 EB L					0.01	8.1	A	0/3	0.01	8.1	A	0/3
Route 16 EB T	0.61	14.6	B	102/289#	0.85	23.3	C	304/823#	0.85	23.3	C	304/823#
Route 16 EB R	0.53	15.5	B	52/243#	0.40	11.7	B	47/169	0.40	11.7	B	47/169
Route 16 WB L	0.63	14.9	B	102/312#	0.19	12.9	B	4/25	0.19	12.9	B	4/25
Route 16 WB TR					0.83	22.0	C	287/795#	0.83	22.0	C	287/795#
Walnut Street NB LTR	0.70	25.4	C	66/173#	0.82	46.5	D	114/224#	0.82	46.5	D	114/224#
Bates Road East SB LTR	0.08	16.2	B	7/34	0.10	25.6	C	13/42	0.10	25.6	C	13/42
Overall	0.66	15.9	B	--	0.84	23.4	C	--	0.84	23.4	C	--
Route 16 at Bates Road East/Walnut Street												
<i>Weekday Evening Peak Hour:</i>												
Route 16 EB L					0.01	11.5	B	0/3	0.01	11.5	B	0/3
Route 16 EB T	0.56	18.7	B	120/271	0.69	21.8	C	381/521	0.69	21.8	C	381/521
Route 16 EB R	0.31	16.8	B	37/128	0.17	5.0	A	31/58	0.17	5.0	A	31/58
Route 16 WB L	0.70	21.5	C	158/388#	0.10	12.8	B	7/20	0.10	12.8	B	7/20
Route 16 WB TR					0.83	28.0	C	524/721	0.83	28.0	C	524/721
Walnut Street NB LTR	0.81	29.6	C	132/386#	0.76	40.8	D	266/426#	0.76	40.8	D	266/426#
Bates Road East SB LTR	0.03	14.8	C	2/16	0.06	44.2	D	6/21	0.06	44.2	D	6/21
Overall	0.75	21.5	C	--	0.80	26.4	C	--	0.80	26.4	C	--
Route 16 at Boylston Street (Unsignalized in Existing Conditions)												
<i>Weekday Morning Peak Hour:</i>												
Route 16 EB TR	0.34	0.0	A	0	0.88	22.2	C	260/854#	0.88	22.2	C	260/854#
Route 16 WB L	0.30	1.1	A	2	0.22	8.9	A	4/30	0.22	8.9	A	4/30
Route 16 WB T					0.70	13.3	B	169/589#	0.70	13.3	B	169/589#
Boylston Street NB LR	1.44	254.8	F	541	0.87	45.6	D	137/116	0.87	45.6	D	137/116
Overall	--	--	--	--	0.88	23.1	C	--	0.88	23.1	C	--

TABLE 9

Signalized Intersection Level of Service Summary with Alternatives (Continued)

Intersection/Peak Period/Movement	2030 Design Year Conditions, Existing Geometry			2030 Design Year Conditions, Alt. 1 – Single Thru Lane			2030 Design Year Conditions, Alt. 2 – TWLTL			2030 Design Year Conditions, Alt. 3 – Raised Median		
	v/c ^a	Delay ^b	LOS ^c	Queue ^d 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th
Route 16 at Boylston Street (Unsignalized in Existing Conditions)												
<i>Weekday Evening Peak Hour:</i>												
Route 16 EB TR	0.31	0.0	A	0	0.60	5.1	A	94/526	0.60	5.1	A	94/526
Route 16 WB L	0.37	0.7	A	1	0.04	2.6	A	1/13	0.04	2.6	A	1/13
Route 16 WB T					0.66	6.0	A	117/664#	0.66	6.0	A	117/664#
Boylston Street NB LR	0.26	26.2	D	25	0.36	34.0	C	15/49	0.36	34.0	C	15/49
Overall	--	--	--	--	0.64	6.4	A	--	0.64	6.4	A	--
Route 16 at School Street												
<i>Weekday Morning Peak Hour:</i>												
Route 16 EB L	0.90	46.3	D	358/600#	0.54	25.2	C	29/70	0.54	25.2	C	29/70
Route 16 EB TR					0.90	38.8	D	524/946#	0.90	38.8	D	524/946#
Route 16 WB L					0.73	77.8	E	28/120#	0.73	77.8	E	28/120#
Route 16 WB T	0.68	33.2	C	253/433	0.84	38.6	D	423/814#	0.84	38.6	D	423/814#
Route 16 WB R					0.04	12.7	B	7/27	0.04	12.7	B	7/27
School Street NB L	0.36	26.3	C	135/222	0.26	38.7	D	14/39	0.26	38.7	D	14/39
School Street NB TR					0.61	43.3	D	143/226	0.61	43.3	D	143/226
School Street SB L	0.89	48.3	D	461/893#	0.29	26.9	C	42/94	0.29	26.9	C	42/94
School Street SB TR	0.89	40.9	D	--	0.91	53.0	D	346/644#	0.91	53.0	D	346/644#
Overall					0.91	41.6	D	--	0.91	41.6	D	--
<i>Weekday Evening Peak Hour:</i>												
Route 16 EB L	0.72	28.3	C	221/461#	1.50	329.5	F	98~/188#	1.50	329.5	F	98~/188#
Route 16 EB TR					0.72	31.1	C	417/716	0.72	31.1	C	417/716
Route 16 WB L					0.21	21.6	C	16/46	0.21	21.6	C	16/46
Route 16 WB T	0.63	24.8	C	265/479	0.90	43.5	D	610/1049#	0.90	43.5	D	610/1049#
Route 16 WB R					0.10	18.1	B	27/68	0.10	18.1	B	27/68
School Street NB L	0.87	46.7	D	351/699#	0.15	28.9	C	26/66	0.15	28.9	C	26/66
School Street NB TR					0.72	42.2	D	353/585	0.72	42.2	D	353/585
School Street SB L	0.31	46.8	D	239/516#	0.52	45.4	D	47/123	0.52	45.4	D	47/123
School Street SB TR	0.78	33.5	C	--	1.16	46.9	D	193/339	1.16	46.9	D	193/339
Overall					1.16	46.9	D	--	1.16	46.9	D	--

TABLE 9

Signalized Intersection Level of Service Summary with Alternatives (Continued)

Intersection/Peak Period/Movement	2030 Design Year Conditions, Existing Geometry			2030 Design Year Conditions, Alt. 1 – Single Thru Lane			2030 Design Year Conditions, Alt. 2 – TWLTL			2030 Design Year Conditions, Alt. 3 – Raised Median		
	v/c ^a	Delay ^b	LOS ^c	Queue ^d 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th
Route 16 at Kimball Road/Bigelow Avenue												
<i>Weekday Morning Peak Hour:</i>												
Route 16 EB L	0.54	12.9	B	181/393	0.04	8.8	A	3/15	0.04	8.8	A	3/15
Route 16 EB TR					0.53	13.4	B	166/322	0.53	13.4	B	166/322
Route 16 WB L	0.59	6.9	A	57/m85	0.20	5.9	A	7/m15	0.20	5.2	A	6/m14
Route 16 WB TR					0.62	7.9	A	94/m135	0.62	7.1	A	93/m130
Bigelow Avenue NB LTR	0.86	72.5	E	194/201	0.71	47.5	D	163/180	0.71	47.5	D	163/180
Kimball Road SB LTR	0.60	51.7	D	105/142	0.46	42.9	D	88/127	0.46	42.9	D	88/127
Overall	0.61	20.3	C	--	0.65	17.3	B	--	0.65	17.1	B	--
<i>Weekday Evening Peak Hour:</i>												
Route 16 EB L	0.43	16.3	B	153/332	0.07	8.8	A	5/14	0.07	8.8	A	5/14
Route 16 EB TR					0.35	10.6	B	129/164	0.35	10.6	B	129/164
Route 16 WB L	0.50	13.9	B	156/208	0.07	5.5	A	4/m6	0.07	5.5	A	4/m6
Route 16 WB TR					0.78	14.9	B	483/m156	0.78	14.9	B	483/m156
Bigelow Avenue NB LTR	0.88	67.1	E	293/326	0.86	65.4	E	284/339	0.86	65.4	E	284/339
Kimball Road SB LTR	0.10	37.2	D	21/38	0.10	35.5	D	21/38	0.10	35.5	D	21/38
Overall	0.62	25.1	C	--	0.80	23.0	C	--	0.80	23.0	C	--

TABLE 9

Signalized Intersection Level of Service Summary with Alternatives (Continued)

Intersection/Peak Period/Movement	2030 Design Year Conditions, Existing Geometry				2030 Design Year Conditions, Alt. 1 – Single Thru Lane				2030 Design Year Conditions, Alt. 2 – TWLTL				2030 Design Year Conditions, Alt. 3 – Raised Median			
	v/c ^a	Delay ^b	LOS ^c	Queue ^d 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th
Route 16 at Arlington Street																
<i>Weekday Morning Peak Hour:</i>																
Route 16 EB L	0.45	46.7	D	58/m90	0.38	34.0	C	48/m60	0.38	34.0	C	48/m60	0.37	33.3	C	48/m60
Route 16 EB TR	1.12	117.5	F	376~/497#	0.94	53.5	D	276/307#	0.94	53.5	D	276/307#	0.92	50.3	D	276/307#
Route 16 WB L	1.16	145.9	F	221~/404#	0.55	26.1	C	107/357#	0.55	26.1	C	107/357#	0.55	26.2	C	109/359#
Route 16 WB TR	0.46	35.4	D	188/243	0.57	22.5	C	235/487	0.57	22.5	C	235/487	0.57	22.0	C	235/487
Arlington Street NB L	0.60	39.6	D	40/75	0.71	50.1	D	38/88#	0.71	50.1	D	38/88#	1.24	227.1	F	72~/172#
Arlington Street NB T	0.48	29.6	C	218/312	0.38	26.9	C	145/219	0.38	26.9	C	145/219	0.39	27.3	C	145/219
Arlington Street NB R					0.06	9.0	A	0/16	0.06	9.0	A	0/16	0.06	9.2	A	0/16
Arlington Street SB L/TR	1.01	73.2	E	564~/701#	1.04	75.7	E	501~/636#	1.04	75.7	E	501~/636#	0.90	44.4	D	420/549#
Overall	1.02	78.5	E	--	0.87	49.9	D	--	0.87	49.9	D	--	0.97	42.4	D	--
<i>Weekday Evening Peak Hour:</i>																
Route 16 EB L	0.62	53.1	D	80/m111	0.48	36.6	D	56/m122	0.48	36.6	D	56/m122	0.48	36.6	D	56/m122
Route 16 EB TR	0.90	58.4	E	278/302	0.57	32.3	C	227/m297	0.57	32.3	C	227/m297	0.57	32.3	C	227/m297
Route 16 WB L	0.69	38.1	D	136/497#	0.61	25.3	C	107/358#	0.61	25.3	C	107/358#	0.61	25.3	C	107/358#
Route 16 WB TR	0.44	31.7	C	188/307	0.67	29.9	C	347/663#	0.67	29.9	C	347/663#	0.67	29.9	C	347/663#
Arlington Street NB L	0.72	27.1	C	165/234	0.90	57.4	E	192/327#	0.90	57.4	E	192/327#	0.90	57.4	E	192/327#
Arlington Street NB T	1.07	82.3	F	990~/1255#	0.97	61.8	E	640/909#	0.97	61.8	E	640/909#	0.97	61.8	E	640/909#
Arlington Street NB R					0.17	14.3	B	15/45	0.17	14.3	B	15/45	0.17	14.3	B	15/45
Arlington Street SB L/TR	0.63	36.7	D	210/276	0.92	67.5	E	241/353#	0.92	67.5	E	241/353#	0.92	67.5	E	241/353#
Overall	0.96	52.9	D	--	0.81	44.8	D	--	0.81	44.8	D	--	0.81	44.8	D	--

TABLE 9

Signalized Intersection Level of Service Summary with Alternatives (Continued)

Intersection/Peak Period/Movement	2030 Design Year Conditions, Existing Geometry			2030 Design Year Conditions, Alt. 1 – Single Thru Lane			2030 Design Year Conditions, Alt. 2 – TWLTL			2030 Design Year Conditions, Alt. 3 – Raised Median		
	v/c ^a	Delay ^b	LOS ^c	Queue ^d 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th	v/c	Delay	LOS	Queue 50 th /95 th
Arlington Street at Grove Street/Tufts Medical Center Driveway (Unsignalized in Existing Conditions)												
<i>Weekday Morning Peak Hour:</i>												
Arlington Street EB LT	0.67	1.2	A	2	0.98	37.8	D	456/ 1083 #	0.98	37.8	D	456/ 1083 #
Arlington Street EB R	0.37	0.0	A	0	0.38	4.1	A	0/30	0.38	4.1	A	0/30
Grove Street WB L	0.06	14.0	B	5	0.28	10.2	B	5/35	0.28	10.2	B	5/35
Grove Street WB TR	0.12	0.0	A	0	0.23	8.0	A	41/122	0.23	8.0	A	41/122
Arlington Street NB L	3.49	*	F	#	1.03	101.6	F	124/ 254 #	1.03	101.6	F	124/ 254 #
Arlington Street NB TR	0.78	68.1	F	135	0.58	42.2	D	61/117	0.58	42.2	D	61/117
Tufts Medical Center SB L	0.13	68.4	F	10	0.15	41.6	D	4/19	0.15	41.6	D	4/19
Tufts Medical Center SB R	0.05	10.5	B	4	0.06	40.9	D	1/32#	0.06	40.9	D	1/32#
Overall	--	--	--	--	0.96	32.5	D	--	0.96	32.5	D	--
<i>Weekday Evening Peak Hour:</i>												
Arlington Street EB LT	0.22	0.0	A	0	0.53	17.7	B	91/228	0.53	17.7	B	91/228
Arlington Street EB R	0.29	0.0	A	0	0.25	8.1	A	0/41	0.25	8.1	A	0/41
Grove Street WB L	0.09	8.3	A	7	0.15	12.6	B	11/44	0.15	12.6	B	11/44
Grove Street WB TR	0.63	0.0	A	0	0.68	18.4	B	149/ 408 #	0.68	18.4	B	149/ 408 #
Arlington Street NB L	5.17	*	F	#	0.75	45.7	D	74/ 230 #	0.75	45.7	D	74/ 230 #
Arlington Street NB TR	0.02	10.1	B	1	0.76	46.4	D	75/ 235 #	0.76	46.4	D	75/ 235 #
Tufts Medical Center SB L	0.78	57.3	F	142	0.61	29.2	C	65/111	0.61	29.2	C	65/111
Tufts Medical Center SB R	1.15	114.7	F	502	0.82	42.5	D	60/ 299 #	0.82	42.5	D	60/ 299 #
Overall	0.96cf	52.9	D	--	0.73	26.7	C	--	0.73	26.7	C	--

^aVolume to Capacity Ratio

^bAverage Delay Time in Seconds

^cLevel-of-Service

^dQueue Length in Feet.

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound;

L = Left Turn; T = Through; R = Right Turn; LT = Shared Left-turn/Thorough; TR Shared Through/Right-turn; LR = Shared Left/Right-turn; LTR = Shared Left/Through/Right-turn.

~# = 50th/95th percentile volume exceeds capacity; reported queues may not be accurate

m = 95th percentile volume metered by upstream signal

Bold/Italic Type indicates v/c ≥ 0.90, LOS E or F, 50th/95th percentile volume exceeds capacity

4.0 CONCLUSIONS AND RECOMMENDATIONS

In this section, the evaluations contained in this feasibility study are summarized and recommendations are discussed regarding the alternatives for the Route 16 corridor, including the proposed roadway cross section, and the horizontal and vertical alignments.

4.1 Alternatives

Design alternatives have been investigated and evaluated for operational improvements under future traffic conditions. They were also evaluated in regards to pedestrian access and safety. Finally, they were evaluated in relation to public parking supply. The conclusions to the various evaluations are provided in this section. The following four alternatives were considered for the study area intersections and roadway segments on Route 16 and Arlington Street:

- *Alternative 1- Single Through Lane with Left-Turn Pockets*

The roadway segment of Route 16 between Upland Road and Arlington Street currently provides two lanes of travel in each direction. The first alternative considered in this feasibility study proposes to eliminate one travel lane in each direction and provide left-turn lanes at key locations. This alternative also proposes the following signalization improvements:

- Elimination of the signal at Parker Street and making Parker Street one-way southbound;
- Signalization at the intersection of Route 16 with Boylston Street;
- Elimination of the pedestrian signal at Oakley Road;
- Installation of a new pedestrian signal at Upland Road/Dexter Avenue;
- Signalization at the intersection of Arlington Street with Grove Street and realignment of the Tufts Medical Center driveway to meet Arlington Street/Grove Street opposite the Arlington Street northbound approach.

- *Alternative 2 - Two-Way Left-Turn Lane*

Alternative 2 proposed to eliminate one travel lane in each direction along Route 16 and construct a continuous two-way left-turn lane between Common Street and Upland Road/Dexter Avenue. The signalization improvements outlined under Alternative 1 would also be implemented under Alternative 2, as would the conversion of Parker Street to one-way southbound operation and the realignment of the Tufts Medical Center driveway.

Implementation of Alternative 2 would improve traffic operations at the unsignalized minor-street approaches compared with Alternative 1. However, there is concern that allowing left-turns at any point along the roadway segment increases vehicle turning conflicts and could become a potential safety hazard. This is especially a concern where the side streets along Route 16 are closely spaced.

- *Alternative 3 - Raised Median*

Alternative 3 proposes to eliminate one travel lane in each direction and construct a raised median starting east of Common Street and extending to Upland Road/Dexter Avenue, allowing breaks at the signalized intersections and selected unsignalized intersections. The signalization improvements outlined under Alternative 1 would also be implemented under Alternative 3, as would the conversion of Parker Street to one-way southbound operation and the realignment of the Tufts Medical Center driveway.

While operations are improved with implementation of Alternative 3, the raised median restricts left-turns at each of the unsignalized study area intersections along Route 16. Fire Station Two is located on Route 16 between Upland Road and Lloyd Road. There is concern that restricting access to the minor streets could have a negative impact on emergency response times. In addition, while a median better delineates traffic movements for vehicles, narrow medians do not improve pedestrian safety. Instead, narrow medians such as this one may give pedestrians a false sense of security, encouraging them to cross the street mid-block, without a crosswalk, and at risk of being hit by vehicle.

Any improvements to the existing intersections will require that they be brought into compliance with the regulations of the Massachusetts AAB, with compliant ramps and crossings. The final design will address sidewalk cross-pitch (<2% max.), sidewalk minimum width (36" unobstructed), and correct access ramp location and construction.

Design and construction of each alternative will incorporate streetscaping to improve the visual aesthetics along Route 16 and Arlington Street within the study area. Selection of architectural elements and landscape will be chosen to improve the physical image of the roadway segments while complementing the existing environment and surrounding land uses. Examples include street trees, ornamental street lights and signal heads, and benches along the sidewalks.

The Town also expressed specific concern at the Route 16 intersection with Bigelow Avenue regarding an existing delta island. As part of the preferred alternative, the intersection will be redesigned to better delineate and align the northbound and southbound approaches. The existing delta island on the northbound approach will be reconstructed to provide a channelized right turn from Route 16 eastbound onto Bigelow Avenue. By increasing the size of the delta island and increasing the curb radius on the southwest corner, the crosswalk across the channelized right-turn lane is decreased, improving pedestrian safety.

The Town expressed great concern over the availability of parking in Coolidge Square and its impact on business. By eliminating one travel lane in each direction, more parking spaces can be accommodated along Route 16. No reduction of parking in the Square are expected as part of the final design. If parking remains to be an issue after the construction of the selected alternative, additional measures can be implemented to improve the parking situation such as decreasing time limits on parking space occupancy. In addition, stricter enforcement of parking violations and an increase in ticket fees have proven to act as a deterrent to occupancy time-limit violations.

5.0 APPENDIX

5.1 Traffic Volume Counts, Field Data

TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950

City/Town: WATERTOWN

Client: WORLDTECH ENG

Location :MT AUBURN/PHILLIPS/MARSHALL ST

File Name : 31406081

Site Code : 31406081

Start Date : 6/8/2010

Page No : 1

Groups Printed- AUTOS - TRUCKS

Start Time	MARSHALL ST From North				MT AUBURN ST From East				PHILLIPS ST From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	0	4	4	173	7	0	0	0	1	0	12	131	0	5	337
07:15 AM	0	0	0	2	3	183	9	1	0	0	0	1	1	163	4	10	377
07:30 AM	0	0	0	3	4	250	6	4	1	1	0	0	2	164	10	2	447
07:45 AM	0	0	0	2	6	219	11	6	1	0	0	0	0	172	2	3	422
Total	0	0	0	11	17	825	33	11	2	1	1	1	15	630	16	20	1583
08:00 AM	0	0	0	3	8	217	12	3	2	0	1	0	2	193	10	0	451
08:15 AM	0	0	0	4	15	213	12	5	2	0	0	0	1	162	3	2	419
08:30 AM	0	0	0	7	10	216	10	6	3	0	1	1	1	142	9	2	408
08:45 AM	0	0	0	6	11	223	9	1	3	0	0	0	0	162	7	8	430
Total	0	0	0	20	44	869	43	15	10	0	2	1	4	659	29	12	1708
04:00 PM	0	0	0	2	8	184	3	0	2	0	1	0	2	182	11	1	396
04:15 PM	0	0	0	1	4	193	10	3	1	0	1	0	4	210	7	0	434
04:30 PM	0	0	0	3	5	203	9	2	0	0	0	0	1	170	13	3	409
04:45 PM	0	0	0	3	5	212	6	5	5	0	1	0	5	172	10	0	424
Total	0	0	0	9	22	792	28	10	8	0	3	0	12	734	41	4	1663
05:00 PM	0	0	0	4	8	188	8	0	1	0	0	0	2	188	9	0	408
05:15 PM	0	0	0	5	5	190	10	2	1	0	1	0	4	179	12	6	415
05:30 PM	0	0	0	8	9	214	12	4	0	0	1	0	0	185	6	5	444
05:45 PM	0	0	0	7	6	193	6	4	0	1	0	0	2	185	6	1	411
Total	0	0	0	24	28	785	36	10	2	1	2	0	8	737	33	12	1678
Grand Total	0	0	0	64	111	3271	140	46	22	2	8	2	39	2760	119	48	6632
Apprch %	0	0	0	100	3.1	91.7	3.9	1.3	64.7	5.9	23.5	5.9	1.3	93.1	4	1.6	
Total %	0	0	0	1	1.7	49.3	2.1	0.7	0.3	0	0.1	0	0.6	41.6	1.8	0.7	
AUTOS	0	0	0	64	111	3183	137	46	22	2	8	2	36	2664	118	48	6441
% AUTOS	0	0	0	100	100	97.3	97.9	100	100	100	100	100	92.3	96.5	99.2	100	97.1
TRUCKS	0	0	0	0	0	88	3	0	0	0	0	0	3	96	1	0	191
% TRUCKS	0	0	0	0	0	2.7	2.1	0	0	0	0	0	7.7	3.5	0.8	0	2.9

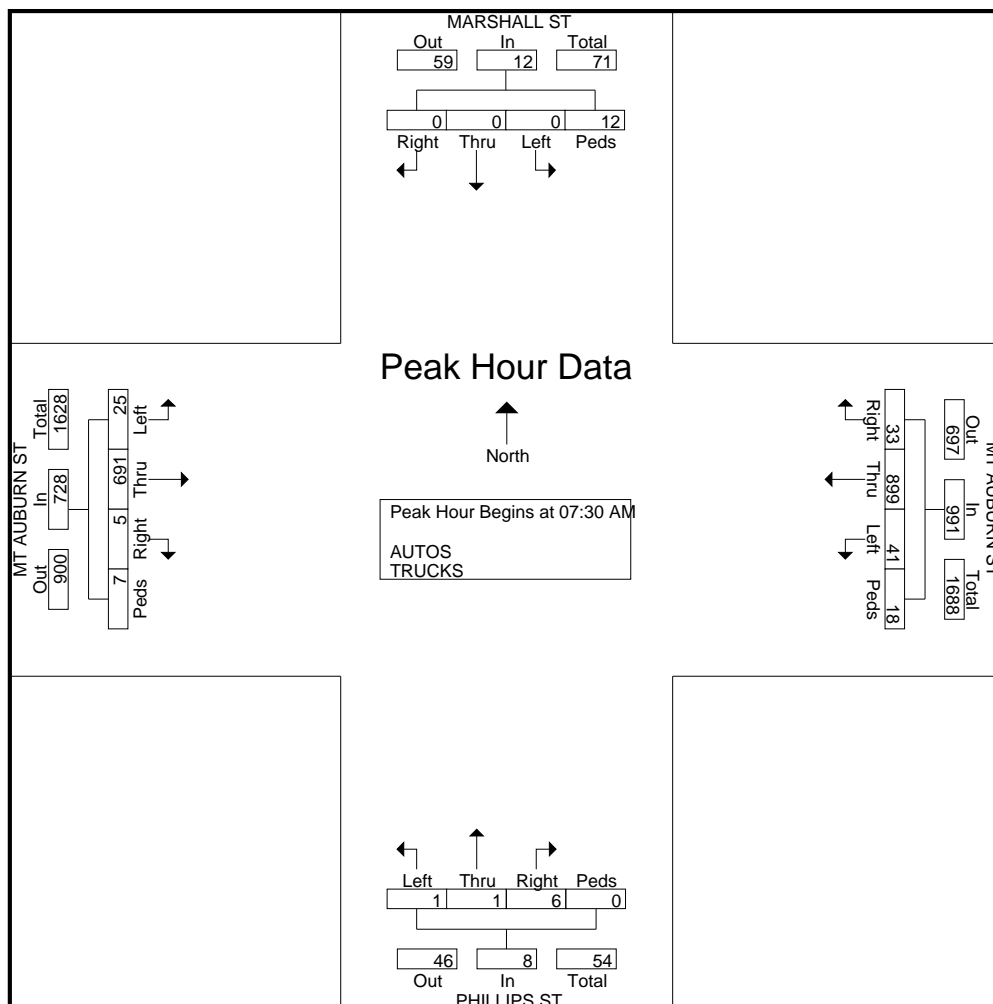
TRANSDATA SERVICES

66 Pleasant Street, Suite 3
 Newburyport, MA 01950
 978 463-2029

City/Town: WATERTOWN
 Client: WORLDTECH ENG
 Location :MT AUBURN/PHILLIPS/MARSHALL ST

File Name : 31406081
 Site Code : 31406081
 Start Date : 6/8/2010
 Page No : 2

Start Time	MARSHALL ST From North					MT AUBURN ST From East					PHILLIPS ST From South					MT AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	3	3	4	250			264	1	1	0	0	2	2	164	10	2	178	447
07:45 AM	0	0	0	2	2	6	219	11	6	242	1	0	0	0	1	0	172	2	3	177	422
08:00 AM	0	0	0	3	3	8	217	12	3	240	2	0	1	0	3	2	193			205	451
08:15 AM	0	0	0	4	4	15	213	12	5	245	2	0	0	0	2	1	162	3	2	168	419
Total Volume	0	0	0	12	12	33	899	41	18	991	6	1	1	0	8	5	691	25	7	728	1739
% App. Total	0	0	0	100		3.3	90.7	4.1	1.8		75	12.5	12.5	0		0.7	94.9	3.4	1		
PHF	.000	.000	.000	.750	.750	.550	.899	.854	.750	.938	.750	.250	.250	.000	.667	.625	.895	.625	.583	.888	.964



TRANSDATA SERVICES

66 Pleasant Street, Suite 3

Newburyport, MA 01950

978 463-2029

City/Town: WATERTOWN

Client: WORLDTECH ENG

Location :MT AUBURN/PHILLIPS/MARSHALL ST

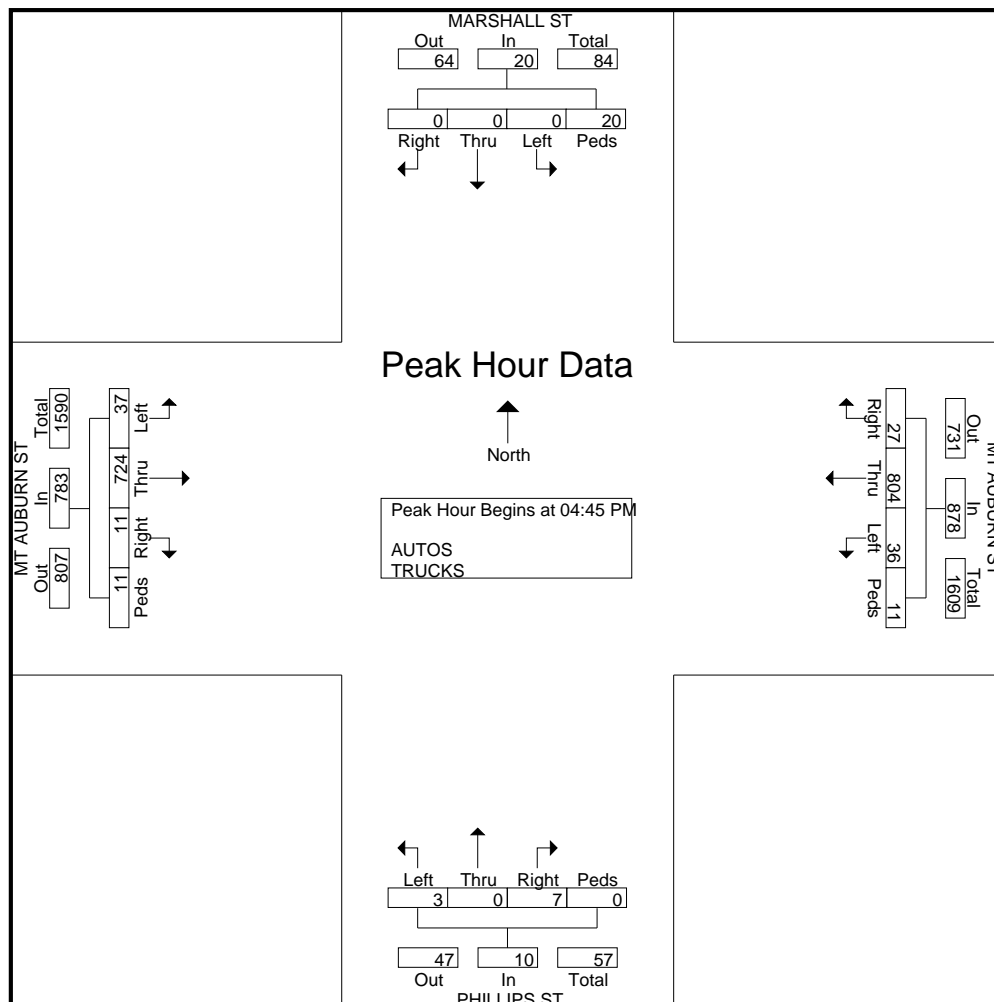
File Name : 31406081

Site Code : 31406081

Start Date : 6/8/2010

Page No : 3

	MARSHALL ST From North					MT AUBURN ST From East					PHILLIPS ST From South					MT AUBURN ST From West						
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 04:45 PM																						
04:45 PM	0	0	0	3	3	5	212	6	5	228	5	0	1	0	6	5	172	10	0	187	424	
05:00 PM	0	0	0	4	4	8	188	8	0	204	1	0	0	0	1	2	188					
05:15 PM	0	0	0	5	5	5	190	10	2	207	1	0	1	0	2	4	179	12	6	201	415	
05:30 PM	0	0	0	8	8	9	214	12	4	239	0	0	1	0	1	0	185	6	5	196	444	
Total Volume	0	0	0	20	20	27	804	36	11	878	7	0	3	0	10	11	724	37	11	783	1691	
% App. Total	0	0	0	100		3.1	91.6	4.1	1.3		70	0	30	0		1.4	92.5	4.7	1.4			
PHF	.000	.000	.000	.625	.625	.750	.939	.750	.550	.918	.350	.000	.750	.000	.417	.550	.963	.771	.458	.974	.952	



TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950

City/Town: WATERTOWN

Client: WORLDTECH ENG

Location :MT AUBURN/PHILLIPS/MARSHALL ST

File Name : 31406081

Site Code : 31406081

Start Date : 6/8/2010

Page No : 1

Groups Printed- AUTOS

Start Time	MARSHALL ST From North				MT AUBURN ST From East				PHILLIPS ST From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	0	4	4	169	7	0	0	0	1	0	12	129	0	5	331
07:15 AM	0	0	0	2	3	180	9	1	0	0	0	1	0	157	4	10	367
07:30 AM	0	0	0	3	4	241	6	4	1	1	0	0	2	159	10	2	433
07:45 AM	0	0	0	2	6	216	11	6	1	0	0	0	0	165	2	3	412
Total	0	0	0	11	17	806	33	11	2	1	1	1	14	610	16	20	1543
08:00 AM	0	0	0	3	8	209	11	3	2	0	1	0	2	177	10	0	426
08:15 AM	0	0	0	4	15	211	12	5	2	0	0	0	1	155	3	2	410
08:30 AM	0	0	0	7	10	207	9	6	3	0	1	1	1	134	9	2	390
08:45 AM	0	0	0	6	11	210	8	1	3	0	0	0	0	146	7	8	400
Total	0	0	0	20	44	837	40	15	10	0	2	1	4	612	29	12	1626
04:00 PM	0	0	0	2	8	181	3	0	2	0	1	0	2	178	10	1	388
04:15 PM	0	0	0	1	4	190	10	3	1	0	1	0	4	205	7	0	426
04:30 PM	0	0	0	3	5	191	9	2	0	0	0	0	1	168	13	3	395
04:45 PM	0	0	0	3	5	210	6	5	5	0	1	0	4	166	10	0	415
Total	0	0	0	9	22	772	28	10	8	0	3	0	11	717	40	4	1624
05:00 PM	0	0	0	4	8	184	8	0	1	0	0	0	2	185	9	0	401
05:15 PM	0	0	0	5	5	183	10	2	1	0	1	0	3	175	12	6	403
05:30 PM	0	0	0	8	9	210	12	4	0	0	1	0	0	184	6	5	439
05:45 PM	0	0	0	7	6	191	6	4	0	1	0	0	2	181	6	1	405
Total	0	0	0	24	28	768	36	10	2	1	2	0	7	725	33	12	1648
Grand Total	0	0	0	64	111	3183	137	46	22	2	8	2	36	2664	118	48	6441
Apprch %	0	0	0	100	3.2	91.5	3.9	1.3	64.7	5.9	23.5	5.9	1.3	93	4.1	1.7	
Total %	0	0	0	1	1.7	49.4	2.1	0.7	0.3	0	0.1	0	0.6	41.4	1.8	0.7	

TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client: WORLDTECH ENG
Location :MT AUBURN/PHILLIPS/MARSHALL ST

File Name : 31406081
Site Code : 31406081
Start Date : 6/8/2010
Page No : 1

Groups Printed- TRUCKS

Start Time	MARSHALL ST From North				MT AUBURN ST From East				PHILLIPS ST From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	2	0	0	6
07:15 AM	0	0	0	0	0	3	0	0	0	0	0	0	1	6	0	0	10
07:30 AM	0	0	0	0	0	9	0	0	0	0	0	0	0	5	0	0	14
07:45 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	7	0	0	10
Total	0	0	0	0	0	19	0	0	0	0	0	0	1	20	0	0	40
08:00 AM	0	0	0	0	0	8	1	0	0	0	0	0	0	16	0	0	25
08:15 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	7	0	0	9
08:30 AM	0	0	0	0	0	9	1	0	0	0	0	0	0	8	0	0	18
08:45 AM	0	0	0	0	0	13	1	0	0	0	0	0	0	16	0	0	30
Total	0	0	0	0	0	32	3	0	0	0	0	0	0	47	0	0	82
04:00 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	4	1	0	8
04:15 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	5	0	0	8
04:30 PM	0	0	0	0	0	12	0	0	0	0	0	0	0	2	0	0	14
04:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	1	6	0	0	9
Total	0	0	0	0	0	20	0	0	0	0	0	0	1	17	1	0	39
05:00 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	3	0	0	7
05:15 PM	0	0	0	0	0	7	0	0	0	0	0	0	1	4	0	0	12
05:30 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	1	0	0	5
05:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0	0	6
Total	0	0	0	0	0	17	0	0	0	0	0	0	1	12	0	0	30
Grand Total	0	0	0	0	0	88	3	0	0	0	0	0	3	96	1	0	191
Apprch %	0	0	0	0	0	96.7	3.3	0	0	0	0	0	3	96	1	0	
Total %	0	0	0	0	0	46.1	1.6	0	0	0	0	0	1.6	50.3	0.5	0	

TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client: WORLDTECH ENG
Location : MT AUBURN/COMMON/
PARKER STS

File Name : 31406082
Site Code : 31406082
Start Date : 6/8/2010
Page No : 1

Groups Printed- AUTOS - TRUCKS

Start Time	COMMON ST From North				MT AUBURN ST From East				PARKER ST From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	69	3	45	6	26	102	1	1	1	2	1	8	4	114	25	1	409
07:15 AM	57	0	50	3	18	140	0	0	3	3	2	4	0	140	29	1	450
07:30 AM	74	0	80	1	28	174	0	2	2	2	5	3	0	136	36	2	545
07:45 AM	81	3	110	2	27	152	1	7	2	2	2	10	1	140	32	5	577
Total	281	6	285	12	99	568	2	10	8	9	10	25	5	530	122	9	1981
08:00 AM	71	3	109	2	33	155	0	0	1	0	3	5	5	169	37	8	601
08:15 AM	76	1	113	3	34	158	0	3	3	4	4	4	0	120	43	1	567
08:30 AM	76	0	106	7	41	171	0	0	2	1	2	0	0	119	27	0	552
08:45 AM	69	1	95	5	36	164	0	0	2	2	3	7	0	134	25	0	543
Total	292	5	423	17	144	648	0	3	8	7	12	16	5	542	132	9	2263
04:00 PM	53	3	74	3	51	137	0	1	2	1	3	4	3	129	47	1	512
04:15 PM	42	2	53	2	42	168	0	1	2	2	3	0	3	168	45	0	533
04:30 PM	41	0	62	2	49	167	0	0	3	2	5	2	0	132	40	0	505
04:45 PM	52	3	80	3	40	167	0	2	1	1	4	1	0	129	45	0	528
Total	188	8	269	10	182	639	0	4	8	6	15	7	6	558	177	1	2078
05:00 PM	52	0	81	3	52	152	0	2	1	3	3	0	1	157	35	0	542
05:15 PM	60	0	89	8	54	147	0	3	2	6	1	0	0	133	54	0	557
05:30 PM	54	0	76	4	56	177	0	1	3	2	2	0	0	141	51	0	567
05:45 PM	59	2	80	13	56	148	0	2	3	2	5	0	0	137	50	2	559
Total	225	2	326	28	218	624	0	8	9	13	11	0	1	568	190	2	2225
Grand Total	986	21	1303	67	643	2479	2	25	33	35	48	48	17	2198	621	21	8547
Apprch %	41.5	0.9	54.8	2.8	20.4	78.7	0.1	0.8	20.1	21.3	29.3	29.3	0.6	76.9	21.7	0.7	
Total %	11.5	0.2	15.2	0.8	7.5	29	0	0.3	0.4	0.4	0.6	0.6	0.2	25.7	7.3	0.2	
AUTOS	971	19	1272	67	623	2398	2	25	33	28	45	48	17	2100	603	21	8272
% AUTOS	98.5	90.5	97.6	100	96.9	96.7	100	100	100	80	93.8	100	100	95.5	97.1	100	96.8
TRUCKS	15	2	31	0	20	81	0	0	0	7	3	0	0	98	18	0	275
% TRUCKS	1.5	9.5	2.4	0	3.1	3.3	0	0	0	20	6.2	0	0	4.5	2.9	0	3.2

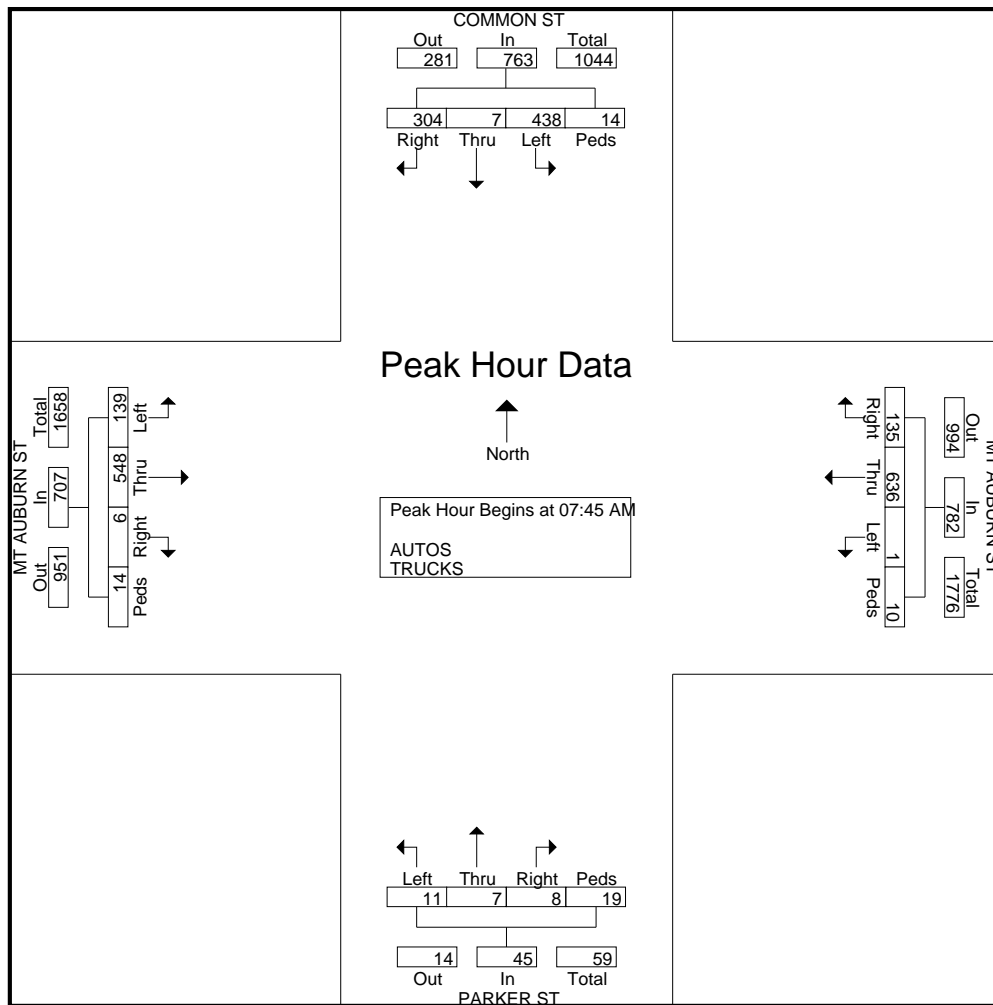
TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client: WORLDTECH ENG
Location : MT AUBURN/COMMON/
PARKER STS

File Name : 31406082
Site Code : 31406082
Start Date : 6/8/2010
Page No : 2

Start Time	COMMON ST From North					MT AUBURN ST From East					PARKER ST From South					MT AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	81	3	110	2	196	27	152	1	7	187	2	2	2	10	16	1	140	32	5	178	577
08:00 AM	71	3	109	2	185	33	155	0	0	188	1	0	3	5	9	5	169		8	219	601
08:15 AM	76	1	113				158	0	3	195	3	4	4	4	15	0	120	43	1	164	567
08:30 AM	76	0	106	7	189	41	171			212	2	1	2	0	5	0	119	27	0	146	552
Total Volume	304	7	438	14	763	135	636	1	10	782	8	7	11	19	45	6	548	139	14	707	2297
% App. Total	39.8	0.9	57.4	1.8		17.3	81.3	0.1	1.3		17.8	15.6	24.4	42.2		0.8	77.5	19.7	2		
PHF	.938	.583	.969	.500	.973	.823	.930	.250	.357	.922	.667	.438	.688	.475	.703	.300	.811	.808	.438	.807	.955



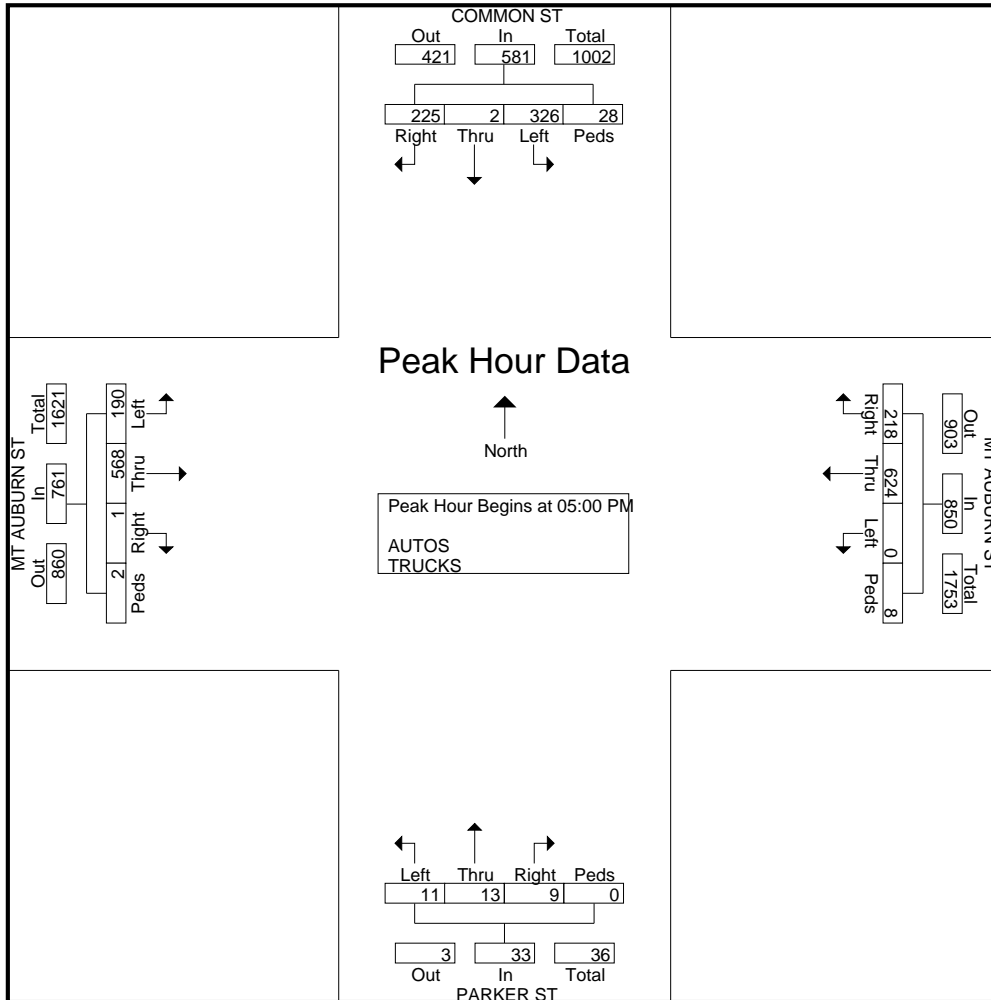
TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client: WORLDTECH ENG
Location : MT AUBURN/COMMON/
PARKER STS

File Name : 31406082
Site Code : 31406082
Start Date : 6/8/2010
Page No : 3

Start Time	COMMON ST From North					MT AUBURN ST From East					PARKER ST From South					MT AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	52	0	81	3	136	52	152	0	2	206	1	3	3	0	7	1	157			193	542
05:15 PM	60	0	89	8	157	54	147	0	3	204	2	6	1	0	9	0	133	54	0	187	557
05:30 PM	54	0	76	4	134	56	177			234	3	2	2	0	7	0	141	51	0	192	567
05:45 PM	59	2	80	13	154	56	148	0	2	206	3	2	5	0	10	0	137	50	2	189	559
Total Volume	225	2	326	28	581	218	624	0	8	850	9	13	11	0	33	1	568	190	2	761	2225
% App. Total	38.7	0.3	56.1	4.8		25.6	73.4	0	0.9		27.3	39.4	33.3	0		0.1	74.6	25	0.3		
PHF	.938	.250	.916	.538	.925	.973	.881	.000	.667	.908	.750	.542	.550	.000	.825	.250	.904	.880	.250	.986	.981



TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client: WORLDTECH ENG
Location : MT AUBURN/COMMON/
PARKER STS

File Name : 31406082
Site Code : 31406082
Start Date : 6/8/2010
Page No : 1

Groups Printed- AUTOS

Start Time	COMMON ST From North				MT AUBURN ST From East				PARKER ST From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	66	3	39	6	25	99	1	1	1	0	1	8	4	104	25	1	384
07:15 AM	57	0	48	3	17	136	0	0	3	1	2	4	0	131	29	1	432
07:30 AM	73	0	78	1	26	170	0	2	2	1	3	3	0	130	34	2	525
07:45 AM	80	3	106	2	26	150	1	7	2	2	2	10	1	131	31	5	559
Total	276	6	271	12	94	555	2	10	8	4	8	25	5	496	119	9	1900
08:00 AM	69	3	108	2	29	149	0	0	1	0	3	5	5	156	34	8	572
08:15 AM	75	1	108	3	32	153	0	3	3	4	4	4	0	114	43	1	548
08:30 AM	75	0	104	7	39	160	0	0	2	0	2	0	0	111	25	0	525
08:45 AM	67	1	93	5	33	154	0	0	2	2	3	7	0	126	21	0	514
Total	286	5	413	17	133	616	0	3	8	6	12	16	5	507	123	9	2159
04:00 PM	53	3	72	3	51	130	0	1	2	1	3	4	3	124	45	1	496
04:15 PM	42	2	52	2	41	163	0	1	2	2	3	0	3	163	45	0	521
04:30 PM	40	0	61	2	48	159	0	0	3	2	4	2	0	129	40	0	490
04:45 PM	52	3	80	3	39	165	0	2	1	1	4	1	0	127	43	0	521
Total	187	8	265	10	179	617	0	4	8	6	14	7	6	543	173	1	2028
05:00 PM	51	0	81	3	52	149	0	2	1	3	3	0	1	153	35	0	534
05:15 PM	60	0	87	8	54	141	0	3	2	5	1	0	0	130	53	0	544
05:30 PM	54	0	76	4	55	174	0	1	3	2	2	0	0	137	51	0	559
05:45 PM	57	0	79	13	56	146	0	2	3	2	5	0	0	134	49	2	548
Total	222	0	323	28	217	610	0	8	9	12	11	0	1	554	188	2	2185
Grand Total	971	19	1272	67	623	2398	2	25	33	28	45	48	17	2100	603	21	8272
Apprch %	41.7	0.8	54.6	2.9	20.4	78.7	0.1	0.8	21.4	18.2	29.2	31.2	0.6	76.6	22	0.8	
Total %	11.7	0.2	15.4	0.8	7.5	29	0	0.3	0.4	0.3	0.5	0.6	0.2	25.4	7.3	0.3	

TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client: WORLDTECH ENG
Location : MT AUBURN/COMMON/
PARKER STS

File Name : 31406082
Site Code : 31406082
Start Date : 6/8/2010
Page No : 1

Groups Printed- TRUCKS

Start Time	COMMON ST From North				MT AUBURN ST From East				PARKER ST From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	3	0	6	0	1	3	0	0	0	2	0	0	0	10	0	0	25
07:15 AM	0	0	2	0	1	4	0	0	0	2	0	0	0	9	0	0	18
07:30 AM	1	0	2	0	2	4	0	0	0	1	2	0	0	6	2	0	20
07:45 AM	1	0	4	0	1	2	0	0	0	0	0	0	0	9	1	0	18
Total	5	0	14	0	5	13	0	0	0	5	2	0	0	34	3	0	81
08:00 AM	2	0	1	0	4	6	0	0	0	0	0	0	0	13	3	0	29
08:15 AM	1	0	5	0	2	5	0	0	0	0	0	0	0	6	0	0	19
08:30 AM	1	0	2	0	2	11	0	0	0	1	0	0	0	8	2	0	27
08:45 AM	2	0	2	0	3	10	0	0	0	0	0	0	0	8	4	0	29
Total	6	0	10	0	11	32	0	0	0	1	0	0	0	35	9	0	104
04:00 PM	0	0	2	0	0	7	0	0	0	0	0	0	0	5	2	0	16
04:15 PM	0	0	1	0	1	5	0	0	0	0	0	0	0	5	0	0	12
04:30 PM	1	0	1	0	1	8	0	0	0	0	1	0	0	3	0	0	15
04:45 PM	0	0	0	0	1	2	0	0	0	0	0	0	0	2	2	0	7
Total	1	0	4	0	3	22	0	0	0	0	1	0	0	15	4	0	50
05:00 PM	1	0	0	0	0	3	0	0	0	0	0	0	0	4	0	0	8
05:15 PM	0	0	2	0	0	6	0	0	0	1	0	0	0	3	1	0	13
05:30 PM	0	0	0	0	1	3	0	0	0	0	0	0	0	4	0	0	8
05:45 PM	2	2	1	0	0	2	0	0	0	0	0	0	0	3	1	0	11
Total	3	2	3	0	1	14	0	0	0	1	0	0	0	14	2	0	40
Grand Total	15	2	31	0	20	81	0	0	0	7	3	0	0	98	18	0	275
Apprch %	31.2	4.2	64.6	0	19.8	80.2	0	0	0	70	30	0	0	84.5	15.5	0	
Total %	5.5	0.7	11.3	0	7.3	29.5	0	0	0	2.5	1.1	0	0	35.6	6.5	0	

TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client: WORLDTECH ENG
Location : MT. AUBURN ST/WALNUT ST/
BATES RD

File Name : 31406083
Site Code : 31406083
Start Date : 6/8/2010
Page No : 1

Groups Printed- AUTOS - TRUCKS

Start Time	BATES RD From North				MT. AUBURN ST From East				WALNUT ST From South				MT. AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	1	0	9	0	129	3	3	1	0	29	4	24	140	0	0	343
07:15 AM	1	1	1	5	0	139	3	1	6	0	28	1	47	128	0	3	364
07:30 AM	1	0	1	3	0	184	5	0	3	0	36	2	60	172	0	0	467
07:45 AM	2	1	5	5	1	195	6	0	1	0	45	1	67	207	0	2	538
Total	4	3	7	22	1	647	17	4	11	0	138	8	198	647	0	5	1712
08:00 AM	1	3	2	4	0	199	6	0	5	0	36	6	74	223	0	1	560
08:15 AM	0	3	2	3	4	202	3	0	7	0	46	10	91	173	0	2	546
08:30 AM	2	2	4	5	2	206	2	1	2	0	30	3	77	159	0	2	497
08:45 AM	2	2	2	3	2	222	2	0	5	1	33	2	58	163	0	4	501
Total	5	10	10	15	8	829	13	1	19	1	145	21	300	718	0	9	2104
04:00 PM	0	1	0	4	1	186	1	2	10	0	66	2	45	174	0	1	493
04:15 PM	1	0	0	5	0	186	2	1	3	0	55	5	34	172	0	5	469
04:30 PM	0	1	0	3	1	214	3	1	9	1	51	10	30	163	0	1	488
04:45 PM	1	0	0	6	3	184	5	1	8	1	57	2	57	163	0	1	489
Total	2	2	0	18	5	770	11	5	30	2	229	19	166	672	0	8	1939
05:00 PM	1	0	0	7	1	190	6	1	10	1	83	9	41	181	0	2	533
05:15 PM	5	2	1	7	3	205	6	1	6	3	61	7	50	170	0	0	527
05:30 PM	7	1	3	8	3	195	3	0	3	0	76	10	43	151	1	6	510
05:45 PM	1	0	0	10	2	169	2	1	6	1	76	7	42	174	0	1	492
Total	14	3	4	32	9	759	17	3	25	5	296	33	176	676	1	9	2062
Grand Total	25	18	21	87	23	3005	58	13	85	8	808	81	840	2713	1	31	7817
Apprch %	16.6	11.9	13.9	57.6	0.7	97	1.9	0.4	8.7	0.8	82.3	8.2	23.4	75.7	0	0.9	
Total %	0.3	0.2	0.3	1.1	0.3	38.4	0.7	0.2	1.1	0.1	10.3	1	10.7	34.7	0	0.4	
AUTOS	25	18	21	87	23	2975	58	13	84	8	802	81	832	2679	1	31	7738
% AUTOS	100	100	100	100	100	99	100	100	98.8	100	99.3	100	99	98.7	100	100	99
TRUCKS	0	0	0	0	0	30	0	0	1	0	6	0	8	34	0	0	79
% TRUCKS	0	0	0	0	0	1	0	0	1.2	0	0.7	0	1	1.3	0	0	1

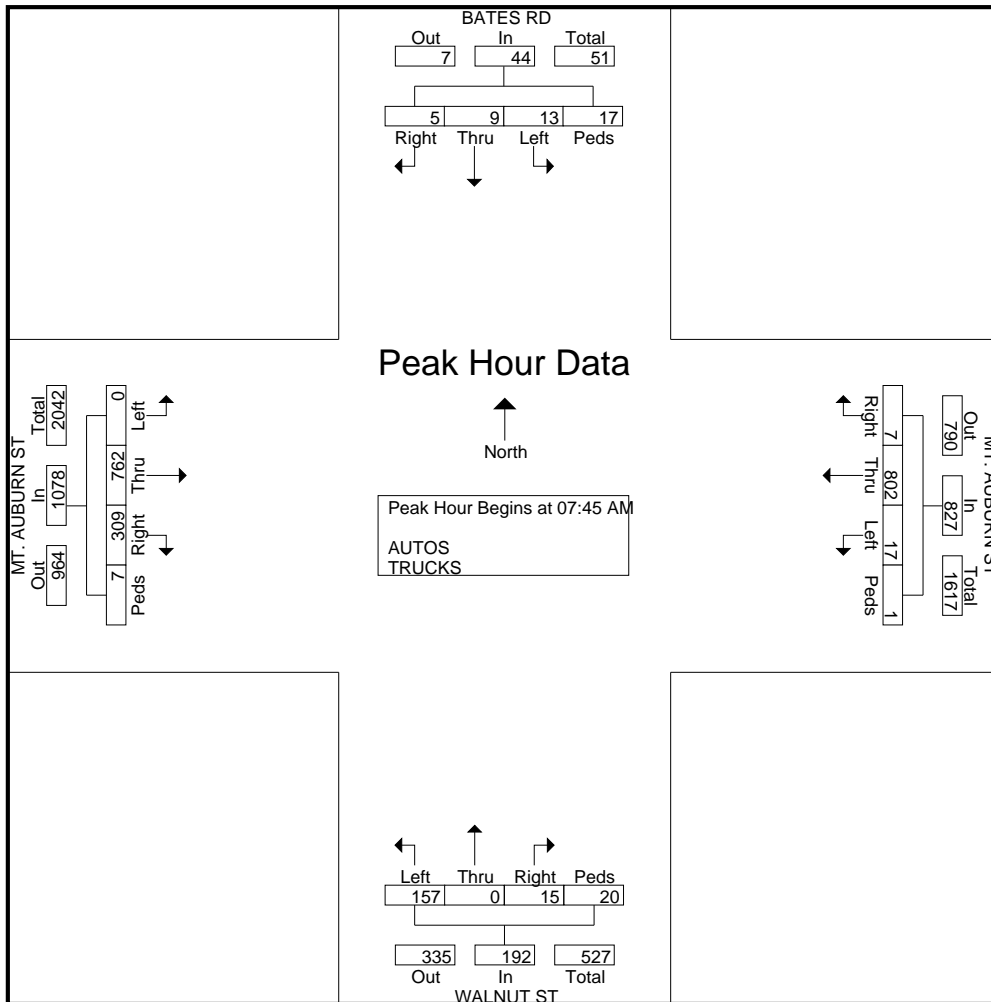
TRANSDATA SERVICES

66 Pleasant Street, Suite 3
 Newburyport, MA 01950
 978 463-2029

City/Town: WATERTOWN
 Client: WORLDTECH ENG
 Location: MT. AUBURN ST/WALNUT ST/
 BATES RD

File Name : 31406083
 Site Code : 31406083
 Start Date : 6/8/2010
 Page No : 2

Start Time	BATES RD From North					MT. AUBURN ST From East					WALNUT ST From South					MT. AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	2	1	5	5	13	1	195	6	0	202	1	0	45	1	47	67	207	0	2	276	538
08:00 AM	1	3	2	4	10	0	199	6	0	205	5	0	36	6	47	74	223	0	2	298	560
08:15 AM	0	3	2	3	8	4	202	3	0	209	7	0	46	10	63	91	173	0	2	266	546
08:30 AM	2	2	4	5	13	2	206	1	1	211	2	0	30	3	35	77	159	0	2	238	497
Total Volume	5	9	13	17	44	7	802	17	1	827	15	0	157	20	192	309	762	0	7	1078	2141
% App. Total	11.4	20.5	29.5	38.6		0.8	97	2.1	0.1		7.8	0	81.8	10.4		28.7	70.7	0	0.6		
PHF	.625	.750	.650	.850	.846	.438	.973	.708	.250	.980	.536	.000	.853	.500	.762	.849	.854	.000	.875	.904	.956



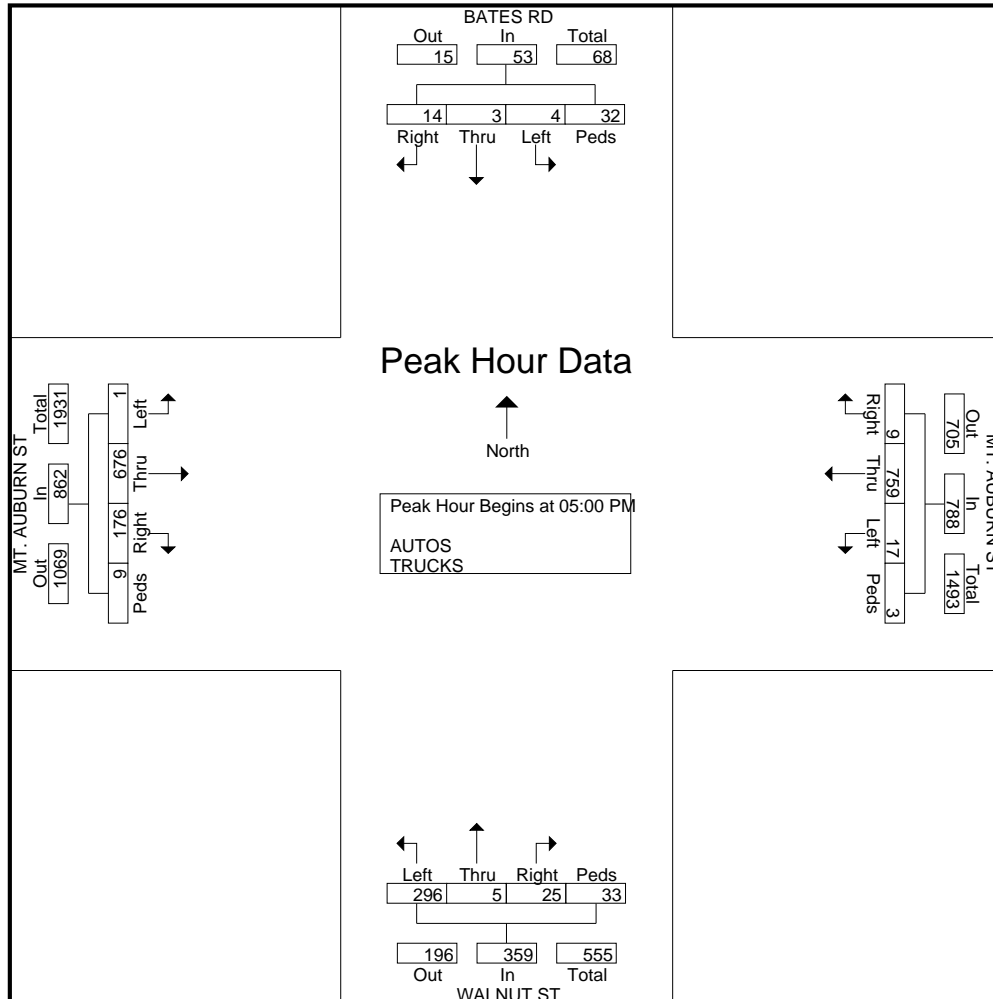
TRANSDATA SERVICES

66 Pleasant Street, Suite 3
 Newburyport, MA 01950
 978 463-2029

City/Town: WATERTOWN
 Client: WORLDTECH ENG
 Location: MT. AUBURN ST/WALNUT ST/
 BATES RD

File Name : 31406083
 Site Code : 31406083
 Start Date : 6/8/2010
 Page No : 3

Start Time	BATES RD From North					MT. AUBURN ST From East					WALNUT ST From South					MT. AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	1	0	0	7	8	1	190	6	1	198	10	1	83	9	103	41	181	0	0	224	533
05:15 PM	5	2	1	7	15	3	205			215	6	3	61	7	77	50	170	0	0	220	527
05:30 PM	7	1	3	8	19	3	195	3	0	201	3	0	76	10	89	43	151	1	6	201	510
05:45 PM	1	0	0	10	11	2	169	2	1	174	6	1	76	7	90	42	174	0	1	217	492
Total Volume	14	3	4	32	53	9	759	17	3	788	25	5	296	33	359	176	676	1	9	862	2062
% App. Total	26.4	5.7	7.5	60.4		1.1	96.3	2.2	0.4		7	1.4	82.5	9.2		20.4	78.4	0.1	1		
PHF	.500	.375	.333	.800	.697	.750	.926	.708	.750	.916	.625	.417	.892	.825	.871	.880	.934	.250	.375	.962	.967



TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client: WORLDTECH ENG
Location : MT. AUBURN ST/WALNUT ST/
BATES RD

File Name : 31406083
Site Code : 31406083
Start Date : 6/8/2010
Page No : 1

Groups Printed- AUTOS

Start Time	BATES RD From North				MT. AUBURN ST From East				WALNUT ST From South				MT. AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	1	0	9	0	129	3	3	1	0	29	4	23	136	0	0	338
07:15 AM	1	1	1	5	0	139	3	1	6	0	28	1	47	126	0	3	362
07:30 AM	1	0	1	3	0	183	5	0	2	0	35	2	59	171	0	0	462
07:45 AM	2	1	5	5	1	194	6	0	1	0	45	1	67	202	0	2	532
Total	4	3	7	22	1	645	17	4	10	0	137	8	196	635	0	5	1694
08:00 AM	1	3	2	4	0	197	6	0	5	0	36	6	74	221	0	1	556
08:15 AM	0	3	2	3	4	199	3	0	7	0	46	10	89	168	0	2	536
08:30 AM	2	2	4	5	2	199	2	1	2	0	30	3	77	155	0	2	486
08:45 AM	2	2	2	3	2	220	2	0	5	1	32	2	58	160	0	4	495
Total	5	10	10	15	8	815	13	1	19	1	144	21	298	704	0	9	2073
04:00 PM	0	1	0	4	1	184	1	2	10	0	64	2	45	172	0	1	487
04:15 PM	1	0	0	5	0	184	2	1	3	0	55	5	33	171	0	5	465
04:30 PM	0	1	0	3	1	210	3	1	9	1	51	10	30	162	0	1	483
04:45 PM	1	0	0	6	3	183	5	1	8	1	56	2	57	163	0	1	487
Total	2	2	0	18	5	761	11	5	30	2	226	19	165	668	0	8	1922
05:00 PM	1	0	0	7	1	188	6	1	10	1	83	9	41	180	0	2	530
05:15 PM	5	2	1	7	3	203	6	1	6	3	61	7	48	169	0	0	522
05:30 PM	7	1	3	8	3	194	3	0	3	0	75	10	42	151	1	6	507
05:45 PM	1	0	0	10	2	169	2	1	6	1	76	7	42	172	0	1	490
Total	14	3	4	32	9	754	17	3	25	5	295	33	173	672	1	9	2049
Grand Total	25	18	21	87	23	2975	58	13	84	8	802	81	832	2679	1	31	7738
Apprch %	16.6	11.9	13.9	57.6	0.7	96.9	1.9	0.4	8.6	0.8	82.3	8.3	23.5	75.6	0	0.9	
Total %	0.3	0.2	0.3	1.1	0.3	38.4	0.7	0.2	1.1	0.1	10.4	1	10.8	34.6	0	0.4	

TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client: WORLDTECH ENG
Location : MT. AUBURN ST/WALNUT ST/
BATES RD

File Name : 31406083
Site Code : 31406083
Start Date : 6/8/2010
Page No : 1

Groups Printed- TRUCKS

Start Time	BATES RD From North				MT. AUBURN ST From East				WALNUT ST From South				MT. AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	0	5
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
07:30 AM	0	0	0	0	0	1	0	0	1	0	1	0	1	1	0	0	5
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	5	0	0	6
Total	0	0	0	0	0	2	0	0	1	0	1	0	2	12	0	0	18
08:00 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
08:15 AM	0	0	0	0	0	3	0	0	0	0	0	0	2	5	0	0	10
08:30 AM	0	0	0	0	0	7	0	0	0	0	0	0	0	4	0	0	11
08:45 AM	0	0	0	0	0	2	0	0	0	0	1	0	0	3	0	0	6
Total	0	0	0	0	0	14	0	0	0	0	1	0	2	14	0	0	31
04:00 PM	0	0	0	0	0	2	0	0	0	0	2	0	0	2	0	0	6
04:15 PM	0	0	0	0	0	2	0	0	0	0	0	0	1	1	0	0	4
04:30 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	1	0	0	5
04:45 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
Total	0	0	0	0	0	9	0	0	0	0	3	0	1	4	0	0	17
05:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	3
05:15 PM	0	0	0	0	0	2	0	0	0	0	0	0	2	1	0	0	5
05:30 PM	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
Total	0	0	0	0	0	5	0	0	0	0	1	0	3	4	0	0	13
Grand Total	0	0	0	0	0	30	0	0	1	0	6	0	8	34	0	0	79
Apprch %	0	0	0	0	0	100	0	0	14.3	0	85.7	0	19	81	0	0	
Total %	0	0	0	0	0	38	0	0	1.3	0	7.6	0	10.1	43	0	0	

TRANSDATA SERVICES

66 Pleasant Street, Suite 3

Newburyport, MA 01950

978 463-2029

City/Town: WATERTOWN

Client : WORLDTECH ENG.

Location : MT. AUBURN ST/BOYLSTON ST

File Name : 31406084

Site Code : 31406084

Start Date : 6/8/2010

Page No : 1

Groups Printed- AUTOS - TRUCKS

Start Time	MT AUBURN ST From East			BOYLSTON ST From South			MT AUBURN ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	124	0	1	3	5	3	6	127	0	269
07:15 AM	143	0	0	1	4	6	9	147	0	310
07:30 AM	167	3	0	7	17	2	15	161	0	372
07:45 AM	157	4	0	5	7	0	22	176	1	372
Total	591	7	1	16	33	11	52	611	1	1323
08:00 AM	167	10	0	13	15	3	26	194	0	428
08:15 AM	157	3	0	40	47	11	30	187	0	475
08:30 AM	143	1	0	10	21	4	13	164	0	356
08:45 AM	184	1	0	4	5	2	7	149	0	352
Total	651	15	0	67	88	20	76	694	0	1611
04:00 PM	188	6	0	3	5	0	5	174	0	381
04:15 PM	197	1	0	4	5	2	8	164	0	381
04:30 PM	215	2	0	2	10	4	8	167	0	408
04:45 PM	183	1	0	1	7	3	12	151	0	358
Total	783	10	0	10	27	9	33	656	0	1528
05:00 PM	208	3	0	4	3	3	8	184	0	413
05:15 PM	214	3	0	3	9	10	15	177	0	431
05:30 PM	214	6	0	2	9	8	7	164	0	410
05:45 PM	166	2	0	5	6	6	14	177	1	377
Total	802	14	0	14	27	27	44	702	1	1631
Grand Total	2827	46	1	107	175	67	205	2663	2	6093
Apprch %	98.4	1.6	0	30.7	50.1	19.2	7.1	92.8	0.1	
Total %	46.4	0.8	0	1.8	2.9	1.1	3.4	43.7	0	
AUTOS	2766	46	1	107	174	67	204	2589	2	5956
% AUTOS	97.8	100	100	100	99.4	100	99.5	97.2	100	97.8
TRUCKS	61	0	0	0	1	0	1	74	0	137
% TRUCKS	2.2	0	0	0	0.6	0	0.5	2.8	0	2.2

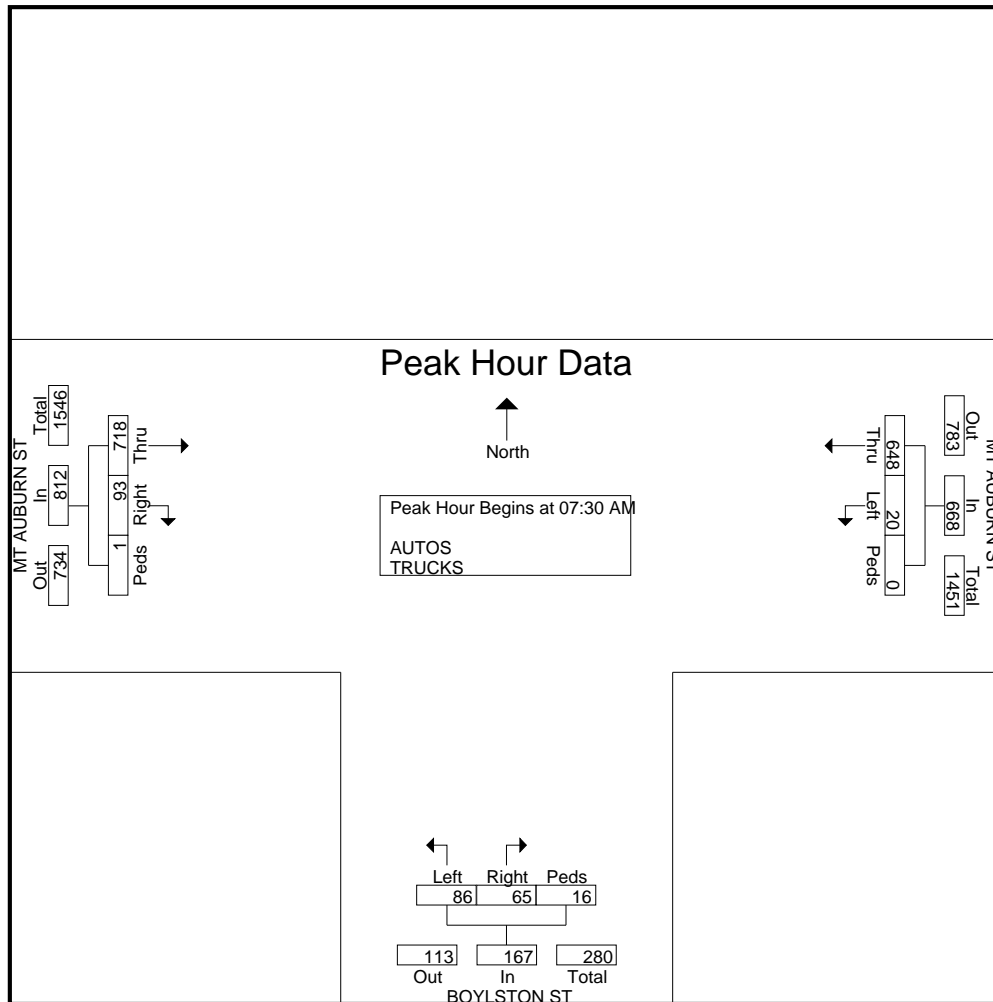
TRANSDATA SERVICES

66 Pleasant Street, Suite 3
 Newburyport, MA 01950
 978 463-2029

City/Town: WATERTOWN
 Client : WORLDTECH ENG.
 Location : MT. AUBURN ST/BOYLSTON ST

File Name : 31406084
 Site Code : 31406084
 Start Date : 6/8/2010
 Page No : 2

Start Time	MT AUBURN ST From East				BOYLSTON ST From South				MT AUBURN ST From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	167	3	0	170	7	17	2	26	15	161	0	176	372
07:45 AM	157	4	0	161	5	7	0	12	22	176	1	199	372
08:00 AM	167	10	0	177	13	15	3	31	26	194	0	220	428
08:15 AM	157	3	0	160	40	47	11	98	30	187	0	217	475
Total Volume	648	20	0	668	65	86	16	167	93	718	1	812	1647
% App. Total	97	3	0		38.9	51.5	9.6		11.5	88.4	0.1		
PHF	.970	.500	.000	.944	.406	.457	.364	.426	.775	.925	.250	.923	.867



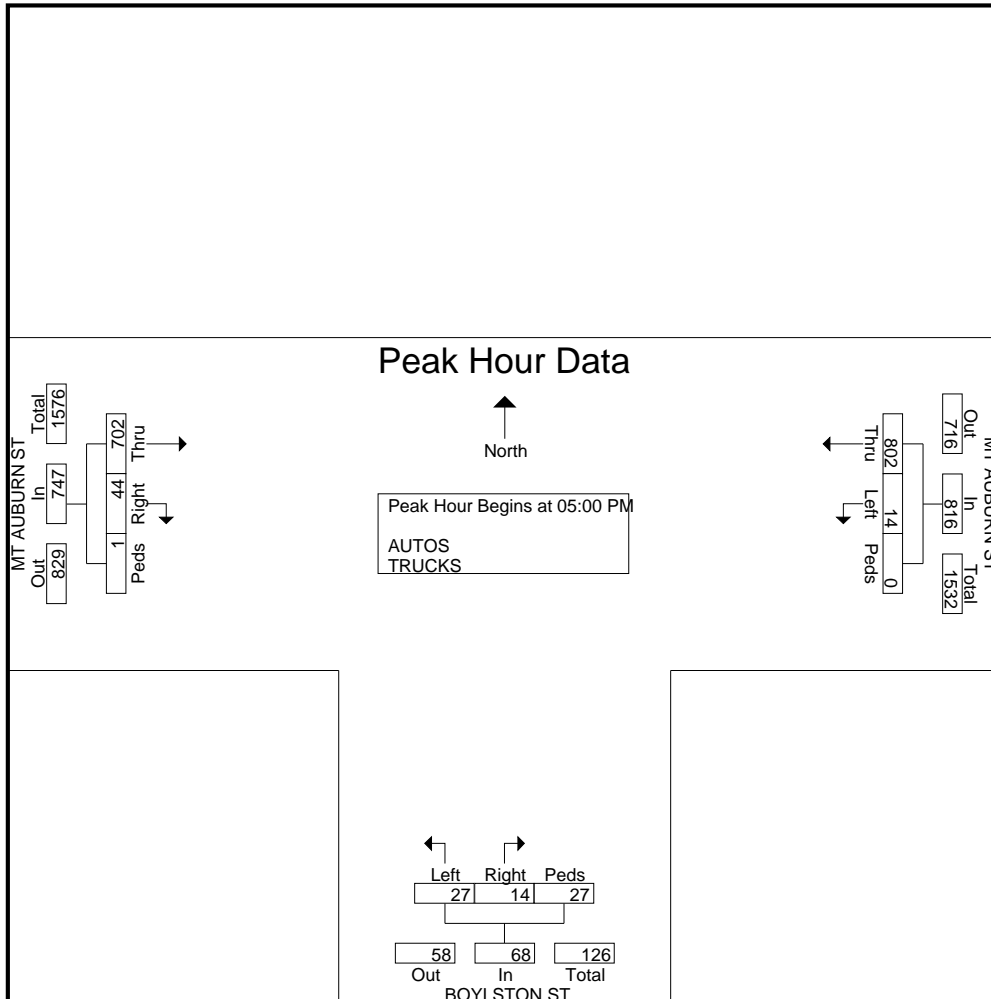
TRANSDATA SERVICES

66 Pleasant Street, Suite 3
 Newburyport, MA 01950
 978 463-2029

City/Town: WATERTOWN
 Client : WORLDTECH ENG.
 Location : MT. AUBURN ST/BOYLSTON ST

File Name : 31406084
 Site Code : 31406084
 Start Date : 6/8/2010
 Page No : 3

Start Time	MT AUBURN ST From East				BOYLSTON ST From South				MT AUBURN ST From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	208	3	0	211	4	3	3	10	8	184	0	192	413
05:15 PM	214	3	0	217	3	9	10	22	15	177	0	192	431
05:30 PM	214	6	0	220	2	9	8	19	7	164	0	171	410
05:45 PM	166	2	0	168	5	6	6	17	14	177	1	192	377
Total Volume	802	14	0	816	14	27	27	68	44	702	1	747	1631
% App. Total	98.3	1.7	0		20.6	39.7	39.7		5.9	94	0.1		
PHF	.937	.583	.000	.927	.700	.750	.675	.773	.733	.954	.250	.973	.946



TRANSDATA SERVICES

66 Pleasant Street, Suite 3
 Newburyport, MA 01950
 978 463-2029

City/Town: WATERTOWN
 Client : WORLDTECH ENG.
 Location : MT. AUBURN ST/BOYLSTON ST

File Name : 31406084
 Site Code : 31406084
 Start Date : 6/8/2010
 Page No : 1

Groups Printed- AUTOS

Start Time	MT AUBURN ST From East			BOYLSTON ST From South			MT AUBURN ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	121	0	1	3	5	3	6	119	0	258
07:15 AM	139	0	0	1	4	6	9	140	0	299
07:30 AM	163	3	0	7	17	2	15	159	0	366
07:45 AM	155	4	0	5	7	0	22	170	1	364
Total	578	7	1	16	33	11	52	588	1	1287
08:00 AM	164	10	0	13	15	3	26	188	0	419
08:15 AM	151	3	0	40	47	11	30	181	0	463
08:30 AM	138	1	0	10	21	4	13	158	0	345
08:45 AM	178	1	0	4	4	2	6	146	0	341
Total	631	15	0	67	87	20	75	673	0	1568
04:00 PM	183	6	0	3	5	0	5	168	0	370
04:15 PM	192	1	0	4	5	2	8	159	0	371
04:30 PM	209	2	0	2	10	4	8	163	0	398
04:45 PM	181	1	0	1	7	3	12	149	0	354
Total	765	10	0	10	27	9	33	639	0	1493
05:00 PM	204	3	0	4	3	3	8	180	0	405
05:15 PM	212	3	0	3	9	10	15	175	0	427
05:30 PM	212	6	0	2	9	8	7	161	0	405
05:45 PM	164	2	0	5	6	6	14	173	1	371
Total	792	14	0	14	27	27	44	689	1	1608
Grand Total	2766	46	1	107	174	67	204	2589	2	5956
Apprch %	98.3	1.6	0	30.7	50	19.3	7.3	92.6	0.1	
Total %	46.4	0.8	0	1.8	2.9	1.1	3.4	43.5	0	

TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client : WORLDTECH ENG.
Location : MT. AUBURN ST/BOYLSTON ST

File Name : 31406084
Site Code : 31406084
Start Date : 6/8/2010
Page No : 1

Groups Printed- TRUCKS

Start Time	MT AUBURN ST From East			BOYLSTON ST From South			MT AUBURN ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	3	0	0	0	0	0	0	8	0	11
07:15 AM	4	0	0	0	0	0	0	7	0	11
07:30 AM	4	0	0	0	0	0	0	2	0	6
07:45 AM	2	0	0	0	0	0	0	6	0	8
Total	13	0	0	0	0	0	0	23	0	36
08:00 AM	3	0	0	0	0	0	0	6	0	9
08:15 AM	6	0	0	0	0	0	0	6	0	12
08:30 AM	5	0	0	0	0	0	0	6	0	11
08:45 AM	6	0	0	0	1	0	1	3	0	11
Total	20	0	0	0	1	0	1	21	0	43
04:00 PM	5	0	0	0	0	0	0	6	0	11
04:15 PM	5	0	0	0	0	0	0	5	0	10
04:30 PM	6	0	0	0	0	0	0	4	0	10
04:45 PM	2	0	0	0	0	0	0	2	0	4
Total	18	0	0	0	0	0	0	17	0	35
05:00 PM	4	0	0	0	0	0	0	4	0	8
05:15 PM	2	0	0	0	0	0	0	2	0	4
05:30 PM	2	0	0	0	0	0	0	3	0	5
05:45 PM	2	0	0	0	0	0	0	4	0	6
Total	10	0	0	0	0	0	0	13	0	23
Grand Total	61	0	0	0	1	0	1	74	0	137
Apprch %	100	0	0	0	100	0	1.3	98.7	0	
Total %	44.5	0	0	0	0.7	0	0.7	54	0	

TRANSDATA SERVICES

66 Pleasant Street, Suite 3

Newburyport, MA 01950

978 463-2029

City/Town:WATERTOWN

Client :WORLDTECH ENG

Location :MT. AUBURN ST/WINTHROP ST

File Name : 31406087

Site Code : 31406087

Start Date : 6/8/2010

Page No : 1

Groups Printed- AUTOS - TRUCKS

Start Time	MT. AUBURN ST From East			WINTHROP ST From South			MT. AUBURN ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	102	2	0	0	1	0	2	137	0	244
07:15 AM	147	2	2	0	2	2	2	155	0	312
07:30 AM	143	3	1	0	3	1	6	172	0	329
07:45 AM	164	5	1	0	2	2	10	178	0	362
Total	556	12	4	0	8	5	20	642	0	1247
08:00 AM	157	5	14	4	3	3	15	190	0	391
08:15 AM	141	5	8	5	7	5	6	201	0	378
08:30 AM	155	2	0	1	4	4	4	178	0	348
08:45 AM	180	2	1	1	0	2	5	165	0	356
Total	633	14	23	11	14	14	30	734	0	1473
04:00 PM	192	2	1	4	1	1	3	173	0	377
04:15 PM	217	1	0	1	3	1	2	163	0	388
04:30 PM	213	2	0	2	4	6	3	155	0	385
04:45 PM	199	6	1	3	3	3	2	145	0	362
Total	821	11	2	10	11	11	10	636	0	1512
05:00 PM	208	2	1	2	7	3	6	171	0	400
05:15 PM	226	3	0	2	4	2	6	170	0	413
05:30 PM	213	2	3	0	5	9	1	170	0	403
05:45 PM	172	2	0	2	7	4	1	179	0	367
Total	819	9	4	6	23	18	14	690	0	1583
Grand Total	2829	46	33	27	56	48	74	2702	0	5815
Apprch %	97.3	1.6	1.1	20.6	42.7	36.6	2.7	97.3	0	
Total %	48.7	0.8	0.6	0.5	1	0.8	1.3	46.5	0	
AUTOS	2751	44	33	27	56	48	71	2610	0	5640
% AUTOS	97.2	95.7	100	100	100	100	95.9	96.6	0	97
TRUCKS	78	2	0	0	0	0	3	92	0	175
% TRUCKS	2.8	4.3	0	0	0	0	4.1	3.4	0	3

TRANSDATA SERVICES

66 Pleasant Street, Suite 3

Newburyport, MA 01950

978 463-2029

City/Town: WATERTOWN

Client : WORLDTECH ENG

Location : MT. AUBURN ST/WINTHROP ST

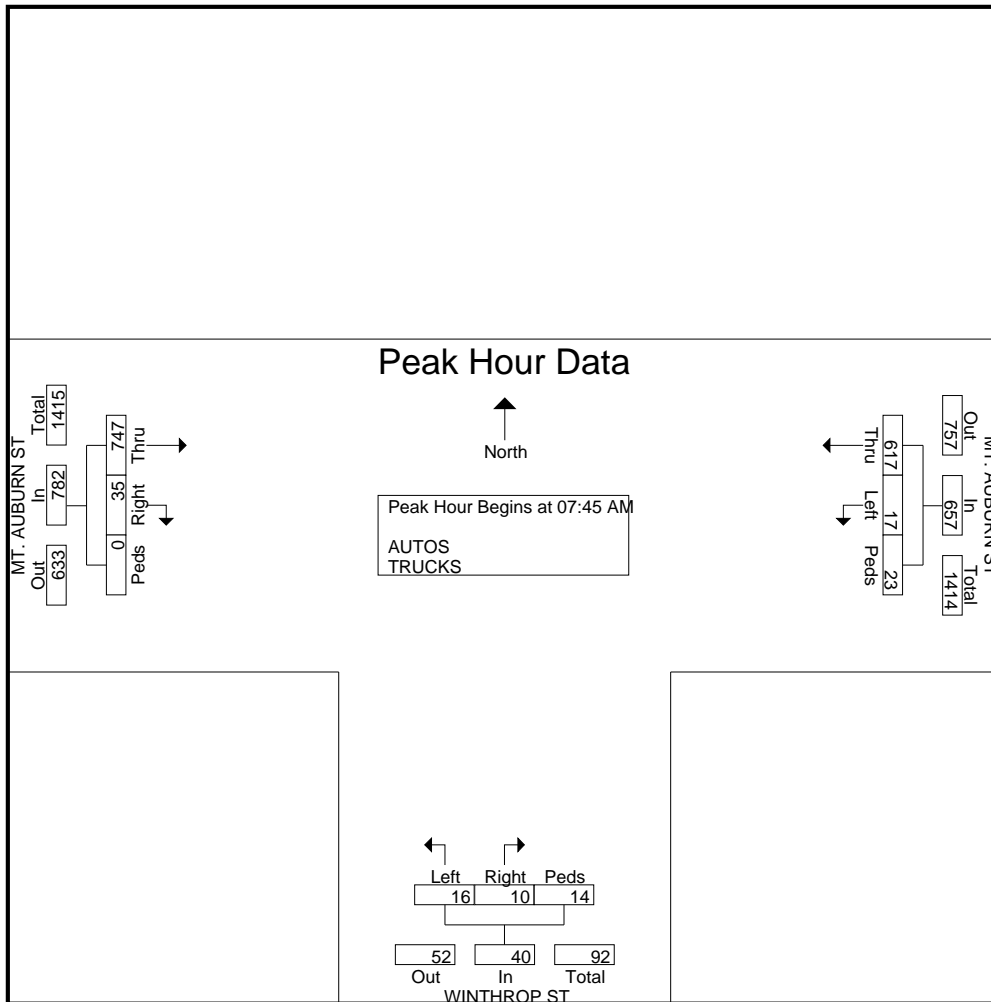
File Name : 31406087

Site Code : 31406087

Start Date : 6/8/2010

Page No : 2

Start Time	MT. AUBURN ST From East				WINTHROP ST From South				MT. AUBURN ST From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	164	5	1	170	0	2	2	4	10	178	0	188	362
08:00 AM	157	5	14	176	4	3	3	10	15	190	0	205	391
08:15 AM	141	5	8	154	5	7	5	17	6	201	0	207	378
08:30 AM	155	2	0	157	1	4	4	9	4	178	0	182	348
Total Volume	617	17	23	657	10	16	14	40	35	747	0	782	1479
% App. Total	93.9	2.6	3.5		25	40	35		4.5	95.5	0		
PHF	.941	.850	.411	.933	.500	.571	.700	.588	.583	.929	.000	.944	.946



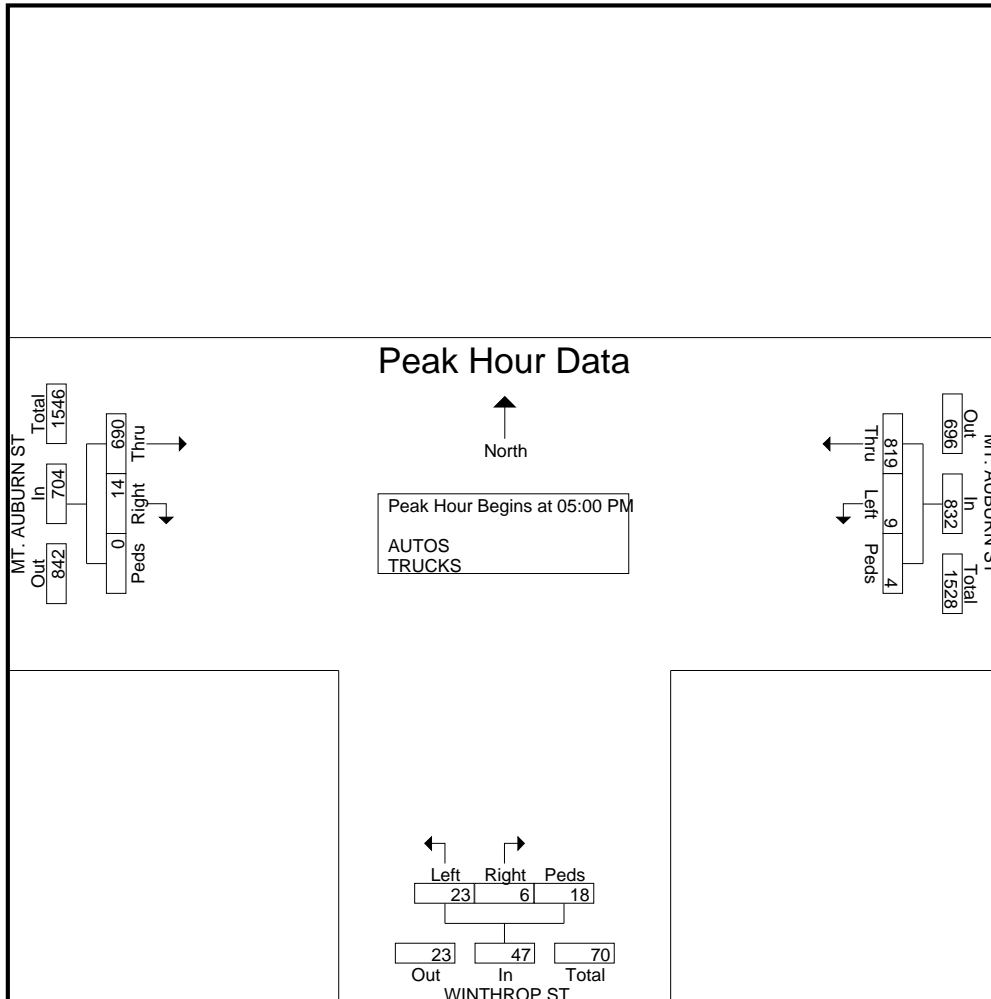
TRANSDATA SERVICES

66 Pleasant Street, Suite 3
 Newburyport, MA 01950
 978 463-2029

City/Town: WATERTOWN
 Client : WORLDTECH ENG
 Location : MT. AUBURN ST/WINTHROP ST

File Name : 31406087
 Site Code : 31406087
 Start Date : 6/8/2010
 Page No : 3

Start Time	MT. AUBURN ST From East				WINTHROP ST From South				MT. AUBURN ST From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	208	2	1	211	2	7	3	12	6	171	0	177	400
05:15 PM	226	3	0	229	2	4	2	8	6	170	0	176	413
05:30 PM	213	2	3	218	0	5	9	14	1	170	0	171	403
05:45 PM	172	2	0	174	2	7	4	13	1	179	0	180	367
Total Volume	819	9	4	832	6	23	18	47	14	690	0	704	1583
% App. Total	98.4	1.1	0.5		12.8	48.9	38.3		2	98	0		
PHF	.906	.750	.333	.908	.750	.821	.500	.839	.583	.964	.000	.978	.958



TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client : WORLDTECH ENG
Location : MT. AUBURN ST/WINTHROP ST

File Name : 31406087
Site Code : 31406087
Start Date : 6/8/2010
Page No : 1

Groups Printed- AUTOS

Start Time	MT. AUBURN ST From East			WINTHROP ST From South			MT. AUBURN ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	100	2	0	0	1	0	2	128	0	233
07:15 AM	144	2	2	0	2	2	2	147	0	301
07:30 AM	137	3	1	0	3	1	6	169	0	320
07:45 AM	161	5	1	0	2	2	10	169	0	350
Total	542	12	4	0	8	5	20	613	0	1204
08:00 AM	152	4	14	4	3	3	13	182	0	375
08:15 AM	132	4	8	5	7	5	6	192	0	359
08:30 AM	143	2	0	1	4	4	4	170	0	328
08:45 AM	172	2	1	1	0	2	5	156	0	339
Total	599	12	23	11	14	14	28	700	0	1401
04:00 PM	188	2	1	4	1	1	3	167	0	367
04:15 PM	212	1	0	1	3	1	2	160	0	380
04:30 PM	208	2	0	2	4	6	3	153	0	378
04:45 PM	196	6	1	3	3	3	2	143	0	357
Total	804	11	2	10	11	11	10	623	0	1482
05:00 PM	202	2	1	2	7	3	6	166	0	389
05:15 PM	223	3	0	2	4	2	6	166	0	406
05:30 PM	211	2	3	0	5	9	1	166	0	397
05:45 PM	170	2	0	2	7	4	0	176	0	361
Total	806	9	4	6	23	18	13	674	0	1553
Grand Total	2751	44	33	27	56	48	71	2610	0	5640
Apprch %	97.3	1.6	1.2	20.6	42.7	36.6	2.6	97.4	0	
Total %	48.8	0.8	0.6	0.5	1	0.9	1.3	46.3	0	

TRANSDATA SERVICES

66 Pleasant Street, Suite 3
 Newburyport, MA 01950
 978 463-2029

City/Town: WATERTOWN
 Client : WORLDTECH ENG
 Location : MT. AUBURN ST/WINTHROP ST

File Name : 31406087
 Site Code : 31406087
 Start Date : 6/8/2010
 Page No : 1

Groups Printed- TRUCKS

Start Time	MT. AUBURN ST From East			WINTHROP ST From South			MT. AUBURN ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	2	0	0	0	0	0	0	9	0	11
07:15 AM	3	0	0	0	0	0	0	8	0	11
07:30 AM	6	0	0	0	0	0	0	3	0	9
07:45 AM	3	0	0	0	0	0	0	9	0	12
Total	14	0	0	0	0	0	0	29	0	43
08:00 AM	5	1	0	0	0	0	2	8	0	16
08:15 AM	9	1	0	0	0	0	0	9	0	19
08:30 AM	12	0	0	0	0	0	0	8	0	20
08:45 AM	8	0	0	0	0	0	0	9	0	17
Total	34	2	0	0	0	0	2	34	0	72
04:00 PM	4	0	0	0	0	0	0	6	0	10
04:15 PM	5	0	0	0	0	0	0	3	0	8
04:30 PM	5	0	0	0	0	0	0	2	0	7
04:45 PM	3	0	0	0	0	0	0	2	0	5
Total	17	0	0	0	0	0	0	13	0	30
05:00 PM	6	0	0	0	0	0	0	5	0	11
05:15 PM	3	0	0	0	0	0	0	4	0	7
05:30 PM	2	0	0	0	0	0	0	4	0	6
05:45 PM	2	0	0	0	0	0	1	3	0	6
Total	13	0	0	0	0	0	1	16	0	30
Grand Total	78	2	0	0	0	0	3	92	0	175
Apprch %	97.5	2.5	0	0	0	0	3.2	96.8	0	
Total %	44.6	1.1	0	0	0	0	1.7	52.6	0	

TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client: WORLDTECH ENG
Location :MT AUBURN CHAUNCEY STS

File Name : 31406085
Site Code : 31406085
Start Date : 6/9/2010
Page No : 1

Groups Printed- AUTOS - TRUCKS

Start Time	MT AUBURN ST From East			CHAUNCEY ST From South			MT AUBURN ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	103	3	0	3	1	2	4	129	1	246
07:15 AM	146	0	0	1	3	7	1	150	0	308
07:30 AM	143	4	0	1	3	3	5	165	1	325
07:45 AM	165	5	0	1	2	4	5	172	1	355
Total	557	12	0	6	9	16	15	616	3	1234
08:00 AM	156	12	0	5	6	4	14	180	0	377
08:15 AM	141	30	0	15	5	11	18	191	3	414
08:30 AM	155	2	0	3	5	12	3	177	2	359
08:45 AM	179	0	0	2	3	6	3	161	0	354
Total	631	44	0	25	19	33	38	709	5	1504
04:00 PM	193	2	0	1	3	3	4	173	1	380
04:15 PM	212	2	0	4	3	6	5	159	2	393
04:30 PM	215	2	0	6	2	12	2	157	0	396
04:45 PM	196	1	0	3	3	6	0	148	1	358
Total	816	7	0	14	11	27	11	637	4	1527
05:00 PM	207	3	0	3	3	5	2	172	2	397
05:15 PM	228	5	0	1	1	4	0	172	1	412
05:30 PM	211	2	0	5	3	6	4	168	0	399
05:45 PM	170	1	0	2	5	9	2	177	0	366
Total	816	11	0	11	12	24	8	689	3	1574
Grand Total	2820	74	0	56	51	100	72	2651	15	5839
Apprch %	97.4	2.6	0	27.1	24.6	48.3	2.6	96.8	0.5	
Total %	48.3	1.3	0	1	0.9	1.7	1.2	45.4	0.3	
AUTOS	2740	74	0	54	48	100	69	2557	15	5657
% AUTOS	97.2	100	0	96.4	94.1	100	95.8	96.5	100	96.9
TRUCKS	80	0	0	2	3	0	3	94	0	182
% TRUCKS	2.8	0	0	3.6	5.9	0	4.2	3.5	0	3.1

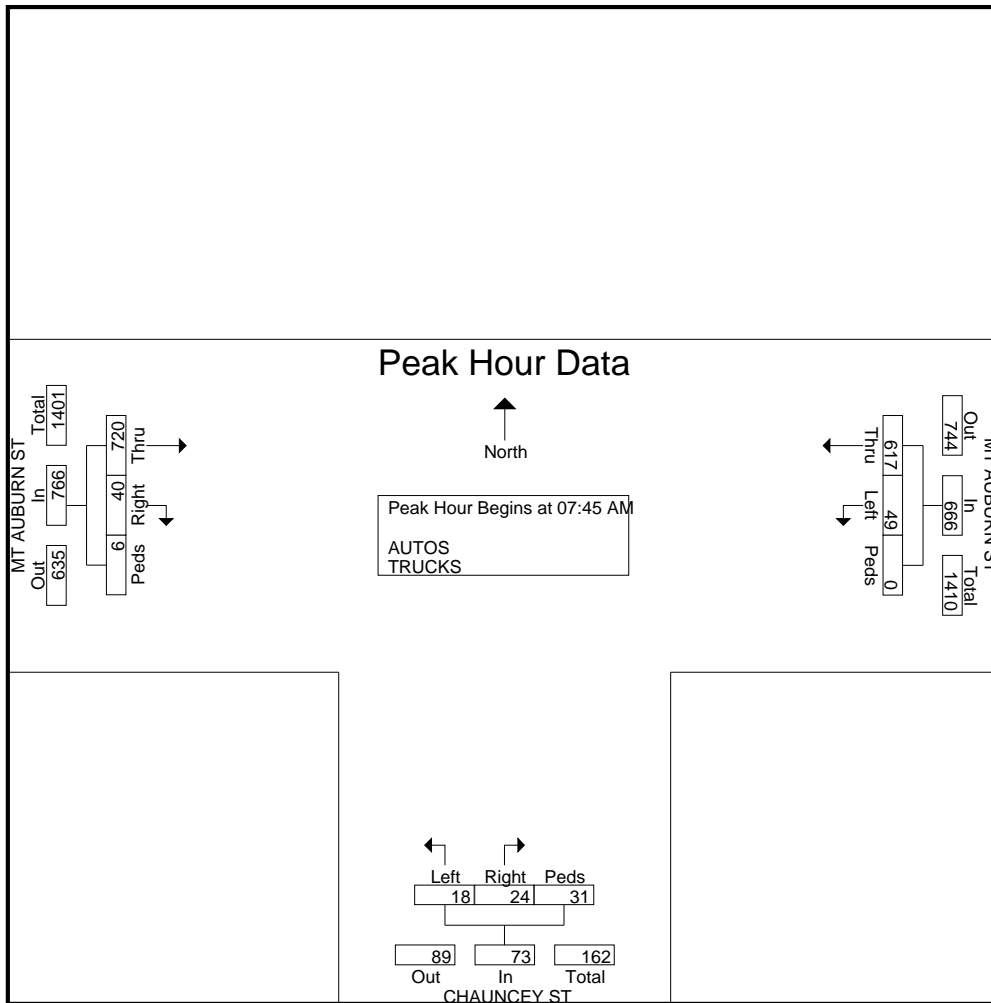
TRANSDATA SERVICES

66 Pleasant Street, Suite 3
 Newburyport, MA 01950
 978 463-2029

City/Town: WATERTOWN
 Client: WORLDTECH ENG
 Location :MT AUBURN CHAUNCEY STS

File Name : 31406085
 Site Code : 31406085
 Start Date : 6/9/2010
 Page No : 2

Start Time	MT AUBURN ST From East				CHAUNCEY ST From South				MT AUBURN ST From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	165	5	0	170	1	2	4	7	5	172	1	178	355
08:00 AM	156	12	0	168	5	6	4	15	14	180	0	194	377
08:15 AM	141	30	0	171	15	5	11	31	18	191	3	212	414
08:30 AM	155	2	0	157	3	5	12	20	3	177	2	182	359
Total Volume	617	49	0	666	24	18	31	73	40	720	6	766	1505
% App. Total	92.6	7.4	0		32.9	24.7	42.5		5.2	94	0.8		
PHF	.935	.408	.000	.974	.400	.750	.646	.589	.556	.942	.500	.903	.909



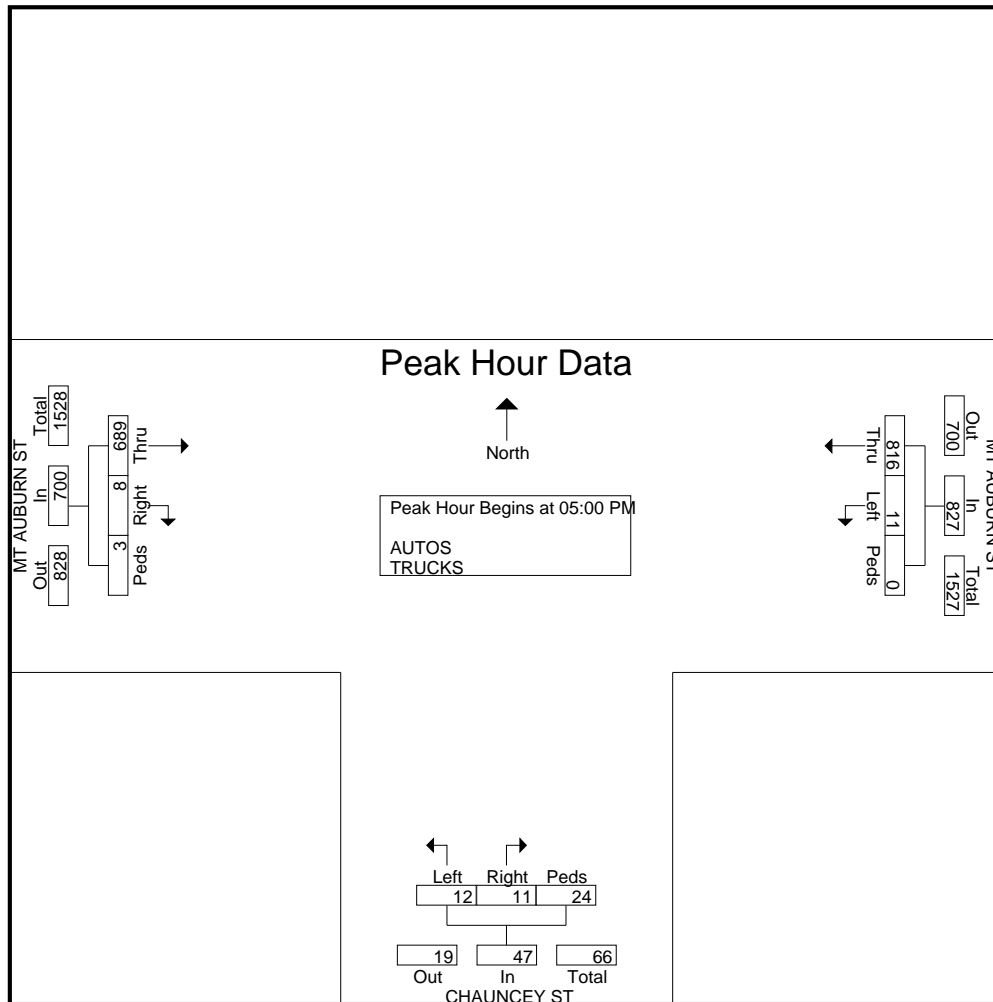
TRANSDATA SERVICES

66 Pleasant Street, Suite 3
 Newburyport, MA 01950
 978 463-2029

City/Town: WATERTOWN
 Client: WORLDTECH ENG
 Location :MT AUBURN CHAUNCEY STS

File Name : 31406085
 Site Code : 31406085
 Start Date : 6/9/2010
 Page No : 3

Start Time	MT AUBURN ST From East				CHAUNCEY ST From South				MT AUBURN ST From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	207	3	0	210	3	3	5	11	2	172	2	176	397
05:15 PM	228	5	0	233	1	1	4	6	0	172	1	173	412
05:30 PM	211	2	0	213	5	3	6	14	4	168	0	172	399
05:45 PM	170	1	0	171	2	5	9	16	2	177	0	179	366
Total Volume	816	11	0	827	11	12	24	47	8	689	3	700	1574
% App. Total	98.7	1.3	0		23.4	25.5	51.1		1.1	98.4	0.4		
PHF	.895	.550	.000	.887	.550	.600	.667	.734	.500	.973	.375	.978	.955



TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client: WORLDTECH ENG
Location :MT AUBURN CHAUNCEY STS

File Name : 31406085
Site Code : 31406085
Start Date : 6/9/2010
Page No : 1

Groups Printed- AUTOS

Start Time	MT AUBURN ST From East			CHAUNCEY ST From South			MT AUBURN ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	101	3	0	3	1	2	3	121	1	235
07:15 AM	143	0	0	1	3	7	1	142	0	297
07:30 AM	137	4	0	1	3	3	5	162	1	316
07:45 AM	163	5	0	1	2	4	5	163	1	344
Total	544	12	0	6	9	16	14	588	3	1192
08:00 AM	150	12	0	4	5	4	14	172	0	361
08:15 AM	130	30	0	14	5	11	18	181	3	392
08:30 AM	144	2	0	3	5	12	3	168	2	339
08:45 AM	170	0	0	2	3	6	3	152	0	336
Total	594	44	0	23	18	33	38	673	5	1428
04:00 PM	189	2	0	1	2	3	3	167	1	368
04:15 PM	208	2	0	4	3	6	5	156	2	386
04:30 PM	209	2	0	6	1	12	1	154	0	385
04:45 PM	193	1	0	3	3	6	0	146	1	353
Total	799	7	0	14	9	27	9	623	4	1492
05:00 PM	201	3	0	3	3	5	2	167	2	386
05:15 PM	225	5	0	1	1	4	0	168	1	405
05:30 PM	209	2	0	5	3	6	4	164	0	393
05:45 PM	168	1	0	2	5	9	2	174	0	361
Total	803	11	0	11	12	24	8	673	3	1545
Grand Total	2740	74	0	54	48	100	69	2557	15	5657
Apprch %	97.4	2.6	0	26.7	23.8	49.5	2.6	96.8	0.6	
Total %	48.4	1.3	0	1	0.8	1.8	1.2	45.2	0.3	

TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client: WORLDTECH ENG
Location :MT AUBURN CHAUNCEY STS

File Name : 31406085
Site Code : 31406085
Start Date : 6/9/2010
Page No : 1

Groups Printed- TRUCKS

Start Time	MT AUBURN ST From East			CHAUNCEY ST From South			MT AUBURN ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	2	0	0	0	0	0	1	8	0	11
07:15 AM	3	0	0	0	0	0	0	8	0	11
07:30 AM	6	0	0	0	0	0	0	3	0	9
07:45 AM	2	0	0	0	0	0	0	9	0	11
Total	13	0	0	0	0	0	1	28	0	42
08:00 AM	6	0	0	1	1	0	0	8	0	16
08:15 AM	11	0	0	1	0	0	0	10	0	22
08:30 AM	11	0	0	0	0	0	0	9	0	20
08:45 AM	9	0	0	0	0	0	0	9	0	18
Total	37	0	0	2	1	0	0	36	0	76
04:00 PM	4	0	0	0	1	0	1	6	0	12
04:15 PM	4	0	0	0	0	0	0	3	0	7
04:30 PM	6	0	0	0	1	0	1	3	0	11
04:45 PM	3	0	0	0	0	0	0	2	0	5
Total	17	0	0	0	2	0	2	14	0	35
05:00 PM	6	0	0	0	0	0	0	5	0	11
05:15 PM	3	0	0	0	0	0	0	4	0	7
05:30 PM	2	0	0	0	0	0	0	4	0	6
05:45 PM	2	0	0	0	0	0	0	3	0	5
Total	13	0	0	0	0	0	0	16	0	29
Grand Total	80	0	0	2	3	0	3	94	0	182
Apprch %	100	0	0	40	60	0	3.1	96.9	0	
Total %	44	0	0	1.1	1.6	0	1.6	51.6	0	

TRANSDATA SERVICES

66 Pleasant Street, Suite 3
 Newburyport, MA 01950
 978 463-2029

City/Town: WATERTOWN
 Client : WORLDTECH ENG
 Location : MT. AUBURN ST/SCHOOL ST

File Name : 31406086
 Site Code : 31406086
 Start Date : 6/8/2010
 Page No : 1

Groups Printed- AUTOS - TRUCKS

Start Time	SCHOOL ST From North				MT. AUBURN ST From East				SCHOOL ST From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	20	60	12	8	8	84	3	2	2	19	1	4	2	112	16	0	353
07:15 AM	25	65	16	4	8	119	7	2	4	19	4	5	1	139	11	2	431
07:30 AM	28	77	27	1	14	115	9	2	7	18	4	12	5	148	13	1	481
07:45 AM	16	93	33	5	7	147	4	3	10	26	8	4	1	161	9	1	528
Total	89	295	88	18	37	465	23	9	23	82	17	25	9	560	49	4	1793
08:00 AM	17	87	25	6	12	150	14	7	8	30	6	4	5	162	18	12	563
08:15 AM	24	82	19	10	10	141	6	8	14	36	5	13	5	181	20	15	589
08:30 AM	13	121	14	4	4	143	8	2	11	22	2	6	5	152	20	4	531
08:45 AM	29	87	22	6	5	148	13	2	7	37	4	6	2	150	10	2	530
Total	83	377	80	26	31	582	41	19	40	125	17	29	17	645	68	33	2213
04:00 PM	22	35	11	1	19	162	6	1	16	74	7	5	2	150	22	0	533
04:15 PM	27	40	8	1	27	186	7	1	12	64	7	4	6	140	21	1	552
04:30 PM	17	29	11	4	25	192	5	4	12	77	9	3	3	144	17	7	559
04:45 PM	18	49	10	1	19	167	9	1	14	69	12	6	11	123	16	0	525
Total	84	153	40	7	90	707	27	7	54	284	35	18	22	557	76	8	2169
05:00 PM	21	43	20	0	15	174	7	1	23	95	13	7	4	148	24	1	596
05:15 PM	19	39	18	4	18	200	5	6	17	88	13	9	5	146	22	1	610
05:30 PM	28	45	13	6	19	176	9	10	20	78	9	10	9	148	15	1	596
05:45 PM	22	54	13	3	16	143	8	2	10	89	5	11	12	148	17	2	555
Total	90	181	64	13	68	693	29	19	70	350	40	37	30	590	78	5	2357
Grand Total	346	1006	272	64	226	2447	120	54	187	841	109	109	78	2352	271	50	8532
Apprch %	20.5	59.6	16.1	3.8	7.9	86	4.2	1.9	15	67.5	8.7	8.7	2.8	85.5	9.9	1.8	
Total %	4.1	11.8	3.2	0.8	2.6	28.7	1.4	0.6	2.2	9.9	1.3	1.3	0.9	27.6	3.2	0.6	
AUTOS	338	986	270	64	224	2373	117	54	181	820	108	109	76	2270	265	50	8305
% AUTOS	97.7	98	99.3	100	99.1	97	97.5	100	96.8	97.5	99.1	100	97.4	96.5	97.8	100	97.3
TRUCKS	8	20	2	0	2	74	3	0	6	21	1	0	2	82	6	0	227
% TRUCKS	2.3	2	0.7	0	0.9	3	2.5	0	3.2	2.5	0.9	0	2.6	3.5	2.2	0	2.7

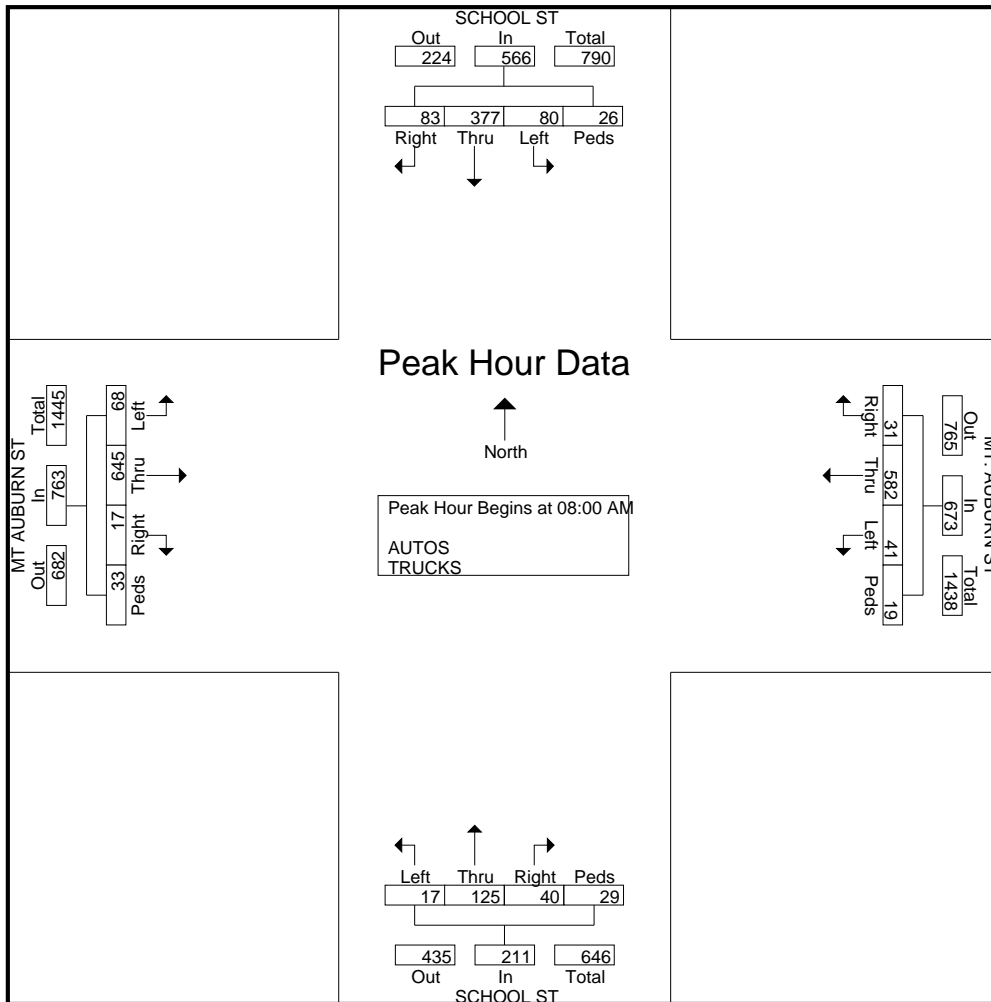
TRANSDATA SERVICES

66 Pleasant Street, Suite 3
 Newburyport, MA 01950
 978 463-2029

City/Town: WATERTOWN
 Client : WORLDTECH ENG
 Location : MT. AUBURN ST/SCHOOL ST

File Name : 31406086
 Site Code : 31406086
 Start Date : 6/8/2010
 Page No : 2

Start Time	SCHOOL ST From North					MT. AUBURN ST From East					SCHOOL ST From South					MT AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	17	87	25	6	135	12	150	14	7	183	8	30	6	4	48	5	162	18	12	197	563
08:15 AM	24	82	19	10	135	10	141	6	8	165	14	36	5	13	68	5	181	20	15	221	589
08:30 AM	13	121			152	4	143	8	2	157	11	22	2	6	41	5	152	20	4	181	531
08:45 AM	29	87	22	6	144	5	148	13	2	168	7	37	4	6	54	2	150	10	2	164	530
Total Volume	83	377	80	26	566	31	582	41	19	673	40	125	17	29	211	17	645	68	33	763	2213
% App. Total	14.7	66.6	14.1	4.6		4.6	86.5	6.1	2.8		19	59.2	8.1	13.7		2.2	84.5	8.9	4.3		
PHF	.716	.779	.800	.650	.931	.646	.970	.732	.594	.919	.714	.845	.708	.558	.776	.850	.891	.850	.550	.863	.939



TRANSDATA SERVICES

66 Pleasant Street, Suite 3

Newburyport, MA 01950

978 463-2029

City/Town: WATERTOWN

Client : WORLDTECH ENG

Location : MT. AUBURN ST/SCHOOL ST

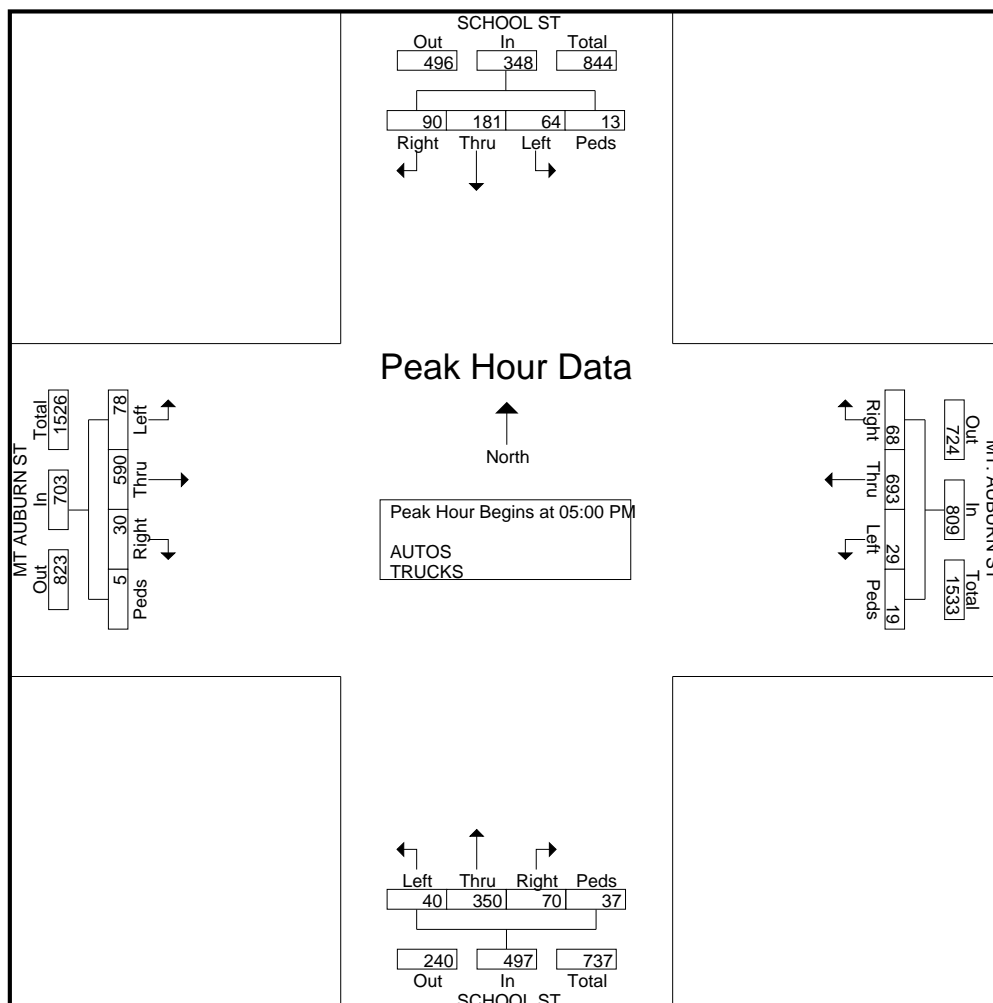
File Name : 31406086

Site Code : 31406086

Start Date : 6/8/2010

Page No : 3

Start Time	SCHOOL ST From North					MT. AUBURN ST From East					SCHOOL ST From South					MT AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	21	43	20	0	84	15	174	7	1	197	23	95	13	7	138	4	148	24	1	177	596
05:15 PM	19	39	18	4	80	18	200			229	17	88	13	9	127	5	146	22	1	174	610
05:30 PM	28	45	13	6	92	19	176	9	10	214	20	78	9	10	117	9	148	15	1	173	596
05:45 PM	22	54	13	3	92	16	143	8	2	169	10	89	5	11	115	12	148	17	2	179	555
Total Volume	90	181	64	13	348	68	693	29	19	809	70	350	40	37	497	30	590	78	5	703	2357
% App. Total	25.9	52	18.4	3.7		8.4	85.7	3.6	2.3		14.1	70.4	8	7.4		4.3	83.9	11.1	0.7		
PHF	.804	.838	.800	.542	.946	.895	.866	.806	.475	.883	.761	.921	.769	.841	.900	.625	.997	.813	.625	.982	.966



TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950

City/Town: WATERTOWN
Client : WORLDTECH ENG
Location : MT. AUBURN ST/SCHOOL ST

File Name : 31406086
Site Code : 31406086
Start Date : 6/8/2010
Page No : 1

Groups Printed- AUTOS

Start Time	SCHOOL ST From North				MT. AUBURN ST From East				SCHOOL ST From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	20	56	12	8	8	82	2	2	2	18	1	4	2	104	16	0	337
07:15 AM	25	61	16	4	8	116	7	2	4	16	4	5	1	132	10	2	413
07:30 AM	28	77	27	1	13	109	8	2	5	17	4	12	5	145	13	1	467
07:45 AM	15	92	33	5	6	144	4	3	10	26	8	4	1	152	9	1	513
Total	88	286	88	18	35	451	21	9	21	77	17	25	9	533	48	4	1730
08:00 AM	16	87	25	6	12	144	13	7	8	24	6	4	5	155	16	12	540
08:15 AM	23	82	19	10	10	132	6	8	14	35	4	13	4	172	19	15	566
08:30 AM	11	120	14	4	4	134	8	2	10	21	2	6	5	145	18	4	508
08:45 AM	28	85	21	6	5	140	13	2	6	35	4	6	2	144	10	2	509
Total	78	374	79	26	31	550	40	19	38	115	16	29	16	616	63	33	2123
04:00 PM	21	33	11	1	19	160	6	1	15	73	7	5	2	144	22	0	520
04:15 PM	27	38	8	1	27	181	7	1	12	64	7	4	5	138	21	1	542
04:30 PM	17	29	11	4	25	186	5	4	12	76	9	3	3	140	17	7	548
04:45 PM	17	49	10	1	19	165	9	1	14	67	12	6	11	122	16	0	519
Total	82	149	40	7	90	692	27	7	53	280	35	18	21	544	76	8	2129
05:00 PM	21	41	19	0	15	169	7	1	23	94	13	7	4	144	24	1	583
05:15 PM	19	38	18	4	18	197	5	6	17	88	13	9	5	143	22	1	603
05:30 PM	28	45	13	6	19	174	9	10	19	77	9	10	9	145	15	1	589
05:45 PM	22	53	13	3	16	140	8	2	10	89	5	11	12	145	17	2	548
Total	90	177	63	13	68	680	29	19	69	348	40	37	30	577	78	5	2323
Grand Total	338	986	270	64	224	2373	117	54	181	820	108	109	76	2270	265	50	8305
Apprch %	20.4	59.5	16.3	3.9	8.1	85.7	4.2	2	14.9	67.3	8.9	8.9	2.9	85.3	10	1.9	
Total %	4.1	11.9	3.3	0.8	2.7	28.6	1.4	0.7	2.2	9.9	1.3	1.3	0.9	27.3	3.2	0.6	

TRANSDATA SERVICES

66 Pleasant Street, Suite 3
Newburyport, MA 01950
978 463-2029

City/Town: WATERTOWN
Client : WORLDTECH ENG
Location : MT. AUBURN ST/SCHOOL ST

File Name : 31406086
Site Code : 31406086
Start Date : 6/8/2010
Page No : 1

Groups Printed- TRUCKS

Start Time	SCHOOL ST From North				MT. AUBURN ST From East				SCHOOL ST From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	4	0	0	0	2	1	0	0	1	0	0	0	8	0	0	16
07:15 AM	0	4	0	0	0	3	0	0	0	3	0	0	0	7	1	0	18
07:30 AM	0	0	0	0	1	6	1	0	2	1	0	0	0	3	0	0	14
07:45 AM	1	1	0	0	1	3	0	0	0	0	0	0	0	9	0	0	15
Total	1	9	0	0	2	14	2	0	2	5	0	0	0	27	1	0	63
08:00 AM	1	0	0	0	0	6	1	0	0	6	0	0	0	7	2	0	23
08:15 AM	1	0	0	0	0	9	0	0	0	1	1	0	1	9	1	0	23
08:30 AM	2	1	0	0	0	9	0	0	1	1	0	0	0	7	2	0	23
08:45 AM	1	2	1	0	0	8	0	0	1	2	0	0	0	6	0	0	21
Total	5	3	1	0	0	32	1	0	2	10	1	0	1	29	5	0	90
04:00 PM	1	2	0	0	0	2	0	0	1	1	0	0	0	6	0	0	13
04:15 PM	0	2	0	0	0	5	0	0	0	0	0	0	1	2	0	0	10
04:30 PM	0	0	0	0	0	6	0	0	0	1	0	0	0	4	0	0	11
04:45 PM	1	0	0	0	0	2	0	0	0	2	0	0	0	1	0	0	6
Total	2	4	0	0	0	15	0	0	1	4	0	0	1	13	0	0	40
05:00 PM	0	2	1	0	0	5	0	0	0	1	0	0	0	4	0	0	13
05:15 PM	0	1	0	0	0	3	0	0	0	0	0	0	0	3	0	0	7
05:30 PM	0	0	0	0	0	2	0	0	1	1	0	0	0	3	0	0	7
05:45 PM	0	1	0	0	0	3	0	0	0	0	0	0	0	3	0	0	7
Total	0	4	1	0	0	13	0	0	1	2	0	0	0	13	0	0	34
Grand Total	8	20	2	0	2	74	3	0	6	21	1	0	2	82	6	0	227
Apprch %	26.7	66.7	6.7	0	2.5	93.7	3.8	0	21.4	75	3.6	0	2.2	91.1	6.7	0	
Total %	3.5	8.8	0.9	0	0.9	32.6	1.3	0	2.6	9.3	0.4	0	0.9	36.1	2.6	0	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/DEXTER AVE

File Name : 31405291
 Site Code : 31405291
 Start Date : 5/29/2007
 Page No : 1

Groups Printed- AUTOS - TRUCKS

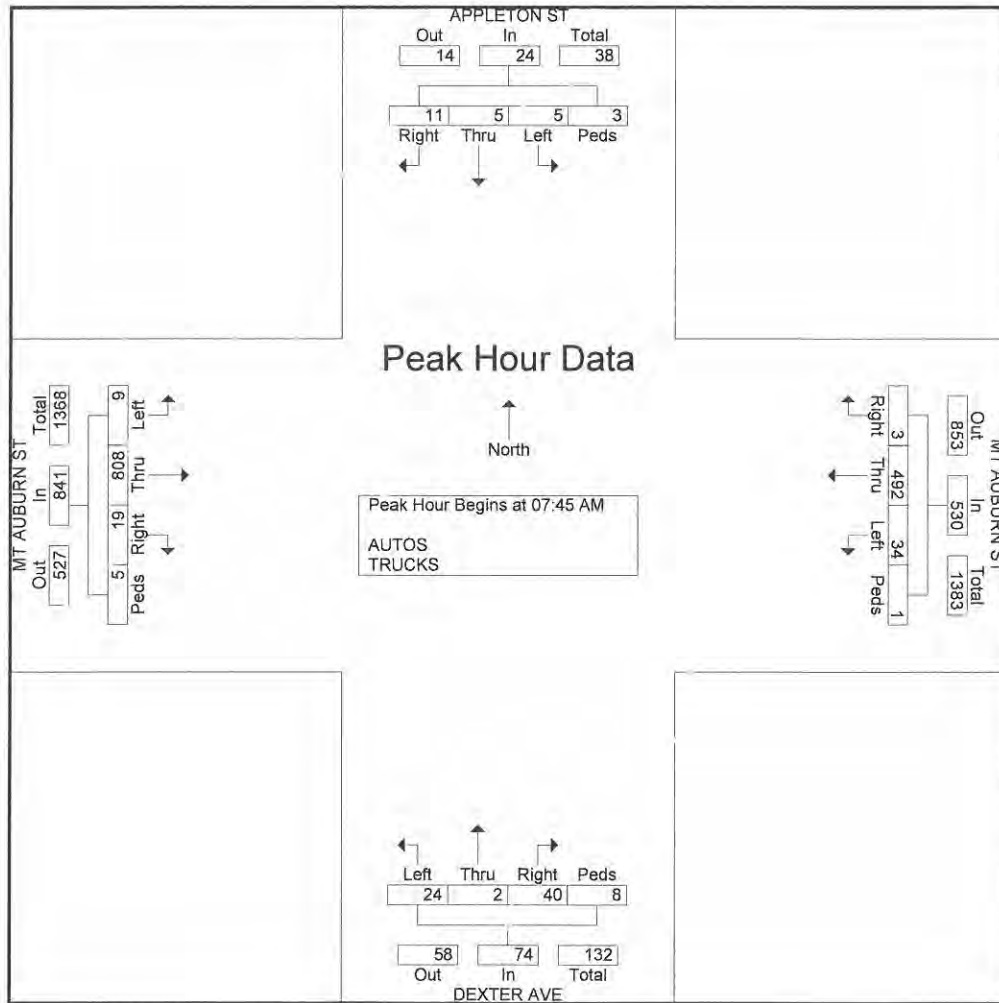
Start Time	APPLETON ST From North				MT AUBURN ST From East				DEXTER AVE From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	1	1	0	1	0	77	8	0	7	1	3	4	2	136	1	0	242
07:15 AM	3	0	1	1	1	106	6	0	7	0	3	1	3	132	0	4	268
07:30 AM	2	1	4	1	1	128	8	0	11	1	1	4	7	187	2	3	361
07:45 AM	2	1	2	0	0	125	8	1	13	2	9	1	4	216	4	2	390
Total	8	3	7	3	2	436	30	1	38	4	16	10	16	671	7	9	1261
08:00 AM	2	2	0	1	1	114	5	0	8	0	3	0	2	198	1	1	338
08:15 AM	2	1	1	2	0	130	10	0	12	0	3	4	3	201	2	1	372
08:30 AM	5	1	2	0	2	123	11	0	7	0	9	3	10	193	2	1	369
08:45 AM	0	1	0	2	2	104	7	0	11	1	4	6	8	171	1	0	318
Total	9	5	3	5	5	471	33	0	38	1	19	13	23	763	6	3	1397
04:00 PM	2	3	1	2	2	164	9	2	10	3	4	6	1	159	2	1	371
04:15 PM	1	0	1	2	3	165	5	0	9	1	3	4	2	155	3	0	354
04:30 PM	0	1	2	6	4	157	15	0	12	0	1	3	2	156	2	0	361
04:45 PM	1	0	1	3	4	180	11	3	19	3	3	2	2	170	7	1	410
Total	4	4	5	13	13	666	40	5	50	7	11	15	7	640	14	2	1496
05:00 PM	0	1	1	11	1	181	10	1	16	3	7	5	5	169	1	4	416
05:15 PM	1	1	2	4	4	190	3	0	18	0	4	9	6	183	2	0	427
05:30 PM	1	0	3	0	3	194	15	0	11	0	8	3	2	156	1	1	398
05:45 PM	1	0	2	6	7	187	4	2	9	4	4	0	4	150	5	6	391
Total	3	2	8	21	15	752	32	3	54	7	23	17	17	658	9	11	1632
Grand Total	24	14	23	42	35	2325	135	9	180	19	69	55	63	2732	36	25	5786
Apprch %	23.3	13.6	22.3	40.8	1.4	92.9	5.4	0.4	55.7	5.9	21.4	17	2.2	95.7	1.3	0.9	
Total %	0.4	0.2	0.4	0.7	0.6	40.2	2.3	0.2	3.1	0.3	1.2	1	1.1	47.2	0.6	0.4	
AUTOS	21	14	22	42	35	2242	135	9	175	17	65	55	63	2630	36	25	5586
% AUTOS	87.5	100	95.7	100	100	96.4	100	100	97.2	89.5	94.2	100	100	96.3	100	100	96.5
TRUCKS	3	0	1	0	0	83	0	0	5	2	4	0	0	102	0	0	200
% TRUCKS	12.5	0	4.3	0	0	3.6	0	0	2.8	10.5	5.8	0	0	3.7	0	0	3.5

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/DEXTER AVE

File Name : 31405291
 Site Code : 31405291
 Start Date : 5/29/2007
 Page No : 2

Start Time	APPLETON ST From North					MT AUBURN ST From East					DEXTER AVE From South					MT AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	2	1	2	0	5	0	125	8	1	134	13	2	9	1	25	4	216	4	2	226	390
08:00 AM	2	2	0	1	5	1	114	5	0	120	8	0	3	0	11	2	198	1	1	202	338
08:15 AM	2	1	1	2	6	0	130	10	0	140	12	0	3	4	19	3	201	2	1	207	372
08:30 AM	5	1	2	0	8	2	123	11	0	136	7	0	9	3	19	10	193	2	1	206	369
Total Volume	11	5	5	3	24	3	492	34	1	530	40	2	24	8	74	19	808	9	5	841	1469
% App. Total	45.8	20.8	20.8	12.5		0.6	92.8	6.4	0.2		54.1	2.7	32.4	10.8		2.3	96.1	1.1	0.6		
PHF	.550	.625	.625	.375	.750	.375	.946	.773	.250	.946	.769	.250	.667	.500	.740	.475	.935	.563	.625	.930	.942

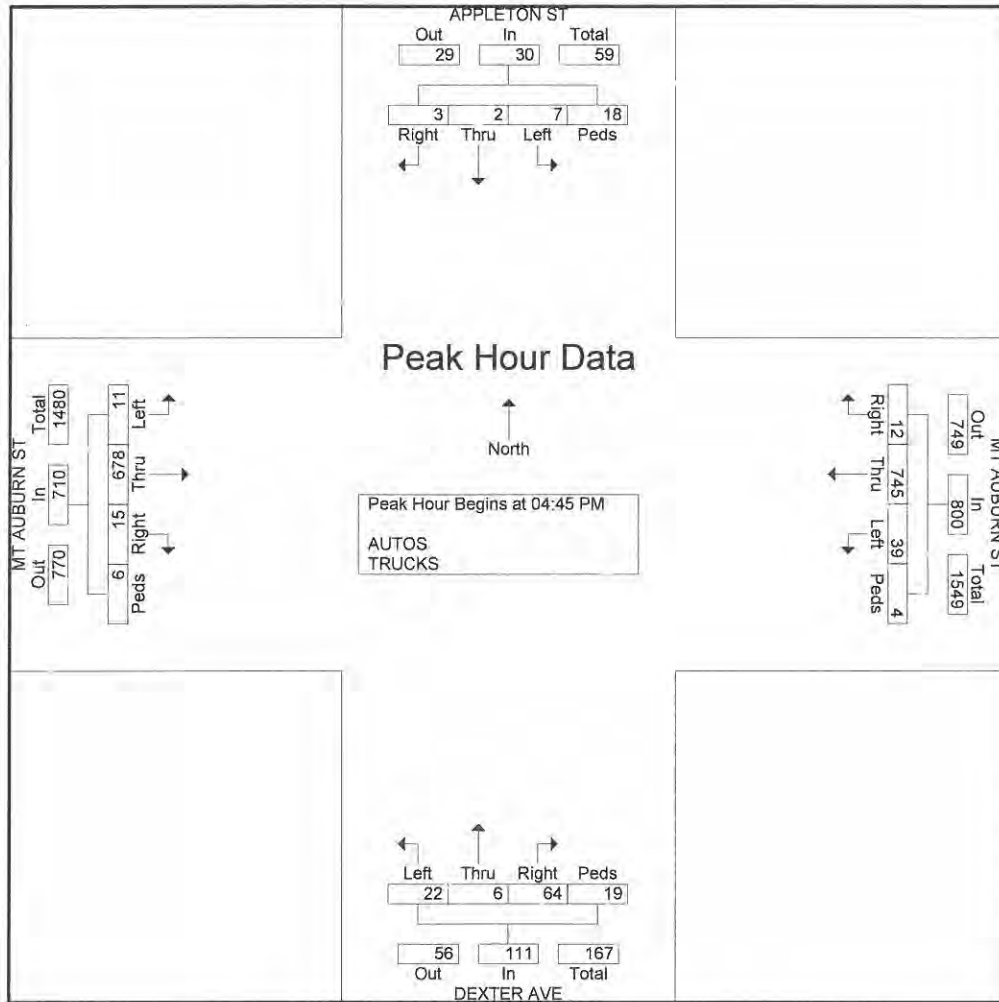


TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/DEXTER AVE

File Name : 31405291
 Site Code : 31405291
 Start Date : 5/29/2007
 Page No : 3

Start Time	APPLETON ST From North					MT AUBURN ST From East					DEXTER AVE From South					MT AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	1	0	1	3	5	4	180	11	3	198	19	3	3	2	27	2	170	7	1	180	410
05:00 PM	0	1	1	11	13	1	181	10	1	193	16	3	7	5	31	5	169	1	4	179	416
05:15 PM	1	1	2	4	8	4	190	3	0	197	18	0	4	9	31	6	183	2	0	191	427
05:30 PM	1	0	3	0	4	3	194	15	0	212	11	0	8	3	22	2	156	1	1	160	398
Total Volume	3	2	7	18	30	12	745	39	4	800	64	6	22	19	111	15	678	11	6	710	1651
% App. Total	10	6.7	23.3	60		1.5	93.1	4.9	0.5		57.7	5.4	19.8	17.1		2.1	95.5	1.5	0.8		
PHF	.750	.500	.583	.409	.577	.750	.960	.650	.333	.943	.842	.500	.688	.528	.895	.625	.926	.393	.375	.929	.967



TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/DEXTER AVE

File Name : 31405291
 Site Code : 31405291
 Start Date : 5/29/2007
 Page No : 1

Groups Printed- AUTOS

Start Time	APPLETON ST From North				MT AUBURN ST From East				DEXTER AVE From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	1	1	0	1	0	72	8	0	7	1	1	4	2	128	1	0	227
07:15 AM	2	0	1	1	1	101	6	0	6	0	2	1	3	125	0	4	253
07:30 AM	2	1	4	1	1	120	8	0	11	1	1	4	7	181	2	3	347
07:45 AM	2	1	1	0	0	120	8	1	13	2	9	1	4	206	4	2	374
Total	7	3	6	3	2	413	30	1	37	4	13	10	16	640	7	9	1201
08:00 AM	2	2	0	1	1	109	5	0	8	0	3	0	2	187	1	1	322
08:15 AM	2	1	1	2	0	129	10	0	12	0	3	4	3	193	2	1	363
08:30 AM	3	1	2	0	2	119	11	0	7	0	8	3	10	185	2	1	354
08:45 AM	0	1	0	2	2	94	7	0	10	1	4	6	8	165	1	0	301
Total	7	5	3	5	5	451	33	0	37	1	18	13	23	730	6	3	1340
04:00 PM	2	3	1	2	2	156	9	2	10	2	4	6	1	154	2	1	357
04:15 PM	1	0	1	2	3	160	5	0	9	1	3	4	2	149	3	0	343
04:30 PM	0	1	2	6	4	150	15	0	12	0	1	3	2	152	2	0	350
04:45 PM	1	0	1	3	4	175	11	3	17	3	3	2	2	168	7	1	401
Total	4	4	5	13	13	641	40	5	48	6	11	15	7	623	14	2	1451
05:00 PM	0	1	1	11	1	177	10	1	16	2	7	5	5	162	1	4	404
05:15 PM	1	1	2	4	4	187	3	0	18	0	4	9	6	181	2	0	422
05:30 PM	1	0	3	0	3	190	15	0	10	0	8	3	2	151	1	1	388
05:45 PM	1	0	2	6	7	183	4	2	9	4	4	0	4	143	5	6	380
Total	3	2	8	21	15	737	32	3	53	6	23	17	17	637	9	11	1594
Grand Total	21	14	22	42	35	2242	135	9	175	17	65	55	63	2630	36	25	5586
Apprch %	21.2	14.1	22.2	42.4	1.4	92.6	5.6	0.4	56.1	5.4	20.8	17.6	2.3	95.5	1.3	0.9	
Total %	0.4	0.3	0.4	0.8	0.6	40.1	2.4	0.2	3.1	0.3	1.2	1	1.1	47.1	0.6	0.4	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/DEXTER AVE

File Name : 31405291
 Site Code : 31405291
 Start Date : 5/29/2007
 Page No : 1

Groups Printed- TRUCKS

Start Time	APPLETON ST From North				MT AUBURN ST From East				DEXTER AVE From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	0	0	0	5	0	0	0	0	2	0	0	8	0	0	15
07:15 AM	1	0	0	0	0	5	0	0	1	0	1	0	0	7	0	0	15
07:30 AM	0	0	0	0	0	8	0	0	0	0	0	0	0	6	0	0	14
07:45 AM	0	0	1	0	0	5	0	0	0	0	0	0	0	10	0	0	16
Total	1	0	1	0	0	23	0	0	1	0	3	0	0	31	0	0	60
08:00 AM	0	0	0	0	0	5	0	0	0	0	0	0	0	11	0	0	16
08:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	8	0	0	9
08:30 AM	2	0	0	0	0	4	0	0	0	0	1	0	0	8	0	0	15
08:45 AM	0	0	0	0	0	10	0	0	1	0	0	0	0	6	0	0	17
Total	2	0	0	0	0	20	0	0	1	0	1	0	0	33	0	0	57
04:00 PM	0	0	0	0	0	8	0	0	0	1	0	0	0	5	0	0	14
04:15 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	6	0	0	11
04:30 PM	0	0	0	0	0	7	0	0	0	0	0	0	0	4	0	0	11
04:45 PM	0	0	0	0	0	5	0	0	2	0	0	0	0	2	0	0	9
Total	0	0	0	0	0	25	0	0	2	1	0	0	0	17	0	0	45
05:00 PM	0	0	0	0	0	4	0	0	0	1	0	0	0	7	0	0	12
05:15 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0	0	5
05:30 PM	0	0	0	0	0	4	0	0	1	0	0	0	0	5	0	0	10
05:45 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	7	0	0	11
Total	0	0	0	0	0	15	0	0	1	1	0	0	0	21	0	0	38
Grand Total	3	0	1	0	0	83	0	0	5	2	4	0	0	102	0	0	200
Apprch %	75	0	25	0	0	100	0	0	45.5	18.2	36.4	0	0	100	0	0	
Total %	1.5	0	0.5	0	0	41.5	0	0	2.5	1	2	0	0	51	0	0	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/MELENDY AVE

File Name : 31405292
 Site Code : 31405292
 Start Date : 5/29/2007
 Page No : 1

Groups Printed- AUTOS - TRUCKS

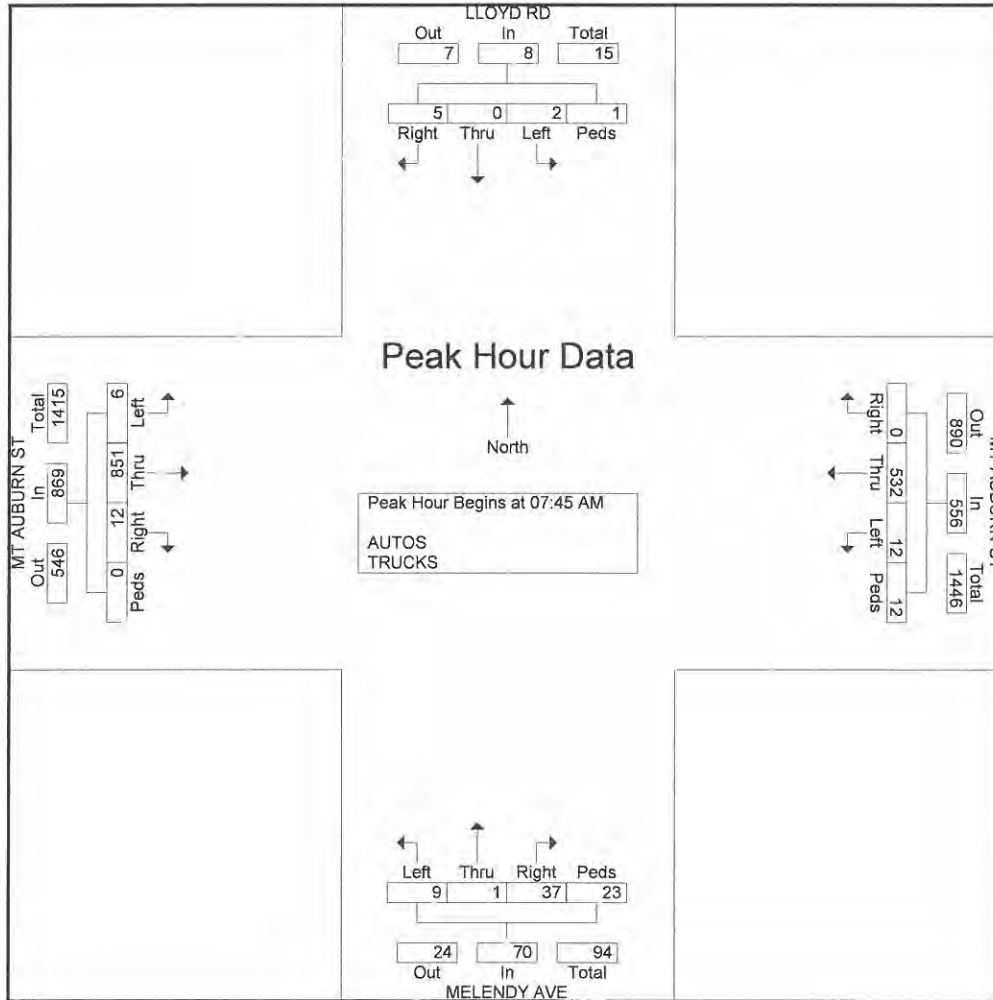
Start Time	LLOYD RD From North				MT AUBURN ST From East				MELENDY AVE From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	2	1	0	89	0	1	2	0	1	9	0	146	0	1	252
07:15 AM	0	0	3	0	1	104	1	5	5	0	2	2	0	136	1	1	261
07:30 AM	0	0	2	0	1	132	2	9	4	0	5	4	2	202	0	0	363
07:45 AM	3	0	1	0	0	132	1	2	14	1	4	6	4	226	2	0	396
Total	3	0	8	1	2	457	4	17	25	1	12	21	6	710	3	2	1272
08:00 AM	1	0	1	0	0	125	2	3	9	0	2	1	3	218	1	0	366
08:15 AM	1	0	0	1	0	142	4	1	6	0	0	2	1	195	2	0	355
08:30 AM	0	0	0	0	0	133	5	6	8	0	3	14	4	212	1	0	386
08:45 AM	0	0	0	4	0	115	1	12	9	0	3	18	7	181	0	1	351
Total	2	0	1	5	0	515	12	22	32	0	8	35	15	806	4	1	1458
04:00 PM	1	0	1	8	3	180	5	19	2	0	2	18	7	169	6	10	431
04:15 PM	3	0	4	9	7	180	5	17	8	0	4	22	10	151	7	14	441
04:30 PM	7	0	3	22	5	166	2	18	16	0	3	14	7	166	11	17	457
04:45 PM	1	0	2	21	7	195	3	15	9	0	3	14	2	169	8	9	458
Total	12	0	10	60	22	721	15	69	35	0	12	68	26	655	32	50	1787
05:00 PM	0	0	2	24	8	182	4	15	9	0	3	8	11	177	5	8	456
05:15 PM	4	0	1	25	3	178	7	28	3	0	4	10	22	181	5	8	479
05:30 PM	4	0	1	28	3	209	5	27	8	0	2	11	9	170	7	7	491
05:45 PM	3	0	0	28	4	207	2	42	6	0	6	15	9	141	6	3	472
Total	11	0	4	105	18	776	18	112	26	0	15	44	51	669	23	26	1898
Grand Total	28	0	23	171	42	2469	49	220	118	1	47	168	98	2840	62	79	6415
Apprch %	12.6	0	10.4	77	1.5	88.8	1.8	7.9	35.3	0.3	14.1	50.3	3.2	92.2	2	2.6	
Total %	0.4	0	0.4	2.7	0.7	38.5	0.8	3.4	1.8	0	0.7	2.6	1.5	44.3	1	1.2	
AUTOS	28	0	22	171	42	2376	48	220	117	1	46	168	97	2725	59	79	6199
% AUTOS	100	0	95.7	100	100	96.2	98	100	99.2	100	97.9	100	99	96	95.2	100	96.6
TRUCKS	0	0	1	0	0	93	1	0	1	0	1	0	1	115	3	0	216
% TRUCKS	0	0	4.3	0	0	3.8	2	0	0.8	0	2.1	0	1	4	4.8	0	3.4

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/MELENDY AVE

File Name : 31405292
 Site Code : 31405292
 Start Date : 5/29/2007
 Page No : 2

Start Time	LLOYD RD From North					MT AUBURN ST From East					MELENDY AVE From South					MT AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	3	0	1	0	4	0	132	1	2	135	14	1	4	6	25	4	226	2	0	232	396
08:00 AM	1	0	1	0	2	0	125	2	3	130	9	0	2	1	12	3	218	1	0	222	366
08:15 AM	1	0	0	1	2	0	142	4	1	147	6	0	0	2	8	1	195	2	0	198	355
08:30 AM	0	0	0	0	0	0	133	5	6	144	8	0	3	14	25	4	212	1	0	217	386
Total Volume	5	0	2	1	8	0	532	12	12	556	37	1	9	23	70	12	851	6	0	869	1503
% App. Total	62.5	0	25	12.5		0	95.7	2.2	2.2		52.9	1.4	12.9	32.9		1.4	97.9	0.7	0		
PHF	.417	.000	.500	.250	.500	.000	.937	.600	.500	.946	.661	.250	.563	.411	.700	.750	.941	.750	.000	.936	.949

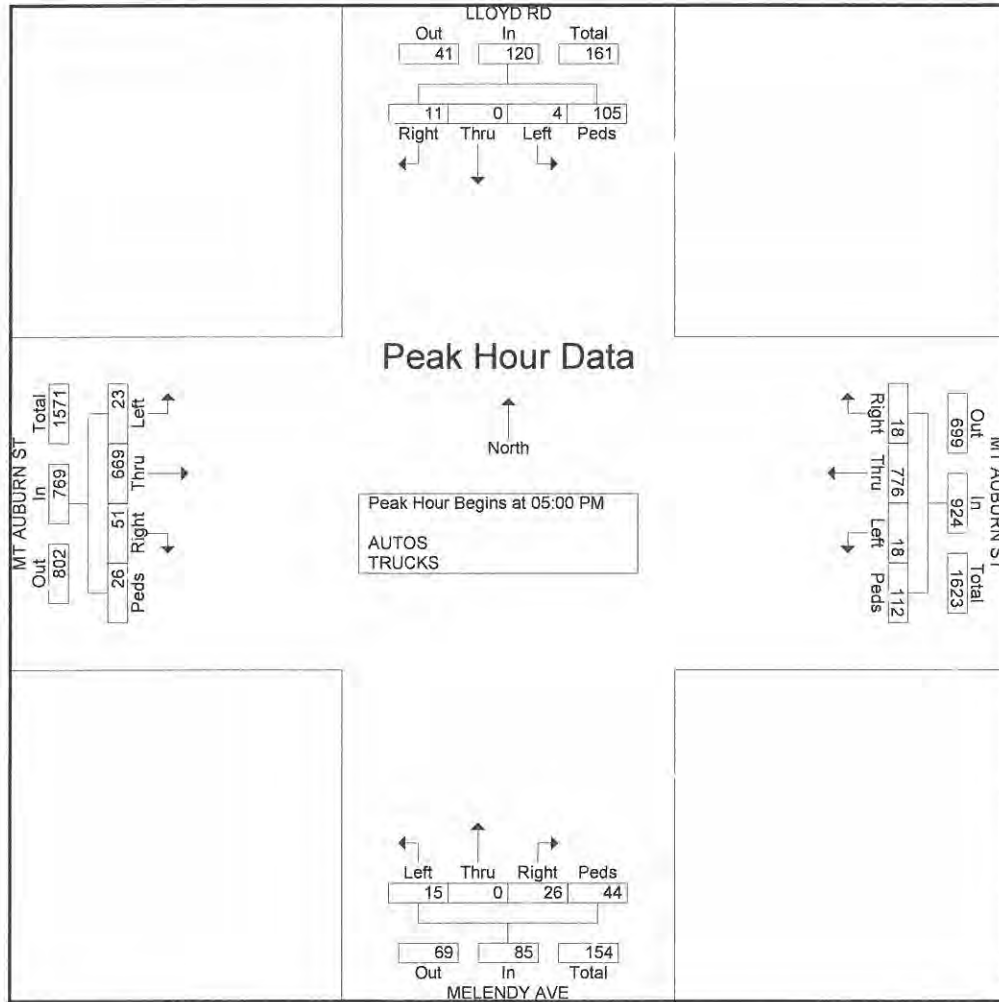


TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/MELENDY AVE

File Name : 31405292
 Site Code : 31405292
 Start Date : 5/29/2007
 Page No : 3

Start Time	LLOYD RD From North					MT AUBURN ST From East					MELENDY AVE From South					MT AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	2	24	26	8	182	4	15	209	9	0	3	8	20	11	177	5	8	201	456
05:15 PM	4	0	1	25	30	3	178	7	28	216	3	0	4	10	17	22	181	5	8	216	479
05:30 PM	4	0	1	28	33	3	209	5	27	244	8	0	2	11	21	9	170	7	7	193	491
05:45 PM	3	0	0	28	31	4	207	2	42	255	6	0	6	15	27	9	141	6	3	159	472
Total Volume	11	0	4	105	120	18	776	18	112	924	26	0	15	44	85	51	669	23	26	769	1898
% App. Total	9.2	0	3.3	87.5		1.9	84	1.9	12.1		30.6	0	17.6	51.8		6.6	87	3	3.4		
PHF	.688	.000	.500	.938	.909	.563	.928	.643	.667	.906	.722	.000	.625	.733	.787	.580	.924	.821	.813	.890	.966



TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
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City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/MELENDY AVE

File Name : 31405292
 Site Code : 31405292
 Start Date : 5/29/2007
 Page No : 1

Groups Printed- AUTOS

Start Time	LLOYD RD From North				MT AUBURN ST From East				MELENDY AVE From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	2	1	0	84	0	1	2	0	1	9	0	137	0	1	238
07:15 AM	0	0	3	0	1	100	1	5	5	0	2	2	0	129	1	1	250
07:30 AM	0	0	2	0	1	124	2	9	4	0	5	4	2	194	0	0	347
07:45 AM	3	0	1	0	0	128	1	2	14	1	4	6	4	217	0	0	381
Total	3	0	8	1	2	436	4	17	25	1	12	21	6	677	1	2	1216
08:00 AM	1	0	0	0	0	119	2	3	9	0	2	1	3	208	0	0	348
08:15 AM	1	0	0	1	0	140	4	1	6	0	0	2	1	186	2	0	344
08:30 AM	0	0	0	0	0	129	5	6	8	0	3	14	4	204	1	0	374
08:45 AM	0	0	0	4	0	102	1	12	8	0	3	18	6	171	0	1	326
Total	2	0	0	5	0	490	12	22	31	0	8	35	14	769	3	1	1392
04:00 PM	1	0	1	8	3	171	5	19	2	0	2	18	7	163	6	10	416
04:15 PM	3	0	4	9	7	174	5	17	8	0	4	22	10	145	7	14	429
04:30 PM	7	0	3	22	5	159	2	18	16	0	3	14	7	161	11	17	445
04:45 PM	1	0	2	21	7	188	3	15	9	0	3	14	2	164	8	9	446
Total	12	0	10	60	22	692	15	69	35	0	12	68	26	633	32	50	1736
05:00 PM	0	0	2	24	8	179	4	15	9	0	3	8	11	170	5	8	446
05:15 PM	4	0	1	25	3	172	6	28	3	0	3	10	22	179	5	8	469
05:30 PM	4	0	1	28	3	204	5	27	8	0	2	11	9	164	7	7	480
05:45 PM	3	0	0	28	4	203	2	42	6	0	6	15	9	133	6	3	460
Total	11	0	4	105	18	758	17	112	26	0	14	44	51	646	23	26	1855
Grand Total	28	0	22	171	42	2376	48	220	117	1	46	168	97	2725	59	79	6199
Apprch %	12.7	0	10	77.4	1.6	88.5	1.8	8.2	35.2	0.3	13.9	50.6	3.3	92.1	2	2.7	
Total %	0.5	0	0.4	2.8	0.7	38.3	0.8	3.5	1.9	0	0.7	2.7	1.6	44	1	1.3	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
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City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/MELENDY AVE

File Name : 31405292
 Site Code : 31405292
 Start Date : 5/29/2007
 Page No : 1

Groups Printed- TRUCKS

Start Time	LLOYD RD From North				MT AUBURN ST From East				MELENDY AVE From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	0	0	0	5	0	0	0	0	0	0	0	9	0	0	14
07:15 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	7	0	0	11
07:30 AM	0	0	0	0	0	8	0	0	0	0	0	0	0	8	0	0	16
07:45 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	9	2	0	15
Total	0	0	0	0	0	21	0	0	0	0	0	0	0	33	2	0	56
08:00 AM	0	0	1	0	0	6	0	0	0	0	0	0	0	10	1	0	18
08:15 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	9	0	0	11
08:30 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	8	0	0	12
08:45 AM	0	0	0	0	0	13	0	0	1	0	0	0	1	10	0	0	25
Total	0	0	1	0	0	25	0	0	1	0	0	0	1	37	1	0	66
04:00 PM	0	0	0	0	0	9	0	0	0	0	0	0	0	6	0	0	15
04:15 PM	0	0	0	0	0	6	0	0	0	0	0	0	0	6	0	0	12
04:30 PM	0	0	0	0	0	7	0	0	0	0	0	0	0	5	0	0	12
04:45 PM	0	0	0	0	0	7	0	0	0	0	0	0	0	5	0	0	12
Total	0	0	0	0	0	29	0	0	0	0	0	0	0	22	0	0	51
05:00 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	7	0	0	10
05:15 PM	0	0	0	0	0	6	1	0	0	0	1	0	0	2	0	0	10
05:30 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	6	0	0	11
05:45 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	8	0	0	12
Total	0	0	0	0	0	18	1	0	0	0	1	0	0	23	0	0	43
Grand Total	0	0	1	0	0	93	1	0	1	0	1	0	1	115	3	0	216
Apprch %	0	0	100	0	0	98.9	1.1	0	50	0	50	0	0.8	96.6	2.5	0	
Total %	0	0	0.5	0	0	43.1	0.5	0	0.5	0	0.5	0	0.5	53.2	1.4	0	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/ELTON AVE

File Name : 31405299
 Site Code : 31405299
 Start Date : 5/29/2007
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Groups Printed- AUTOS - TRUCKS

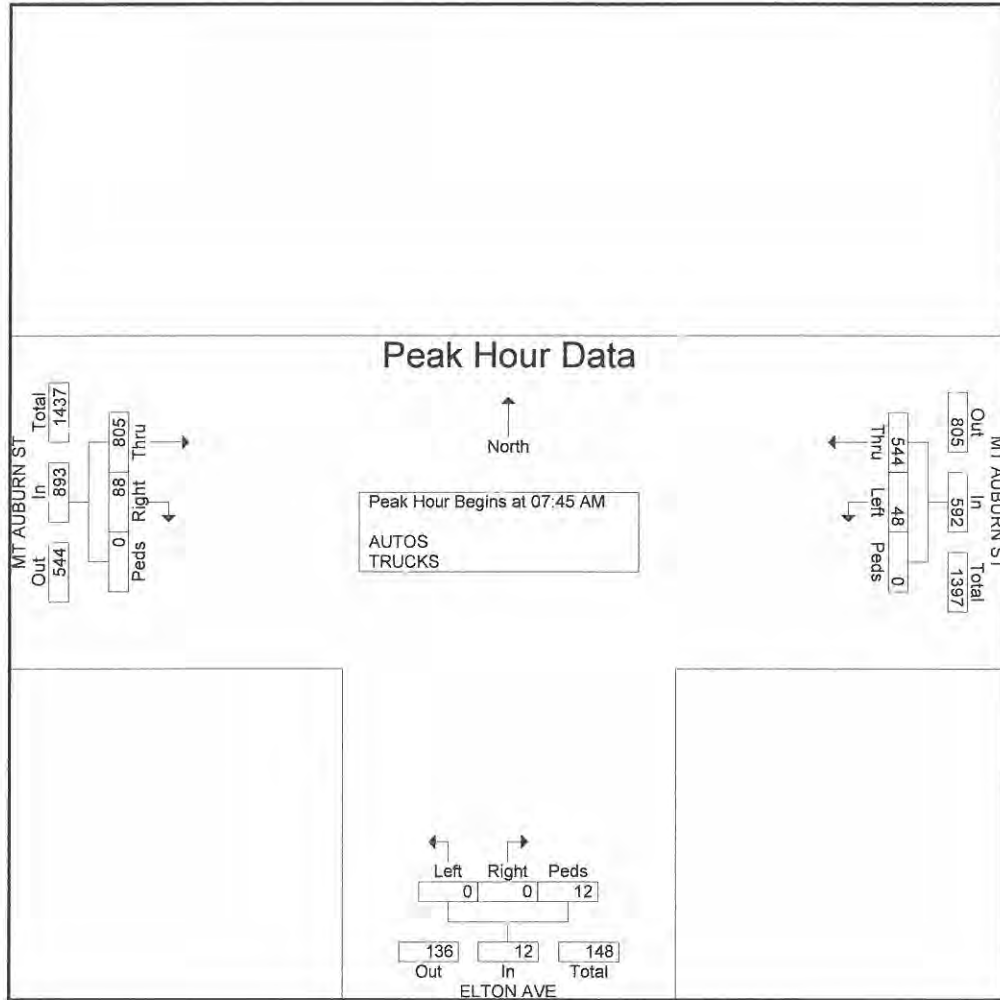
Start Time	MT AUBURN ST From East			ELTON AVE From South			MT AUBURN ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	89	1	0	0	0	4	8	140	0	242
07:15 AM	106	2	0	0	0	3	8	133	0	252
07:30 AM	135	5	0	0	0	1	6	200	0	347
07:45 AM	133	14	0	0	0	4	21	222	0	394
Total	463	22	0	0	0	12	43	695	0	1235
08:00 AM	127	14	0	0	0	1	37	191	0	370
08:15 AM	146	8	0	0	0	2	13	189	0	358
08:30 AM	138	12	0	0	0	5	17	203	0	375
08:45 AM	116	10	0	0	0	4	16	174	0	320
Total	527	44	0	0	0	12	83	757	0	1423
04:00 PM	188	5	0	0	0	7	9	163	0	372
04:15 PM	192	10	0	0	0	1	14	148	0	365
04:30 PM	173	12	0	0	0	5	7	157	0	354
04:45 PM	205	9	0	0	0	3	12	167	0	396
Total	758	36	0	0	0	16	42	635	0	1487
05:00 PM	194	5	0	0	0	2	5	181	0	387
05:15 PM	188	11	0	0	0	17	8	180	0	404
05:30 PM	217	9	0	0	0	4	12	170	0	412
05:45 PM	213	9	0	0	0	9	11	139	0	381
Total	812	34	0	0	0	32	36	670	0	1584
Grand Total	2560	136	0	0	0	72	204	2757	0	5729
Apprch %	95	5	0	0	0	100	6.9	93.1	0	
Total %	44.7	2.4	0	0	0	1.3	3.6	48.1	0	
AUTOS	2466	135	0	0	0	72	200	2645	0	5518
% AUTOS	96.3	99.3	0	0	0	100	98	95.9	0	96.3
TRUCKS	94	1	0	0	0	0	4	112	0	211
% TRUCKS	3.7	0.7	0	0	0	0	2	4.1	0	3.7

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/ELTON AVE

File Name : 31405299
 Site Code : 31405299
 Start Date : 5/29/2007
 Page No : 2

Start Time	MT AUBURN ST From East				ELTON AVE From South				MT AUBURN ST From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	133	14	0	147	0	0	4	4	21	222	0	243	394
08:00 AM	127	14	0	141	0	0	1	1	37	191	0	228	370
08:15 AM	146	8	0	154	0	0	2	2	13	189	0	202	358
08:30 AM	138	12	0	150	0	0	5	5	17	203	0	220	375
Total Volume	544	48	0	592	0	0	12	12	88	805	0	893	1497
% App. Total	91.9	8.1	0		0	0	100		9.9	90.1	0		
PHF	.932	.857	.000	.961	.000	.000	.600	.600	.595	.907	.000	.919	.950

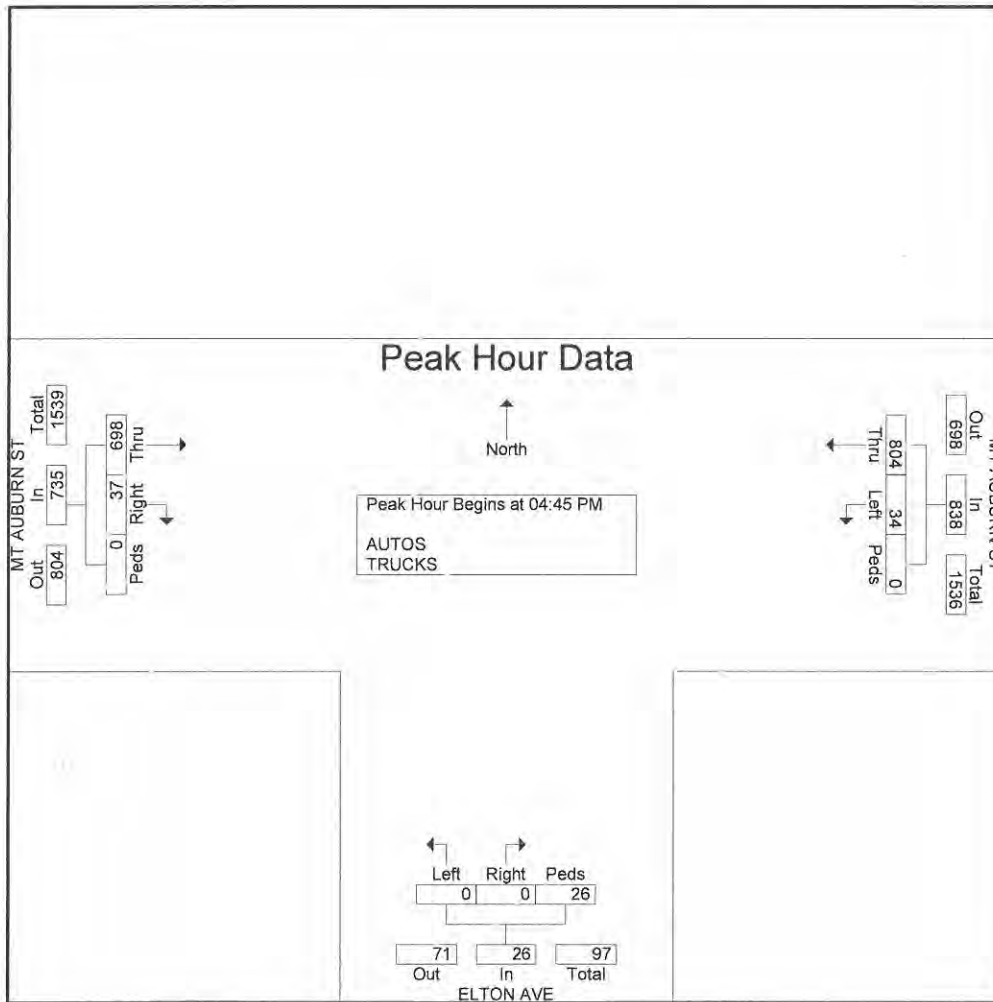


TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/ELTON AVE

File Name : 31405299
 Site Code : 31405299
 Start Date : 5/29/2007
 Page No : 3

Start Time	MT AUBURN ST From East				ELTON AVE From South				MT AUBURN ST From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	205	9	0	214	0	0	3	3	12	167	0	179	396
05:00 PM	194	5	0	199	0	0	2	2	5	181	0	186	387
05:15 PM	188	11	0	199	0	0	17	17	8	180	0	188	404
05:30 PM	217	9	0	226	0	0	4	4	12	170	0	182	412
Total Volume	804	34	0	838	0	0	26	26	37	698	0	735	1599
% App. Total	95.9	4.1	0		0	0	100		5	95	0		
PHF	.926	.773	.000	.927	.000	.000	.382	.382	.771	.964	.000	.977	.970



TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/ELTON AVE

File Name : 31405299
 Site Code : 31405299
 Start Date : 5/29/2007
 Page No : 1

Groups Printed- AUTOS

Start Time	MT AUBURN ST From East			ELTON AVE From South			MT AUBURN ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	84	1	0	0	0	4	7	132	0	228
07:15 AM	102	2	0	0	0	3	8	126	0	241
07:30 AM	127	4	0	0	0	1	6	192	0	330
07:45 AM	129	14	0	0	0	4	19	215	0	381
Total	442	21	0	0	0	12	40	665	0	1180
08:00 AM	121	14	0	0	0	1	37	181	0	354
08:15 AM	144	8	0	0	0	2	13	180	0	347
08:30 AM	134	12	0	0	0	5	16	196	0	363
08:45 AM	103	10	0	0	0	4	16	163	0	296
Total	502	44	0	0	0	12	82	720	0	1360
04:00 PM	179	5	0	0	0	7	9	157	0	357
04:15 PM	186	10	0	0	0	1	14	142	0	353
04:30 PM	166	12	0	0	0	5	7	152	0	342
04:45 PM	198	9	0	0	0	3	12	162	0	384
Total	729	36	0	0	0	16	42	613	0	1436
05:00 PM	191	5	0	0	0	2	5	174	0	377
05:15 PM	181	11	0	0	0	17	8	178	0	395
05:30 PM	212	9	0	0	0	4	12	164	0	401
05:45 PM	209	9	0	0	0	9	11	131	0	369
Total	793	34	0	0	0	32	36	647	0	1542
Grand Total	2466	135	0	0	0	72	200	2645	0	5518
Apprch %	94.8	5.2	0	0	0	100	7	93	0	
Total %	44.7	2.4	0	0	0	1.3	3.6	47.9	0	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/ELTON AVE

File Name : 31405299
 Site Code : 31405299
 Start Date : 5/29/2007
 Page No : 1

Groups Printed- TRUCKS

Start Time	MT AUBURN ST From East			ELTON AVE From South			MT AUBURN ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	5	0	0	0	0	0	1	8	0	14
07:15 AM	4	0	0	0	0	0	0	7	0	11
07:30 AM	8	1	0	0	0	0	0	8	0	17
07:45 AM	4	0	0	0	0	0	2	7	0	13
Total	21	1	0	0	0	0	3	30	0	55
08:00 AM	6	0	0	0	0	0	0	10	0	16
08:15 AM	2	0	0	0	0	0	0	9	0	11
08:30 AM	4	0	0	0	0	0	1	7	0	12
08:45 AM	13	0	0	0	0	0	0	11	0	24
Total	25	0	0	0	0	0	1	37	0	63
04:00 PM	9	0	0	0	0	0	0	6	0	15
04:15 PM	6	0	0	0	0	0	0	6	0	12
04:30 PM	7	0	0	0	0	0	0	5	0	12
04:45 PM	7	0	0	0	0	0	0	5	0	12
Total	29	0	0	0	0	0	0	22	0	51
05:00 PM	3	0	0	0	0	0	0	7	0	10
05:15 PM	7	0	0	0	0	0	0	2	0	9
05:30 PM	5	0	0	0	0	0	0	6	0	11
05:45 PM	4	0	0	0	0	0	0	8	0	12
Total	19	0	0	0	0	0	0	23	0	42
Grand Total	94	1	0	0	0	0	4	112	0	211
Apprch %	98.9	1.1	0	0	0	0	3.4	96.6	0	
Total %	44.5	0.5	0	0	0	0	1.9	53.1	0	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/IRMA AVE

File Name : 31405313
 Site Code : 31405313
 Start Date : 5/31/2007
 Page No : 1

Groups Printed- AUTOS - TRUCKS

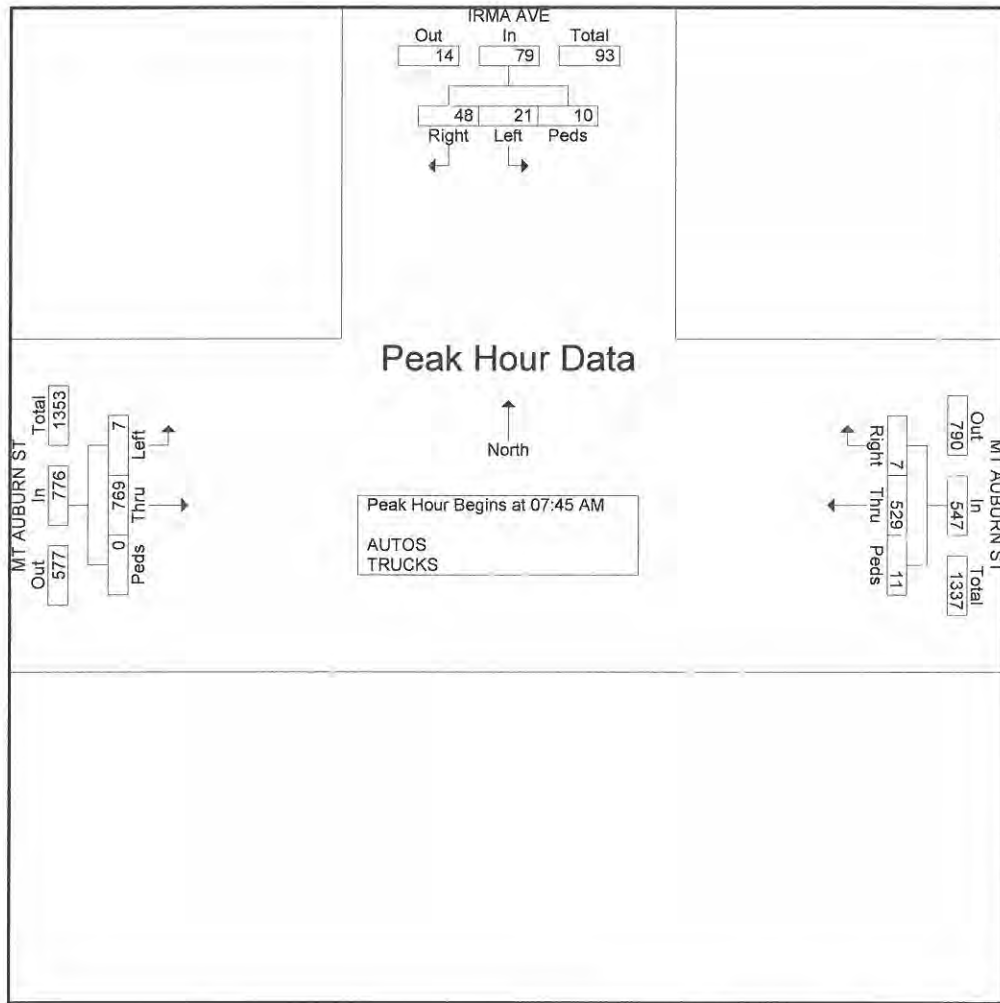
Start Time	IRMA AVE From North			MT AUBURN ST From East			MT AUBURN ST From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	2	3	1	5	92	0	161	0	0	264
07:15 AM	1	2	5	2	119	1	125	2	0	257
07:30 AM	5	5	4	1	102	0	199	3	0	319
07:45 AM	19	5	5	0	111	0	189	1	0	330
Total	27	15	15	8	424	1	674	6	0	1170
08:00 AM	14	6	3	3	136	2	183	2	0	349
08:15 AM	11	6	2	1	131	7	191	2	0	351
08:30 AM	4	4	0	3	151	2	206	2	0	372
08:45 AM	8	4	10	1	131	1	165	1	0	321
Total	37	20	15	8	549	12	745	7	0	1393
04:00 PM	7	0	7	5	188	3	153	3	0	366
04:15 PM	2	3	5	2	178	5	150	2	2	349
04:30 PM	2	0	12	4	181	2	140	2	2	345
04:45 PM	3	0	5	5	174	3	144	1	2	337
Total	14	3	29	16	721	13	587	8	6	1397
05:00 PM	4	0	4	4	199	3	149	5	6	374
05:15 PM	2	2	9	4	223	5	165	8	4	422
05:30 PM	1	0	8	4	235	3	156	4	2	413
05:45 PM	3	3	10	4	181	7	161	8	0	377
Total	10	5	31	16	838	18	631	25	12	1586
Grand Total	88	43	90	48	2532	44	2637	46	18	5546
Apprch %	39.8	19.5	40.7	1.8	96.5	1.7	97.6	1.7	0.7	
Total %	1.6	0.8	1.6	0.9	45.7	0.8	47.5	0.8	0.3	
AUTOS	87	43	90	48	2446	44	2538	45	18	5359
% AUTOS	98.9	100	100	100	96.6	100	96.2	97.8	100	96.6
TRUCKS	1	0	0	0	86	0	99	1	0	187
% TRUCKS	1.1	0	0	0	3.4	0	3.8	2.2	0	3.4

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/IRMA AVE

File Name : 31405313
 Site Code : 31405313
 Start Date : 5/31/2007
 Page No : 2

Start Time	IRMA AVE From North				MT AUBURN ST From East				MT AUBURN ST From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	19	5	5	29	0	111	0	111	189	1	0	190	330
08:00 AM	14	6	3	23	3	136	2	141	183	2	0	185	349
08:15 AM	11	6	2	19	1	131	7	139	191	2	0	193	351
08:30 AM	4	4	0	8	3	151	2	156	206	2	0	208	372
Total Volume	48	21	10	79	7	529	11	547	769	7	0	776	1402
% App. Total	60.8	26.6	12.7		1.3	96.7	2		99.1	0.9	0		
PHF	.632	.875	.500	.681	.583	.876	.393	.877	.933	.875	.000	.933	.942

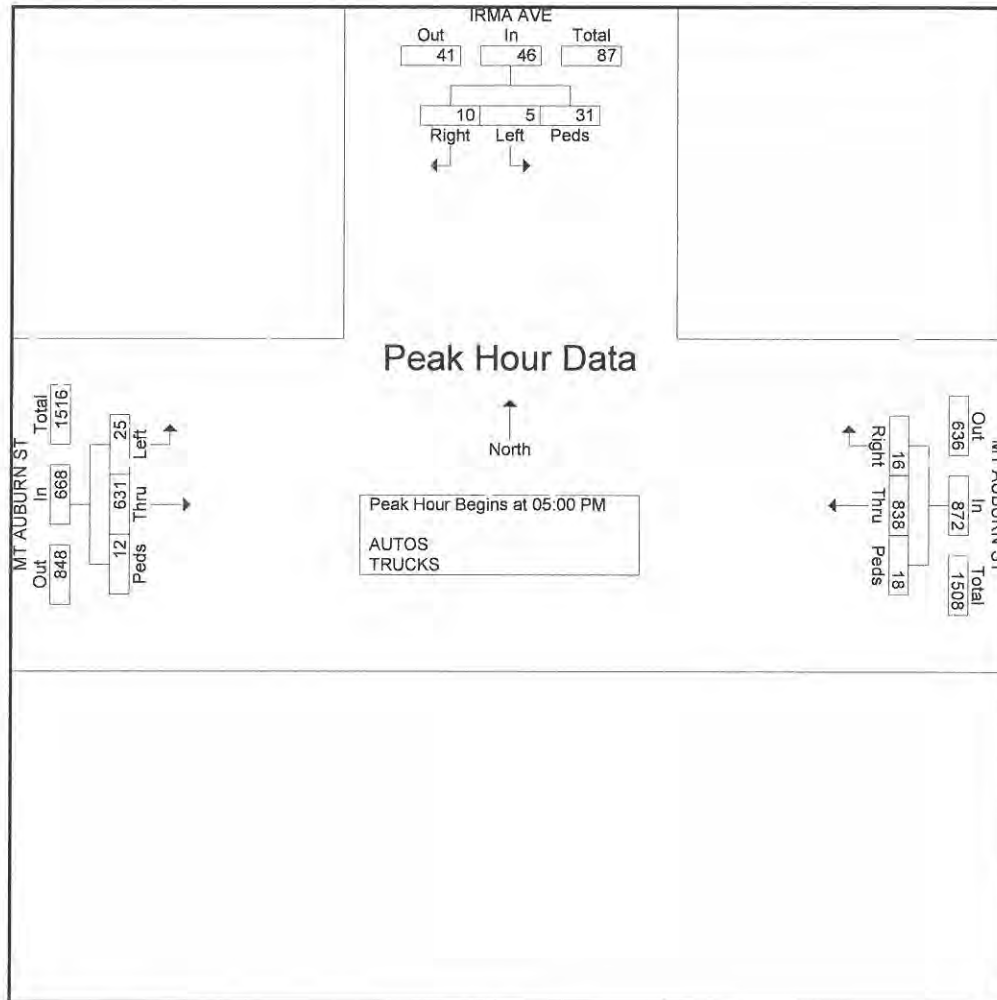


TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/IRMA AVE

File Name : 31405313
 Site Code : 31405313
 Start Date : 5/31/2007
 Page No : 3

Start Time	IRMA AVE From North				MT AUBURN ST From East				MT AUBURN ST From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	4	0	4	8	4	199	3	206	149	5	6	160	374
05:15 PM	2	2	9	13	4	223	5	232	165	8	4	177	422
05:30 PM	1	0	8	9	4	235	3	242	156	4	2	162	413
05:45 PM	3	3	10	16	4	181	7	192	161	8	0	169	377
Total Volume	10	5	31	46	16	838	18	872	631	25	12	668	1586
% App. Total	21.7	10.9	67.4		1.8	96.1	2.1		94.5	3.7	1.8		
PHF	.625	.417	.775	.719	1.000	.891	.643	.901	.956	.781	.500	.944	.940



TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/IRMA AVE

File Name : 31405313
 Site Code : 31405313
 Start Date : 5/31/2007
 Page No : 1

Groups Printed- AUTOS

Start Time	IRMA AVE From North			MT AUBURN ST From East			MT AUBURN ST From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	2	3	1	5	90	0	151	0	0	252
07:15 AM	1	2	5	2	116	1	118	2	0	247
07:30 AM	5	5	4	1	97	0	192	3	0	307
07:45 AM	19	5	5	0	102	0	178	1	0	310
Total	27	15	15	8	405	1	639	6	0	1116
08:00 AM	14	6	3	3	129	2	176	2	0	335
08:15 AM	11	6	2	1	124	7	183	2	0	336
08:30 AM	3	4	0	3	149	2	198	2	0	361
08:45 AM	8	4	10	1	124	1	157	1	0	306
Total	36	20	15	8	526	12	714	7	0	1338
04:00 PM	7	0	7	5	183	3	149	3	0	357
04:15 PM	2	3	5	2	174	5	145	1	2	339
04:30 PM	2	0	12	4	173	2	135	2	2	332
04:45 PM	3	0	5	5	166	3	142	1	2	327
Total	14	3	29	16	696	13	571	7	6	1355
05:00 PM	4	0	4	4	193	3	146	5	6	365
05:15 PM	2	2	9	4	218	5	159	8	4	411
05:30 PM	1	0	8	4	232	3	152	4	2	406
05:45 PM	3	3	10	4	176	7	157	8	0	368
Total	10	5	31	16	819	18	614	25	12	1550
Grand Total	87	43	90	48	2446	44	2538	45	18	5359
Apprch %	39.5	19.5	40.9	1.9	96.4	1.7	97.6	1.7	0.7	
Total %	1.6	0.8	1.7	0.9	45.6	0.8	47.4	0.8	0.3	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/IRMA AVE

File Name : 31405313
 Site Code : 31405313
 Start Date : 5/31/2007
 Page No : 1

Groups Printed- TRUCKS

Start Time	IRMA AVE From North			MT AUBURN ST From East			MT AUBURN ST From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	0	0	0	0	2	0	10	0	0	12
07:15 AM	0	0	0	0	3	0	7	0	0	10
07:30 AM	0	0	0	0	5	0	7	0	0	12
07:45 AM	0	0	0	0	9	0	11	0	0	20
Total	0	0	0	0	19	0	35	0	0	54
08:00 AM	0	0	0	0	7	0	7	0	0	14
08:15 AM	0	0	0	0	7	0	8	0	0	15
08:30 AM	1	0	0	0	2	0	8	0	0	11
08:45 AM	0	0	0	0	7	0	8	0	0	15
Total	1	0	0	0	23	0	31	0	0	55
04:00 PM	0	0	0	0	5	0	4	0	0	9
04:15 PM	0	0	0	0	4	0	5	1	0	10
04:30 PM	0	0	0	0	8	0	5	0	0	13
04:45 PM	0	0	0	0	8	0	2	0	0	10
Total	0	0	0	0	25	0	16	1	0	42
05:00 PM	0	0	0	0	6	0	3	0	0	9
05:15 PM	0	0	0	0	5	0	6	0	0	11
05:30 PM	0	0	0	0	3	0	4	0	0	7
05:45 PM	0	0	0	0	5	0	4	0	0	9
Total	0	0	0	0	19	0	17	0	0	36
Grand Total	1	0	0	0	86	0	99	1	0	187
Apprch %	100	0	0	0	100	0	99	1	0	
Total %	0.5	0	0	0	46	0	52.9	0.5	0	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/BIGELOW AVE

File Name : 31405294
 Site Code : 31405294
 Start Date : 5/29/2007
 Page No : 1

Groups Printed- AUTOS - TRUCKS

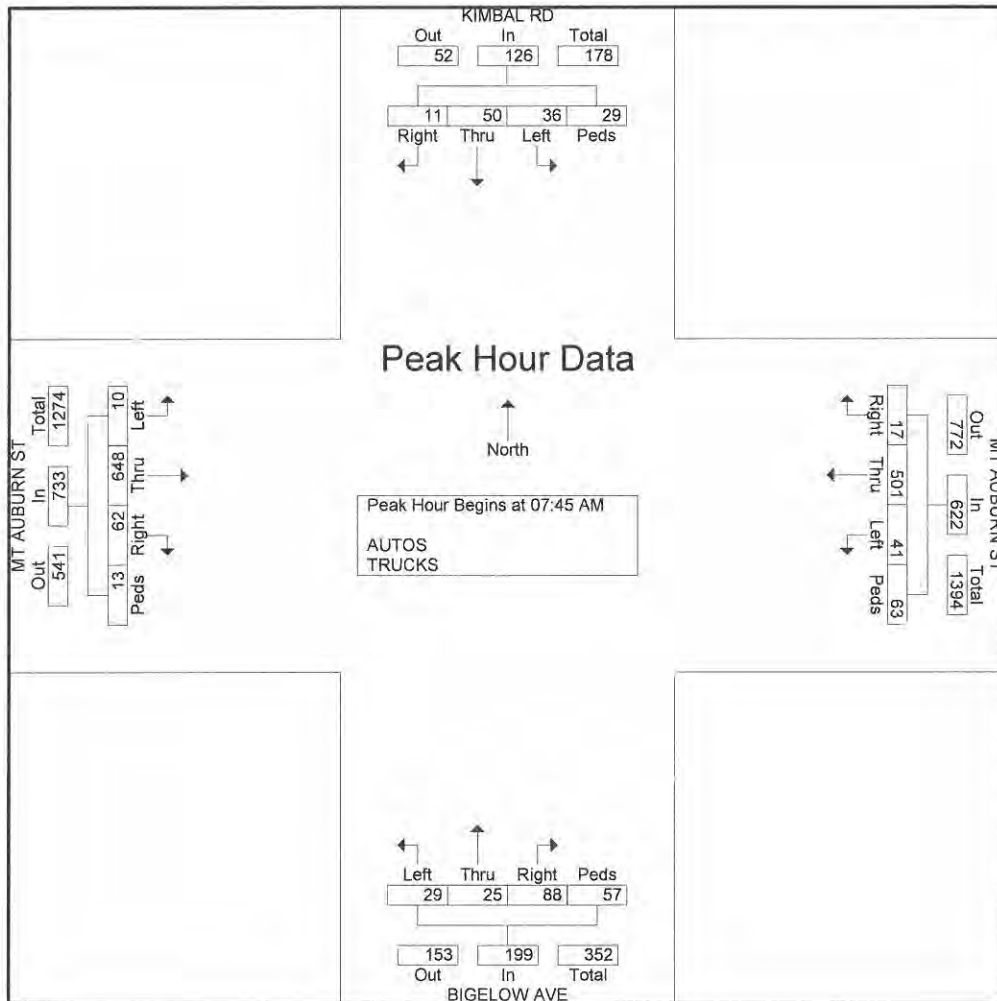
Start Time	KIMBAL RD From North				MT AUBURN ST From East				BIGELOW AVE From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	2	3	4	7	1	81	8	8	19	1	5	6	9	110	1	2	267
07:15 AM	2	4	7	7	6	103	5	13	17	3	3	2	4	124	2	6	308
07:30 AM	2	9	12	7	7	121	10	14	12	7	8	7	28	165	3	6	418
07:45 AM	1	17	13	3	1	115	9	13	22	6	6	13	27	182	4	2	434
Total	7	33	36	24	15	420	32	48	70	17	22	28	68	581	10	16	1427
08:00 AM	2	13	13	13	5	108	8	25	16	1	7	13	13	155	2	5	399
08:15 AM	6	12	7	7	5	142	13	11	20	4	7	11	9	149	2	1	406
08:30 AM	2	8	3	6	6	136	11	14	30	14	9	20	13	162	2	5	441
08:45 AM	2	8	6	10	4	113	7	17	32	6	8	12	13	148	5	7	398
Total	12	41	29	36	20	499	39	67	98	25	31	56	48	614	11	18	1644
04:00 PM	5	5	3	10	7	164	8	10	15	11	22	9	11	141	2	2	425
04:15 PM	5	4	4	10	7	174	5	9	25	19	22	3	18	116	4	5	430
04:30 PM	5	1	2	9	3	165	9	4	20	13	20	5	14	157	5	2	434
04:45 PM	0	2	1	10	6	179	6	11	15	22	11	9	16	140	6	4	438
Total	15	12	10	39	23	682	28	34	75	65	75	26	59	554	17	13	1727
05:00 PM	6	4	3	9	9	175	5	6	31	27	25	16	13	168	3	1	501
05:15 PM	4	3	5	24	10	189	7	15	24	22	20	10	18	165	5	5	526
05:30 PM	5	2	1	21	9	190	4	14	21	22	21	13	14	145	2	3	487
05:45 PM	4	1	2	12	7	183	10	9	17	24	12	14	15	118	2	3	433
Total	19	10	11	66	35	737	26	44	93	95	78	53	60	596	12	12	1947
Grand Total	53	96	86	165	93	2338	125	193	336	202	206	163	235	2345	50	59	6745
Apprch %	13.2	24	21.5	41.2	3.4	85	4.5	7	37	22.3	22.7	18	8.7	87.2	1.9	2.2	
Total %	0.8	1.4	1.3	2.4	1.4	34.7	1.9	2.9	5	3	3.1	2.4	3.5	34.8	0.7	0.9	
AUTOS	53	95	84	165	91	2239	121	193	329	197	202	163	234	2234	49	58	6507
% AUTOS	100	99	97.7	100	97.8	95.8	96.8	100	97.9	97.5	98.1	100	99.6	95.3	98	98.3	96.5
TRUCKS	0	1	2	0	2	99	4	0	7	5	4	0	1	111	1	1	238
% TRUCKS	0	1	2.3	0	2.2	4.2	3.2	0	2.1	2.5	1.9	0	0.4	4.7	2	1.7	3.5

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/BIGELOW AVE

File Name : 31405294
 Site Code : 31405294
 Start Date : 5/29/2007
 Page No : 2

Start Time	KIMBAL RD From North					MT AUBURN ST From East					BIGELOW AVE From South					MT AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	1	17	13	3	34	1	115	9	13	138	22	6	6	13	47	27	182	4	2	215	434
08:00 AM	2	13	13	13	41	5	108	8	25	146	16	1	7	13	37	13	155	2	5	175	399
08:15 AM	6	12	7	7	32	5	142	13	11	171	20	4	7	11	42	9	149	2	1	161	406
08:30 AM	2	8	3	6	19	6	136	11	14	167	30	14	9	20	73	13	162	2	5	182	441
Total Volume	11	50	36	29	126	17	501	41	63	622	88	25	29	57	199	62	648	10	13	733	1680
% App. Total	8.7	39.7	28.6	23		2.7	80.5	6.6	10.1		44.2	12.6	14.6	28.6		8.5	88.4	1.4	1.8		
PHF	.458	.735	.692	.558	.768	.708	.882	.788	.630	.909	.733	.446	.806	.713	.682	.574	.890	.625	.650	.852	.952

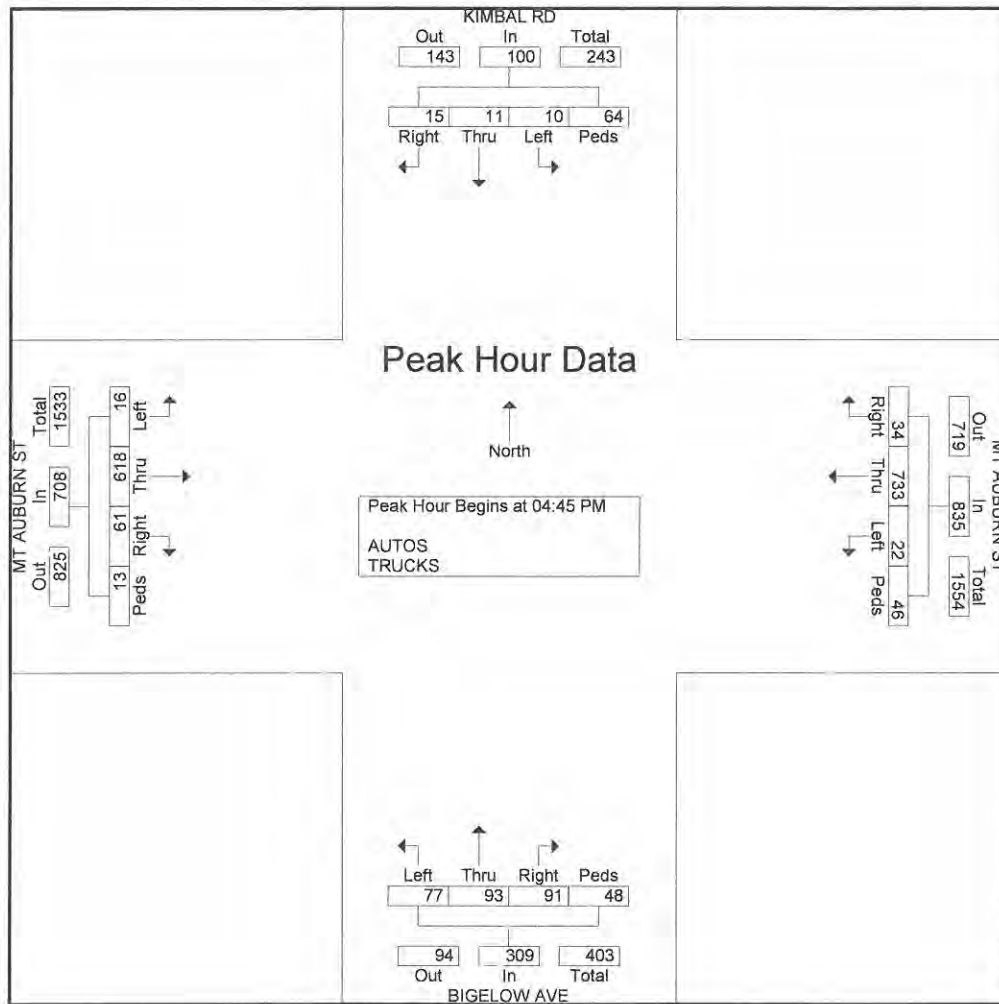


TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/BIGELOW AVE

File Name : 31405294
 Site Code : 31405294
 Start Date : 5/29/2007
 Page No : 3

Start Time	KIMBAL RD From North					MT AUBURN ST From East					BIGELOW AVE From South					MT AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	2	1	10	13	6	179	6	11	202	15	22	11	9	57	16	140	6	4	166	438
05:00 PM	6	4	3	9	22	9	175	5	6	195	31	27	25	16	99	13	168	3	1	185	501
05:15 PM	4	3	5	24	36	10	189	7	15	221	24	22	20	10	76	18	165	5	5	193	526
05:30 PM	5	2	1	21	29	9	190	4	14	217	21	22	21	13	77	14	145	2	3	164	487
Total Volume	15	11	10	64	100	34	733	22	46	835	91	93	77	48	309	61	618	16	13	708	1952
% App. Total	15	11	10	64		4.1	87.8	2.6	5.5		29.4	30.1	24.9	15.5		8.6	87.3	2.3	1.8		
PHF	.625	.688	.500	.667	.694	.850	.964	.786	.767	.945	.734	.861	.770	.750	.780	.847	.920	.667	.650	.917	.928



TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/BIGELOW AVE

File Name : 31405294
 Site Code : 31405294
 Start Date : 5/29/2007
 Page No : 1

Groups Printed- AUTOS

Start Time	KIMBAL RD From North				MT AUBURN ST From East				BIGELOW AVE From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	2	3	4	7	1	77	7	8	19	1	5	6	9	101	1	2	253
07:15 AM	2	4	7	7	5	98	5	13	16	3	3	2	4	118	2	6	295
07:30 AM	2	9	11	7	6	111	9	14	12	7	8	7	28	159	3	5	398
07:45 AM	1	16	13	3	1	109	9	13	22	6	6	13	27	175	4	2	420
Total	7	32	35	24	13	395	30	48	69	17	22	28	68	553	10	15	1366
08:00 AM	2	13	13	13	5	104	7	25	16	1	5	13	12	145	1	5	380
08:15 AM	6	12	7	7	5	141	13	11	19	3	7	11	9	139	2	1	393
08:30 AM	2	8	3	6	6	124	11	14	29	12	9	20	13	153	2	5	417
08:45 AM	2	8	6	10	4	103	7	17	31	6	8	12	13	140	5	7	379
Total	12	41	29	36	20	472	38	67	95	22	29	56	47	577	10	18	1569
04:00 PM	5	5	3	10	7	155	7	10	15	11	22	9	11	135	2	2	409
04:15 PM	5	4	4	10	7	169	5	9	24	19	22	3	18	110	4	5	418
04:30 PM	5	1	2	9	3	157	9	4	20	13	20	5	14	150	5	2	419
04:45 PM	0	2	1	10	6	171	6	11	14	22	11	9	16	136	6	4	425
Total	15	12	10	39	23	652	27	34	73	65	75	26	59	531	17	13	1671
05:00 PM	6	4	2	9	9	171	5	6	31	27	25	16	13	160	3	1	488
05:15 PM	4	3	5	24	10	182	7	15	24	21	20	10	18	164	5	5	517
05:30 PM	5	2	1	21	9	188	4	14	21	21	19	13	14	138	2	3	475
05:45 PM	4	1	2	12	7	179	10	9	16	24	12	14	15	111	2	3	421
Total	19	10	10	66	35	720	26	44	92	93	76	53	60	573	12	12	1901
Grand Total	53	95	84	165	91	2239	121	193	329	197	202	163	234	2234	49	58	6507
Apprch %	13.4	23.9	21.2	41.6	3.4	84.7	4.6	7.3	36.9	22.1	22.7	18.3	9.1	86.8	1.9	2.3	
Total %	0.8	1.5	1.3	2.5	1.4	34.4	1.9	3	5.1	3	3.1	2.5	3.6	34.3	0.8	0.9	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/BIGELOW AVE

File Name : 31405294
 Site Code : 31405294
 Start Date : 5/29/2007
 Page No : 1

Groups Printed- TRUCKS

Start Time	KIMBAL RD From North				MT AUBURN ST From East				BIGELOW AVE From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	0	0	0	4	1	0	0	0	0	0	0	9	0	0	14
07:15 AM	0	0	0	0	1	5	0	0	1	0	0	0	0	6	0	0	13
07:30 AM	0	0	1	0	1	10	1	0	0	0	0	0	0	6	0	1	20
07:45 AM	0	1	0	0	0	6	0	0	0	0	0	0	0	7	0	0	14
Total	0	1	1	0	2	25	2	0	1	0	0	0	0	28	0	1	61
08:00 AM	0	0	0	0	0	4	1	0	0	0	2	0	1	10	1	0	19
08:15 AM	0	0	0	0	0	1	0	0	1	1	0	0	0	10	0	0	13
08:30 AM	0	0	0	0	0	12	0	0	1	2	0	0	0	9	0	0	24
08:45 AM	0	0	0	0	0	10	0	0	1	0	0	0	0	8	0	0	19
Total	0	0	0	0	0	27	1	0	3	3	2	0	1	37	1	0	75
04:00 PM	0	0	0	0	0	9	1	0	0	0	0	0	0	6	0	0	16
04:15 PM	0	0	0	0	0	5	0	0	1	0	0	0	0	6	0	0	12
04:30 PM	0	0	0	0	0	8	0	0	0	0	0	0	0	7	0	0	15
04:45 PM	0	0	0	0	0	8	0	0	1	0	0	0	0	4	0	0	13
Total	0	0	0	0	0	30	1	0	2	0	0	0	0	23	0	0	56
05:00 PM	0	0	1	0	0	4	0	0	0	0	0	0	0	8	0	0	13
05:15 PM	0	0	0	0	0	7	0	0	0	1	0	0	0	1	0	0	9
05:30 PM	0	0	0	0	0	2	0	0	0	1	2	0	0	7	0	0	12
05:45 PM	0	0	0	0	0	4	0	0	1	0	0	0	0	7	0	0	12
Total	0	0	1	0	0	17	0	0	1	2	2	0	0	23	0	0	46
Grand Total	0	1	2	0	2	99	4	0	7	5	4	0	1	111	1	1	238
Apprch %	0	33.3	66.7	0	1.9	94.3	3.8	0	43.8	31.2	25	0	0.9	97.4	0.9	0.9	
Total %	0	0.4	0.8	0	0.8	41.6	1.7	0	2.9	2.1	1.7	0	0.4	46.6	0.4	0.4	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/TEMPLETON PKWY

File Name : 31405309
 Site Code : 31405309
 Start Date : 5/30/2007
 Page No : 1

Groups Printed- AUTOS - TRUCKS

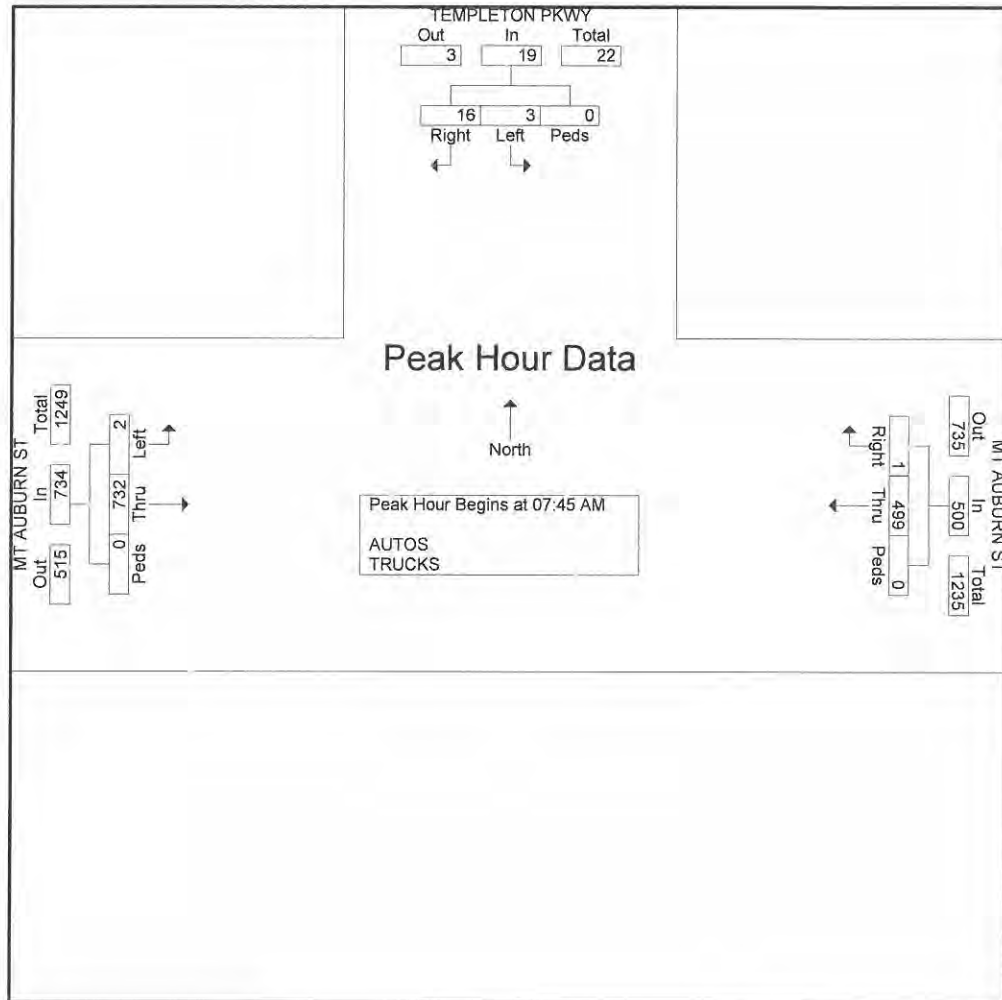
Start Time	TEMPLETON PKWY From North			MT AUBURN ST From East			MT AUBURN ST From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	5	3	0	1	82	0	157	3	0	251
07:15 AM	5	1	0	0	122	0	137	1	0	266
07:30 AM	5	1	0	0	109	0	167	2	0	284
07:45 AM	5	1	0	0	116	0	204	1	0	327
Total	20	6	0	1	429	0	665	7	0	1128
08:00 AM	5	0	0	0	131	0	159	0	0	295
08:15 AM	5	1	0	1	127	0	195	1	0	330
08:30 AM	1	1	0	0	125	0	174	0	0	301
08:45 AM	6	1	5	1	120	0	166	2	0	301
Total	17	3	5	2	503	0	694	3	0	1227
04:00 PM	1	0	0	2	168	0	145	0	0	316
04:15 PM	3	2	0	1	189	0	144	1	0	340
04:30 PM	4	1	3	1	179	0	153	0	0	341
04:45 PM	1	0	0	1	162	0	158	0	0	322
Total	9	3	3	5	698	0	600	1	0	1319
05:00 PM	5	0	8	5	183	0	136	6	0	343
05:15 PM	2	2	0	8	132	0	154	5	0	303
05:30 PM	4	0	17	2	179	0	163	4	0	369
05:45 PM	2	0	9	5	182	0	169	1	0	368
Total	13	2	34	20	676	0	622	16	0	1383
Grand Total	59	14	42	28	2306	0	2581	27	0	5057
Apprch %	51.3	12.2	36.5	1.2	98.8	0	99	1	0	
Total %	1.2	0.3	0.8	0.6	45.6	0	51	0.5	0	
AUTOS	54	13	42	28	2218	0	2459	26	0	4840
% AUTOS	91.5	92.9	100	100	96.2	0	95.3	96.3	0	95.7
TRUCKS	5	1	0	0	88	0	122	1	0	217
% TRUCKS	8.5	7.1	0	0	3.8	0	4.7	3.7	0	4.3

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
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City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/TEMPLETON PKWY

File Name : 31405309
 Site Code : 31405309
 Start Date : 5/30/2007
 Page No : 2

Start Time	TEMPLETON PKWY From North				MT AUBURN ST From East				MT AUBURN ST From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	5	1	0	6	0	116	0	116	204	1	0	205	327
08:00 AM	5	0	0	5	0	131	0	131	159	0	0	159	295
08:15 AM	5	1	0	6	1	127	0	128	195	1	0	196	330
08:30 AM	1	1	0	2	0	125	0	125	174	0	0	174	301
Total Volume	16	3	0	19	1	499	0	500	732	2	0	734	1253
% App. Total	84.2	15.8	0		0.2	99.8	0		99.7	0.3	0		
PHF	.800	.750	.000	.792	.250	.952	.000	.954	.897	.500	.000	.895	.949

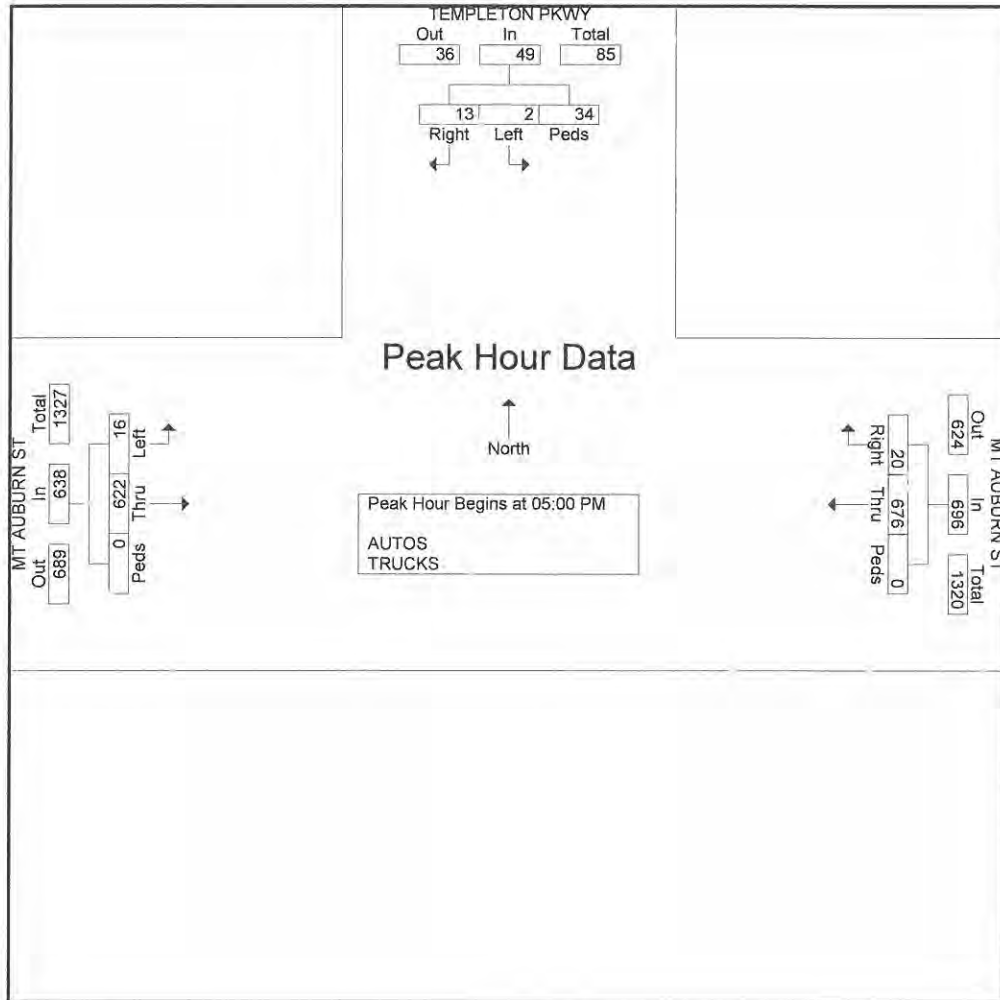


TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/TEMPLETON PKWY

File Name : 31405309
 Site Code : 31405309
 Start Date : 5/30/2007
 Page No : 3

Start Time	TEMPLETON PKWY From North				MT AUBURN ST From East				MT AUBURN ST From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	5	0	8	13	5	183	0	188	136	6	0	142	343
05:15 PM	2	2	0	4	8	132	0	140	154	5	0	159	303
05:30 PM	4	0	17	21	2	179	0	181	163	4	0	167	369
05:45 PM	2	0	9	11	5	182	0	187	169	1	0	170	368
Total Volume	13	2	34	49	20	676	0	696	622	16	0	638	1383
% App. Total	26.5	4.1	69.4		2.9	97.1	0		97.5	2.5	0		
PHF	.650	.250	.500	.583	.625	.923	.000	.926	.920	.667	.000	.938	.937



TRANSDATA SERVICES
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978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/TEMPLETON PKWY

File Name : 31405309
 Site Code : 31405309
 Start Date : 5/30/2007
 Page No : 1

Groups Printed- AUTOS

Start Time	TEMPLETON PKWY From North			MT AUBURN ST From East			MT AUBURN ST From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	5	3	0	1	76	0	143	3	0	231
07:15 AM	5	1	0	0	117	0	130	1	0	254
07:30 AM	5	1	0	0	102	0	159	2	0	269
07:45 AM	4	1	0	0	106	0	192	1	0	304
Total	19	6	0	1	401	0	624	7	0	1058
08:00 AM	5	0	0	0	127	0	151	0	0	283
08:15 AM	3	1	0	1	120	0	184	1	0	310
08:30 AM	1	0	0	0	118	0	163	0	0	282
08:45 AM	5	1	5	1	117	0	159	2	0	290
Total	14	2	5	2	482	0	657	3	0	1165
04:00 PM	1	0	0	2	162	0	137	0	0	302
04:15 PM	3	2	0	1	185	0	138	1	0	330
04:30 PM	3	1	3	1	173	0	146	0	0	327
04:45 PM	1	0	0	1	157	0	153	0	0	312
Total	8	3	3	5	677	0	574	1	0	1271
05:00 PM	5	0	8	5	179	0	135	6	0	338
05:15 PM	2	2	0	8	127	0	153	4	0	296
05:30 PM	4	0	17	2	173	0	154	4	0	354
05:45 PM	2	0	9	5	179	0	162	1	0	358
Total	13	2	34	20	658	0	604	15	0	1346
Grand Total	54	13	42	28	2218	0	2459	26	0	4840
Apprch %	49.5	11.9	38.5	1.2	98.8	0	99	1	0	
Total %	1.1	0.3	0.9	0.6	45.8	0	50.8	0.5	0	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/TEMPLETON PKWY

File Name : 31405309
 Site Code : 31405309
 Start Date : 5/30/2007
 Page No : 1

Groups Printed- TRUCKS

Start Time	TEMPLETON PKWY From North			MT AUBURN ST From East			MT AUBURN ST From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	0	0	0	0	6	0	14	0	0	20
07:15 AM	0	0	0	0	5	0	7	0	0	12
07:30 AM	0	0	0	0	7	0	8	0	0	15
07:45 AM	1	0	0	0	10	0	12	0	0	23
Total	1	0	0	0	28	0	41	0	0	70
08:00 AM	0	0	0	0	4	0	8	0	0	12
08:15 AM	2	0	0	0	7	0	11	0	0	20
08:30 AM	0	1	0	0	7	0	11	0	0	19
08:45 AM	1	0	0	0	3	0	7	0	0	11
Total	3	1	0	0	21	0	37	0	0	62
04:00 PM	0	0	0	0	6	0	8	0	0	14
04:15 PM	0	0	0	0	4	0	6	0	0	10
04:30 PM	1	0	0	0	6	0	7	0	0	14
04:45 PM	0	0	0	0	5	0	5	0	0	10
Total	1	0	0	0	21	0	26	0	0	48
05:00 PM	0	0	0	0	4	0	1	0	0	5
05:15 PM	0	0	0	0	5	0	1	1	0	7
05:30 PM	0	0	0	0	6	0	9	0	0	15
05:45 PM	0	0	0	0	3	0	7	0	0	10
Total	0	0	0	0	18	0	18	1	0	37
Grand Total	5	1	0	0	88	0	122	1	0	217
Apprch %	83.3	16.7	0	0	100	0	99.2	0.8	0	
Total %	2.3	0.5	0	0	40.6	0	56.2	0.5	0	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
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City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/ARLINGTON ST

File Name : 31405305
 Site Code : 31405305
 Start Date : 5/30/2007
 Page No : 1

Groups Printed- AUTOS - TRUCKS

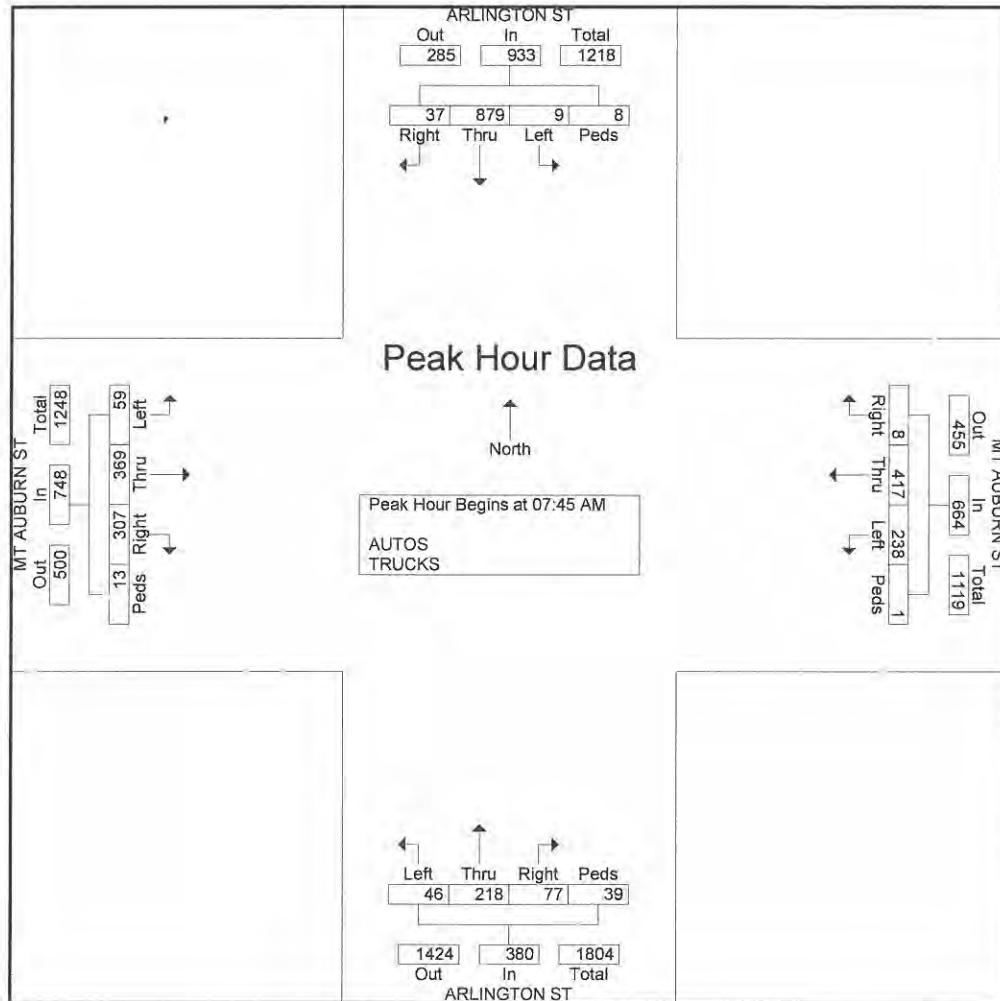
Start Time	ARLINGTON ST From North				MT AUBURN ST From East				ARLINGTON ST From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	17	155	3	0	6	56	46	0	25	32	10	0	49	96	15	1	511
07:15 AM	10	197	3	1	1	101	53	0	19	42	11	1	57	71	10	2	579
07:30 AM	5	233	3	0	4	98	52	0	14	51	6	2	75	86	7	0	636
07:45 AM	15	237	1	3	2	90	60	1	18	44	11	4	88	102	15	5	696
Total	47	822	10	4	13	345	211	1	76	169	38	7	269	355	47	8	2422
08:00 AM	6	212	6	1	1	114	49	0	21	46	11	8	76	74	9	5	639
08:15 AM	8	216	1	3	3	108	64	0	19	66	12	12	73	98	25	3	711
08:30 AM	8	214	1	1	2	105	65	0	19	62	12	15	70	95	10	0	679
08:45 AM	6	173	5	0	2	98	45	0	37	63	17	11	69	88	12	2	628
Total	28	815	13	5	8	425	223	0	96	237	52	46	288	355	56	10	2657
04:00 PM	17	74	7	0	9	99	33	3	54	157	54	8	18	105	22	1	661
04:15 PM	19	88	13	1	5	119	46	19	42	137	52	3	27	107	12	9	699
04:30 PM	14	67	7	13	8	98	38	5	45	155	68	12	28	106	20	2	686
04:45 PM	12	65	7	1	5	97	32	2	52	157	54	4	23	120	15	3	649
Total	62	294	34	15	27	413	149	29	193	606	228	27	96	438	69	15	2695
05:00 PM	11	82	4	4	14	100	41	0	68	153	77	8	17	105	14	2	700
05:15 PM	7	87	3	3	8	86	45	10	45	166	47	1	19	122	15	1	665
05:30 PM	13	91	4	18	8	105	38	0	48	169	63	5	22	117	24	0	725
05:45 PM	9	102	3	11	4	124	52	1	55	144	54	3	26	112	31	1	732
Total	40	362	14	36	34	415	176	11	216	632	241	17	84	456	84	4	2822
Grand Total	177	2293	71	60	82	1598	759	41	581	1644	559	97	737	1604	256	37	10596
Apprch %	6.8	88.2	2.7	2.3	3.3	64.4	30.6	1.7	20.2	57.1	19.4	3.4	28	60.9	9.7	1.4	
Total %	1.7	21.6	0.7	0.6	0.8	15.1	7.2	0.4	5.5	15.5	5.3	0.9	7	15.1	2.4	0.3	
AUTOS	168	2239	67	60	79	1529	692	41	506	1604	549	97	713	1517	242	35	10138
% AUTOS	94.9	97.6	94.4	100	96.3	95.7	91.2	100	87.1	97.6	98.2	100	96.7	94.6	94.5	94.6	95.7
TRUCKS	9	54	4	0	3	69	67	0	75	40	10	0	24	87	14	2	458
% TRUCKS	5.1	2.4	5.6	0	3.7	4.3	8.8	0	12.9	2.4	1.8	0	3.3	5.4	5.5	5.4	4.3

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/ARLINGTON ST

File Name : 31405305
 Site Code : 31405305
 Start Date : 5/30/2007
 Page No : 2

Start Time	ARLINGTON ST From North					MT AUBURN ST From East					ARLINGTON ST From South					MT AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	15	237	1	3	256	2	90	60	1	153	18	44	11	4	77	88	102	15	5	210	696
08:00 AM	6	212	6	1	225	1	114	49	0	164	21	46	11	8	86	76	74	9	5	164	639
08:15 AM	8	216	1	3	228	3	108	64	0	175	19	66	12	12	109	73	98	25	3	199	711
08:30 AM	8	214	1	1	224	2	105	65	0	172	19	62	12	15	108	70	95	10	0	175	679
Total Volume	37	879	9	8	933	8	417	238	1	664	77	218	46	39	380	307	369	59	13	748	2725
% App. Total	4	94.2	1	0.9		1.2	62.8	35.8	0.2		20.3	57.4	12.1	10.3		41	49.3	7.9	1.7		
PHF	.617	.927	.375	.667	.911	.667	.914	.915	.250	.949	.917	.826	.958	.650	.872	.872	.904	.590	.650	.890	.958

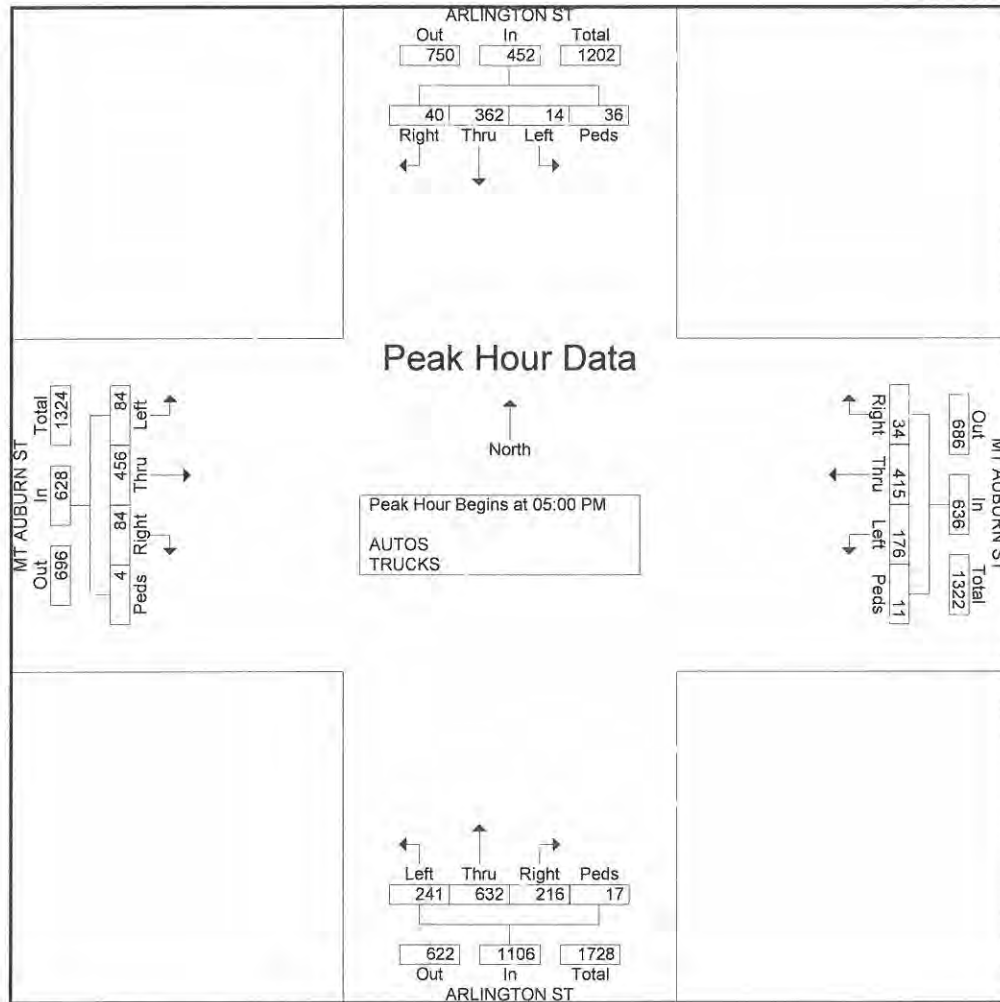


TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/ARLINGTON ST

File Name : 31405305
 Site Code : 31405305
 Start Date : 5/30/2007
 Page No : 3

Start Time	ARLINGTON ST From North					MT AUBURN ST From East					ARLINGTON ST From South					MT AUBURN ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	11	82	4	4	101	14	100	41	0	155	68	153	77	8	306	17	105	14	2	138	700
05:15 PM	7	87	3	3	100	8	86	45	10	149	45	166	47	1	259	19	122	15	1	157	665
05:30 PM	13	91	4	18	126	8	105	38	0	151	48	169	63	5	285	22	117	24	0	163	725
05:45 PM	9	102	3	11	125	4	124	52	1	181	55	144	54	3	256	26	112	31	1	170	732
Total Volume	40	362	14	36	452	34	415	176	11	636	216	632	241	17	1106	84	456	84	4	628	2822
% App. Total	8.8	80.1	3.1	8		5.3	65.3	27.7	1.7		19.5	57.1	21.8	1.5		13.4	72.6	13.4	0.6		
PHF	.769	.887	.875	.500	.897	.607	.837	.846	.275	.878	.794	.935	.782	.531	.904	.808	.934	.677	.500	.924	.964



TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/ARLINGTON ST

File Name : 31405305
 Site Code : 31405305
 Start Date : 5/30/2007
 Page No : 1

Groups Printed- AUTOS

Start Time	ARLINGTON ST From North				MT AUBURN ST From East				ARLINGTON ST From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	16	151	3	0	5	52	41	0	17	31	9	0	48	85	13	1	472
07:15 AM	9	191	3	1	0	97	47	0	12	38	11	1	56	65	10	1	542
07:30 AM	5	227	2	0	4	92	46	0	9	42	5	2	73	80	7	0	594
07:45 AM	15	235	1	3	2	83	53	1	13	43	8	4	85	95	13	5	659
Total	45	804	9	4	11	324	187	1	51	154	33	7	262	325	43	7	2267
08:00 AM	6	206	6	1	1	110	47	0	17	41	11	8	75	67	9	5	610
08:15 AM	7	211	1	3	3	103	59	0	15	63	11	12	72	90	23	3	676
08:30 AM	7	210	1	1	2	100	63	0	15	61	11	15	66	87	10	0	649
08:45 AM	6	172	4	0	1	95	41	0	27	60	17	11	67	83	10	2	596
Total	26	799	12	5	7	408	210	0	74	225	50	46	280	327	52	10	2531
04:00 PM	15	73	7	0	9	95	28	3	50	156	54	8	17	100	20	1	636
04:15 PM	19	84	13	1	5	116	41	19	38	133	51	3	26	102	12	8	671
04:30 PM	13	66	6	13	8	93	35	5	41	155	68	12	27	102	18	2	664
04:45 PM	11	62	7	1	5	94	28	2	49	153	53	4	21	117	15	3	625
Total	58	285	33	15	27	398	132	29	178	597	226	27	91	421	65	14	2596
05:00 PM	11	80	3	4	14	96	37	0	64	151	77	8	17	104	14	2	682
05:15 PM	6	85	3	3	8	82	41	10	44	165	47	1	19	121	15	1	651
05:30 PM	13	88	4	18	8	100	37	0	44	169	62	5	19	113	22	0	702
05:45 PM	9	98	3	11	4	121	48	1	51	143	54	3	25	106	31	1	709
Total	39	351	13	36	34	399	163	11	203	628	240	17	80	444	82	4	2744
Grand Total	168	2239	67	60	79	1529	692	41	506	1604	549	97	713	1517	242	35	10138
Apprch %	6.6	88.4	2.6	2.4	3.4	65.3	29.6	1.8	18.4	58.2	19.9	3.5	28.4	60.5	9.7	1.4	
Total %	1.7	22.1	0.7	0.6	0.8	15.1	6.8	0.4	5	15.8	5.4	1	7	15	2.4	0.3	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST/ARLINGTON ST

File Name : 31405305
 Site Code : 31405305
 Start Date : 5/30/2007
 Page No : 1

Groups Printed- TRUCKS

Start Time	ARLINGTON ST From North				MT AUBURN ST From East				ARLINGTON ST From South				MT AUBURN ST From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	1	4	0	0	1	4	5	0	8	1	1	0	1	11	2	0	39
07:15 AM	1	6	0	0	1	4	6	0	7	4	0	0	1	6	0	1	37
07:30 AM	0	6	1	0	0	6	6	0	5	9	1	0	2	6	0	0	42
07:45 AM	0	2	0	0	0	7	7	0	5	1	3	0	3	7	2	0	37
Total	2	18	1	0	2	21	24	0	25	15	5	0	7	30	4	1	155
08:00 AM	0	6	0	0	0	4	2	0	4	5	0	0	1	7	0	0	29
08:15 AM	1	5	0	0	0	5	5	0	4	3	1	0	1	8	2	0	35
08:30 AM	1	4	0	0	0	5	2	0	4	1	1	0	4	8	0	0	30
08:45 AM	0	1	1	0	1	3	4	0	10	3	0	0	2	5	2	0	32
Total	2	16	1	0	1	17	13	0	22	12	2	0	8	28	4	0	126
04:00 PM	2	1	0	0	0	4	5	0	4	1	0	0	1	5	2	0	25
04:15 PM	0	4	0	0	0	3	5	0	4	4	1	0	1	5	0	1	28
04:30 PM	1	1	1	0	0	5	3	0	4	0	0	0	1	4	2	0	22
04:45 PM	1	3	0	0	0	3	4	0	3	4	1	0	2	3	0	0	24
Total	4	9	1	0	0	15	17	0	15	9	2	0	5	17	4	1	99
05:00 PM	0	2	1	0	0	4	4	0	4	2	0	0	0	1	0	0	18
05:15 PM	1	2	0	0	0	4	4	0	1	1	0	0	0	1	0	0	14
05:30 PM	0	3	0	0	0	5	1	0	4	0	1	0	3	4	2	0	23
05:45 PM	0	4	0	0	0	3	4	0	4	1	0	0	1	6	0	0	23
Total	1	11	1	0	0	16	13	0	13	4	1	0	4	12	2	0	78
Grand Total	9	54	4	0	3	69	67	0	75	40	10	0	24	87	14	2	458
Apprch %	13.4	80.6	6	0	2.2	49.6	48.2	0	60	32	8	0	18.9	68.5	11	1.6	
Total %	2	11.8	0.9	0	0.7	15.1	14.6	0	16.4	8.7	2.2	0	5.2	19	3.1	0.4	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : ARLINGTON ST/GROVE ST

File Name : 31405306
 Site Code : 31405306
 Start Date : 5/30/2007
 Page No : 1

Groups Printed- AUTOS - TRUCKS

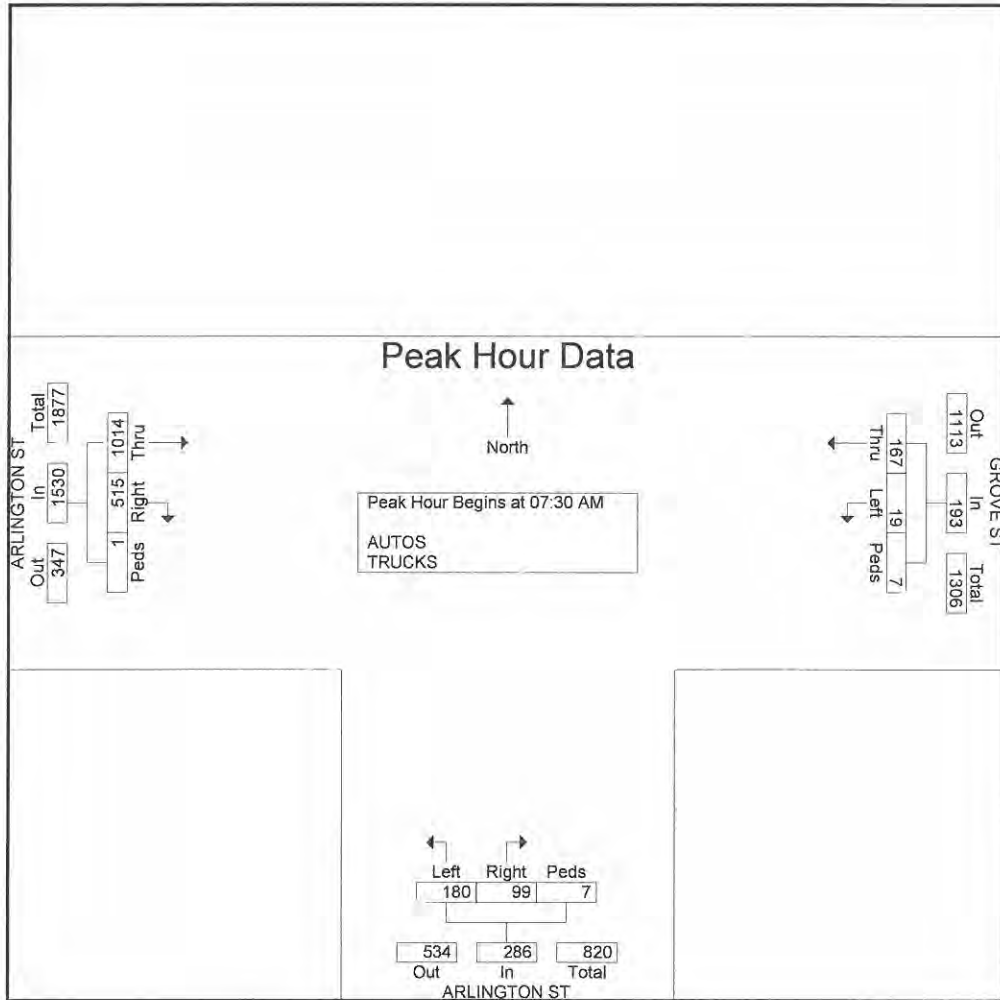
Start Time	GROVE ST From East			ARLINGTON ST From South			ARLINGTON ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	27	3	0	21	27	0	91	187	0	356
07:15 AM	25	3	0	17	45	3	110	181	0	384
07:30 AM	33	2	2	26	49	3	124	261	0	500
07:45 AM	38	4	0	20	37	1	139	270	1	510
Total	123	12	2	84	158	7	464	899	1	1750
08:00 AM	38	7	3	20	51	0	110	230	0	459
08:15 AM	58	6	2	33	43	3	142	253	0	540
08:30 AM	53	9	4	21	51	0	131	220	0	489
08:45 AM	68	9	3	12	56	0	122	218	1	489
Total	217	31	12	86	201	3	505	921	1	1977
04:00 PM	197	11	4	6	105	2	89	59	0	473
04:15 PM	165	12	3	12	78	8	110	55	0	443
04:30 PM	216	16	2	7	53	3	81	69	2	449
04:45 PM	179	8	3	6	83	2	90	50	0	421
Total	757	47	12	31	319	15	370	233	2	1786
05:00 PM	238	34	3	6	64	5	81	75	0	506
05:15 PM	175	15	6	2	101	9	103	73	0	484
05:30 PM	189	15	5	0	90	4	84	69	0	456
05:45 PM	174	20	2	1	66	3	124	75	1	466
Total	776	84	16	9	321	21	392	292	1	1912
Grand Total	1873	174	42	210	999	46	1731	2345	5	7425
Apprch %	89.7	8.3	2	16.7	79.6	3.7	42.4	57.5	0.1	
Total %	25.2	2.3	0.6	2.8	13.5	0.6	23.3	31.6	0.1	
AUTOS	1813	164	42	189	949	46	1650	2281	5	7139
% AUTOS	96.8	94.3	100	90	95	100	95.3	97.3	100	96.1
TRUCKS	60	10	0	21	50	0	81	64	0	286
% TRUCKS	3.2	5.7	0	10	5	0	4.7	2.7	0	3.9

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : ARLINGTON ST/GROVE ST

File Name : 31405306
 Site Code : 31405306
 Start Date : 5/30/2007
 Page No : 2

Start Time	GROVE ST From East				ARLINGTON ST From South				ARLINGTON ST From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	33	2	2	37	26	49	3	78	124	261	0	385	500
07:45 AM	38	4	0	42	20	37	1	58	139	270	1	410	510
08:00 AM	38	7	3	48	20	51	0	71	110	230	0	340	459
08:15 AM	58	6	2	66	33	43	3	79	142	253	0	395	540
Total Volume	167	19	7	193	99	180	7	286	515	1014	1	1530	2009
% App. Total	86.5	9.8	3.6		34.6	62.9	2.4		33.7	66.3	0.1		
PHF	.720	.679	.583	.731	.750	.882	.583	.905	.907	.939	.250	.933	.930

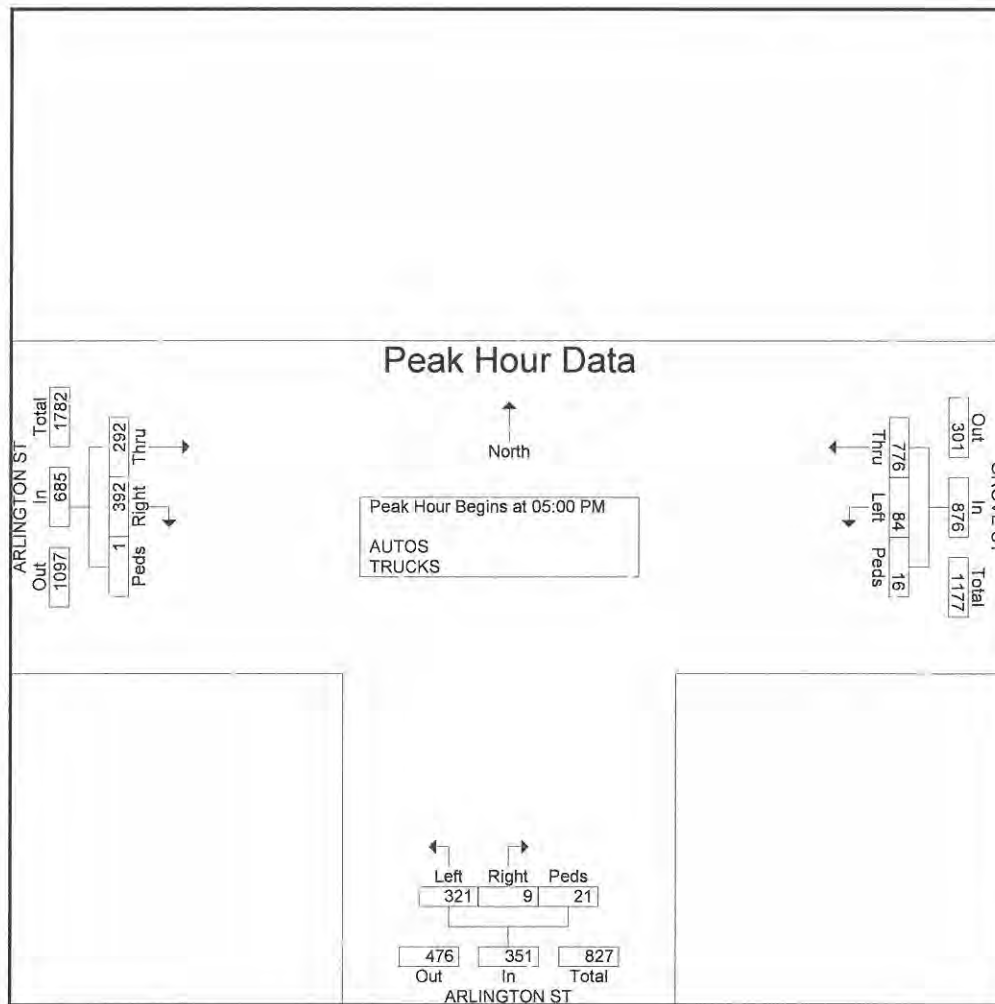


TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : ARLINGTON ST/GROVE ST

File Name : 31405306
 Site Code : 31405306
 Start Date : 5/30/2007
 Page No : 3

Start Time	GROVE ST From East				ARLINGTON ST From South				ARLINGTON ST From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	238	34	3	275	6	64	5	75	81	75	0	156	506
05:15 PM	175	15	6	196	2	101	9	112	103	73	0	176	484
05:30 PM	189	15	5	209	0	90	4	94	84	69	0	153	456
05:45 PM	174	20	2	196	1	66	3	70	124	75	1	200	466
Total Volume	776	84	16	876	9	321	21	351	392	292	1	685	1912
% App. Total	88.6	9.6	1.8		2.6	91.5	6		57.2	42.6	0.1		
PHF	.815	.618	.667	.796	.375	.795	.583	.783	.790	.973	.250	.856	.945



TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : ARLINGTON ST/GROVE ST

File Name : 31405306
 Site Code : 31405306
 Start Date : 5/30/2007
 Page No : 1

Groups Printed- AUTOS

Start Time	GROVE ST From East			ARLINGTON ST From South			ARLINGTON ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	26	3	0	18	26	0	86	184	0	343
07:15 AM	23	3	0	12	39	3	100	179	0	359
07:30 AM	24	1	2	22	46	3	115	255	0	468
07:45 AM	34	4	0	18	35	1	130	266	1	489
Total	107	11	2	70	146	7	431	884	1	1659
08:00 AM	36	4	3	20	44	0	104	227	0	438
08:15 AM	56	4	2	33	38	3	131	252	0	519
08:30 AM	52	8	4	19	46	0	124	214	0	467
08:45 AM	60	8	3	11	52	0	121	212	1	468
Total	204	24	12	83	180	3	480	905	1	1892
04:00 PM	191	10	4	5	105	2	88	53	0	458
04:15 PM	160	12	3	10	74	8	105	54	0	426
04:30 PM	212	15	2	7	53	3	75	66	2	435
04:45 PM	176	8	3	5	76	2	84	47	0	401
Total	739	45	12	27	308	15	352	220	2	1720
05:00 PM	233	34	3	6	63	5	81	69	0	494
05:15 PM	174	15	6	2	100	9	102	68	0	476
05:30 PM	185	15	5	0	89	4	82	68	0	448
05:45 PM	171	20	2	1	63	3	122	67	1	450
Total	763	84	16	9	315	21	387	272	1	1868
Grand Total	1813	164	42	189	949	46	1650	2281	5	7139
Apprch %	89.8	8.1	2.1	16	80.2	3.9	41.9	58	0.1	
Total %	25.4	2.3	0.6	2.6	13.3	0.6	23.1	32	0.1	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
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City/Town: WATERTOWN
 Client : E & K
 Location : ARLINGTON ST/GROVE ST

File Name : 31405306
 Site Code : 31405306
 Start Date : 5/30/2007
 Page No : 1

Groups Printed- TRUCKS

Start Time	GROVE ST From East			ARLINGTON ST From South			ARLINGTON ST From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	1	0	0	3	1	0	5	3	0	13
07:15 AM	2	0	0	5	6	0	10	2	0	25
07:30 AM	9	1	0	4	3	0	9	6	0	32
07:45 AM	4	0	0	2	2	0	9	4	0	21
Total	16	1	0	14	12	0	33	15	0	91
08:00 AM	2	3	0	0	7	0	6	3	0	21
08:15 AM	2	2	0	0	5	0	11	1	0	21
08:30 AM	1	1	0	2	5	0	7	6	0	22
08:45 AM	8	1	0	1	4	0	1	6	0	21
Total	13	7	0	3	21	0	25	16	0	85
04:00 PM	6	1	0	1	0	0	1	6	0	15
04:15 PM	5	0	0	2	4	0	5	1	0	17
04:30 PM	4	1	0	0	0	0	6	3	0	14
04:45 PM	3	0	0	1	7	0	6	3	0	20
Total	18	2	0	4	11	0	18	13	0	66
05:00 PM	5	0	0	0	1	0	0	6	0	12
05:15 PM	1	0	0	0	1	0	1	5	0	8
05:30 PM	4	0	0	0	1	0	2	1	0	8
05:45 PM	3	0	0	0	3	0	2	8	0	16
Total	13	0	0	0	6	0	5	20	0	44
Grand Total	60	10	0	21	50	0	81	64	0	286
Apprch %	85.7	14.3	0	29.6	70.4	0	55.9	44.1	0	
Total %	21	3.5	0	7.3	17.5	0	28.3	22.4	0	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : GROVE ST/TUFTS MEDICAL

File Name : 31405311
 Site Code : 31405311
 Start Date : 5/31/2007
 Page No : 1

Groups Printed- AUTOS - TRUCKS

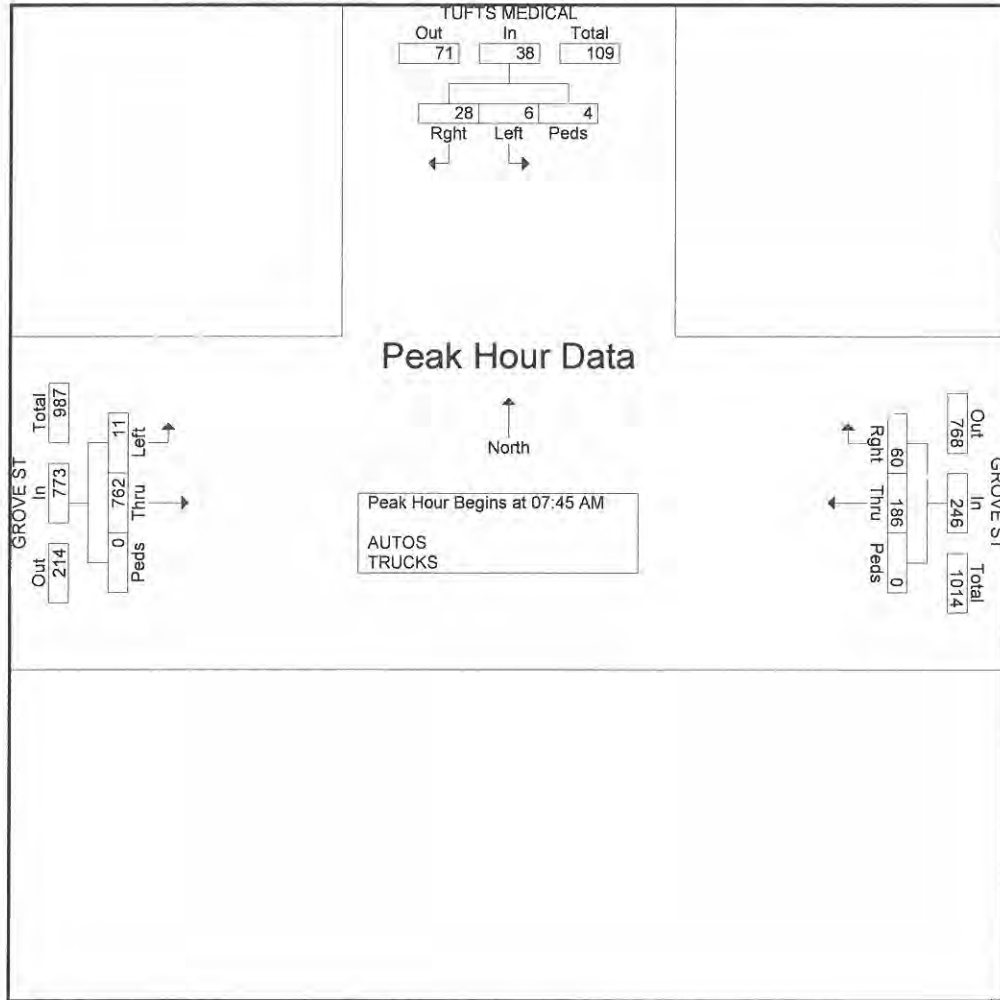
Start Time	TUFTS MEDICAL From North			GROVE ST From East			GROVE ST From West			Int. Total
	Rght	Left	Peds	Rght	Thru	Peds	Thru	Left	Peds	
07:00 AM	8	3	0	7	27	0	121	8	0	174
07:15 AM	7	0	1	12	23	0	132	6	0	181
07:30 AM	6	1	1	8	29	0	183	4	0	232
07:45 AM	7	2	2	16	35	0	212	5	0	279
Total	28	6	4	43	114	0	648	23	0	866
08:00 AM	6	1	1	10	39	0	174	1	0	232
08:15 AM	7	1	1	16	57	0	207	1	0	290
08:30 AM	8	2	0	18	55	0	169	4	0	256
08:45 AM	3	4	0	10	74	0	181	4	0	276
Total	24	8	2	54	225	0	731	10	0	1054
04:00 PM	88	15	2	4	114	1	53	11	1	289
04:15 PM	45	11	16	1	129	12	50	11	0	275
04:30 PM	92	24	3	3	138	0	56	4	0	320
04:45 PM	57	24	1	2	132	0	46	6	2	270
Total	282	74	22	10	513	13	205	32	3	1154
05:00 PM	149	30	0	2	119	0	66	6	0	372
05:15 PM	60	32	2	0	140	1	56	6	1	298
05:30 PM	46	19	0	1	156	1	68	0	0	291
05:45 PM	49	5	0	1	166	0	72	2	0	295
Total	304	86	2	4	581	2	262	14	1	1256
Grand Total	638	174	30	111	1433	15	1846	79	4	4330
Apprch %	75.8	20.7	3.6	7.1	91.9	1	95.7	4.1	0.2	
Total %	14.7	4	0.7	2.6	33.1	0.3	42.6	1.8	0.1	
AUTOS	595	162	30	96	1395	15	1805	39	4	4141
% AUTOS	93.3	93.1	100	86.5	97.3	100	97.8	49.4	100	95.6
TRUCKS	43	12	0	15	38	0	41	40	0	189
% TRUCKS	6.7	6.9	0	13.5	2.7	0	2.2	50.6	0	4.4

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : GROVE ST/TUFTS MEDICAL

File Name : 31405311
 Site Code : 31405311
 Start Date : 5/31/2007
 Page No : 2

Start Time	TUFTS MEDICAL From North				GROVE ST From East				GROVE ST From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	7	2	2	11	16	35	0	51	212	5	0	217	279
08:00 AM	6	1	1	8	10	39	0	49	174	1	0	175	232
08:15 AM	7	1	1	9	16	57	0	73	207	1	0	208	290
08:30 AM	8	2	0	10	18	55	0	73	169	4	0	173	256
Total Volume	28	6	4	38	60	186	0	246	762	11	0	773	1057
% App. Total	73.7	15.8	10.5		24.4	75.6	0		98.6	1.4	0		
PHF	.875	.750	.500	.864	.833	.816	.000	.842	.899	.550	.000	.891	.911

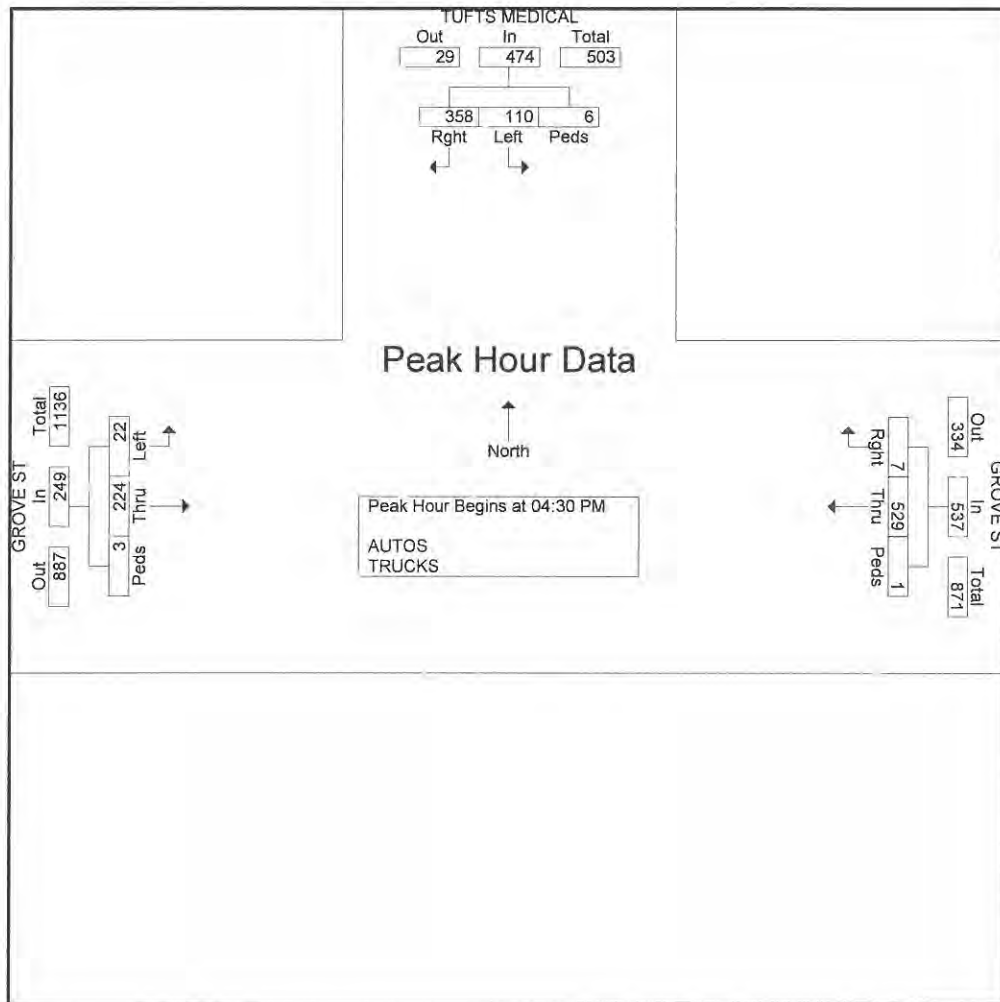


TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : GROVE ST/TUFTS MEDICAL

File Name : 31405311
 Site Code : 31405311
 Start Date : 5/31/2007
 Page No : 3

Start Time	TUFTS MEDICAL From North				GROVE ST From East				GROVE ST From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	92	24	3	119	3	138	0	141	56	4	0	60	320
04:45 PM	57	24	1	82	2	132	0	134	46	6	2	54	270
05:00 PM	149	30	0	179	2	119	0	121	66	6	0	72	372
05:15 PM	60	32	2	94	0	140	1	141	56	6	1	63	298
Total Volume	358	110	6	474	7	529	1	537	224	22	3	249	1260
% App. Total	75.5	23.2	1.3		1.3	98.5	0.2		90	8.8	1.2		
PHF	.601	.859	.500	.662	.583	.945	.250	.952	.848	.917	.375	.865	.847



TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : GROVE ST/TUFTS MEDICAL

File Name : 31405311
 Site Code : 31405311
 Start Date : 5/31/2007
 Page No : 1

Groups Printed- AUTOS

Start Time	TUFTS MEDICAL From North			GROVE ST From East			GROVE ST From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	2	3	0	7	27	0	120	3	0	162
07:15 AM	3	0	1	12	23	0	131	0	0	170
07:30 AM	0	1	1	8	25	0	176	1	0	212
07:45 AM	4	2	2	13	34	0	209	2	0	266
Total	9	6	4	40	109	0	636	6	0	810
08:00 AM	2	1	1	7	38	0	171	1	0	221
08:15 AM	4	1	1	13	56	0	206	1	0	282
08:30 AM	5	2	0	17	55	0	163	2	0	244
08:45 AM	1	4	0	8	67	0	174	4	0	258
Total	12	8	2	45	216	0	714	8	0	1005
04:00 PM	86	14	2	3	110	1	51	7	1	275
04:15 PM	44	11	16	1	124	12	49	8	0	265
04:30 PM	88	22	3	3	137	0	56	3	0	312
04:45 PM	56	21	1	2	131	0	45	2	2	260
Total	274	68	22	9	502	13	201	20	3	1112
05:00 PM	148	28	0	1	114	0	66	4	0	361
05:15 PM	60	29	2	0	138	1	55	1	1	287
05:30 PM	45	19	0	1	152	1	67	0	0	285
05:45 PM	47	4	0	0	164	0	66	0	0	281
Total	300	80	2	2	568	2	254	5	1	1214
Grand Total	595	162	30	96	1395	15	1805	39	4	4141
Apprch %	75.6	20.6	3.8	6.4	92.6	1	97.7	2.1	0.2	
Total %	14.4	3.9	0.7	2.3	33.7	0.4	43.6	0.9	0.1	

TRANSDATA SERVICES
66 PLEASANT ST. SUITE 3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : GROVE ST/TUFTS MEDICAL

File Name : 31405311
 Site Code : 31405311
 Start Date : 5/31/2007
 Page No : 1

Groups Printed- TRUCKS

Start Time	TUFTS MEDICAL From North			GROVE ST From East			GROVE ST From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	6	0	0	0	0	0	1	5	0	12
07:15 AM	4	0	0	0	0	0	1	6	0	11
07:30 AM	6	0	0	0	4	0	7	3	0	20
07:45 AM	3	0	0	3	1	0	3	3	0	13
Total	19	0	0	3	5	0	12	17	0	56
08:00 AM	4	0	0	3	1	0	3	0	0	11
08:15 AM	3	0	0	3	1	0	1	0	0	8
08:30 AM	3	0	0	1	0	0	6	2	0	12
08:45 AM	2	0	0	2	7	0	7	0	0	18
Total	12	0	0	9	9	0	17	2	0	49
04:00 PM	2	1	0	1	4	0	2	4	0	14
04:15 PM	1	0	0	0	5	0	1	3	0	10
04:30 PM	4	2	0	0	1	0	0	1	0	8
04:45 PM	1	3	0	0	1	0	1	4	0	10
Total	8	6	0	1	11	0	4	12	0	42
05:00 PM	1	2	0	1	5	0	0	2	0	11
05:15 PM	0	3	0	0	2	0	1	5	0	11
05:30 PM	1	0	0	0	4	0	1	0	0	6
05:45 PM	2	1	0	1	2	0	6	2	0	14
Total	4	6	0	2	13	0	8	9	0	42
Grand Total	43	12	0	15	38	0	41	40	0	189
Apprch %	78.2	21.8	0	28.3	71.7	0	50.6	49.4	0	
Total %	22.8	6.3	0	7.9	20.1	0	21.7	21.2	0	

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town :WATERTOWN
 Client :WORLDTECH ENG
 Location :MT AUBURN ST northeast of
 COMMON ST WESTBOUND

Site Code: 314060811
 Station ID: 314060811

Start Time	08-Jun-10		09-Jun-10		10-Jun-10		Daily Average	
	Tue A.M.	P.M.	Wed A.M.	P.M.	Thu A.M.	P.M.	A.M.	P.M.
12:00	32	193	53	164	*	*	42	178
12:15	13	156	27	141	*	*	20	148
12:30	25	136	32	168	*	*	28	152
12:45	25	160	28	163	*	*	26	162
01:00	12	159	18	162	*	*	15	160
01:15	11	146	16	189	*	*	14	168
01:30	10	176	7	142	*	*	8	159
01:45	12	171	15	167	*	*	14	169
02:00	16	197	9	220	*	*	12	208
02:15	6	174	8	183	*	*	7	178
02:30	4	209	3	219	*	*	4	214
02:45	3	214	2	191	*	*	2	202
03:00	6	211	1	194	*	*	4	202
03:15	3	187	10	185	*	*	6	186
03:30	4	211	3	205	*	*	4	208
03:45	4	183	5	195	*	*	4	189
04:00	7	195	4	209	*	*	6	202
04:15	8	206	8	187	*	*	8	196
04:30	12	222	14	216	*	*	13	219
04:45	16	204	12	208	*	*	14	206
05:00	11	200	13	208	*	*	12	204
05:15	35	202	31	237	*	*	33	220
05:30	29	198	15	234	*	*	22	216
05:45	45	205	35	191	*	*	40	198
06:00	32	190	59	186	*	*	46	188
06:15	67	201	66	181	*	*	66	191
06:30	74	201	99	175	*	*	86	188
06:45	92	210	98	193	*	*	95	202
07:00	130	169	142	165	*	*	136	167
07:15	160	164	162	151	*	*	161	158
07:30	203	124	179	115	*	*	191	120
07:45	183	125	193	123	*	*	188	124
08:00	189	139	206	98	*	*	198	118
08:15	196	150	199	108	*	*	198	129
08:30	214	122	176	91	*	*	195	106
08:45	205	120	183	106	*	*	194	113
09:00	175	111	172	92	*	*	174	102
09:15	129	88	160	75	*	*	144	82
09:30	169	79	158	79	*	*	164	79
09:45	138	75	155	118	*	*	146	96
10:00	154	109	124	86	*	*	139	98
10:15	127	68	151	68	*	*	139	68
10:30	165	58	146	70	*	*	156	64
10:45	172	45	154	47	*	*	163	46
11:00	147	42	171	42	*	*	159	42
11:15	147	36	153	44	*	*	150	40
11:30	176	22	165	22	*	*	170	22
11:45	179	50	174	34	*	*	176	42
Total	3972	7213	4014	7047	0	0	3992	7129
Combined Total	11185		11061		0		11121	
Peak	08:00	04:15	07:30	04:45			08:00	04:30
Vol.	804	832	777	887			785	849
P.H.F.	0.939	0.937	0.943	0.936			0.991	0.965
ADT		ADT 11,123		AADT 11,123				

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town :WATERTOWN
 Client :WORLDTECH ENG
 Location :MT AUBURN ST northeast of
 COMMON ST WESTBOUND

Site Code: 314060811
 Station ID: 314060811

Start Time	Mon 07-Jun-10	Tue 08-Jun-10	Wed 09-Jun-10	Thu 10-Jun-10	Fri 11-Jun-10	Average Day	Sat 12-Jun-10	Sun 13-Jun-10	Week Average
12:00 AM	*	95	140	*	*	118	*	*	118
01:00	*	45	56	*	*	50	*	*	50
02:00	*	29	22	*	*	26	*	*	26
03:00	*	17	19	*	*	18	*	*	18
04:00	*	43	38	*	*	40	*	*	40
05:00	*	120	94	*	*	107	*	*	107
06:00	*	265	322	*	*	294	*	*	294
07:00	*	676	676	*	*	676	*	*	676
08:00	*	804	764	*	*	784	*	*	784
09:00	*	611	645	*	*	628	*	*	628
10:00	*	618	575	*	*	596	*	*	596
11:00	*	649	663	*	*	656	*	*	656
12:00 PM	*	645	636	*	*	640	*	*	640
01:00	*	652	660	*	*	656	*	*	656
02:00	*	794	813	*	*	804	*	*	804
03:00	*	792	779	*	*	786	*	*	786
04:00	*	827	820	*	*	824	*	*	824
05:00	*	805	870	*	*	838	*	*	838
06:00	*	802	735	*	*	768	*	*	768
07:00	*	582	554	*	*	568	*	*	568
08:00	*	531	403	*	*	467	*	*	467
09:00	*	353	364	*	*	358	*	*	358
10:00	*	280	271	*	*	276	*	*	276
11:00	*	150	142	*	*	146	*	*	146
Day Total	0	11185	11061	0	0	11124	0	0	11124
% Avg. WkDay	0.0%	100.5%	99.4%	0.0%	0.0%				
% Avg. Week	0.0%	100.5%	99.4%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak		08:00	08:00			08:00			08:00
Vol.		804	764			784			784
PM Peak		16:00	17:00			17:00			17:00
Vol.		827	870			838			838
Grand Total	0	11185	11061	0	0	11124	0	0	11124

ADT

ADT 11,123

AADT 11,123

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town WATERTOWN
 Client :WORLDTECH ENG
 Location :MT AUBURN ST northeast of
 COMMON ST EASTBOUND

Site Code: 314060812
 Station ID: 314060812

Start Time	08-Jun-10		09-Jun-10		10-Jun-10		Daily Average	
	Tue A.M.	P.M.	Wed A.M.	P.M.	Thu A.M.	P.M.	A.M.	P.M.
12:00	24	160	49	171	*	*	36	166
12:15	22	167	30	196	*	*	26	182
12:30	17	189	21	180	*	*	19	184
12:45	17	195	14	197	*	*	16	196
01:00	11	169	18	203	*	*	14	186
01:15	13	183	8	189	*	*	10	186
01:30	17	149	7	205	*	*	12	177
01:45	5	202	14	179	*	*	10	190
02:00	12	175	14	180	*	*	13	178
02:15	7	217	3	203	*	*	5	210
02:30	2	206	3	200	*	*	2	203
02:45	5	203	9	225	*	*	7	214
03:00	3	206	1	167	*	*	2	186
03:15	1	176	4	217	*	*	2	196
03:30	1	204	3	178	*	*	2	191
03:45	3	201	1	183	*	*	2	192
04:00	3	209	2	193	*	*	2	201
04:15	5	225	7	216	*	*	6	220
04:30	7	199	3	168	*	*	5	184
04:45	16	214	6	215	*	*	11	214
05:00	19	243	15	232	*	*	17	238
05:15	16	229	15	205	*	*	16	217
05:30	33	226	34	230	*	*	34	228
05:45	55	222	55	207	*	*	55	214
06:00	47	225	57	217	*	*	52	221
06:15	83	220	85	230	*	*	84	225
06:30	125	245	112	196	*	*	118	220
06:45	127	205	127	203	*	*	127	204
07:00	167	204	155	189	*	*	161	196
07:15	194	179	171	160	*	*	182	170
07:30	220	151	213	163	*	*	216	157
07:45	254	164	230	138	*	*	242	151
08:00	282	161	266	123	*	*	274	142
08:15	242	148	238	152	*	*	240	150
08:30	235	120	261	109	*	*	248	114
08:45	232	131	215	111	*	*	224	121
09:00	189	133	203	88	*	*	196	110
09:15	163	109	195	110	*	*	179	110
09:30	179	112	192	103	*	*	186	108
09:45	184	82	171	116	*	*	178	99
10:00	160	72	167	102	*	*	164	87
10:15	153	74	174	100	*	*	164	87
10:30	148	71	176	78	*	*	162	74
10:45	201	43	168	51	*	*	184	47
11:00	164	52	146	57	*	*	155	54
11:15	149	40	152	40	*	*	150	40
11:30	162	35	147	25	*	*	154	30
11:45	181	35	186	33	*	*	184	34
Total	4555	7780	4543	7633	0	0	4548	7704
Combined Total	12335		12176		0		12252	
Peak	07:45	05:00	07:45	05:30			07:45	04:45
Vol.	1013	920	995	884			1004	897
P.H.F.	0.898	0.947	0.935	0.953			0.916	0.942
ADT	ADT 12,256		AADT 12,256					

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town WATERTOWN
 Client :WORLDTECH ENG
 Location :MT AUBURN ST northeast of
 COMMON ST EASTBOUND

Site Code: 314060812
 Station ID: 314060812

Start Time	Mon 07-Jun-10	Tue 08-Jun-10	Wed 09-Jun-10	Thu 10-Jun-10	Fri 11-Jun-10	Average Day	Sat 12-Jun-10	Sun 13-Jun-10	Week Average
12:00 AM	*	80	114	*	*	97	*	*	97
01:00	*	46	47	*	*	46	*	*	46
02:00	*	26	29	*	*	28	*	*	28
03:00	*	8	9	*	*	8	*	*	8
04:00	*	31	18	*	*	24	*	*	24
05:00	*	123	119	*	*	121	*	*	121
06:00	*	382	381	*	*	382	*	*	382
07:00	*	835	769	*	*	802	*	*	802
08:00	*	991	980	*	*	986	*	*	986
09:00	*	715	761	*	*	738	*	*	738
10:00	*	662	685	*	*	674	*	*	674
11:00	*	656	631	*	*	644	*	*	644
12:00 PM	*	711	744	*	*	728	*	*	728
01:00	*	703	776	*	*	740	*	*	740
02:00	*	801	808	*	*	804	*	*	804
03:00	*	787	745	*	*	766	*	*	766
04:00	*	847	792	*	*	820	*	*	820
05:00	*	920	874	*	*	897	*	*	897
06:00	*	895	846	*	*	870	*	*	870
07:00	*	698	650	*	*	674	*	*	674
08:00	*	560	495	*	*	528	*	*	528
09:00	*	436	417	*	*	426	*	*	426
10:00	*	260	331	*	*	296	*	*	296
11:00	*	162	155	*	*	158	*	*	158
Day Total	0	12335	12176	0	0	12257	0	0	12257
% Avg. WkDay	0.0%	100.6%	99.3%	0.0%	0.0%				
% Avg. Week	0.0%	100.6%	99.3%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak		08:00	08:00			08:00			08:00
Vol.		991	980			986			986
PM Peak		17:00	17:00			17:00			17:00
Vol.		920	874			897			897
Grand Total	0	12335	12176	0	0	12257	0	0	12257

ADT

ADT 12,256

AADT 12,256

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town WATERTOWN
 Client :WORLDTECH ENG
 Location MT AUBURN ST northeast of
 WALNUT ST WESTBOUND

















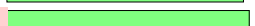

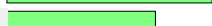
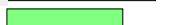




Site Code: 314060821
 Station ID: 314060821

Start Time	08-Jun-10		09-Jun-10		10-Jun-10		Daily Average	
	Tue A.M.	P.M.	Wed A.M.	P.M.	Thu A.M.	P.M.	A.M.	P.M.
12:00	23	151	48	130	*	*	36	140
12:15	20	126	26	120	*	*	23	123
12:30	19	119	33	135	*	*	26	127
12:45	27	135	27	124	*	*	27	130
01:00	7	146	20	148	*	*	14	147
01:15	13	119	19	165	*	*	16	142
01:30	8	140	4	127	*	*	6	134
01:45	10	150	8	112	*	*	9	131
02:00	15	149	13	154	*	*	14	152
02:15	6	158	6	159	*	*	6	158
02:30	5	175	6	183	*	*	6	179
02:45	2	194	3	192	*	*	2	193
03:00	5	193	2	155	*	*	4	174
03:15	6	169	8	191	*	*	7	180
03:30	3	159	4	153	*	*	4	156
03:45	2	176	4	176	*	*	3	176
04:00	7	191	4	197	*	*	6	194
04:15	5	190	7	183	*	*	6	186
04:30	13	220	9	194	*	*	11	207
04:45	17	195	13	202	*	*	15	198
05:00	7	199	13	192	*	*	10	196
05:15	22	219	22	231	*	*	22	225
05:30	28	202	17	210	*	*	22	206
05:45	40	171	29	186	*	*	34	178
06:00	25	161	46	157	*	*	36	159
06:15	42	179	64	173	*	*	53	176
06:30	68	189	58	160	*	*	63	174
06:45	97	175	95	171	*	*	96	173
07:00	134	141	124	140	*	*	129	140
07:15	146	150	143	137	*	*	144	144
07:30	190	112	193	111	*	*	192	112
07:45	200	94	197	103	*	*	198	98
08:00	206	112	200	82	*	*	203	97
08:15	210	85	212	109	*	*	211	97
08:30	214	121	200	89	*	*	207	105
08:45	229	100	219	73	*	*	224	86
09:00	163	87	161	73	*	*	162	80
09:15	134	73	136	60	*	*	135	66
09:30	126	72	124	70	*	*	125	71
09:45	133	58	140	105	*	*	136	82
10:00	129	94	111	69	*	*	120	82
10:15	116	71	122	63	*	*	119	67
10:30	124	51	119	63	*	*	122	57
10:45	156	49	134	48	*	*	145	48
11:00	127	34	159	33	*	*	143	34
11:15	108	32	125	38	*	*	116	35
11:30	146	25	144	22	*	*	145	24
11:45	158	30	153	27	*	*	156	28
Total	3691	6341	3724	6195	0	0	3709	6267
Combined Total	10032		9919		0		9976	
Peak	08:00	04:30	08:00	04:45			08:00	04:30
Vol.	859	833	831	835			845	826
P.H.F.	0.938	0.947	0.949	0.904			0.943	0.918
ADT		ADT 9,976	AADT 9,976					

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town WATERTOWN
 Client :WORLDTECH ENG
 Location MT AUBURN ST northeast of
 WALNUT ST WESTBOUND

Site Code: 314060821
 Station ID: 314060821

Start Time	Mon 07-Jun-10	Tue 08-Jun-10	Wed 09-Jun-10	Thu 10-Jun-10	Fri 11-Jun-10	Average Day	Sat 12-Jun-10	Sun 13-Jun-10	Week Average
12:00 AM	*	89	134	*	*	112	*	*	112 
01:00	*	38	51	*	*	44	*	*	44 
02:00	*	28	28	*	*	28	*	*	28 
03:00	*	16	18	*	*	17	*	*	17 
04:00	*	42	33	*	*	38	*	*	38 
05:00	*	97	81	*	*	89	*	*	89 
06:00	*	232	263	*	*	248	*	*	248 
07:00	*	670	657	*	*	664	*	*	664 
08:00	*	859	831	*	*	845	*	*	845 
09:00	*	556	561	*	*	558	*	*	558 
10:00	*	525	486	*	*	506	*	*	506 
11:00	*	539	581	*	*	560	*	*	560 
12:00 PM	*	531	509	*	*	520	*	*	520 
01:00	*	555	552	*	*	554	*	*	554 
02:00	*	676	688	*	*	682	*	*	682 
03:00	*	697	675	*	*	686	*	*	686 
04:00	*	796	776	*	*	786	*	*	786 
05:00	*	791	819	*	*	805	*	*	805 
06:00	*	704	661	*	*	682	*	*	682 
07:00	*	497	491	*	*	494	*	*	494 
08:00	*	418	353	*	*	386	*	*	386 
09:00	*	290	308	*	*	299	*	*	299 
10:00	*	265	243	*	*	254	*	*	254 
11:00	*	121	120	*	*	120	*	*	120 
Day Total	0	10032	9919	0	0	9977	0	0	9977
% Avg. WkDay	0.0%	100.6%	99.4%	0.0%	0.0%				
% Avg. Week	0.0%	100.6%	99.4%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak		08:00	08:00			08:00			08:00
Vol.		859	831			845			845
PM Peak		16:00	17:00			17:00			17:00
Vol.		796	819			805			805

Grand Total 0 10032 9919 0 0 9977 0 0 9977

ADT

ADT 9,976

AADT 9,976

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town :WATERTOWN
 Client:WORLDTECH ENG
 Location :MT AUBURN ST northeast of
 WALNUT ST EASTBOUND

Site Code: 314060822
 Station ID: 314060822

Start Time	08-Jun-10		09-Jun-10		10-Jun-10		Daily Average	
	Tue A.M.	P.M.	Wed A.M.	P.M.	Thu A.M.	P.M.	A.M.	P.M.
12:00	21	137	42	129	*	*	32	133
12:15	20	134	36	150	*	*	28	142
12:30	17	180	15	140	*	*	16	160
12:45	17	145	15	169	*	*	16	157
01:00	11	150	17	166	*	*	14	158
01:15	12	160	6	161	*	*	9	160
01:30	20	137	6	164	*	*	13	150
01:45	8	169	14	149	*	*	11	159
02:00	12	159	13	152	*	*	12	156
02:15	5	191	6	178	*	*	6	184
02:30	2	166	2	164	*	*	2	165
02:45	3	197	7	193	*	*	5	195
03:00	3	179	3	147	*	*	3	163
03:15	1	157	4	158	*	*	2	158
03:30	0	163	4	158	*	*	2	160
03:45	4	164	1	161	*	*	2	162
04:00	4	188	3	168	*	*	4	178
04:15	5	180	6	174	*	*	6	177
04:30	7	175	4	153	*	*	6	164
04:45	15	177	6	162	*	*	10	170
05:00	16	194	11	182	*	*	14	188
05:15	15	182	12	190	*	*	14	186
05:30	34	163	32	188	*	*	33	176
05:45	42	186	48	173	*	*	45	180
06:00	37	181	51	188	*	*	44	184
06:15	67	181	73	187	*	*	70	184
06:30	103	212	86	152	*	*	94	182
06:45	105	178	109	156	*	*	107	167
07:00	145	179	139	166	*	*	142	172
07:15	138	159	160	119	*	*	149	139
07:30	181	129	164	137	*	*	172	133
07:45	212	133	192	115	*	*	202	124
08:00	238	135	239	98	*	*	238	116
08:15	185	140	203	129	*	*	194	134
08:30	170	125	192	105	*	*	181	115
08:45	173	125	167	91	*	*	170	108
09:00	143	109	154	76	*	*	148	92
09:15	131	95	145	115	*	*	138	105
09:30	141	99	159	108	*	*	150	104
09:45	137	78	131	106	*	*	134	92
10:00	143	66	146	89	*	*	144	78
10:15	131	58	148	89	*	*	140	74
10:30	130	61	151	70	*	*	140	66
10:45	158	37	147	48	*	*	152	42
11:00	134	39	133	52	*	*	134	46
11:15	139	34	135	37	*	*	137	36
11:30	131	29	116	26	*	*	124	28
11:45	163	34	164	32	*	*	164	33
Total	3729	6649	3817	6420	0	0	3773	6535
Combined Total	10378		10237		0		10308	
Peak	07:30	05:45	07:45	05:15			07:45	05:00
Vol.	816	760	826	739			815	730
P.H.F.	0.857	0.896	0.864	0.972			0.856	0.971
ADT	ADT 10,308		AADT 10,308					

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town :WATERTOWN
 Client:WORLDTECH ENG
 Location :MT AUBURN ST northeast of
 WALNUT ST EASTBOUND

Site Code: 314060822
 Station ID: 314060822

Start Time	Mon 07-Jun-10	Tue 08-Jun-10	Wed 09-Jun-10	Thu 10-Jun-10	Fri 11-Jun-10	Average Day	Sat 12-Jun-10	Sun 13-Jun-10	Week Average
12:00 AM	*	75	108	*	*	92	*	*	92
01:00	*	51	43	*	*	47	*	*	47
02:00	*	22	28	*	*	25	*	*	25
03:00	*	8	12	*	*	10	*	*	10
04:00	*	31	19	*	*	25	*	*	25
05:00	*	107	103	*	*	105	*	*	105
06:00	*	312	319	*	*	316	*	*	316
07:00	*	676	655	*	*	666	*	*	666
08:00	*	766	801	*	*	784	*	*	784
09:00	*	552	589	*	*	570	*	*	570
10:00	*	562	592	*	*	577	*	*	577
11:00	*	567	548	*	*	558	*	*	558
12:00 PM	*	596	588	*	*	592	*	*	592
01:00	*	616	640	*	*	628	*	*	628
02:00	*	713	687	*	*	700	*	*	700
03:00	*	663	624	*	*	644	*	*	644
04:00	*	720	657	*	*	688	*	*	688
05:00	*	725	733	*	*	729	*	*	729
06:00	*	752	683	*	*	718	*	*	718
07:00	*	600	537	*	*	568	*	*	568
08:00	*	525	423	*	*	474	*	*	474
09:00	*	381	405	*	*	393	*	*	393
10:00	*	222	296	*	*	259	*	*	259
11:00	*	136	147	*	*	142	*	*	142
Day Total	0	10378	10237	0	0	10310	0	0	10310
% Avg. WkDay	0.0%	100.7%	99.3%	0.0%	0.0%				
% Avg. Week	0.0%	100.7%	99.3%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak		08:00	08:00			08:00			08:00
Vol.		766	801			784			784
PM Peak		18:00	17:00			17:00			17:00
Vol.		752	733			729			729
Grand Total	0	10378	10237	0	0	10310	0	0	10310

ADT

ADT 10,308

AADT 10,308

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town :WATERTOWN
 Client :WORLDTECH ENG
 Location :MT AUBURN ST east of
 OAKLEY ROAD WESTBOUND

Site Code: 314060831
 Station ID: 314060831

Start Time	08-Jun-10		09-Jun-10		10-Jun-10		Daily Average	
	Tue A.M.	P.M.	Wed A.M.	P.M.	Thu A.M.	P.M.	A.M.	P.M.
12:00	31	154	47	131	*	*	39	142
12:15	13	132	31	124	*	*	22	128
12:30	23	110	33	138	*	*	28	124
12:45	22	150	28	147	*	*	25	148
01:00	7	144	19	146	*	*	13	145
01:15	10	135	15	175	*	*	12	155
01:30	11	150	5	101	*	*	8	126
01:45	10	156	14	127	*	*	12	142
02:00	14	156	8	168	*	*	11	162
02:15	4	150	8	167	*	*	6	158
02:30	4	164	2	173	*	*	3	168
02:45	4	207	1	187	*	*	2	197
03:00	6	165	4	171	*	*	5	168
03:15	3	166	7	171	*	*	5	168
03:30	4	196	2	183	*	*	3	190
03:45	1	151	5	182	*	*	3	166
04:00	7	196	4	198	*	*	6	197
04:15	8	223	8	163	*	*	8	193
04:30	11	213	13	186	*	*	12	200
04:45	13	205	12	220	*	*	12	212
05:00	11	212	8	225	*	*	10	218
05:15	26	225	26	242	*	*	26	234
05:30	26	219	12	229	*	*	19	224
05:45	31	180	37	180	*	*	34	180
06:00	30	192	49	160	*	*	40	176
06:15	50	191	54	185	*	*	52	188
06:30	67	174	85	170	*	*	76	172
06:45	89	199	88	165	*	*	88	182
07:00	105	140	115	153	*	*	110	146
07:15	150	160	128	140	*	*	139	150
07:30	150	104	179	98	*	*	164	101
07:45	161	102	158	116	*	*	160	109
08:00	169	114	166	89	*	*	168	102
08:15	151	106	130	114	*	*	140	110
08:30	162	116	140	79	*	*	151	98
08:45	187	103	158	86	*	*	172	94
09:00	144	84	142	74	*	*	143	79
09:15	119	76	134	66	*	*	126	71
09:30	136	76	135	75	*	*	136	76
09:45	127	61	126	106	*	*	126	84
10:00	131	106	104	75	*	*	118	90
10:15	103	62	130	71	*	*	116	66
10:30	141	55	117	75	*	*	129	65
10:45	132	45	118	39	*	*	125	42
11:00	136	30	167	38	*	*	152	34
11:15	114	33	139	44	*	*	126	38
11:30	145	22	138	22	*	*	142	22
11:45	147	48	154	33	*	*	150	40
Total	3346	6558	3403	6407	0	0	3373	6480
Combined Total	9904		9810		0		9853	
Peak	08:00	04:45	07:30	04:45			07:30	04:45
Vol.	669	861	633	916			632	888
P.H.F.	0.894	0.957	0.884	0.946			0.940	0.949
ADT	ADT 9,857		AADT 9,857					

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town :WATERTOWN
 Client :WORLDTECH ENG
 Location :MT AUBURN ST east of
 OAKLEY ROAD WESTBOUND

Site Code: 314060831
 Station ID: 314060831

Start Time	Mon 07-Jun-10	Tue 08-Jun-10	Wed 09-Jun-10	Thu 10-Jun-10	Fri 11-Jun-10	Average Day	Sat 12-Jun-10	Sun 13-Jun-10	Week Average
12:00 AM	*	89	139	*	*	114	*	*	114
01:00	*	38	53	*	*	46	*	*	46
02:00	*	26	19	*	*	22	*	*	22
03:00	*	14	18	*	*	16	*	*	16
04:00	*	39	37	*	*	38	*	*	38
05:00	*	94	83	*	*	88	*	*	88
06:00	*	236	276	*	*	256	*	*	256
07:00	*	566	580	*	*	573	*	*	573
08:00	*	669	594	*	*	632	*	*	632
09:00	*	526	537	*	*	532	*	*	532
10:00	*	507	469	*	*	488	*	*	488
11:00	*	542	598	*	*	570	*	*	570
12:00 PM	*	546	540	*	*	543	*	*	543
01:00	*	585	549	*	*	567	*	*	567
02:00	*	677	695	*	*	686	*	*	686
03:00	*	678	707	*	*	692	*	*	692
04:00	*	837	767	*	*	802	*	*	802
05:00	*	836	876	*	*	856	*	*	856
06:00	*	756	680	*	*	718	*	*	718
07:00	*	506	507	*	*	506	*	*	506
08:00	*	439	368	*	*	404	*	*	404
09:00	*	297	321	*	*	309	*	*	309
10:00	*	268	260	*	*	264	*	*	264
11:00	*	133	137	*	*	135	*	*	135
Day Total	0	9904	9810	0	0	9857	0	0	9857
% Avg. WkDay	0.0%	100.5%	99.5%	0.0%	0.0%				
% Avg. Week	0.0%	100.5%	99.5%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak		08:00	11:00			08:00			08:00
Vol.		669	598			632			632
PM Peak		16:00	17:00			17:00			17:00
Vol.		837	876			856			856
Grand Total	0	9904	9810	0	0	9857	0	0	9857

ADT

ADT 9,857

AADT 9,857

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town :WATERTOWN
 Client :WORLDTECH ENG
 Location :MT AUBURN ST east of
 OAKLEY ROAD EASTBOUND















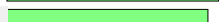


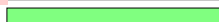






Site Code: 314060832
 Station ID: 314060832

Start Time	08-Jun-10		09-Jun-10		10-Jun-10		Daily Average	
	Tue A.M.	P.M.	Wed A.M.	P.M.	Thu A.M.	P.M.	A.M.	P.M.
12:00	17	120	35	140	*	*	26	130
12:15	15	134	28	138	*	*	22	136
12:30	18	167	15	133	*	*	16	150
12:45	15	150	12	162	*	*	14	156
01:00	11	131	16	161	*	*	14	146
01:15	12	148	7	139	*	*	10	144
01:30	17	144	7	139	*	*	12	142
01:45	2	149	9	150	*	*	6	150
02:00	11	146	9	140	*	*	10	143
02:15	5	166	3	144	*	*	4	155
02:30	2	162	1	157	*	*	2	160
02:45	2	188	7	187	*	*	4	188
03:00	2	166	1	142	*	*	2	154
03:15	1	158	3	153	*	*	2	156
03:30	1	158	4	152	*	*	2	155
03:45	4	151	3	145	*	*	4	148
04:00	4	179	3	160	*	*	4	170
04:15	4	167	6	156	*	*	5	162
04:30	5	160	3	143	*	*	4	152
04:45	12	154	8	149	*	*	10	152
05:00	16	183	9	166	*	*	12	174
05:15	15	170	12	159	*	*	14	164
05:30	29	172	28	177	*	*	28	174
05:45	41	181	44	156	*	*	42	168
06:00	30	160	53	177	*	*	42	168
06:15	68	183	68	168	*	*	68	176
06:30	91	203	88	139	*	*	90	171
06:45	111	159	109	157	*	*	110	158
07:00	139	165	139	155	*	*	139	160
07:15	163	135	158	107	*	*	160	121
07:30	174	121	163	118	*	*	168	120
07:45	188	120	190	103	*	*	189	112
08:00	208	120	227	88	*	*	218	104
08:15	210	127	190	120	*	*	200	124
08:30	182	100	186	102	*	*	184	101
08:45	176	108	170	95	*	*	173	102
09:00	136	101	144	75	*	*	140	88
09:15	114	85	144	103	*	*	129	94
09:30	154	82	152	88	*	*	153	85
09:45	132	71	141	97	*	*	136	84
10:00	144	63	133	82	*	*	138	72
10:15	118	58	143	79	*	*	130	68
10:30	131	58	155	67	*	*	143	62
10:45	153	36	136	39	*	*	144	38
11:00	136	38	116	54	*	*	126	46
11:15	132	28	132	31	*	*	132	30
11:30	112	22	119	25	*	*	116	24
11:45	151	38	142	26	*	*	146	32
Total	3614	6185	3671	5943	0	0	3643	6069
Combined Total	9799		9614		0		9712	
Peak	07:45	05:45	07:45	05:30			07:45	05:30
Vol.	788	727	793	678			791	686
P.H.F.	0.938	0.895	0.873	0.958			0.907	0.974
ADT		ADT 9,706		AAAT 9,706				

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town :WATERTOWN
 Client :WORLDTECH ENG
 Location :MT AUBURN ST east of
 OAKLEY ROAD EASTBOUND

Site Code: 314060832
 Station ID: 314060832

Start Time	Mon 07-Jun-10	Tue 08-Jun-10	Wed 09-Jun-10	Thu 10-Jun-10	Fri 11-Jun-10	Average Day	Sat 12-Jun-10	Sun 13-Jun-10	Week Average
12:00 AM	*	65	90	*	*	78	*	*	78 
01:00	*	42	39	*	*	40	*	*	40 
02:00	*	20	20	*	*	20	*	*	20 
03:00	*	8	11	*	*	10	*	*	10 
04:00	*	25	20	*	*	22	*	*	22 
05:00	*	101	93	*	*	97	*	*	97 
06:00	*	300	318	*	*	309	*	*	309 
07:00	*	664	650	*	*	657	*	*	657 
08:00	*	776	773	*	*	774	*	*	774 
09:00	*	536	581	*	*	558	*	*	558 
10:00	*	546	567	*	*	556	*	*	556 
11:00	*	531	509	*	*	520	*	*	520 
12:00 PM	*	571	573	*	*	572	*	*	572 
01:00	*	572	589	*	*	580	*	*	580 
02:00	*	662	628	*	*	645	*	*	645 
03:00	*	633	592	*	*	612	*	*	612 
04:00	*	660	608	*	*	634	*	*	634 
05:00	*	706	658	*	*	682	*	*	682 
06:00	*	705	641	*	*	673	*	*	673 
07:00	*	541	483	*	*	512	*	*	512 
08:00	*	455	405	*	*	430	*	*	430 
09:00	*	339	363	*	*	351	*	*	351 
10:00	*	215	267	*	*	241	*	*	241 
11:00	*	126	136	*	*	131	*	*	131 
Day Total	0	9799	9614	0	0	9704	0	0	9704
% Avg. WkDay	0.0%	101.0%	99.1%	0.0%	0.0%				
% Avg. Week	0.0%	101.0%	99.1%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak		08:00	08:00			08:00			08:00
Vol.		776	773			774			774
PM Peak		17:00	17:00			17:00			17:00
Vol.		706	658			682			682
Grand Total	0	9799	9614	0	0	9704	0	0	9704
ADT		ADT 9,706			AADT 9,706				

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town :WATERTOWN
 Client :WORLDTECH ENG
 Location :MT AUBURN ST northeast of
 SCHOOL ST WESTBOUND

Site Code: 314060841
 Station ID: 314060841

Start Time	08-Jun-10		09-Jun-10		10-Jun-10		Daily Average	
	Tue A.M.	P.M.	Wed A.M.	P.M.	Thu A.M.	P.M.	A.M.	P.M.
12:00	26	133	44	129	*	*	35	131
12:15	16	127	35	114	*	*	26	120
12:30	19	105	28	138	*	*	24	122
12:45	21	149	30	131	*	*	26	140
01:00	8	135	18	121	*	*	13	128
01:15	8	134	14	158	*	*	11	146
01:30	13	126	7	100	*	*	10	113
01:45	9	157	12	124	*	*	10	140
02:00	13	151	8	148	*	*	10	150
02:15	4	130	9	157	*	*	6	144
02:30	4	137	2	153	*	*	3	145
02:45	3	174	1	148	*	*	2	161
03:00	6	154	6	184	*	*	6	169
03:15	3	169	5	166	*	*	4	168
03:30	4	188	3	185	*	*	4	186
03:45	1	160	4	167	*	*	2	164
04:00	8	183	4	195	*	*	6	189
04:15	6	222	6	168	*	*	6	195
04:30	12	225	12	185	*	*	12	205
04:45	14	193	13	206	*	*	14	200
05:00	12	199	8	241	*	*	10	220
05:15	20	210	25	217	*	*	22	214
05:30	19	203	12	207	*	*	16	205
05:45	29	169	32	184	*	*	30	176
06:00	29	181	49	157	*	*	39	169
06:15	52	183	52	186	*	*	52	184
06:30	54	180	84	179	*	*	69	180
06:45	84	173	87	173	*	*	86	173
07:00	100	145	106	163	*	*	103	154
07:15	131	147	121	124	*	*	126	136
07:30	144	96	145	100	*	*	144	98
07:45	154	110	162	112	*	*	158	111
08:00	178	114	158	93	*	*	168	104
08:15	154	117	144	110	*	*	149	114
08:30	156	105	124	81	*	*	140	93
08:45	167	90	147	77	*	*	157	84
09:00	132	92	136	81	*	*	134	86
09:15	115	78	124	69	*	*	120	74
09:30	128	79	131	76	*	*	130	78
09:45	112	67	121	101	*	*	116	84
10:00	114	91	91	76	*	*	102	84
10:15	97	60	109	76	*	*	103	68
10:30	126	66	110	73	*	*	118	70
10:45	119	35	133	44	*	*	126	40
11:00	117	34	144	35	*	*	130	34
11:15	130	32	121	41	*	*	126	36
11:30	129	22	127	24	*	*	128	23
11:45	137	44	148	34	*	*	142	39
Total	3137	6274	3212	6211	0	0	3174	6247
Combined Total	9411		9423		0		9421	
Peak	08:00	04:15	07:30	04:45			07:30	04:30
Vol.	655	839	609	871			619	839
P.H.F.	0.920	0.932	0.940	0.904			0.921	0.953
ADT		ADT 9,417	AADT 9,417					

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town :WATERTOWN
 Client :WORLDTECH ENG
 Location :MT AUBURN ST northeast of
 SCHOOL ST WESTBOUND

Site Code: 314060841
 Station ID: 314060841

Start Time	Mon 07-Jun-10	Tue 08-Jun-10	Wed 09-Jun-10	Thu 10-Jun-10	Fri 11-Jun-10	Average Day	Sat 12-Jun-10	Sun 13-Jun-10	Week Average
12:00 AM	*	82	137	*	*	110	*	*	110
01:00	*	38	51	*	*	44	*	*	44
02:00	*	24	20	*	*	22	*	*	22
03:00	*	14	18	*	*	16	*	*	16
04:00	*	40	35	*	*	38	*	*	38
05:00	*	80	77	*	*	78	*	*	78
06:00	*	219	272	*	*	246	*	*	246
07:00	*	529	534	*	*	532	*	*	532
08:00	*	655	573	*	*	614	*	*	614
09:00	*	487	512	*	*	500	*	*	500
10:00	*	456	443	*	*	450	*	*	450
11:00	*	513	540	*	*	526	*	*	526
12:00 PM	*	514	512	*	*	513	*	*	513
01:00	*	552	503	*	*	528	*	*	528
02:00	*	592	606	*	*	599	*	*	599
03:00	*	671	702	*	*	686	*	*	686
04:00	*	823	754	*	*	788	*	*	788
05:00	*	781	849	*	*	815	*	*	815
06:00	*	717	695	*	*	706	*	*	706
07:00	*	498	499	*	*	498	*	*	498
08:00	*	426	361	*	*	394	*	*	394
09:00	*	316	327	*	*	322	*	*	322
10:00	*	252	269	*	*	260	*	*	260
11:00	*	132	134	*	*	133	*	*	133
Day Total	0	9411	9423	0	0	9418	0	0	9418
% Avg. WkDay	0.0%	99.9%	100.1%	0.0%	0.0%				
% Avg. Week	0.0%	99.9%	100.1%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak		08:00	08:00			08:00			08:00
Vol.		655	573			614			614
PM Peak		16:00	17:00			17:00			17:00
Vol.		823	849			815			815
Grand Total	0	9411	9423	0	0	9418	0	0	9418

ADT

ADT 9,417

AADT 9,417

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town :WATERTOWN
 Client :WORLDTECH ENG
 Location :MT AUBURN ST northeast of
 SCHOOL ST EASTBOUND















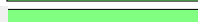


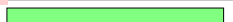






Site Code: 314060842
 Station ID: 314060842

Start Time	08-Jun-10		09-Jun-10		10-Jun-10		Daily Average	
	Tue A.M.	P.M.	Wed A.M.	P.M.	Thu A.M.	P.M.	A.M.	P.M.
12:00	14	123	26	147	*	*	20	135
12:15	15	130	26	134	*	*	20	132
12:30	16	164	15	133	*	*	16	148
12:45	16	158	12	152	*	*	14	155
01:00	7	130	14	145	*	*	10	138
01:15	10	158	5	138	*	*	8	148
01:30	13	136	6	143	*	*	10	140
01:45	4	140	8	152	*	*	6	146
02:00	9	129	8	138	*	*	8	134
02:15	3	149	3	119	*	*	3	134
02:30	3	161	1	146	*	*	2	154
02:45	2	173	4	166	*	*	3	170
03:00	2	175	2	143	*	*	2	159
03:15	1	154	3	147	*	*	2	150
03:30	1	159	3	139	*	*	2	149
03:45	4	158	2	131	*	*	3	144
04:00	4	176	4	142	*	*	4	159
04:15	4	162	4	152	*	*	4	157
04:30	4	168	3	136	*	*	4	152
04:45	12	144	8	158	*	*	10	151
05:00	16	191	9	162	*	*	12	176
05:15	17	179	14	165	*	*	16	172
05:30	26	175	26	186	*	*	26	180
05:45	33	169	44	160	*	*	38	164
06:00	37	166	51	163	*	*	44	164
06:15	63	180	57	171	*	*	60	176
06:30	85	183	105	138	*	*	95	160
06:45	123	172	117	144	*	*	120	158
07:00	127	150	131	161	*	*	129	156
07:15	155	137	147	113	*	*	151	125
07:30	184	121	166	111	*	*	175	116
07:45	204	120	195	100	*	*	200	110
08:00	201	117	204	84	*	*	202	100
08:15	220	100	194	103	*	*	207	102
08:30	171	102	188	95	*	*	180	98
08:45	179	94	187	96	*	*	183	95
09:00	134	93	169	73	*	*	152	83
09:15	139	73	150	103	*	*	144	88
09:30	146	69	165	71	*	*	156	70
09:45	144	67	140	83	*	*	142	75
10:00	140	81	145	79	*	*	142	80
10:15	141	56	139	65	*	*	140	60
10:30	134	52	145	60	*	*	140	56
10:45	151	33	153	34	*	*	152	34
11:00	131	41	125	51	*	*	128	46
11:15	159	32	137	24	*	*	148	28
11:30	111	24	129	24	*	*	120	24
11:45	138	37	151	21	*	*	144	29
Total	3653	6061	3740	5701	0	0	3697	5880
Combined Total	9714		9441		0		9577	
Peak	07:30	05:00	07:45	05:30			07:45	05:00
Vol.	809	714	781	680			789	692
P.H.F.	0.919	0.935	0.957	0.914			0.953	0.961
ADT	ADT 9,578		AADT 9,578					

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029

City/Town :WATERTOWN
 Client :WORLDTECH ENG
 Location :MT AUBURN ST northeast of
 SCHOOL ST EASTBOUND

Site Code: 314060842
 Station ID: 314060842

Start Time	Mon 07-Jun-10	Tue 08-Jun-10	Wed 09-Jun-10	Thu 10-Jun-10	Fri 11-Jun-10	Average Day	Sat 12-Jun-10	Sun 13-Jun-10	Week Average
12:00 AM	*	61	79	*	*	70	*	*	70 
01:00	*	34	33	*	*	34	*	*	34 
02:00	*	17	16	*	*	16	*	*	16 
03:00	*	8	10	*	*	9	*	*	9 
04:00	*	24	19	*	*	22	*	*	22 
05:00	*	92	93	*	*	92	*	*	92 
06:00	*	308	330	*	*	319	*	*	319 
07:00	*	670	639	*	*	654	*	*	654 
08:00	*	771	773	*	*	772	*	*	772 
09:00	*	563	624	*	*	594	*	*	594 
10:00	*	566	582	*	*	574	*	*	574 
11:00	*	539	542	*	*	540	*	*	540 
12:00 PM	*	575	566	*	*	570	*	*	570 
01:00	*	564	578	*	*	571	*	*	571 
02:00	*	612	569	*	*	590	*	*	590 
03:00	*	646	560	*	*	603	*	*	603 
04:00	*	650	588	*	*	619	*	*	619 
05:00	*	714	673	*	*	694	*	*	694 
06:00	*	701	616	*	*	658	*	*	658 
07:00	*	528	485	*	*	506	*	*	506 
08:00	*	413	378	*	*	396	*	*	396 
09:00	*	302	330	*	*	316	*	*	316 
10:00	*	222	238	*	*	230	*	*	230 
11:00	*	134	120	*	*	127	*	*	127 
Day Total	0	9714	9441	0	0	9576	0	0	9576
% Avg. WkDay	0.0%	101.4%	98.6%	0.0%	0.0%				
% Avg. Week	0.0%	101.4%	98.6%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak		08:00	08:00			08:00			08:00
Vol.		771	773			772			772
PM Peak		17:00	17:00			17:00			17:00
Vol.		714	673			694			694
Grand Total	0	9714	9441	0	0	9576	0	0	9576
ADT		ADT 9,578				AADT 9,578			

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST
 WEST OF IRMA AVE

Site Code: 314053007001
 Station ID: 3140530001

Start Time	30-May		WB		EB		Combined		31-May	WB		EB		Combined	
	Wed	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	Thu	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	
12:00		29	131	11	133	40	264		*	*	*	*	*	*	
12:15		20	157	24	125	44	282		*	*	*	*	*	*	
12:30		22	164	15	110	37	274		*	*	*	*	*	*	
12:45		12	136	8	134	20	270		*	*	*	*	*	*	
01:00		12	139	14	141	26	280		*	*	*	*	*	*	
01:15		11	166	9	140	20	306		*	*	*	*	*	*	
01:30		8	130	6	125	14	255		*	*	*	*	*	*	
01:45		10	138	7	139	17	277		*	*	*	*	*	*	
02:00		5	159	1	135	6	294		*	*	*	*	*	*	
02:15		7	148	2	116	9	264		*	*	*	*	*	*	
02:30		2	174	2	157	4	331		*	*	*	*	*	*	
02:45		4	165	4	132	8	297		*	*	*	*	*	*	
03:00		4	160	5	137	9	297		*	*	*	*	*	*	
03:15		7	198	6	115	13	313		*	*	*	*	*	*	
03:30		7	215	5	145	12	360		*	*	*	*	*	*	
03:45		2	183	7	128	9	311		*	*	*	*	*	*	
04:00		8	187	1	134	9	321		*	*	*	*	*	*	
04:15		1	223	8	115	9	338		*	*	*	*	*	*	
04:30		10	191	11	142	21	333		*	*	*	*	*	*	
04:45		14	170	8	149	22	319		*	*	*	*	*	*	
05:00		14	206	15	152	29	358		*	*	*	*	*	*	
05:15		29	153	17	143	46	296		*	*	*	*	*	*	
05:30		46	190	30	158	76	348		*	*	*	*	*	*	
05:45		39	211	55	155	94	366		*	*	*	*	*	*	
06:00		36	172	52	126	88	298		*	*	*	*	*	*	
06:15		57	163	73	151	130	314		*	*	*	*	*	*	
06:30		84	184	90	128	174	312		*	*	*	*	*	*	
06:45		99	142	124	127	223	269		*	*	*	*	*	*	
07:00		116	151	132	153	248	304		*	*	*	*	*	*	
07:15		144	132	111	133	255	265		*	*	*	*	*	*	
07:30		156	148	162	151	318	299		*	*	*	*	*	*	
07:45		157	130	173	101	330	231		*	*	*	*	*	*	
08:00		145	137	188	103	333	240		*	*	*	*	*	*	
08:15		152	118	190	114	342	232		*	*	*	*	*	*	
08:30		140	96	188	67	328	163		*	*	*	*	*	*	
08:45		129	98	162	71	291	169		*	*	*	*	*	*	
09:00		125	94	122	98	247	192		*	*	*	*	*	*	
09:15		120	101	150	105	270	206		*	*	*	*	*	*	
09:30		103	90	160	64	263	154		*	*	*	*	*	*	
09:45		137	102	117	77	254	179		*	*	*	*	*	*	
10:00		100	89	151	74	251	163		*	*	*	*	*	*	
10:15		177	86	125	67	302	153		*	*	*	*	*	*	
10:30		128	80	123	51	251	131		*	*	*	*	*	*	
10:45		141	70	146	42	287	112		*	*	*	*	*	*	
11:00		145	56	120	34	265	90		*	*	*	*	*	*	
11:15		148	42	100	35	248	77		*	*	*	*	*	*	
11:30		215	43	68	27	283	70		*	*	*	*	*	*	
11:45		242	31	30	31	272	62		*	*	*	*	*	*	
Total		3519	6649	3328	5390	6847	12039		0	0	0	0	0	0	
Day Total		10168		8718		18886			0		0		0		
% Total		18.6%	35.2%	17.6%	28.5%				0.0%	0.0%	0.0%	0.0%			
Peak Vol.		750	808	739	608	1333	1368								
P.H.F.		0.775	0.906	0.972	0.962	0.974	0.934								
ADT		Not Calculated													

TRANSDATA SERVICES

66 PLEASANT ST #3

NEWBURYPORT, MA 01950

978 463-2029 FAX 978 463-2043

Site Code: 314053007001

Station ID: 3140530001

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST
 WEST OF IRMA AVE

Start Time	30-May-07 Wed	WB	EB	Combined Total	
12:00 AM		83	58	141	
01:00		41	36	77	
02:00		18	9	27	
03:00		20	23	43	
04:00		33	28	61	
05:00		128	117	245	
06:00		276	339	615	
07:00		573	578	1151	
08:00		566	728	1294	
09:00		485	549	1034	
10:00		546	545	1091	
11:00		750	318	1068	
12:00 PM		588	502	1090	
01:00		573	545	1118	
02:00		646	540	1186	
03:00		756	525	1281	
04:00		771	540	1311	
05:00		760	608	1368	
06:00		661	532	1193	
07:00		561	538	1099	
08:00		449	355	804	
09:00		387	344	731	
10:00		325	234	559	
11:00		172	127	299	
Total		10168	8718	18886	
Percent		53.8%	46.2%		
Grand Total		10168	8718		
Percentage		53.8%	46.2%		

ADT

Not Calculated

TRANSDATA SERVICES

66 PLEASANT ST #3
 NEWBURYPORT, MA 01950
 978 463-2029 FAX 978 463-2043

Site Code: 314053007002
 Station ID: 3140530002

City/Town: WATERTOWN
 Client : E & K
 Location : MT AUBURN ST
 WEST OF BRIMMER ST

Start Time	30-May		WB		EB		Combined		31-May	WB		EB		Combined	
	Wed		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		Thu	A.M.	P.M.	A.M.	P.M.	A.M.
12:00			24	119	22	119	46	238		*	*	*	*	*	*
12:15			25	131	20	138	45	269		*	*	*	*	*	*
12:30			13	157	10	117	23	274		*	*	*	*	*	*
12:45			15	129	14	125	29	254		*	*	*	*	*	*
01:00			8	155	6	93	14	248		*	*	*	*	*	*
01:15			5	133	4	136	9	269		*	*	*	*	*	*
01:30			9	104	4	131	13	235		*	*	*	*	*	*
01:45			6	139	7	135	13	274		*	*	*	*	*	*
02:00			7	131	3	102	10	233		*	*	*	*	*	*
02:15			4	130	2	110	6	240		*	*	*	*	*	*
02:30			2	131	0	171	2	302		*	*	*	*	*	*
02:45			4	139	2	133	6	272		*	*	*	*	*	*
03:00			4	143	3	144	7	287		*	*	*	*	*	*
03:15			6	184	9	116	15	300		*	*	*	*	*	*
03:30			3	172	1	127	4	299		*	*	*	*	*	*
03:45			0	163	1	153	1	316		*	*	*	*	*	*
04:00			4	144	5	160	9	304		*	*	*	*	*	*
04:15			7	162	3	130	10	292		*	*	*	*	*	*
04:30			8	150	9	131	17	281		*	*	*	*	*	*
04:45			14	141	3	155	17	296		*	*	*	*	*	*
05:00			16	127	12	163	28	290		*	*	*	*	*	*
05:15			24	163	13	136	37	299		*	*	*	*	*	*
05:30			42	156	16	136	58	292		*	*	*	*	*	*
05:45			63	161	43	139	106	300		*	*	*	*	*	*
06:00			58	152	25	122	83	274		*	*	*	*	*	*
06:15			70	151	47	145	117	296		*	*	*	*	*	*
06:30			106	183	70	121	176	304		*	*	*	*	*	*
06:45			95	146	77	126	172	272		*	*	*	*	*	*
07:00			121	124	94	135	215	259		*	*	*	*	*	*
07:15			137	140	113	105	250	245		*	*	*	*	*	*
07:30			138	135	106	130	244	265		*	*	*	*	*	*
07:45			144	112	125	124	269	236		*	*	*	*	*	*
08:00			166	126	95	107	261	233		*	*	*	*	*	*
08:15			173	110	88	104	261	214		*	*	*	*	*	*
08:30			178	74	121	85	299	159		*	*	*	*	*	*
08:45			138	84	114	79	252	163		*	*	*	*	*	*
09:00			134	91	119	82	253	173		*	*	*	*	*	*
09:15			133	76	121	111	254	187		*	*	*	*	*	*
09:30			110	78	132	71	242	149		*	*	*	*	*	*
09:45			130	80	106	87	236	167		*	*	*	*	*	*
10:00			107	79	110	69	217	148		*	*	*	*	*	*
10:15			137	65	125	84	262	149		*	*	*	*	*	*
10:30			130	67	120	42	250	109		*	*	*	*	*	*
10:45			129	57	102	67	231	124		*	*	*	*	*	*
11:00			135	45	139	39	274	84		*	*	*	*	*	*
11:15			138	40	101	38	239	78		*	*	*	*	*	*
11:30			138	31	112	33	250	64		*	*	*	*	*	*
11:45			126	37	127	37	253	74		*	*	*	*	*	*
Total			3384	5747	2701	5343	6085	11090		0	0	0	0	0	0
Day Total			9131		8044		17175			0		0		0	
% Total			19.7%	33.5%	15.7%	31.1%				0.0%	0.0%	0.0%	0.0%		
Peak			07:45	03:15	08:45	04:45	07:45	03:15							
Vol.			661	663	486	590	1090	1219							
P.H.F.			0.928	0.901	0.920	0.905	0.911	0.964							

ADT Not Calculated

TRANSDATA SERVICES

66 PLEASANT ST #3

NEWBURYPORT, MA 01950

978 463-2029 FAX 978 463-2043

Site Code: 314053007002

Station ID: 3140530002

City/Town: WATERTOWN

Client : E & K

Location : MT AUBURN ST

WEST OF BRIMMER ST

Start Time	30-May-07 Wed	WB	EB	Combined Total	
12:00 AM		77	66	143	█
01:00		28	21	49	█
02:00		17	7	24	█
03:00		13	14	27	█
04:00		33	20	53	█
05:00		145	84	229	█
06:00		329	219	548	█
07:00		540	438	978	█
08:00		655	418	1073	█
09:00		507	478	985	█
10:00		503	457	960	█
11:00		537	479	1016	█
12:00 PM		536	499	1035	█
01:00		531	495	1026	█
02:00		531	516	1047	█
03:00		662	540	1202	█
04:00		597	576	1173	█
05:00		607	574	1181	█
06:00		632	514	1146	█
07:00		511	494	1005	█
08:00		394	375	769	█
09:00		325	351	676	█
10:00		268	262	530	█
11:00		153	147	300	█
Total		9131	8044	17175	
Percent		53.2%	46.8%		
Grand Total		9131	8044		
Percentage		53.2%	46.8%		

ADT

Not Calculated

TRANSDATA SERVICES

66 PLEASANT ST #3
 NEWBURYPORT, MA 01950
 978 463-2029 FAX 978 463-2043

Site Code: 314053007003
 Station ID: 3140530003

City/Town: WATERTOWN
 Client : E & K
 Location : ARLINGTON ST
 NORTH OF MT AUBURN ST

Start Time	30-May Wed	NB		SB		Combined		31-May Thu	NB		SB		Combined	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00		11	95	4	108	15	203		*	*	*	*	*	*
12:15		8	99	6	95	14	194		*	*	*	*	*	*
12:30		7	125	4	91	11	216		*	*	*	*	*	*
12:45		4	117	3	94	7	211		*	*	*	*	*	*
01:00		10	82	3	82	13	164		*	*	*	*	*	*
01:15		9	89	2	103	11	192		*	*	*	*	*	*
01:30		5	98	2	87	7	185		*	*	*	*	*	*
01:45		5	103	3	79	8	182		*	*	*	*	*	*
02:00		3	100	3	112	6	212		*	*	*	*	*	*
02:15		2	131	2	93	4	224		*	*	*	*	*	*
02:30		5	112	0	124	5	236		*	*	*	*	*	*
02:45		1	132	4	102	5	234		*	*	*	*	*	*
03:00		3	134	2	91	5	225		*	*	*	*	*	*
03:15		3	140	1	94	4	234		*	*	*	*	*	*
03:30		1	162	6	113	7	275		*	*	*	*	*	*
03:45		7	150	4	114	11	264		*	*	*	*	*	*
04:00		5	167	1	112	6	279		*	*	*	*	*	*
04:15		4	172	5	108	9	280		*	*	*	*	*	*
04:30		3	170	5	85	8	255		*	*	*	*	*	*
04:45		13	184	12	80	25	264		*	*	*	*	*	*
05:00		5	172	14	99	19	271		*	*	*	*	*	*
05:15		8	178	22	107	30	285		*	*	*	*	*	*
05:30		23	186	27	109	50	295		*	*	*	*	*	*
05:45		10	189	28	118	38	307		*	*	*	*	*	*
06:00		26	187	54	104	80	291		*	*	*	*	*	*
06:15		28	146	73	124	101	270		*	*	*	*	*	*
06:30		59	135	108	107	167	242		*	*	*	*	*	*
06:45		72	142	123	105	195	247		*	*	*	*	*	*
07:00		62	137	158	88	220	225		*	*	*	*	*	*
07:15		79	120	174	75	253	195		*	*	*	*	*	*
07:30		98	109	174	78	272	187		*	*	*	*	*	*
07:45		119	115	190	81	309	196		*	*	*	*	*	*
08:00		91	99	171	77	262	176		*	*	*	*	*	*
08:15		130	98	180	68	310	166		*	*	*	*	*	*
08:30		84	76	196	51	280	127		*	*	*	*	*	*
08:45		126	88	164	64	290	152		*	*	*	*	*	*
09:00		117	79	147	47	264	126		*	*	*	*	*	*
09:15		94	62	138	42	232	104		*	*	*	*	*	*
09:30		97	60	132	28	229	88		*	*	*	*	*	*
09:45		82	57	117	37	199	94		*	*	*	*	*	*
10:00		73	81	118	31	191	112		*	*	*	*	*	*
10:15		82	56	119	32	201	88		*	*	*	*	*	*
10:30		82	31	115	18	197	49		*	*	*	*	*	*
10:45		86	29	91	29	177	58		*	*	*	*	*	*
11:00		115	36	75	20	190	56		*	*	*	*	*	*
11:15		84	46	96	24	180	70		*	*	*	*	*	*
11:30		81	31	94	11	175	42		*	*	*	*	*	*
11:45		109	20	83	10	192	30		*	*	*	*	*	*
Total		2231	5327	3253	3751	5484	9078		0	0	0	0	0	0
Day Total		7558		7004		14562			0		0		0	
% Total		15.3%	36.6%	22.3%	25.8%				0.0%	0.0%	0.0%	0.0%		
Peak		08:15	05:15	07:45	05:30	07:45	05:15							
Vol.		457	740	737	455	1161	1178							
P.H.F.		0.879	0.979	0.940	0.917	0.936	0.959							

ADT Not Calculated

TRANSDATA SERVICES

66 PLEASANT ST #3

NEWBURYPORT, MA 01950

978 463-2029 FAX 978 463-2043

Site Code: 314053007003

Station ID: 3140530003

City/Town: WATERTOWN
 Client : E & K
 Location : ARLINGTON ST
 NORTH OF MT AUBURN ST

Start Time	30-May-07 Wed	NB	SB	Combined Total	
12:00 AM		30	17	47	█
01:00		29	10	39	█
02:00		11	9	20	█
03:00		14	13	27	█
04:00		25	23	48	█
05:00		46	91	137	█
06:00		185	358	543	█
07:00		358	696	1054	█
08:00		431	711	1142	█
09:00		390	534	924	█
10:00		323	443	766	█
11:00		389	348	737	█
12:00 PM		436	388	824	█
01:00		372	351	723	█
02:00		475	431	906	█
03:00		586	412	998	█
04:00		693	385	1078	█
05:00		725	433	1158	█
06:00		610	440	1050	█
07:00		481	322	803	█
08:00		361	260	621	█
09:00		258	154	412	█
10:00		197	110	307	█
11:00		133	65	198	█
Total		7558	7004	14562	
Percent		51.9%	48.1%		
Grand Total		7558	7004		
Percentage		51.9%	48.1%		

ADT

Not Calculated

TRANSDATA SERVICES

66 PLEASANT ST #3
 NEWBURYPORT, MA 01950
 978 463-2029 FAX 978 463-2043

Site Code: 314053007041
 Station ID: 3140530041

City/Town:Watertown
 Client :E & K
 Location :Arlington St. South of
 Mount Auburn St.

Start Time	30-May Wed	S to Arlington		S to Grove		Combined		31-May Thu	S to Arlington		S to Grove		Combined	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00		1	88	13	77	14	165		*	*	*	*	*	*
12:15		8	95	7	67	15	162		*	*	*	*	*	*
12:30		2	82	6	69	8	151		*	*	*	*	*	*
12:45		4	76	3	76	7	152		*	*	*	*	*	*
01:00		4	98	1	59	5	157		*	*	*	*	*	*
01:15		7	102	2	71	9	173		*	*	*	*	*	*
01:30		3	70	1	66	4	136		*	*	*	*	*	*
01:45		1	79	2	75	3	154		*	*	*	*	*	*
02:00		1	89	3	74	4	163		*	*	*	*	*	*
02:15		1	88	1	71	2	159		*	*	*	*	*	*
02:30		0	92	2	72	2	164		*	*	*	*	*	*
02:45		1	106	2	73	3	179		*	*	*	*	*	*
03:00		2	98	0	74	2	172		*	*	*	*	*	*
03:15		3	110	2	56	5	166		*	*	*	*	*	*
03:30		2	138	3	65	5	203		*	*	*	*	*	*
03:45		2	123	6	62	8	185		*	*	*	*	*	*
04:00		0	83	2	59	2	142		*	*	*	*	*	*
04:15		4	106	8	56	12	162		*	*	*	*	*	*
04:30		2	77	7	57	9	134		*	*	*	*	*	*
04:45		5	82	13	48	18	130		*	*	*	*	*	*
05:00		8	77	13	73	21	150		*	*	*	*	*	*
05:15		11	90	25	65	36	155		*	*	*	*	*	*
05:30		16	83	42	67	58	150		*	*	*	*	*	*
05:45		34	122	61	75	95	197		*	*	*	*	*	*
06:00		45	86	68	62	113	148		*	*	*	*	*	*
06:15		36	111	93	82	129	193		*	*	*	*	*	*
06:30		69	90	162	63	231	153		*	*	*	*	*	*
06:45		87	101	155	70	242	171		*	*	*	*	*	*
07:00		92	80	175	51	267	131		*	*	*	*	*	*
07:15		112	68	191	42	303	110		*	*	*	*	*	*
07:30		119	65	245	50	364	115		*	*	*	*	*	*
07:45		136	67	252	50	388	117		*	*	*	*	*	*
08:00		121	67	231	36	352	103		*	*	*	*	*	*
08:15		144	56	229	35	373	91		*	*	*	*	*	*
08:30		132	53	219	21	351	74		*	*	*	*	*	*
08:45		115	56	214	33	329	89		*	*	*	*	*	*
09:00		128	43	152	35	280	78		*	*	*	*	*	*
09:15		104	49	152	20	256	69		*	*	*	*	*	*
09:30		91	36	113	22	204	58		*	*	*	*	*	*
09:45		92	30	101	19	193	49		*	*	*	*	*	*
10:00		103	24	81	14	184	38		*	*	*	*	*	*
10:15		111	26	79	30	190	56		*	*	*	*	*	*
10:30		94	25	83	12	177	37		*	*	*	*	*	*
10:45		94	19	78	19	172	38		*	*	*	*	*	*
11:00		88	17	56	19	144	36		*	*	*	*	*	*
11:15		101	12	70	17	171	29		*	*	*	*	*	*
11:30		98	13	69	7	167	20		*	*	*	*	*	*
11:45		88	4	51	15	139	19		*	*	*	*	*	*
Total		2522	3452	3544	2431	6066	5883		0	0	0	0	0	0
Day Total		5974		5975		11949			0	0	0	0	0	0
% Total		21.1%	28.9%	29.7%	20.3%				0.0%	0.0%	0.0%	0.0%		
Peak		07:45	03:00	07:30	01:45	07:30	03:00							
Vol.		533	469	957	292	1477	726							
P.H.F.		0.925	0.850	0.949	0.961	0.952	0.894							

ADT Not Calculated

TRANSDATA SERVICES

66 PLEASANT ST #3
 NEWBURYPORT, MA 01950
 978 463-2029 FAX 978 463-2043

Site Code: 314053007042
 Station ID: 3140530042

City/Town:Watertown
 Client :E & K
 Location :Arlington St. South of
 Mount Auburn St.

Start Time	Wed	30-May-0	Thu	31-May-0	Fri	01-Jun-07	Daily Average	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00	24	156	*	*	*	*	24	156
12:15	13	173	*	*	*	*	13	173
12:30	16	166	*	*	*	*	16	166
12:45	13	161	*	*	*	*	13	161
01:00	15	135	*	*	*	*	15	135
01:15	11	140	*	*	*	*	11	140
01:30	7	166	*	*	*	*	7	166
01:45	7	142	*	*	*	*	7	142
02:00	6	157	*	*	*	*	6	157
02:15	5	178	*	*	*	*	5	178
02:30	7	176	*	*	*	*	7	176
02:45	3	175	*	*	*	*	3	175
03:00	3	198	*	*	*	*	3	198
03:15	8	185	*	*	*	*	8	185
03:30	2	254	*	*	*	*	2	254
03:45	9	244	*	*	*	*	9	244
04:00	10	279	*	*	*	*	10	279
04:15	6	236	*	*	*	*	6	236
04:30	10	239	*	*	*	*	10	239
04:45	8	262	*	*	*	*	8	262
05:00	6	281	*	*	*	*	6	281
05:15	20	272	*	*	*	*	20	272
05:30	11	262	*	*	*	*	11	262
05:45	18	261	*	*	*	*	18	261
06:00	17	252	*	*	*	*	17	252
06:15	31	215	*	*	*	*	31	215
06:30	50	173	*	*	*	*	50	173
06:45	72	191	*	*	*	*	72	191
07:00	62	182	*	*	*	*	62	182
07:15	77	163	*	*	*	*	77	163
07:30	85	160	*	*	*	*	85	160
07:45	80	161	*	*	*	*	80	161
08:00	88	154	*	*	*	*	88	154
08:15	106	124	*	*	*	*	106	124
08:30	100	116	*	*	*	*	100	116
08:45	117	115	*	*	*	*	117	115
09:00	117	111	*	*	*	*	117	111
09:15	121	94	*	*	*	*	121	94
09:30	107	71	*	*	*	*	107	71
09:45	107	80	*	*	*	*	107	80
10:00	107	95	*	*	*	*	107	95
10:15	120	93	*	*	*	*	120	93
10:30	117	52	*	*	*	*	117	52
10:45	134	48	*	*	*	*	134	48
11:00	150	55	*	*	*	*	150	55
11:15	119	63	*	*	*	*	119	63
11:30	137	51	*	*	*	*	137	51
11:45	150	36	*	*	*	*	150	36
Total	2609	7753	0	0	0	0	2609	7753
Combined Total	10362		0		0		10362	
Peak	11:00	04:45					11:00	04:45
Vol.	556	1077					556	1077
P.H.F.	0.927	0.958					0.927	0.958
ADT	Not Calculated							

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

Site Code: 314053007041
 Station ID: 3140530041

City/Town:Watertown
 Client :E & K
 Location :Arlington St. South of
 Mount Auburn St.

Start Time	30-May-07 Wed	S to Arlington	S to Grove	Combined Total	
12:00 AM		15	29	44	█
01:00		15	6	21	█
02:00		3	8	11	█
03:00		9	11	20	█
04:00		11	30	41	█
05:00		69	141	210	█
06:00		237	478	715	█
07:00		459	863	1322	█
08:00		512	893	1405	█
09:00		415	518	933	█
10:00		402	321	723	█
11:00		375	246	621	█
12:00 PM		341	289	630	█
01:00		349	271	620	█
02:00		375	290	665	█
03:00		469	257	726	█
04:00		348	220	568	█
05:00		372	280	652	█
06:00		388	277	665	█
07:00		280	193	473	█
08:00		232	125	357	█
09:00		158	96	254	█
10:00		94	75	169	█
11:00		46	58	104	█
Total		5974	5975	11949	
Percent		50.0%	50.0%		
Grand Total		5974	5975		
Percentage		50.0%	50.0%		

ADT

Not Calculated

TRANSDATA SERVICES

66 PLEASANT ST #3

NEWBURYPORT, MA 01950

978 463-2029 FAX 978 463-2043

Site Code: 314053007042

Station ID: 3140530042

City/Town: Watertown

Client : E & K

Location : Arlington St. South of
Mount Auburn St.

Start Time	Mon 28-May-07	Tue 29-May-07	Wed 30-May-07	Thu 31-May-07	Fri 01-Jun-07	Average Day	Sat 02-Jun-07	Sun 03-Jun-07	Week Average
12:00 AM	*	*	66	*	*	66	*	*	66
01:00	*	*	40	*	*	40	*	*	40
02:00	*	*	21	*	*	21	*	*	21
03:00	*	*	22	*	*	22	*	*	22
04:00	*	*	34	*	*	34	*	*	34
05:00	*	*	55	*	*	55	*	*	55
06:00	*	*	170	*	*	170	*	*	170
07:00	*	*	304	*	*	304	*	*	304
08:00	*	*	411	*	*	411	*	*	411
09:00	*	*	452	*	*	452	*	*	452
10:00	*	*	478	*	*	478	*	*	478
11:00	*	*	556	*	*	556	*	*	556
12:00 PM	*	*	656	*	*	656	*	*	656
01:00	*	*	583	*	*	583	*	*	583
02:00	*	*	686	*	*	686	*	*	686
03:00	*	*	881	*	*	881	*	*	881
04:00	*	*	1016	*	*	1016	*	*	1016
05:00	*	*	1076	*	*	1076	*	*	1076
06:00	*	*	831	*	*	831	*	*	831
07:00	*	*	666	*	*	666	*	*	666
08:00	*	*	509	*	*	509	*	*	509
09:00	*	*	356	*	*	356	*	*	356
10:00	*	*	288	*	*	288	*	*	288
11:00	*	*	205	*	*	205	*	*	205
Day Total	0	0	10362	0	0	10362	0	0	10362
% Avg. WkDay	0.0%	0.0%	100.0%	0.0%	0.0%				
% Avg. Week	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak Vol.			11:00 556			11:00 556			11:00 556
PM Peak Vol.			17:00 1076			17:00 1076			17:00 1076
Grand Total	0	0	10362	0	0	10362	0	0	10362
ADT	Not Calculated								

TRANSDATA SERVICES
66 PLEASANT ST #3
NEWBURYPORT, MA 01950
978 463-2029 FAX 978 463-2043

City/Town: Watertown
 Client : E & K
 Location : Arlington St. South of
 Wells Ave

Site Code: 314053007005
 Station ID: 3140530005

Start Time	30-May		SouthBd		NorthBd		Combined		31-May	SouthBd		NorthBd		Combined	
	Wed		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		Thu	A.M.	P.M.	A.M.	P.M.	A.M.
12:00			2	95	7	110	9	205		*	*	*	*	*	*
12:15			8	97	3	101	11	198		*	*	*	*	*	*
12:30			3	87	4	105	7	192		*	*	*	*	*	*
12:45			5	84	3	93	8	177		*	*	*	*	*	*
01:00			4	102	2	88	6	190		*	*	*	*	*	*
01:15			8	111	7	100	15	211		*	*	*	*	*	*
01:30			3	75	5	82	8	157		*	*	*	*	*	*
01:45			1	76	2	91	3	167		*	*	*	*	*	*
02:00			1	87	4	85	5	172		*	*	*	*	*	*
02:15			1	93	3	75	4	168		*	*	*	*	*	*
02:30			0	97	2	94	2	191		*	*	*	*	*	*
02:45			2	109	2	95	4	204		*	*	*	*	*	*
03:00			2	103	1	99	3	202		*	*	*	*	*	*
03:15			3	120	4	90	7	210		*	*	*	*	*	*
03:30			3	139	1	101	4	240		*	*	*	*	*	*
03:45			1	121	4	102	5	223		*	*	*	*	*	*
04:00			0	90	7	115	7	205		*	*	*	*	*	*
04:15			3	105	4	93	7	198		*	*	*	*	*	*
04:30			2	83	5	86	7	169		*	*	*	*	*	*
04:45			8	81	5	81	13	162		*	*	*	*	*	*
05:00			7	105	0	92	7	197		*	*	*	*	*	*
05:15			12	97	12	98	24	195		*	*	*	*	*	*
05:30			14	84	9	94	23	178		*	*	*	*	*	*
05:45			30	128	7	79	37	207		*	*	*	*	*	*
06:00			45	99	16	80	61	179		*	*	*	*	*	*
06:15			34	107	15	84	49	191		*	*	*	*	*	*
06:30			64	94	32	81	96	175		*	*	*	*	*	*
06:45			85	81	49	112	134	193		*	*	*	*	*	*
07:00			82	78	49	91	131	169		*	*	*	*	*	*
07:15			106	75	56	73	162	148		*	*	*	*	*	*
07:30			109	64	72	81	181	145		*	*	*	*	*	*
07:45			120	69	72	81	192	150		*	*	*	*	*	*
08:00			122	69	71	82	193	151		*	*	*	*	*	*
08:15			132	56	91	77	223	133		*	*	*	*	*	*
08:30			122	53	90	69	212	122		*	*	*	*	*	*
08:45			114	59	72	57	186	116		*	*	*	*	*	*
09:00			115	38	70	86	185	124		*	*	*	*	*	*
09:15			93	48	73	52	166	100		*	*	*	*	*	*
09:30			85	33	67	43	152	76		*	*	*	*	*	*
09:45			96	36	80	48	176	84		*	*	*	*	*	*
10:00			101	30	74	52	175	82		*	*	*	*	*	*
10:15			109	24	81	36	190	60		*	*	*	*	*	*
10:30			94	27	80	26	174	53		*	*	*	*	*	*
10:45			100	19	64	17	164	36		*	*	*	*	*	*
11:00			90	17	84	23	174	40		*	*	*	*	*	*
11:15			87	12	68	28	155	40		*	*	*	*	*	*
11:30			97	12	89	18	186	30		*	*	*	*	*	*
11:45			93	5	96	13	189	18		*	*	*	*	*	*
Total			2418	3574	1714	3659	4132	7233		0	0	0	0	0	0
Day Total			5992		5373		11365			0		0		0	
% Total			21.3%	31.4%	15.1%	32.2%				0.0%	0.0%	0.0%	0.0%		
Peak Vol.			496	483	337	411	820	878							
P.H.F.			0.939	0.869	0.878	0.893	0.919	0.915							

ADT Not Calculated

TRANSDATA SERVICES

66 PLEASANT ST #3

NEWBURYPORT, MA 01950

978 463-2029 FAX 978 463-2043

Site Code: 314053007005

Station ID: 3140530005

City/Town:Watertown
 Client :E & K
 Location :Arlington St. South of
 Wells Ave

Start Time	30-May-07 Wed	SouthBd	NorthBd	Combined Total	
12:00 AM		18	17	35	█
01:00		16	16	32	█
02:00		4	11	15	█
03:00		9	10	19	█
04:00		13	21	34	█
05:00		63	28	91	█
06:00		228	112	340	█
07:00		417	249	666	█
08:00		490	324	814	█
09:00		389	290	679	█
10:00		404	299	703	█
11:00		367	337	704	█
12:00 PM		363	409	772	█
01:00		364	361	725	█
02:00		386	349	735	█
03:00		483	392	875	█
04:00		359	375	734	█
05:00		414	363	777	█
06:00		381	357	738	█
07:00		286	326	612	█
08:00		237	285	522	█
09:00		155	229	384	█
10:00		100	131	231	█
11:00		46	82	128	█
Total		5992	5373	11365	
Percent		52.7%	47.3%		
Grand Total		5992	5373		
Percentage		52.7%	47.3%		

ADT

Not Calculated

5.0 APPENDIX

5.2 Crash Summary & Crash Rate Calculation



MassDOT Crash Report for WATERTOWN in the year 2006

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicles Travel Directions	Most Harmful Events	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2077057	WATERTOWN	Sunday, January 01, 2006	1:00 PM	Property damage only (none injured)	2	0	0	Not reported	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear		MOUNT AUBURN STREET				
1977364	WATERTOWN	Tuesday, January 03, 2006	11:36 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Wet	Daylight	Rain/Sleet, hail (freezing rain or drizzle)	MOUNT AUBURN STREET / ELTON AVENUE					
1977368	WATERTOWN	Thursday, January 05, 2006	9:41 AM	Property damage only (none injured)	2	0	0	Angle	V1:Westbound / V2:Westbound	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic	Wet	Daylight	Rain/Snow	MOUNT AUBURN STREET Rte 16 W / SUMMER STREET					
2060538	WATERTOWN	Thursday, January 05, 2006	4:30 AM	Property damage only (none injured)	1	0	0	Angle	V1:Southbound	V1: Not reported	Dry	Dusk	Clear	TEMPLETON PARKWAY / MOUNT AUBURN STREET					
1977378	WATERTOWN	Friday, January 06, 2006	6:25 PM	Property damage only (none injured)	3	0	0	Rear-end	V1:Westbound / V2:Westbound / V3:Westbound	V1: Not reported / V2: Not reported / V3: Collision with motor vehicle in traffic	Dry	Dark - lighted roadway	Clear		594 MOUNT AUBURN STREET				
1981977	WATERTOWN	Tuesday, January 10, 2006	10:20 PM	Property damage only (none injured)	2	0	0	Angle	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Not reported	Dry	Dark - lighted roadway	Clear		481 MOUNT AUBURN STREET Rte 16 W				
1981963	WATERTOWN	Wednesday, January 11, 2006	9:03 AM	Property damage only (none injured)	2	0	0	Angle	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Dry	Daylight	Cloudy	ARLINGTON STREET / WELLS AVENUE					
2058273	WATERTOWN	Monday, January 16, 2006	7:45 PM	Property damage only (none injured)	2	0	0	Not reported	V1:Northbound / V2:Eastbound	V1: Not reported / V2: Not reported	Dry	Dark - lighted roadway	Clear	IRVING STREET / MOUNT AUBURN STREET					
1984855	WATERTOWN	Tuesday, January 24, 2006	8:50 AM	Non-fatal injury	2	1	0	Head-on	V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Wet	Daylight	Clear	MOUNT AUBURN STREET / ADAMS AVENUE					
1993241	WATERTOWN	Friday, February 03, 2006	1:43 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1:Not reported	V1: Collision with pedestrian	Wet	Daylight	Cloudy/Rain		594 MOUNT AUBURN STREET / LLOYD ROAD				P2:Pedestrian
1993415	WATERTOWN	Tuesday, February 07, 2006	6:55 PM	Property damage only (none injured)	2	0	0	Angle	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Dry	Dark - lighted roadway	Cloudy		80 MOUNT AUBURN STREET				
2002490	WATERTOWN	Monday, February 13, 2006	6:18 PM	Non-fatal injury	2	2	0	Angle	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Wet	Dark - lighted roadway	Clear	ARLINGTON STREET / GROVE STREET					
2002338	WATERTOWN	Sunday, February 19, 2006	6:38 PM	Property damage only (none injured)	2	0	0	Angle	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Not reported	Dark - lighted roadway	Clear	MOUNT AUBURN STREET / IRVING STREET					
2063204	WATERTOWN	Sunday, February 19, 2006	12:03 PM	Property damage only (none injured)	2	0	0	Rear-end	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported	Dry	Daylight	Cloudy	MOUNT AUBURN STREET / SUMMER STREET					
2091123	WATERTOWN	Saturday, February 25, 2006	12:00 PM	Non-fatal injury	2	2	0	Rear-end	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported	Snow	Dark - lighted roadway	Snow		MOUNT AUBURN STREET			7-11 STORE	
2002926	WATERTOWN	Saturday, March 04, 2006	6:08 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1:Westbound	V1: Collision with curb	Dry	Dawn	Clear		528 MOUNT AUBURN STREET				
2094190	WATERTOWN	Monday, March 06, 2006	10:11 AM	Property damage only (none injured)	2	0	0	Angle	V1:Northbound / V2:Eastbound	V1: Not reported / V2: Not reported	Not reported	Daylight	Clear		521 MOUNT AUBURN STREET				
2006626	WATERTOWN	Monday, March 06, 2006	8:14 AM	Property damage only (none injured)	2	0	0	Angle	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Dry	Daylight	Clear	MOUNT AUBURN STREET / SUMMER STREET					
2079416	WATERTOWN	Monday, March 13, 2006	6:40 PM	Not Reported	2	0	0	Sideswipe, opposite direction	V1:Northbound / V2:Eastbound	V1: Not reported / V2: Not reported	Wet	Daylight	Clear		MOUNT AUBURN STREET / SUMMER STREET				
2092771	WATERTOWN	Monday, March 20, 2006	9:45 AM	Property damage only (none injured)	2	0	0	Rear-end	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	Dry	Daylight	Clear		705 MOUNT AUBURN STREET Rte 16			OCCURRED AT CROSS WALK	



MassDOT Crash Report for WATERTOWN in the year 2006

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicles Travel Directions	Most Harmful Events	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2012953	WATERTOWN	Monday, March 20, 2006	1:00 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1:Westbound	V1: Collision with pedestrian	Dry	Daylight	Clear	MOUNT AUBURN STREET / BIGELOW AVENUE					P2:Pedestrian
2019191	WATERTOWN	Tuesday, March 21, 2006	10:08 PM	Property damage only (none injured)	1	0	0	Sideswipe, opposite direction	V1:Westbound	V1: Collision with motor vehicle in traffic	Dry	Not reported	Clear	MOUNT AUBURN STREET / SCHOOL STREET					
2014762	WATERTOWN	Friday, March 24, 2006	4:28 PM	Non-fatal injury	2	1	0	Angle	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Dry	Daylight	Clear/Clear	ARLINGTON STREET / GROVE STREET					
2090811	WATERTOWN	Sunday, March 26, 2006	12:30 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	MERRIFIELD AVENUE / ARLINGTON STREET					
2067938	WATERTOWN	Monday, March 27, 2006	12:15 PM	Property damage only (none injured)	2	0	0	Angle	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	Dry	Daylight	Clear		BIGELOW AVENUE			TOWN DINER	
2014903	WATERTOWN	Tuesday, March 28, 2006	11:14 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1:Southbound / V2:Southbound	V1: Collision with parked motor vehicle / V2: Collision with parked motor vehicle	Dry	Daylight	Clear	BIGELOW AVENUE / MOUNT AUBURN STREET / WELLS AVENUE					
2020574	WATERTOWN	Monday, April 10, 2006	7:26 AM	Property damage only (none injured)	3	0	0	Rear-end	V1:Westbound / V2:Westbound / V3:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic	Dry	Daylight	Clear		564 MOUNT AUBURN STREET				
2097101	WATERTOWN	Thursday, April 13, 2006	6:05 PM	Property damage only (none injured)	2	0	0	Rear-end	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear		MOUNT AUBURN STREET / SUMMER STREET				
2088302	WATERTOWN	Saturday, April 15, 2006	8:10 AM	Property damage only (none injured)	2	0	0	Rear-end	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	MOUNT AUBURN STREET / PARKER STREET					
2154759	WATERTOWN	Tuesday, April 18, 2006	11:00 AM	Property damage only (none injured)	2	0	0	Angle	V1:Northbound / V2:Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear		MOUNT AUBURN STREET Rte 16 / Rte 16				
2098057	WATERTOWN	Wednesday, April 19, 2006	10:30 AM	Property damage only (none injured)	2	0	0	Unknown	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	MELENDY AVENUE / MOUNT AUBURN STREET					
2027209	WATERTOWN	Monday, April 24, 2006	9:43 AM	Property damage only (none injured)	2	0	0	Rear-end	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Collision with motor vehicle in traffic	Wet	Daylight	Cloudy/Rain		30 feet E from Intersection 63 MOUNT AUBURN STREET / SUMMER STREET			STARBUCKS COFFEE	
2114686	WATERTOWN	Wednesday, May 03, 2006	4:10 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	V1:Northbound / V2:Eastbound	V1: Not reported / V2: Not reported	Dry	Daylight	Cloudy		521 MOUNT AUBURN STREET				
2029397	WATERTOWN	Thursday, May 04, 2006	3:18 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1:Westbound	V1: Collision with utility pole	Wet	Dark - lighted roadway	Rain	MOUNT AUBURN STREET / FRANCIS STREET					
2036939	WATERTOWN	Monday, May 08, 2006	10:57 PM	Property damage only (none injured)	2	0	0	Angle	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Dry	Dark - lighted roadway	Clear	MOUNT AUBURN STREET / STEARNS ROAD					
2036933	WATERTOWN	Wednesday, May 10, 2006	12:21 PM	Non-fatal injury	2	1	0	Angle	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Wet	Daylight	Cloudy/Rain	MOUNT AUBURN STREET / HILLSIDE ROAD					
2111655	WATERTOWN	Thursday, May 11, 2006	8:55 AM	Property damage only (none injured)	2	0	0	Not reported	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	Wet	Daylight	Rain		MOUNT AUBURN STREET Rte 16 / UPLAND ROAD Rte 16				
2037245	WATERTOWN	Friday, May 19, 2006	2:06 PM	Property damage only (none injured)	2	0	0	Head-on	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Dry	Daylight	Cloudy	MOUNT AUBURN STREET / SCHOOL STREET					
2043326	WATERTOWN	Wednesday, May 24, 2006	2:55 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1:Westbound	V1: Collision with cyclist (bicycle, tricycle, unicycle, pedal car)	Wet	Daylight	Cloudy/Rain	MOUNT AUBURN STREET / AMHERST ROAD					P2:Pedalcyclist (bicycle, tricycle, unicycle, pedal car)



MassDOT Crash Report for WATERTOWN in the year 2006

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicles Travel Directions	Most Harmful Events	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2043348	WATERTOWN	Saturday, May 27, 2006	10:18 AM	Property damage only (none injured)	3	0	0	Rear-end	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic	Dry	Daylight	Clear	MOUNT AUBURN STREET / ARLINGTON STREET					
2091948	WATERTOWN	Wednesday, May 31, 2006	5:00 PM	Not Reported	1	0	0	Not reported	V1:Not reported	V1: Not reported	Dry	Dark - unknown roadway lighting	Clear	PARKER STREET / MOUNT AUBURN STREET					
2057035	WATERTOWN	Saturday, June 03, 2006	11:00 AM	Property damage only (none injured)	2	0	0	Unknown	V1:Southbound / V2:Southbound	V1: Not reported / V2: Not reported	Wet	Daylight	Rain	35 feet S from Intersection ARLINGTON STREET / MOUNT AUBURN STREET					
2068741	WATERTOWN	Monday, June 05, 2006	10:10 AM	Property damage only (none injured)	2	0	0	Angle	V1:Eastbound / V2:Southbound	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	MOUNT AUBURN STREET / RUSSELL AVENUE					
2124619	WATERTOWN	Wednesday, June 07, 2006	11:00 AM	Unknown	2	0	0	Rear-end	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	Wet	Dusk	Cloudy/Rain	521 MOUNT AUBURN STREET					
2054255	WATERTOWN	Thursday, June 15, 2006	5:30 PM	Property damage only (none injured)	2	0	0	Angle	V1:Eastbound / V2:Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	MOUNT AUBURN STREET Rte 16 / PARKER STREET					
2107619	WATERTOWN	Wednesday, June 28, 2006	11:16 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	Not reported	Daylight	Not Reported	MOUNT AUBURN STREET Rte 16 / SPRUCE STREET					
2062573	WATERTOWN	Thursday, July 13, 2006	6:52 PM	Non-fatal injury	1	1	0	Angle	V1:Eastbound	V1: Collision with cyclist (bicycle, tricycle, unicycle, pedal car)	Dry	Daylight	Clear	RUSSELL AVENUE / MOUNT AUBURN STREET					P2:Pedalcyclist (bicycle, tricycle, unicycle, pedal car)
2130611	WATERTOWN	Monday, July 17, 2006	1:33 AM	Property damage only (none injured)	3	0	0	Rear-end	V1:Westbound / V2:Westbound / V3:Westbound	V1: Not reported / V2: Not reported / V3: Not reported	Dry	Daylight	Clear	75 feet W from Intersection 572 MOUNT AUBURN STREET / Rte 16					
2062556	WATERTOWN	Monday, July 17, 2006	4:58 PM	Non-fatal injury	2	1	0	Rear-end	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	MOUNT AUBURN STREET Rte 16 / SCHOOL STREET					
2070153	WATERTOWN	Tuesday, July 25, 2006	4:05 PM	Property damage only (none injured)	2	0	0	Rear-end	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Dry	Daylight	Clear	650 MOUNT AUBURN STREET Rte 16 W					
2102283	WATERTOWN	Tuesday, August 01, 2006	1:45 PM	Property damage only (none injured)	2	0	0	Rear-end	V1:Northbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Wet	Daylight	Cloudy/Rain	ARLINGTON STREET / MOUNT AUBURN STREET					
2160266	WATERTOWN	Tuesday, August 01, 2006	4:10 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	V1:Westbound / V2:Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	GROVE STREET / ARLINGTON STREET					
2164654	WATERTOWN	Wednesday, August 02, 2006	5:44 PM	Property damage only (none injured)	3	0	0	Rear-end	V1:Not reported / V2:Westbound / V3:Southbound	V1: Not reported / V2: Not reported / V3: Not reported	Dry	Daylight	Clear	MOUNT AUBURN STREET / SUMMER STREET					
2161240	WATERTOWN	Thursday, August 03, 2006	12:00 PM	Not Reported	2	0	0	Rear-end	V1:Westbound / V2:Not reported	V1: Not reported / V2: Not reported	Dry	Dark - roadway not lighted	Clear	PALFREY STREET / MOUNT AUBURN STREET					
2157141	WATERTOWN	Thursday, August 03, 2006	4:30 AM	Property damage only (none injured)	3	0	0	Angle	V1:Southbound / V2:Westbound / V3:Not reported	V1: Not reported / V2: Not reported / V3: Not reported	Snow	Daylight	Cloudy	MOUNT AUBURN STREET / SUMMER STREET					
2167014	WATERTOWN	Thursday, August 24, 2006	2:55 PM	Not Reported	2	0	0	Angle	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	ARLINGTON STREET / GROVE STREET					
2183606	WATERTOWN	Friday, August 25, 2006	9:11 PM	Property damage only (none injured)	2	0	0	Angle	V1:Eastbound / V2:Southbound	V1: Not reported / V2: Not reported	Dry	Dark - lighted roadway	Clear	MOUNT AUBURN STREET Rte 16 / IRMA AVENUE					
2181071	WATERTOWN	Friday, August 25, 2006	6:15 PM	Unknown	2	0	0	Angle	V1:Northbound / V2:Eastbound	V1: Not reported / V2: Not reported	Wet	Dusk	Rain	PATTEN STREET / MOUNT AUBURN STREET					
2169591	WATERTOWN	Thursday, September 07, 2006	10:05 AM	Property damage only (none injured)	2	0	0	Angle	V1:Not reported / V2:Westbound	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	MOUNT AUBURN STREET / SUMMER STREET					
2169267	WATERTOWN	Saturday, September 09, 2006	9:30 AM	Property damage only (none injured)	2	0	0	Not reported	V1:Eastbound / V2:Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	MOUNT AUBURN STREET / RUSSELL AVENUE					
2169845	WATERTOWN	Sunday, September 10, 2006	7:45 AM	Not Reported	2	0	0	Not reported	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported	Dry	Dark - lighted roadway	Clear	762 MOUNT AUBURN STREET / SAINT MARY STREET Rte 16					



MassDOT Crash Report for WATERTOWN in the year 2006

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicles Travel Directions	Most Harmful Events	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2217155	WATERTOWN	Wednesday, September 13, 2006	1:20 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	MOUNT AUBURN STREET / SUMMER STREET					
2089462	WATERTOWN	Saturday, September 16, 2006	5:35 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1:Eastbound	V1: Not reported	Dry	Dark - lighted roadway	Clear		320 MOUNT AUBURN STREET				
2093002	WATERTOWN	Friday, September 22, 2006	9:46 AM	Property damage only (none injured)	2	0	0	Angle	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Dry	Daylight	Clear	BAILEY ROAD / MOUNT AUBURN STREET					
2219561	WATERTOWN	Friday, September 22, 2006	12:50 PM	Not Reported	2	0	0	Not reported	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported	Dry	Daylight	Clear		16 MOUNT AUBURN STREET / PALFREY STREET				
2166947	WATERTOWN	Saturday, September 23, 2006	12:00 PM	Property damage only (none injured)	2	0	0	Rear-end	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	MOUNT AUBURN STREET / PATTEN STREET					
2093005	WATERTOWN	Monday, September 25, 2006	1:31 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1:Not reported	V1: Collision with pedestrian	Dry	Daylight	Clear		MT AUBURN STREET			STANTONS FUNERAL HOME	P2:Pedestrian
2219060	WATERTOWN	Tuesday, September 26, 2006	5:10 AM	Non-fatal injury	2	1	0	Rear-end	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported	Dry	Daylight	Clear		20 feet E from Intersection MOUNT AUBURN STREET / CHESTER STREET				
2214572	WATERTOWN	Saturday, October 07, 2006	2:07 AM	Non-fatal injury	2	2	0	Rear-end	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	Dry	Daylight	Clear		51 MOUNT AUBURN STREET / Rte 16				
2098433	WATERTOWN	Tuesday, October 10, 2006	8:52 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1:Eastbound	V1: Collision with tree	Dry	Daylight	Clear	MOUNT AUBURN STREET / BOYLSTON STREET					
2136785	WATERTOWN	Friday, October 20, 2006	6:30 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	V1:Southbound / V2:Westbound	V1: Not reported / V2: Not reported	Wet	Dark - lighted roadway	Cloudy/Rain	MOUNT AUBURN STREET / PARKER STREET					
2107061	WATERTOWN	Friday, October 27, 2006	2:58 PM	Property damage only (none injured)	2	0	0	Rear-end	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Dry	Daylight	Clear	MOUNT AUBURN STREET / COMMON STREET					
2175930	WATERTOWN	Monday, October 30, 2006	2:10 PM	Property damage only (none injured)	2	0	0	Rear-end	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	Dry	Daylight	Clear		Rte 16 / Rte 16				
2112017	WATERTOWN	Thursday, November 09, 2006	10:12 PM	Non-fatal injury	1	1	0	Sideswipe, same direction	V1:Eastbound	V1: Collision with pedestrian	Dry	Dark - lighted roadway	Clear	MOUNT AUBURN STREET Rte 16 E / WINTHROP STREET					P2:Pedestrian
2112027	WATERTOWN	Saturday, November 11, 2006	11:36 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1:Westbound	V1: Collision with pedestrian	Dry	Daylight	Clear	MOUNT AUBURN STREET / LLOYD ROAD / ELTON AVENUE					P2:Pedestrian
2117519	WATERTOWN	Monday, November 13, 2006	9:20 AM	Not Reported	1	0	0	Single vehicle crash	V1:Eastbound	V1: Collision with pedestrian	Wet	Daylight	Rain/Cloudy	MOUNT AUBURN STREET / BIGELOW AVENUE					
2117048	WATERTOWN	Thursday, November 16, 2006	5:47 PM	Property damage only (none injured)	2	0	0	Angle	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Dry	Dark - lighted roadway	Clear	MOUNT AUBURN STREET Rte 16 / SCHOOL STREET					
2186765	WATERTOWN	Tuesday, November 21, 2006	8:38 AM	Non-fatal injury	2	1	0	Not reported	V1:Eastbound / V2:Northbound	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	MOUNT AUBURN STREET / MELENDY AVENUE					
2220334	WATERTOWN	Thursday, December 07, 2006	9:40 AM	Property damage only (none injured)	2	0	0	Not reported	V1:Eastbound / V2:Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear	MOUNT AUBURN STREET / PARKER STREET					
2193618	WATERTOWN	Wednesday, December 20, 2006	11:18 AM	Property damage only (none injured)	2	0	0	Rear-end	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	Dry	Daylight	Clear		MOUNT AUBURN STREET / KEENAN STREET				
2135222	WATERTOWN	Saturday, December 23, 2006	9:30 AM	Property damage only (none injured)	2	0	0	Angle	V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	Wet	Daylight	Rain	MOUNT AUBURN STREET / SUMMER STREET					



MassDOT Crash Report for WATERTOWN in the year 2007

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles Involved	Total Injured	Total Fatal	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration	Road Surface Condition	ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Marker	Distance from Nearest Etc.	Distance from Nearest Landmark	Non Motorist Type	X Coordinate	Y Coordinate		
237463	WATERTOWN	Monday, April 30, 2007	8:00 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2: Travelling straight ahead	V1: Not reported / V2: Not reported	V1: Not reported / V2: Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear		Rte 16 / Rte 16								
233284	WATERTOWN	Tuesday, July 10, 2007	5:30 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2: Not reported	V1: Eastbound / V2: Not reported	V1: Not reported / V2: Not reported	V1: Passenger car / V2: Not reported	Dry	Daylight	Clear		MOUNT AUBURN STREET / MOUNT AUBURN STREET								
233089	WATERTOWN	Thursday, September 06, 2007	6:45 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2: Travelling straight ahead	V1: Not reported / V2: Not reported	V1: Not reported / V2: Not reported	V1: Not reported / V2: Not reported	Dry	Dusk	Clear		MOUNT AUBURN STREET Rte 16 Rte 16								
237968	WATERTOWN	Friday, September 07, 2007	8:30 AM	Property damage only (none injured)	2	0	0	Not reported	V1: Slowing or stopped in traffic / V2: Not reported	V1: Southbound / V2: Not reported	V1: Not reported / V2: Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear		MOUNT AUBURN STREET / Rte 16								
230264	WATERTOWN	Tuesday, October 16, 2007	10:00 AM	Not Reported	3	0	0	Angle	V1: Travelling straight ahead / V2: Turning left	V1: Eastbound / V2: Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2: Unknown heavy truck, motor classify	Wet	Daylight	Rain		MOUNT AUBURN STREET Rte 16 Rte 16								
240910	WATERTOWN	Tuesday, November 13, 2007	5:45 AM	Not Reported	2	0	0	Sideways, same direction	V1: Other / V2: Not reported	V1: Not reported / V2: Not reported	V1: Not reported / V2: Not reported	V1: Passenger car / V2: Passenger car	Dry	Dusk	Clear		MOUNT AUBURN STREET								
2170819	WATERTOWN	Monday, March 26, 2007	3:19 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2: Travelling straight ahead	V1: Southbound / V2: Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2: Light truck, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Wet	Daylight	Cloudy/Rain	ARLINGTON STREET / ARLINGTON STREET	228270.87508569	902450.437361405							
218662	WATERTOWN	Monday, June 04, 2007	4:23 AM	Non-fatal injury	2	2	0	Angle	V1: Travelling straight ahead / V2: Travelling straight ahead	V1: Eastbound / V2: Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2: Light truck, mini-van, panel, pickup, sport utility with only four tires	Wet	Dark - lighted roadway	Rain	ARLINGTON STREET / Rte 16 E / ARLINGTON STREET	228270.87508573	902450.437361412							
232496	WATERTOWN	Wednesday, August 08, 2007	5:30 AM	Property damage only (none injured)	2	0	0	Sideways, same direction	V1: Travelling straight ahead / V2: Leaving traffic lane	V1: Southbound / V2: Southbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2: Passenger car	Dry	Daylight	Clear	ARLINGTON STREET / ARLINGTON STREET	228270.87508573	902450.437361412							
2351618	WATERTOWN	Monday, September 03, 2007	2:40 AM	Non-fatal injury	2	2	0	Rear-end	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: Northbound / V2: Northbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2: Passenger car	Dry	Daylight	Clear		300 feet N from Intersection 300 ARLINGTON STREET / MOUNT AUBURN STREET	232521.416948701	902527.22863596						
2324862	WATERTOWN	Wednesday, October 24, 2007	6:35 AM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2: Travelling straight ahead	V1: Southbound / V2: Westbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2: Light truck, mini-van, panel, pickup, sport utility with only four tires	Dry	Dawn	Cloudy	ARLINGTON STREET / MOUNT AUBURN STREET	228270.87508573	902450.437361412							
2320268	WATERTOWN	Thursday, October 25, 2007	8:30 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: Not reported / V2: Not reported	V1: Not reported / V2: Not reported	V1: Passenger car / V2: Passenger car	Wet	Daylight	Clear		MOUNT AUBURN STREET / ARLINGTON STREET	228270.87508573	902450.437361412						
2345367	WATERTOWN	Wednesday, November 07, 2007	4:15 PM	Property damage only (none injured)	2	0	0	Angle	V1: Turning left / V2: Turning left	V1: Westbound / V2: Southbound	V1: Not reported / V2: Not reported	V1: Light truck, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Dry	Daylight	Clear		MOUNT AUBURN STREET / ARLINGTON STREET	228270.87508573	902450.437361412						
226516	WATERTOWN	Friday, December 28, 2007	7:12 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1: Southbound	V1: Collision with light pole or other post/support	V1: Passenger car	Ice	Daylight	Clear		300 feet N from Intersection ARLINGTON STREET / MOUNT AUBURN STREET	232521.416948701	902527.22863596						
2227638	WATERTOWN	Monday, August 27, 2007	7:11 AM	Property damage only (none injured)	2	0	0	Angle	V1: Backing / V2: Travelling straight ahead	V1: Southbound / V2: Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Dry	Daylight	Clear	810 MOUNT AUBURN STREET	228277.00008550	902691.28889571							
2228564	WATERTOWN	Wednesday, September 12, 2007	6:22 PM	Property damage only (none injured)	2	0	0	Not reported	V1: Backing / V2: Parked	V1: Westbound / V2: Not reported	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Not reported	Not reported	Not reported	820 MOUNT AUBURN STREET	228237.73768751	902665.89227865							
2173159	WATERTOWN	Friday, April 06, 2007	11:04 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2: Turning left	V1: Eastbound / V2: Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Dry	Dark - lighted roadway	Clear	BOYLSTON STREET / MOUNT AUBURN STREET Rte 16	228270.87508573	902450.437361412							
2162211	WATERTOWN	Tuesday, February 20, 2007	6:56 PM	Non-fatal injury	2	1	0	Rear-end	V1: Changing lanes / V2: Travelling straight ahead	V1: Eastbound / V2: Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2: Passenger car	Wet	Dark - lighted roadway	Clear		161 MOUNT AUBURN STREET / Rte 16	226551.08364768	90204.99924143						
2226265	WATERTOWN	Sunday, November 18, 2007	4:57 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Other	V1: Eastbound	V1: Collision with light pole or other post/support	V1: Passenger car	Dry	Dark - lighted roadway	Clear		161 MOUNT AUBURN STREET	226551.08364768	90204.99924143						
2403255	WATERTOWN	Monday, April 16, 2007	10:00 AM	Not Reported	1	0	0	Sideways, same direction	V1: Parked	V1: Not reported	V1: Not reported	V1: Light truck, mini-van, panel, pickup, sport utility with only four tires	Wet	Daylight	Rain		MOUNT AUBURN STREET Rte 16 / COMMON STREET	226498.797001921	902013.437681004						
2184154	WATERTOWN	Saturday, May 05, 2007	8:47 AM	Non-fatal injury	2	2	0	Rear-end	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1: Westbound / V2: Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2: Passenger car	Dry	Daylight	Clear		MOUNT AUBURN STREET / COMMON STREET	226498.797001918	902013.437681004						
2362070	WATERTOWN	Wednesday, October 24, 2007	9:25 AM	Property damage only (none injured)	2	0	0	Sideways, same direction	V1: Travelling straight ahead / V2: Changing lanes	V1: Eastbound / V2: Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2: Passenger car	Dry	Daylight	Clear		MOUNT AUBURN STREET Rte 16 / COMMON STREET	226498.797001921	902013.437681004						
2367631	WATERTOWN	Thursday, December 13, 2007	3:30 PM	Non-fatal injury	2	1	0	Rear-end	V1: Slowing or stopped in traffic / V2: Not reported	V1: Westbound / V2: Eastbound	V1: Not reported / V2: Not reported	V1: Light truck, mini-van, panel, pickup, sport utility with only four tires	Snow	Dusk	Snow		MOUNT AUBURN STREET / COMMON STREET	226498.797001921	902013.437681004						
2221620	WATERTOWN	Thursday, August 09, 2007	6:32 AM	Property damage only (none injured)	3	0	0	Rear-to-rear	V1: Travelling straight ahead / V2: Travelling straight ahead / V3: Travelling straight ahead	V1: Westbound / V2: Westbound / V3: Not reported	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic	V1: Not reported / V2: Not reported / V3: Not reported	Dry	Daylight	Cloudy		MOUNT AUBURN STREET / COTTAGE STREET	228099.40287932	902679.250161622						
2283820	WATERTOWN	Wednesday, March 21, 2007	1:30 AM	Not Reported	2	0	0	Not reported	V1: Parked / V2: Not reported	V1: Not reported / V2: Westbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2: Single-stir truck (2-axle, 6-tires)	Dry	Daylight	Clear		MOUNT AUBURN STREET / ELTON AVENUE	226290.720291409	902260.326257392						
2348409	WATERTOWN	Saturday, October 27, 2007	11:50 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2: Turning left	V1: Eastbound / V2: Northbound	V1: Not reported / V2: Not reported	V1: Not reported / V2: Not reported	Wet	Daylight	Cloudy/Rain		MOUNT AUBURN STREET / ELTON AVENUE	226292.720291409	902260.326257392						
2141031	WATERTOWN	Saturday, January 06, 2007	2:01 PM	Non-fatal injury	2	1	0	Rear-end	V1: Turning right / V2: Overtaking/passing	V1: Not reported / V2: Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2: Passenger car	Dry	Daylight	Clear		1 GROVE STREET	228349.951002775	902370.265713423						
2140998	WATERTOWN	Sunday, January 14, 2007	6:08 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2: Turning left	V1: Southbound / V2: Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2: Passenger car	Wet	Dusk	Rain/Steel, hail (freezing rain or drizzle)	268 ARLINGTON STREET	228332.702481283	902281.197226944							
2143338	WATERTOWN	Thursday, January 18, 2007	4:13 PM	Property damage only (none injured)	1	0	0	Sideways, opposite direction	V1: Slowing or stopped in traffic	V1: Southbound	V1: Collision with pedestrian	V1: Not made for 7-15 people, including driver	Dry	Daylight	Clear		268 ARLINGTON STREET	228347.01244768	902292.303645415						
2302538	WATERTOWN	Thursday, December 20, 2007	2:27 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1: Eastbound	V1: Collision with light pole or other post/support	V1: Passenger car	Snow	Dark - lighted roadway	Steel, hail (freezing rain or drizzle)		80 feet S from Intersection MOUNT AUBURN STREET Rte 16 / BOYLSTON STREET	227783.11543810	902268.746025274						
2300404	WATERTOWN	Monday, March 26, 2007	3:30 AM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2: Not reported	V1: Eastbound / V2: Not reported	V1: Not reported / V2: Not reported	V1: Light truck, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Dry	Daylight	Rain		501 MOUNT AUBURN STREET	227779.71339601	902299.810214861						
2184130	WATERTOWN	Friday, April 27, 2007	5:27 PM	Non-fatal injury	2	2	0	Not reported	V1: Travelling straight ahead / V2: Not reported	V1: Eastbound / V2: Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Unknown	Daylight	Cloudy/Rain		MOUNT AUBURN STREET / PALFREY STREET	226372.11721800	901934.500080925						
237964	WATERTOWN	Thursday, October 11, 2007	8:56 AM	Non-fatal injury	2	1	0	Rear-end	V1: Slowing or stopped in traffic / V2: Unknown	V1: Eastbound / V2: Westbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2: Passenger car	Unknown	Daylight	Cloudy		106 MOUNT AUBURN STREET	228372.80886225	901934.946358741						
2364100	WATERTOWN	Friday, May 04, 2007	7:30 PM	Not Reported	2	0	0	Sideways, same direction	V1: Travelling straight ahead / V2: Changing lanes	V1: Eastbound / V2: Eastbound	V1: Not reported / V2: Not reported	V1: Not reported / V2: Not reported	Dry	Dusk	Clear		825 MOUNT AUBURN STREET	228168.79962406	902360.52514546						
2190765	WATERTOWN	Thursday, May 24, 2007	7:33 PM	Property damage only (none injured)	2	0	0	Angle	V1: Entering traffic lane / V2: Slowing or stopped in traffic	V1: Southbound / V2: Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2: Light truck, mini-van, panel, pickup, sport utility with only four tires	Dry	Dusk	Clear		KIMBALL ROAD / MOUNT AUBURN STREET	228184.70292492	902376.68745431						
2214188	WATERTOWN	Saturday, July 28, 2007	3:29 PM	Non-fatal injury	2	1	0	Angle	V1: Travelling straight ahead / V2: Travelling straight ahead	V1: Westbound / V2: Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2: Passenger car	Dry	Daylight	Rain		MOUNT AUBURN STREET Rte 16 W / BIGELOW AVENUE	228184.70292492	902376.68745431						
237950	WATERTOWN	Saturday, August 11, 2007	10:30 AM	Property damage only (none injured)	2	0	0	Sideways, same direction	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: Westbound / V2: Northbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2: Not reported	Dry	Daylight	Clear		BIGELOW AVENUE / MOUNT AUBURN STREET	228184.70292492	902376.68745431						
2371036	WATERTOWN	Friday, October 05, 2007	7:30 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Turning left / V2: Turning left	V1: Eastbound / V2: Eastbound	V1: Not reported / V2: Not reported	V1: Light truck, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Dry	Daylight	Clear		MOUNT AUBURN STREET Rte 16 BIGELOW AVENUE	228184.70292492	902376.68745431						
2327249	WATERTOWN	Monday, December 03, 2007	4:15 PM	Property damage only (none injured)	2	0	0	Sideways, opposite direction	V1: Travelling straight ahead / V2: Turning left	V1: Westbound / V2: Eastbound	V1: Not reported / V2: Not reported	V1: Not reported / V2: Not reported	Snow	Daylight	Steel, hail (freezing rain or drizzle)		MOUNT AUBURN STREET / KIMBALL ROAD	228184.70292492	902376.68745431						
2140977	WATERTOWN	Monday, January 15, 2007	11:28 AM	Property damage only (none injured)	1	0	0	Angle	V1: Travelling straight ahead	V1: Westbound	V1: Collision with utility pole	V1: Passenger car	Wet	Daylight	Cloudy/Rain		MOUNT AUBURN STREET / LANGKON AVENUE	227738.746899073	902211.582481276						
2246180	WATERTOWN	Sunday, October 28, 2007	3:13 AM	Property damage only (none injured)	2	0	0	Sideways, same direction	V1: Travelling straight ahead / V2: Not reported	V1: Eastbound / V2: Not reported	V1: Collision with motor vehicle in traffic / V2: Not reported	V1: Passenger car / V2: Not reported	Dry	Dark - lighted roadway	Clear/Unknown		480 MOUNT AUBURN STREET	227698.194291545	902318.959584420						



MassDOT Crash Report for WATERTOWN in the year 2007

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Injured	Total Fatal Injured	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Hazardous Events	Vehicle Configuration	Road Surface Condition	ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Roadmarker	Distance from Nearest Etc.	Distance from Nearest Landmark	Non Motorist Type	X Coordinate	Y Coordinate		
2216918	WATERTOWN	Saturday, April 14, 2007	2:30 PM	Non-fatal injury	2	1	0	Rear-end	V1: Travelling straight ahead / V2:Turning left	V1:Eastbound / V2:Northbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck/van, mini-van, panel pickup, sport utility with only four tires	Dry	Daylight	Clear	MOUNT ALBURN STREET / Rte 16 / MELINDY AVENUE						228469.207696382	60276.37470648		
2187772	WATERTOWN	Sunday, June 11, 2007	10:20 PM	Non-fatal injury	2	1	0	Rear-end	V1: Travelling straight ahead / V2:Turning left	V1:Southbound / V2:Southbound	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic	V1: Not reported / V2: Not reported	Dry	Dark - lighted roadway	Cloudy/Rain		216 ARLINGTON STREET						228349.48846151	602209.41426187	
2236351	WATERTOWN	Saturday, October 06, 2007	4:11 PM	Non-fatal injury	2	2	0	Angle	V1: Turning left / V2:Travelling straight ahead	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear/Other		321 ARLINGTON STREET / MERRIFIELD AVENUE						228347.687371641	602254.62500628	
2245964	WATERTOWN	Monday, October 15, 2007	4:58 PM	Property damage only (phone damaged)	2	0	0	Rear-end	V1: Backing / V2:Slowing or stopped in traffic	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear	MERRIFIELD AVENUE / ARLINGTON STREET							228347.687371641	602254.62500628	
2227661	WATERTOWN	Monday, April 09, 2007	10:15 AM	Property damage only (phone damaged)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Turning left	V1:Southbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Single- unit truck (2-axle, 6-tire)	Dry	Daylight	Clear	MOUNT ALBURN STREET / NORSEMAN AVENUE							228286.29677864	602027.75129577	
2274100	WATERTOWN	Saturday, March 03, 2007	8:35 AM	Non-fatal injury	2	1	0	Not reported	V1: Slowing or stopped in traffic / V2:Not reported	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car	Unknown	Daylight	Rain	PARKER STREET / MOUNT ALBURN STREET / Rte 16							228467.921865895	601998.437616989	
233701	WATERTOWN	Wednesday, February 21, 2007	6:30 AM	Non-fatal injury	2	1	0	Not reported	V1: Travelling straight ahead / V2:Turning right	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck/van, mini-van, panel, pickup, sport utility with only four tires	Unknown	Dark - lighted roadway	Clear	MOUNT ALBURN STREET / PATTEN STREET							228296.656201705	601845.812464848	
2340568	WATERTOWN	Monday, September 03, 2007	3:30 AM	Non-fatal injury	2	1	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck/van, mini-van, panel, pickup, sport utility with only four tires	Dry	Daylight	Clear	MOUNT ALBURN STREET / Rte 16 / PHILLIPS STREET							228410.406346837	601960.002403952	
2225699	WATERTOWN	Monday, November 26, 2007	5:36 PM	Property damage only (phone damaged)	2	0	0	Angle	V1: Turning left / V2:Travelling straight ahead	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Bus seats for more than 15 people (including driver)	Wet	Dark - lighted roadway	Rain/Cloudy	MOUNT ALBURN STREET / PETER TERRACE								228649.687499925	602065.937265602
2261117	WATERTOWN	Sunday, October 28, 2007	5:27 PM	Property damage only (phone damaged)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Dry	Dusk	Clear/Unknown		368 MOUNT ALBURN STREET							227230.044126317	602221.733430515
2181986	WATERTOWN	Thursday, March 08, 2007	8:05 PM	Non-fatal injury	2	1	0	Angle	V1: Travelling straight ahead / V2:Turning left	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Not reported	Dry	Dark - lighted roadway	Cloudy	MOUNT ALBURN STREET / RUSSELL AVENUE								228468.062346058	602039.187897022
2246077	WATERTOWN	Saturday, October 27, 2007	4:04 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with tree	V1: Passenger car	Wet	Dark - lighted roadway	Rain		200 feet E from Intersection 206 MOUNT ALBURN STREET / RUSSELL AVENUE							228708.718899736	602005.410219320
2173155	WATERTOWN	Friday, April 06, 2007	5:24 PM	Property damage only (phone damaged)	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck/van, mini-van, panel, pickup, sport utility with only four tires / V2:Light truck/van, mini-van, panel, pickup, sport utility with only four tires	Dry	Daylight	Cloudy	SCHOOL STREET / MOUNT ALBURN STREET								227590.300730995	602288.62481255
2265512	WATERTOWN	Thursday, August 30, 2007	8:20 AM	Not Reported	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck/van, mini-van, panel, pickup, sport utility with only four tires	Dry	Daylight	Clear	SCHOOL STREET / MOUNT ALBURN STREET								227590.300730940	602288.62481240
2248312	WATERTOWN	Friday, November 02, 2007	3:40 PM	Property damage only (phone damaged)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck/van, mini-van, panel, pickup, sport utility with only four tires	Dry	Daylight	Clear/Cloudy	SCHOOL STREET / MOUNT ALBURN STREET								227590.300730940	602288.62481240
2297115	WATERTOWN	Monday, July 09, 2007	5:38 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Backlift	V1: Motorcycle	Dry	Daylight	Clear	MOUNT ALBURN STREET / SPRUCE STREET								227344.90644234	602212.75006189
2241117	WATERTOWN	Thursday, October 11, 2007	12:26 PM	Not Reported	2	0	0	Angle	V1: Parked / V2:Turning right	V1:Not reported / V2:Not reported	V1: Collision with parked motor vehicle	V1: Passenger car / V2:Single- unit truck (2-axle, 6-tire)	Wet	Daylight	Cloudy	SPRUCE STREET / MOUNT ALBURN STREET								227344.90644234	602212.75006189
2140594	WATERTOWN	Monday, January 15, 2007	10:42 AM	Property damage only (phone damaged)	2	0	0	Angle	V1: Turning left / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Wet	Daylight	Cloudy/Rain	MOUNT ALBURN STREET / STEARNS ROAD								227179.812295652	602324.748909195
2283987	WATERTOWN	Saturday, February 10, 2007	1:16 AM	Property damage only (phone damaged)	2	0	0	Sideways, opposite direction	V1: Turning left / V2:Slowing or stopped in traffic	V1:Southbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck/van, mini-van, panel, pickup, sport utility with only four tires	Dry	Daylight	Clear	MOUNT ALBURN STREET / SUMMER STREET								228215.437257655	601812.312304817
2168743	WATERTOWN	Wednesday, March 21, 2007	8:15 AM	Property damage only (phone damaged)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck/van, mini-van, panel, pickup, sport utility with only four tires / V2:Passenger car	Dry	Daylight	Clear	MOUNT ALBURN STREET / SUMMER STREET								228215.437257654	601812.312304811
2403520	WATERTOWN	Friday, April 20, 2007	5:41 AM	Property damage only (phone damaged)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear		43 MOUNT ALBURN STREET / Rte 16							228189.068680720	601800.33122148
2313366	WATERTOWN	Thursday, May 31, 2007	7:50 AM	Property damage only (phone damaged)	2	0	0	Angle	V1: Travelling straight ahead / V2:Turning left	V1:Eastbound / V2:Westbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car	Dry	Daylight	Cloudy		63 MOUNT ALBURN STREET / Rte 16							228240.410511771	601827.264412226
2339469	WATERTOWN	Friday, June 08, 2007	8:00 AM	Property damage only (phone damaged)	2	0	0	Rear-end	V1: Turning right / V2:Turning left	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear		SUMMER STREET / MOUNT ALBURN STREET							228215.437257655	601812.312304817
2020952	WATERTOWN	Saturday, June 23, 2007	12:10 PM	Property damage only (phone damaged)	2	0	0	Sideways, same direction	V1: Travelling straight ahead / V2:Turning left	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear/Other		49 MOUNT ALBURN STREET							228209.887456376	601809.543402720
2281937	WATERTOWN	Friday, September 07, 2007	7:40 PM	Property damage only (phone damaged)	2	0	0	Not reported	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car	Dry	Dark - lighted roadway	Clear		MOUNT ALBURN STREET / SUMMER STREET							228215.437257655	601812.312304817
2347880	WATERTOWN	Tuesday, September 11, 2007	6:55 PM	Property damage only (phone damaged)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Not reported	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car	Wet	Dusk	Rain		20 feet W from Intersection 43 MOUNT ALBURN STREET / Rte 16							228189.068680720	601800.33122148
2246084	WATERTOWN	Tuesday, October 23, 2007	7:34 PM	Property damage only (phone damaged)	2	0	0	Rear-end	V1: Turning left / V2:Slowing or stopped in traffic	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Dry	Dark - lighted roadway	Cloudy		50 feet E from Intersection 75 MOUNT ALBURN STREET / SUMMER STREET							228228.489878991	601820.179438278
2307250	WATERTOWN	Monday, December 03, 2007	4:25 PM	Property damage only (phone damaged)	2	0	0	Not reported	V1: Travelling straight ahead / V2:Turning left	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car	Wet	Dusk	Cloudy		MOUNT ALBURN STREET / SUMMER STREET							228215.437257655	601812.312304817
0234834	WATERTOWN	Sunday, April 22, 2007	12:20 PM	Property damage only (phone damaged)	2	0	0	Sideways, same direction	V1: Parked / V2:Not reported	V1:Not reported / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear		645 MOUNT ALBURN STREET							228212.024678664	602404.637367248
2214426	WATERTOWN	Wednesday, August 01, 2007	5:14 PM	Non-fatal injury	1	1	0	Angle	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with cyclist (bicycle, tricycle, unicycle, sled) car	V1: Passenger car	Dry	Daylight	Clear/Unknown		MOUNT ALBURN STREET / DEXTER AVENUE							227969.265611291	602259.75129234
2214434	WATERTOWN	Wednesday, August 01, 2007	5:57 PM	Not Reported	2	0	0	Angle	V1: Backing / V2:Parked	V1:Westbound / V2:Not reported	V1: Collision with other vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear		568 MOUNT ALBURN STREET / Rte 16 / Rte 16							228219.070964022	602261.695026202
2190226	WATERTOWN	Saturday, May 26, 2007	1:01 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with tree	V1: Light truck/van, mini-van, panel, pickup, sport utility with only four tires	Dry	Daylight	Clear		524 MOUNT ALBURN STREET / Rte 16 W							228294.90075955	602134.884169220
2348469	WATERTOWN	Thursday, May 03, 2007	7:36 AM	Non-fatal injury	2	1	0	Angle	V1: Travelling straight ahead / V2:Turning left	V1:Eastbound / V2:Westbound	V1: Not reported / V2: Not reported	V1: Not reported / V2: Not reported	Dry	Daylight	Clear		MOUNT ALBURN STREET / WINTHROP STREET							227385.515466750	602220.562073196



MassDOT Crash Report for WATERTOWN for the year 2008

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	RM Reported Injuries	Fatal Injuries	Minor Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Direction	Most Harmful Events	Vehicle Configuration	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Interchange	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type	K Coordinate	V Coordinate	
239896	WATERTOWN	Tuesday, June 17, 2008	12:46 PM	Property damage only (none injured)	2	0	0	0	Rear-to-rear	V1: Parked / V2 Backing	V1:Northbound / V2:Northbound	V1: Collision with parked motor vehicle / V2: Collision with parked motor vehicle	V1: Passenger car / V2: Single-unit truck (2 axle, 6 tire)	Dry	Daylight	Clear		MELENDY AVENUE / MOUNT ALBURN STREET				Pedestrian	228029.2871	902275.3748	
243150	WATERTOWN	Thursday, June 19, 2008	11:57 AM	Fatal injury	1	0	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with pedestrian	V1: Single-unit truck (3-or-more axles)	Dry	Daylight	Clear		MOUNT ALBURN STREET				Pedestrian	228035.2873	902595.2865	
237704	WATERTOWN	Friday, June 20, 2008	4:06 PM	Property damage only (none injured)	2	0	0	0	Rear-end	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear/Other		MOUNT ALBURN STREET / DANLEY ROAD / STEARNS ROAD						228462.6861	901995.0758
260392	WATERTOWN	Sunday, June 22, 2008	3:03 PM	Property damage only (none injured)	2	0	0	0	Rear-end	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck/van, minivan, panel, pickup, sport utility with only four tires	Dry	Daylight	Cloudy		MOUNT ALBURN STREET / DANLEY ROAD / STEARNS ROAD						227255.1874	902223.3126
2343628	WATERTOWN	Thursday, June 26, 2008	5:55 PM	Property damage only (none injured)	2	0	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Dry	Daylight	Cloudy		MOUNT ALBURN STREET / DANLEY ROAD / STEARNS ROAD						227869.8439	902275.7501
261828	WATERTOWN	Sunday, June 29, 2008	11:00 AM	Not Reported	1	0	0	0	Not Reported	V1: Parked	V1:Westbound	V1: Not reported	V1: Passenger car	Dry	Dark - lighted roadway	Clear		808 MOUNT ALBURN STREET Rte.16						228143.5917	902334.8201
2343682	WATERTOWN	Wednesday, July 09, 2008	9:55 AM	Property damage only (none injured)	2	0	0	0	Rear-end	V1: Travelling straight ahead / V2:Turning right	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck/van, minivan, panel, pickup, sport utility with only four tires	Dry	Daylight	Clear		MOUNT ALBURN STREET						226209.5189	901808.3702
247518	WATERTOWN	Wednesday, July 16, 2008	8:30 AM	Property damage only (none injured)	2	0	0	0	Unknown	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Westbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear		SCHOOL STREET / MOUNT ALBURN STREET						227590.3007	902288.6240
2349392	WATERTOWN	Monday, July 21, 2008	4:27 PM	Non-fatal injury	2	1	0	0	Head-on	V1: Turning left / V2:Changing lane	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Unknown heavy truck, cannot classify / V2:Passenger car	Wet	Daylight	Cloudy/Rain		MOUNT ALBURN STREET / PARKER STREET						228467.9219	901998.4378
2475071	WATERTOWN	Monday, July 21, 2008	8:40 AM	Property damage only (none injured)	2	0	0	0	Head-on	V1: Parked / V2:Turning left	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck/van, minivan, panel, pickup, sport utility with only four tires	Dry	Daylight	Clear		569 MOUNT ALBURN STREET						228018.9029	902261.6848
2349404	WATERTOWN	Thursday, July 24, 2008	8:02 AM	Property damage only (none injured)	2	0	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck/van, minivan, panel, pickup, sport utility with only four tires	Wet	Daylight	Rain/Cloudy		MOUNT ALBURN STREET / WINTHROP STREET						227365.5155	902220.5627
230633	WATERTOWN	Friday, July 25, 2008	1:48 PM	Non-fatal injury	2	1	0	0	Angle	V1: Turning left / V2:Travelling straight ahead	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Not reported / V2:Not reported	Dry	Daylight	Clear		MOUNT ALBURN STREET / DEXTER AVENUE						227369.2856	902259.7501
236507	WATERTOWN	Monday, August 04, 2008	10:46 AM	Property damage only (none injured)	2	0	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck/van, minivan, panel, pickup, sport utility with only four tires	Dry	Daylight	Clear		COMMON STREET / MOUNT ALBURN STREET						226498.737	902013.4377
249077	WATERTOWN	Monday, August 04, 2008	9:00 AM	Property damage only (none injured)	2	0	0	0	Sideswipe, same direction	V1: Travelling straight ahead / V2:Turning right	V1:Eastbound / V2:Not reported	V1: Not reported / V2: Not reported	V1: Light truck/van, minivan, panel, pickup, sport utility with only four tires / V2:Passenger car	Dry	Daylight	Clear		MOUNT ALBURN STREET / BIGELOW AVENUE						228184.7029	902376.6872
2497619	WATERTOWN	Thursday, August 21, 2008	9:50 AM	Property damage only (none injured)	2	0	0	0	Angle	V1: Travelling straight ahead / V2:Not reported	V1:Westbound / V2:Not reported	V1: Not reported / V2: Not reported	V1: Collision with other fixed object (wall, building, tunnel, etc.)	Dry	Daylight	Clear		MOUNT ALBURN STREET / SUMMER STREET						228215.4373	901812.3123
2371967	WATERTOWN	Friday, August 22, 2008	10:39 AM	Non-fatal injury	1	1	0	0	Single vehicle crash	V1: Backing	V1:Southbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)	V1: Passenger car	Dry	Daylight	Clear		MOUNT ALBURN STREET						227226.4071	902223.8597
2371973	WATERTOWN	Friday, August 22, 2008	5:17 PM	Non-fatal injury	2	1	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear		MOUNT ALBURN STREET / DEXTER AVENUE						227369.2856	902259.7501
2475470	WATERTOWN	Saturday, August 23, 2008	1:00 AM	Property damage only (none injured)	2	0	0	0	Sideswipe, same direction	V1: Other / V2:Not reported	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear		SANT MARY STREET / MOUNT ALBURN STREET						228610.7033	902638.1248
2372005	WATERTOWN	Friday, August 29, 2008	11:50 AM	Non-fatal injury	3	1	0	0	Sideswipe, opposite direction	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in traffic	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck/van, minivan, panel, pickup, sport utility with only four tires	Dry	Daylight	Clear		MOUNT ALBURN STREET / MARSHALL STREET						228434.0157	901976.7498
2371977	WATERTOWN	Sunday, August 31, 2008	9:15 PM	Non-fatal injury	1	5	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with tree	V1: Passenger car	Dry	Dark - lighted roadway	Clear		MOUNT ALBURN STREET Rte.16 W / KEEMAN STREET				Pedestrian / P2-Pedestrian / P3-Pedestrian / P4-Pedestrian	228424.9062	902540.3748	
2504586	WATERTOWN	Wednesday, September 03, 2008	8:40 PM	Non-fatal injury	2	1	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Not reported / V2: Not reported	V1: Not reported / V2:Passenger car	Dry	Daylight	Clear		ARLINGTON STREET / WELLS AVENUE						228345.4054	902331.0629
2371994	WATERTOWN	Friday, September 05, 2008	9:28 AM	Property damage only (none injured)	2	0	0	0	Angle	V1: Turning left / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear		MOUNT ALBURN STREET / SUMMER STREET						228215.4373	901812.3123
2372043	WATERTOWN	Wednesday, September 10, 2008	3:19 PM	Property damage only (none injured)	2	0	0	0	Angle	V1: Travelling straight ahead / V2:Turning left	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Truck/trailer	Dry	Daylight	Clear		MOUNT ALBURN STREET / PARKER STREET						228467.9219	901998.4378
2372030	WATERTOWN	Friday, September 12, 2008	2:19 PM	Property damage only (none injured)	2	0	0	0	Angle	V1: Backing / V2:Parked	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Not reported	Dry	Daylight	Clear		MOUNT ALBURN STREET						227478.0541	902259.0820
2384472	WATERTOWN	Friday, September 26, 2008	9:33 PM	Non-fatal injury	2	1	0	0	Angle	V1: Travelling straight ahead / V2:Turning left	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Wet (slippery, moving)	Dusk	Cloudy/Rain		MOUNT ALBURN STREET / BOYLSTON STREET						227774.2499	902300.9999
2498786	WATERTOWN	Sunday, September 28, 2008	9:42 PM	Property damage only (none injured)	2	0	0	0	Sideswipe, same direction	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Light truck/van, minivan, panel, pickup, sport utility with only four tires / V2:Not reported	Not reported	Daylight	Cloudy		BIGELOW AVENUE / MOUNT ALBURN STREET						228184.7029	902376.6872
2384461	WATERTOWN	Friday, October 03, 2008	9:28 AM	Property damage only (none injured)	1	0	0	0	Single vehicle crash	V1: Changing lanes	V1:Westbound	V1: Other	V1: Passenger car	Dry	Daylight	Clear		MOUNT ALBURN STREET						228140.1543	902331.0341
2475276	WATERTOWN	Wednesday, October 15, 2008	8:50 AM	Property damage only (none injured)	2	0	0	0	Rear-end	V1: Turning left / V2:Turning left	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported	V1: Light truck/van, minivan, panel, pickup, sport utility with only four tires / V2:Passenger car	Dry	Daylight	Clear		Rte.16 / Rte.16							
2301938	WATERTOWN	Tuesday, October 21, 2008	8:09 PM	Non-fatal injury	2	1	0	0	Angle	V1: Turning left / V2:Travelling straight ahead	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Wet	Dark - lighted roadway	Cloudy/Rain		MOUNT ALBURN STREET / IRVING STREET						228353.8095	901920.2501
2488992	WATERTOWN	Saturday, October 25, 2008	2:30 PM	Property damage only (none injured)	2	0	0	0	Sideswipe, same direction	V1: Travelling straight ahead / V2:Not reported	V1:Southbound / V2:Not reported	V1: Not reported / V2: Not reported	V1: Unknown heavy truck, cannot classify / V2:Light truck/van, minivan, panel, pickup, sport utility with only four tires	Dry	Daylight	Clear		MOUNT ALBURN STREET Rte.16 / ELTON AVENUE / LLOYD ROAD						228002.7293	902290.3263
2301929	WATERTOWN	Tuesday, October 28, 2008	8:48 PM	Unknown	2	0	0	0	Rear-end	V1: Parked / V2:Other	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with parked motor vehicle	V1: Passenger car / V2:Passenger car	Wet	Dark - lighted roadway	Rain		341 MOUNT ALBURN STREET						227226.4071	902223.8597
2519110	WATERTOWN	Tuesday, October 28, 2008	2:30 AM	Non-fatal injury	2	1	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Not reported / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck/van, minivan, panel, pickup, sport utility with only four tires	Wet	Daylight	Cloudy		MOUNT ALBURN STREET / PARKER STREET						228467.9219	901998.4378
2301917	WATERTOWN	Friday, October 31, 2008	11:34 AM	Property damage only (none injured)	2	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear		MOUNT ALBURN STREET / KIMBALL ROAD					Pedestrian	228184.7029	902376.6872
2301909	WATERTOWN	Tuesday, November 04, 2008	9:30 AM	Property damage only (none injured)	2	0	0	0	Sideswipe, same direction	V1: Changing lanes / V2:Travelling straight ahead	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck/van, minivan, panel, pickup, sport utility with only four tires / V2:Passenger car	Dry	Daylight	Clear		MOUNT ALBURN STREET / IRMA AVENUE						228133.3283	902324.5002
2301908	WATERTOWN	Tuesday, November 04, 2008	11:36 AM	Property damage only (none injured)	1	0	0	0	Single vehicle crash	V1: Slowing or stopped in traffic	V1:Westbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)	V1: Passenger car	Dry	Daylight	Clear		MOUNT ALBURN STREET / KIMBALL ROAD						228184.7029	902376.6872
2488248	WATERTOWN	Friday, November 07, 2008	2:36 PM	Property damage only (none injured)	2	0	0	0	Not reported	V1: Turning left / V2:Not reported	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported	V1: Not reported / V2:Not reported	Dry	Daylight	Clear		ARTS&H STREET / BIGELOW AVENUE / MOUNT ALBURN STREET						228184.7029	902376.6872
2621572	WATERTOWN	Friday, November 14, 2008	7:55 AM	Property damage only (none injured)	2	0	0	0	Rear-end	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Not reported / V2:Not reported	Dry	Daylight	Cloudy		MOUNT ALBURN STREET / ELTON AVENUE						228090.7293	902290.3263
2483274	WATERTOWN	Tuesday, November 18, 2008	4:30 PM	Property damage only (none injured)	2	0	0	0	Not reported	V1: Parked / V2:Not reported	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported	V1: Not reported / V2:Not reported	Dry	Daylight	Clear		KIMBALL ROAD / MOUNT ALBURN STREET						228184.7029	902376.6872
2402926	WATERTOWN	Wednesday, November 19, 2008	9:33 PM	Non-fatal injury	2	1	0	0	Angle	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Dry	Dark - lighted roadway	Clear		MOUNT ALBURN STREET / IRMA AVENUE						228133.3283	902324.5002
2469965	WATERTOWN	Friday, November 28, 2008	1:20 AM	Property damage only (none injured)	2	0	0	0	Angle	V1: Travelling straight ahead / V2:Turning left	V1:Northbound / V2:Westbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Not reported	Wet	Daylight	Clear		MOUNT ALBURN STREET Rte.16						228202.8751	902450.4374



MassDOT Crash Report for WATERTOWN for the year 2008

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	RM Reported Injuries	FM Reported Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Direction	Most Harmful Events	Vehicle Configuration	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Roadway Intersection	X Coordinate	Y Coordinate
244973	WATERTOWN	Friday, November 28, 2008	12:24 PM	Property damage only (none injured)	3	0	0	Rear-end	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Unknown	V1: Southbound / V2: Eastbound / V3: Eastbound	V1: Not reported / V2: Not reported / V3: Not reported	V1: Passenger car / V2: Passenger car / V3: Light truck/van, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Wet	Daylight	Rain	MOUNT AUBURN STREET / COMMON STREET							256498.797	902013.4377
2405246	WATERTOWN	Sunday, November 30, 2008	9:31 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2: Travelling straight ahead	V1: Westbound / V2: Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck/van, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Wet	Dark - lighted roadway	Rain		150 feet E from Intersection / MOUNT AUBURN STREET / SAINT MARY STREET						238652.2787	902057.1502
2402019	WATERTOWN	Tuesday, December 02, 2008	4:52 PM	Injection	2	0	0	Sideswipe, same direction	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: Northbound / V2: Northbound	V1: Not reported / V2: Not reported	V1: Light truck/van, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Dry	Dark - lighted roadway	Clear	ARLINGTON STREET / MOUNT AUBURN STREET						239270.8751	902450.4374	
2401782	WATERTOWN	Thursday, December 04, 2008	4:00 AM	Property damage only (none injured)	2	0	0	Not reported	V1: Travelling straight ahead / V2: Backing	V1: Northbound / V2: Eastbound	V1: Not reported / V2: Not reported	V1: Light truck/van, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Dry	Dark - lighted roadway	Clear		DEXTER AVENUE / MOUNT AUBURN STREET					227369.2856	902259.7501	
2416028	WATERTOWN	Wednesday, December 10, 2008	8:22 PM	Non-fatal injury	2	1	0	Rear-end	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: Southbound / V2: Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck/van, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Wet	Dark - lighted roadway	Rain	MOUNT AUBURN STREET / RUSSELL AVENUE						226649.0623	902039.1877	
2416021	WATERTOWN	Thursday, December 11, 2008	8:33 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: Eastbound / V2: Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2: Passenger car	Wet	Dark - lighted roadway	Rain	MOUNT AUBURN STREET / RUSSELL AVENUE						226649.0623	902039.1877	
2439454	WATERTOWN	Sunday, December 21, 2008	9:37 PM	Property damage only (none injured)	2	0	0	Not reported	V1: Not reported / V2: Travelling straight ahead	V1: Southbound / V2: Eastbound	V1: Not reported / V2: Not reported	V1: Light truck/van, mini-van, panel, pickup, sport utility with only four tires / V2: Passenger car	Snow	Dark - lighted roadway	Snow	MOUNT AUBURN STREET / BUNN STREET						226353.8596	901920.2501	
2476765	WATERTOWN	Sunday, December 21, 2008	7:00 PM	Not Reported	2	0	0	Angle	V1: Travelling straight ahead / V2: Turning right	V1: Not reported / V2: Not reported	V1: Not reported / V2: Not reported	V1: Not reported / V2: Not reported	Snow	Dark - lighted roadway	Snow		SCHOOL STREET Rte 16 / Rte 16					227590.3907	902288.6240	
2415737	WATERTOWN	Saturday, December 27, 2008	4:54 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1: Westbound	V1: Collision with utility pole	V1: Passenger car	Wet	Dark - lighted roadway	Cloudy		20 feet W from Intersection MOUNT AUBURN STREET / COTTAGE STREET					238693.9326	902678.6641	
2415729	WATERTOWN	Tuesday, December 30, 2008	1:01 PM	Property damage only (none injured)	2	0	0	Angle	V1: Turning left / V2: Travelling straight ahead	V1: Eastbound / V2: Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2: Passenger car	Dry	Daylight	Clear/Severe crosswinds	MOUNT AUBURN STREET / SUMMER STREET						226215.4373	901812.3123	

CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury		1		1	25.00%
Property Damage	3			3	75.00%
Total Accidents	3	1	0	4	100.00%
Persons Injured		1			

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2	3	1		4	100.00%
3				0	0.00%
Other				0	0.00%
Total	3	1	0	4	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle	1			1	25.00%
CML - Cross Mov. Left Turn	1			1	25.00%
CMR - Cross Mov. Right Turn		1		1	25.00%
RE - Rear End Both Same Dir.	1			1	25.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	3	1	0	4	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB	1			1	33.33%
EB - SB				0	0.00%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning	1			1	33.33%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported		1		1	33.33%
Total	2	1	0	3	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	0.00%
WB - WB				0	0.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported	1			1	100.00%
Total	1	0	0	1	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday	1			1	25.00%
Wednesday		1		1	25.00%
Thursday				0	0.00%
Friday	1			1	25.00%
Saturday	1			1	25.00%
Total	3	1	0	4	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February	1	1		2	50.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August	1			1	25.00%
September	1			1	25.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	3	1	0	4	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM		1		1	25.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon	1			1	25.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM		2		2	50.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	3	1	0	4	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	3	1		4	100.00%
Total	3	1	0	4	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1	1		2	50.00%
Cloudy	1			1	25.00%
Rain	1			1	25.00%
Snow				0	0.00%
Other				0	0.00%
Total	3	1	0	4	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet	1			1	25.00%
Dry	2			2	50.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported		1		1	25.00%
Total	3	1	0	4	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	1			1	25.00%
Dawn / Dusk	1			1	25.00%
Dark-Lighted	1	1		2	50.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	3	1	0	4	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury		2	4	6	40.00%
Property Damage	4		5	9	60.00%
Total Accidents	4	2	9	15	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1			3	3	20.00%
2	4	2	6	12	80.00%
3				0	0.00%
Other				0	0.00%
Total	4	2	9	15	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle	1	1	1	3	20.00%
CML - Cross Mov. Left Turn			3	3	20.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.	2			2	13.33%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped		1	2	3	20.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.	1		1	2	13.33%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On			1	1	6.67%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car			1	1	6.67%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	4	2	9	15	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB	1	1		2	33.33%
EB - SB			1	1	16.67%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning			2	2	33.33%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported			1	1	16.67%
Total	1	1	4	6	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB			1	1	20.00%
WB - WB	2	1		3	60.00%
NB - NB			1	1	20.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	2	1	2	5	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday	1		1	2	13.33%
Monday	1			1	6.67%
Tuesday			4	4	26.67%
Wednesday			1	1	6.67%
Thursday	1	1	1	3	20.00%
Friday	1	1	2	4	26.67%
Saturday				0	0.00%
Total	4	2	9	15	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January	1		1	2	13.33%
February	1		2	3	20.00%
March				0	0.00%
April		1	3	4	26.67%
May			1	1	6.67%
June				0	0.00%
July				0	0.00%
August	1			1	6.67%
September	1			1	6.67%
October		1	1	2	13.33%
November				0	0.00%
December			1	1	6.67%
Total	4	2	9	15	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM		1		1	25.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon	1			1	25.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM		2		2	50.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	3	1	0	4	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	4	2	9	15	100.00%
Total	4	2	9	15	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	4		5	9	60.00%
Cloudy		1		1	6.67%
Rain		1	3	4	26.67%
Snow			1	1	6.67%
Other				0	0.00%
Total	4	2	9	15	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet		1	3	4	26.67%
Dry	3		5	8	53.33%
Snow / Ice			1	1	6.67%
Other				0	0.00%
Not Reported	1	1		2	13.33%
Total	4	2	9	15	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	1	2	6	9	60.00%
Dawn / Dusk				0	0.00%
Dark-Lighted	3		3	6	40.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	4	2	9	15	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury		1		1	100.00%
Property Damage				0	0.00%
Total Accidents	0	1	0	1	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2		1		1	100.00%
3				0	0.00%
Other				0	0.00%
Total	0	1	0	1	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped		1		1	100.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	0	1	0	1	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB		1		1	100.00%
WB - WB				0	0.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday		1		1	100.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	0	1	0	1	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September		1		1	100.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	0	1	0	1	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM		1		1	100.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	0	1	0	1	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported		1		1	100.00%
Total	0	1	0	1	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear		1		1	100.00%
Cloudy				0	0.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Total	0	1	0	1	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry		1		1	100.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight		1		1	100.00%
Dawn / Dusk				0	0.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	0	1	0	1	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury			1	1	100.00%
Property Damage				0	0.00%
Total Accidents	0	0	1	1	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2				0	0.00%
3			1	1	100.00%
Other				0	0.00%
Total	0	0	1	1	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.			1	1	100.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	0	0	1	1	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB		1		1	100.00%
WB - WB				0	0.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday			1	1	100.00%
Saturday				0	0.00%
Total	0	0	1	1	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August			1	1	100.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	0	0	1	1	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM			1	1	100.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	0	0	1	1	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported			1	1	100.00%
Total	0	0	1	1	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear			1	1	100.00%
Cloudy				0	0.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Total	0	0	1	1	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry			1	1	100.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	0	1	1	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight			1	1	100.00%
Dawn / Dusk				0	0.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	0	0	1	1	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury	1	1	2	4	40.00%
Property Damage	4		2	6	60.00%
Total Accidents	5	1	4	10	100.00%
Persons Injured	1	1	2		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1	1			1	10.00%
2	4	1	4	9	90.00%
3				0	0.00%
Other				0	0.00%
Total	5	1	4	10	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle	1			1	10.00%
CML - Cross Mov. Left Turn			1	1	10.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.	1			1	10.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped		1	2	3	30.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.	1			1	10.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On			1	1	10.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other	2			2	20.00%
Total	5	1	4	10	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB				0	0.00%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning			1	1	100.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	0	0	1	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB		1	2	3	100.00%
WB - WB				0	0.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	0	1	2	3	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday			1	1	10.00%
Tuesday			1	1	10.00%
Wednesday	1		1	2	20.00%
Thursday	2			2	20.00%
Friday	1		1	2	20.00%
Saturday	1	1		2	20.00%
Total	5	1	4	10	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March		1		1	10.00%
April	1			1	10.00%
May	1			1	10.00%
June	1		1	2	20.00%
July			1	1	10.00%
August				0	0.00%
September			1	1	10.00%
October	1		1	2	20.00%
November				0	0.00%
December	1			1	10.00%
Total	5	1	4	10	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM			1	1	10.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM	1	1		2	20.00%
9 AM	1			1	10.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM			1	1	10.00%
4 PM			2	2	20.00%
5 PM	2			2	20.00%
6 PM	1			1	10.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	5	1	4	10	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	5	1	4	10	100.00%
Total	5	1	4	10	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	4		2	6	60.00%
Cloudy			1	1	10.00%
Rain	1	1	1	3	30.00%
Snow				0	0.00%
Other				0	0.00%
Total	5	1	4	10	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet	1		2	3	30.00%
Dry	4		2	6	60.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported		1		1	10.00%
Total	5	1	4	10	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	3	1	4	8	80.00%
Dawn / Dusk				0	0.00%
Dark-Lighted	2			2	20.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	5	1	4	10	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury		2		2	28.57%
Property Damage	1	2	2	5	71.43%
Total Accidents	1	4	2	7	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2	1	4	1	6	85.71%
3			1	1	14.29%
Other				0	0.00%
Total	1	4	2	7	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.	1			1	14.29%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped		2	2	4	57.14%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.		1		1	14.29%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car		1		1	14.29%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	4	2	7	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB			2	2	40.00%
WB - WB	1	2		3	60.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	1	2	2	5	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday		1	1	2	28.57%
Tuesday				0	0.00%
Wednesday		1		1	14.29%
Thursday		1		1	14.29%
Friday	1		1	2	28.57%
Saturday		1		1	14.29%
Total	1	4	2	7	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April		1		1	14.29%
May		1		1	14.29%
June				0	0.00%
July				0	0.00%
August			1	1	14.29%
September				0	0.00%
October	1	1		2	28.57%
November			1	1	14.29%
December		1		1	14.29%
Total	1	4	2	7	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM		1		1	14.29%
9 AM		1		1	14.29%
10 AM		1	1	2	28.57%
11 AM				0	0.00%
12 Noon			1	1	14.29%
1 PM				0	0.00%
2 PM	1			1	14.29%
3 PM		1		1	14.29%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	1	4	2	7	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1	4	2	7	100.00%
Total	1	4	2	7	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1	2	1	4	57.14%
Cloudy				0	0.00%
Rain		1	1	2	28.57%
Snow		1		1	14.29%
Other				0	0.00%
Total	1	4	2	7	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet		1	1	2	28.57%
Dry	1	2	1	4	57.14%
Snow / Ice		1		1	14.29%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	4	2	7	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	1	3	2	6	85.71%
Dawn / Dusk		1		1	14.29%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	4	2	7	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury	1	1		2	66.67%
Property Damage		1		1	33.33%
Total Accidents	1	2	0	3	100.00%
Persons Injured	1	1			

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1		1		1	33.33%
2	1	1		2	66.67%
3				0	0.00%
Other				0	0.00%
Total	1	2	0	3	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.	1	1		2	66.67%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object		1		1	33.33%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	2	0	3	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB		1		1	50.00%
WB - WB	1			1	50.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	1	1	0	2	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday		1		1	33.33%
Monday				0	0.00%
Tuesday	1	1		2	66.67%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	1	2	0	3	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February		1		1	33.33%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September	1			1	33.33%
October				0	0.00%
November		1		1	33.33%
December				0	0.00%
Total	1	2	0	3	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM		1		1	33.33%
5 AM	1			1	33.33%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM		1		1	33.33%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	1	2	0	3	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1	2		3	100.00%
Total	1	2	0	3	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1	2		3	100.00%
Cloudy				0	0.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Total	1	2	0	3	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet		1		1	33.33%
Dry	1	1		2	66.67%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	2	0	3	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	1			1	33.33%
Dawn / Dusk				0	0.00%
Dark-Lighted		2		2	66.67%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	2	0	3	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury	1	2	1	4	50.00%
Property Damage	2		2	4	50.00%
Total Accidents	3	2	3	8	100.00%
Persons Injured	1	2	1		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1	1	1		2	25.00%
2	2	1	3	6	75.00%
3				0	0.00%
Other				0	0.00%
Total	3	2	3	8	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle	1			1	12.50%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped			3	3	37.50%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.		1		1	12.50%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object		1		1	12.50%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle	1			1	12.50%
O - Other	1			1	12.50%
Total	3	2	3	8	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB	1			1	100.00%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB			3	3	100.00%
WB - WB				0	0.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	0	0	3	3	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday	1			1	12.50%
Tuesday				0	0.00%
Wednesday			2	2	25.00%
Thursday	1	1	1	3	37.50%
Friday				0	0.00%
Saturday	1	1		2	25.00%
Total	3	2	3	8	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March		1	1	2	25.00%
April				0	0.00%
May				0	0.00%
June	1			1	12.50%
July	1			1	12.50%
August				0	0.00%
September	1			1	12.50%
October		1		1	12.50%
November				0	0.00%
December			2	2	25.00%
Total	3	2	3	8	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM		1		1	12.50%
5 AM			1	1	12.50%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM	1			1	12.50%
10 AM	1			1	12.50%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM	1		1	2	25.00%
7 PM				0	0.00%
8 PM		1	1	2	25.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	3	2	3	8	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	3	2	3	8	100.00%
Total	3	2	3	8	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	3		1	4	50.00%
Cloudy		1		1	12.50%
Rain		1	2	3	37.50%
Snow				0	0.00%
Other				0	0.00%
Total	3	2	3	8	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet		1	2	3	37.50%
Dry	3	1	1	5	62.50%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	3	2	3	8	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	3			3	37.50%
Dawn / Dusk			1	1	12.50%
Dark-Lighted		2	2	4	50.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	3	2	3	8	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury		1		1	100.00%
Property Damage				0	0.00%
Total Accidents	0	1	0	1	100.00%
Persons Injured		1			

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1		1	1	2	100.00%
2				0	0.00%
3				0	0.00%
Other				0	0.00%
Total	0	1	1	2	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object		1		1	50.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian			1	1	50.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	0	1	1	2	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday			1	1	50.00%
Saturday		1		1	50.00%
Total	0	1	1	2	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February			1	1	50.00%
March				0	0.00%
April				0	0.00%
May		1		1	50.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	0	1	1	2	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM			1	1	50.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM		1		1	50.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	0	1	1	2	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported		1	1	2	100.00%
Total	0	1	1	2	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear		1	1	2	100.00%
Cloudy				0	0.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Total	0	1	1	2	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet		1	1	2	100.00%
Dry				0	0.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	1	1	2	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight			1	1	50.00%
Dawn / Dusk		1		1	50.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	0	1	1	2	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage			1	1	100.00%
Total Accidents	0	0	1	1	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2			1	1	100.00%
3				0	0.00%
Other				0	0.00%
Total	0	0	1	1	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.			1	1	100.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	0	0	1	1	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday			1	1	100.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	0	0	1	1	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January			1	1	100.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	0	0	1	1	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM			1	1	100.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	0	0	1	1	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported			1	1	100.00%
Total	0	0	1	1	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear			1	1	100.00%
Cloudy				0	0.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Total	0	0	1	1	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry			1	1	100.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	0	1	1	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight			1	1	100.00%
Dawn / Dusk				0	0.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	0	0	1	1	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage	1			1	100.00%
Total Accidents	1	0	0	1	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2	1			1	100.00%
3				0	0.00%
Other				0	0.00%
Total	1	0	0	1	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle	1			1	100.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	0	0	1	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB				0	0.00%
WB - NB				0	0.00%
WB - SB	1			1	100.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday	1			1	100.00%
Saturday				0	0.00%
Total	1	0	0	1	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September	1			1	100.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	1	0	0	1	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM	1			1	100.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	1	0	0	1	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1			1	100.00%
Total	1	0	0	1	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1			1	100.00%
Cloudy				0	0.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Total	1	0	0	1	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry	1			1	100.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	1			1	100.00%
Dawn / Dusk				0	0.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	0	0	1	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury		1		1	33.33%
Property Damage	1	1		2	66.67%
Total Accidents	1	2	0	3	100.00%
Persons Injured		1			

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1		2		2	66.67%
2	1			1	33.33%
3				0	0.00%
Other				0	0.00%
Total	1	2	0	3	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.	1			1	33.33%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car		1		1	33.33%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other		1		1	33.33%
Total	1	2	0	3	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB				0	0.00%
WB - NB				0	0.00%
WB - SB	1			1	100.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday		1		1	33.33%
Tuesday				0	0.00%
Wednesday	1			1	33.33%
Thursday		1		1	33.33%
Friday				0	0.00%
Saturday				0	0.00%
Total	1	2	0	3	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June	1			1	33.33%
July		1		1	33.33%
August				0	0.00%
September				0	0.00%
October		1		1	33.33%
November				0	0.00%
December				0	0.00%
Total	1	2	0	3	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM	1			1	33.33%
12 Noon		1		1	33.33%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM		1		1	33.33%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	1	2	0	3	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1	2		3	100.00%
Total	1	2	0	3	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear		1		1	33.33%
Cloudy		1		1	33.33%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported	1			1	33.33%
Total	1	2	0	3	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet		1		1	33.33%
Dry		1		1	33.33%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported	1			1	33.33%
Total	1	2	0	3	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	1	2		3	100.00%
Dawn / Dusk				0	0.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	2	0	3	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage	1			1	100.00%
Total Accidents	1	0	0	1	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1	1			1	100.00%
2				0	0.00%
3				0	0.00%
Other				0	0.00%
Total	1	0	0	1	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle	1			1	100.00%
O - Other				0	0.00%
Total	1	0	0	1	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday				0	0.00%
Wednesday	1			1	100.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	1	0	0	1	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May	1			1	100.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	1	0	0	1	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM	1			1	100.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	1	0	0	1	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1			1	100.00%
Total	1	0	0	1	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear				0	0.00%
Cloudy				0	0.00%
Rain	1			1	100.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet	1			1	100.00%
Dry				0	0.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	1			1	100.00%
Dawn / Dusk				0	0.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	0	0	1	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage	2	1		3	100.00%
Total Accidents	2	1	0	3	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1	2			2	66.67%
2		1		1	33.33%
3				0	0.00%
Other				0	0.00%
Total	2	1	0	3	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn		1		1	33.33%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object	2			2	66.67%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	2	1	0	3	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB		1		1	100.00%
EB - SB				0	0.00%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday	1			1	33.33%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday		1		1	33.33%
Saturday	1			1	33.33%
Total	2	1	0	3	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April		1		1	33.33%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September	1			1	33.33%
October	1			1	33.33%
November				0	0.00%
December				0	0.00%
Total	2	1	0	3	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM	1			1	33.33%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM	1			1	33.33%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM		1		1	33.33%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	2	1	0	3	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	2	1		3	100.00%
Total	2	1	0	3	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	2	1		3	100.00%
Cloudy				0	0.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	2	1	0	3	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet		1		1	33.33%
Dry	2			2	66.67%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	2	1	0	3	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	1			1	33.33%
Dawn / Dusk				0	0.00%
Dark-Lighted	1	1		2	66.67%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	2	1	0	3	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage	1	1		2	100.00%
Total Accidents	1	1	0	2	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2	1	1		2	100.00%
3				0	0.00%
Other				0	0.00%
Total	1	1	0	2	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.	1	1		2	100.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	1	0	2	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday	1	1		2	100.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	1	1	0	2	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January		1		1	50.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May	1			1	50.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	1	1	0	2	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM		1		1	50.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM	1			1	50.00%
11 PM				0	0.00%
Total	1	1	0	2	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1	1		2	100.00%
Total	1	1	0	2	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1			1	50.00%
Cloudy				0	0.00%
Rain		1		1	50.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	1	0	2	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet		1		1	50.00%
Dry	1			1	50.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	1	0	2	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight		1		1	50.00%
Dawn / Dusk				0	0.00%
Dark-Lighted	1			1	50.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	1	0	2	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury			1	1	33.33%
Property Damage			2	2	66.67%
Total Accidents	0	0	3	3	100.00%
Persons Injured			1		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1			2	2	66.67%
2			1	1	33.33%
3				0	0.00%
Other				0	0.00%
Total	0	0	3	3	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped			1	1	33.33%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car			1	1	33.33%
B - Backing			1	1	33.33%
PE - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	0	0	3	3	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	0.00%
WB - WB			1	1	100.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	0	0	1	1	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday			1	1	33.33%
Monday				0	0.00%
Tuesday			1	1	33.33%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday			1	1	33.33%
Saturday				0	0.00%
Total	0	0	3	3	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June			1	1	33.33%
July				0	0.00%
August			1	1	33.33%
September				0	0.00%
October			1	1	33.33%
November				0	0.00%
December				0	0.00%
Total	0	0	3	3	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM			1	1	33.33%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM			1	1	33.33%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM			1	1	33.33%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	0	0	3	3	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported			3	3	100.00%
Total	0	0	3	3	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear			1	1	33.33%
Cloudy			1	1	33.33%
Rain			1	1	33.33%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	0	3	3	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet			1	1	33.33%
Dry			2	2	66.67%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	0	3	3	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight			2	2	66.67%
Dawn / Dusk				0	0.00%
Dark-Lighted			1	1	33.33%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	0	0	3	3	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury			1	1	50.00%
Property Damage		1		1	50.00%
Total Accidents	0	1	1	2	100.00%
Persons Injured			1		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2		1		1	50.00%
3			1	1	50.00%
Other				0	0.00%
Total	0	1	1	2	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.		1		1	50.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped			1	1	50.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	0	1	1	2	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB			1	1	50.00%
WB - WB		1		1	50.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	0	1	1	2	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday		1		1	50.00%
Monday				0	0.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday			1	1	50.00%
Total	0	1	1	2	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January			1	1	50.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October		1		1	50.00%
November				0	0.00%
December				0	0.00%
Total	0	1	1	2	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM			1	1	50.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM		1		1	50.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	0	1	1	2	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported		1	1	2	100.00%
Total	0	1	1	2	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear		1		1	50.00%
Cloudy			1	1	50.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	1	1	2	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry		1	1	2	100.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	1	1	2	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight			1	1	50.00%
Dawn / Dusk		1		1	50.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	0	1	1	2	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury	1	1		2	66.67%
Property Damage			1	1	33.33%
Total Accidents	1	1	1	3	100.00%
Persons Injured	1	1			

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1	1			1	33.33%
2		1	1	2	66.67%
3				0	0.00%
Other				0	0.00%
Total	1	1	1	3	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn		1		1	33.33%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped			1	1	33.33%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian	1			1	33.33%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	1	1	3	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB				0	0.00%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning		1		1	100.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB			1	1	100.00%
WB - WB				0	0.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	0	0	1	1	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday	1	1	1	3	100.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	1	1	1	3	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May		1		1	33.33%
June				0	0.00%
July			1	1	33.33%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November	1			1	33.33%
December				0	0.00%
Total	1	1	1	3	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM		1		1	33.33%
8 AM			1	1	33.33%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM	1			1	33.33%
11 PM				0	0.00%
Total	1	1	1	3	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1	1	1	3	100.00%
Total	1	1	1	3	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1	1		2	66.67%
Cloudy			1	1	33.33%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	1	1	3	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet			1	1	33.33%
Dry	1	1		2	66.67%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	1	1	3	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight		1	1	2	66.67%
Dawn / Dusk				0	0.00%
Dark-Lighted	1			1	33.33%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	1	1	3	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury	1			1	100.00%
Property Damage				0	0.00%
Total Accidents	1	0	0	1	100.00%
Persons Injured	1				

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2	1			1	100.00%
3				0	0.00%
Other				0	0.00%
Total	1	0	0	1	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On	1			1	100.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	0	0	1	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday	1			1	100.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	1	0	0	1	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January	1			1	100.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	1	0	0	1	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM	1			1	100.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	1	0	0	1	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1			1	100.00%
Total	1	0	0	1	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1			1	100.00%
Cloudy				0	0.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet	1			1	100.00%
Dry				0	0.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	1			1	100.00%
Dawn / Dusk				0	0.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	0	0	1	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury	1			1	7.69%
Property Damage	3	3	6	12	92.31%
Total Accidents	4	3	6	13	100.00%
Persons Injured	1				

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2	4	3	6	13	100.00%
3				0	0.00%
Other				0	0.00%
Total	4	3	6	13	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle	1	1	2	4	30.77%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn			1	1	7.69%
RE - Rear End Both Same Dir.	1	2		3	23.08%
REB - Rear End One Backing			1	1	7.69%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.	1			1	7.69%
HO - Head On	1		2	3	23.08%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	4	3	6	13	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB		1		1	33.33%
EB - SB				0	0.00%
WB - NB	1		1	2	66.67%
WB - SB				0	0.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	1	1	1	3	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB	1		1	2	50.00%
WB - WB				0	0.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported		2		2	50.00%
Total	1	2	1	4	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday			2	2	15.38%
Monday	1		1	2	15.38%
Tuesday	1			1	7.69%
Wednesday			1	1	7.69%
Thursday	1			1	7.69%
Friday	1	1		2	15.38%
Saturday		2	2	4	30.77%
Total	4	3	6	13	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February			1	1	7.69%
March	1			1	7.69%
April		1	1	2	15.38%
May	1		1	2	15.38%
June			1	1	7.69%
July	1		1	2	15.38%
August		1		1	7.69%
September				0	0.00%
October				0	0.00%
November	1	1		2	15.38%
December			1	1	7.69%
Total	4	3	6	13	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM			1	1	7.69%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM		1	1	2	15.38%
9 AM			2	2	15.38%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM	1			1	7.69%
3 PM		1		1	7.69%
4 PM	1			1	7.69%
5 PM	1	1		2	15.38%
6 PM				0	0.00%
7 PM			1	1	7.69%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM	1			1	7.69%
11 PM			1	1	7.69%
Total	4	3	6	13	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	4	3	6	13	100.00%
Total	4	3	6	13	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	3	1	5	9	69.23%
Cloudy	1	2		3	23.08%
Rain				0	0.00%
Snow			1	1	7.69%
Other				0	0.00%
Not Reported				0	0.00%
Total	4	3	6	13	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry	4	3	5	12	92.31%
Snow / Ice			1	1	7.69%
Other				0	0.00%
Not Reported				0	0.00%
Total	4	3	6	13	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	2	3	4	9	69.23%
Dawn / Dusk				0	0.00%
Dark-Lighted	1		2	3	23.08%
Dark-Unlighted				0	0.00%
Not Reported	1			1	7.69%
Other				0	0.00%
Total	4	3	6	13	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage			1	1	100.00%
Total Accidents	0	0	1	1	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2			1	1	100.00%
3				0	0.00%
Other				0	0.00%
Total	0	0	1	1	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.			1	1	100.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	0	0	1	1	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday			1	1	100.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	0	0	1	1	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February			1	1	100.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	0	0	1	1	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM			1	1	100.00%
11 PM				0	0.00%
Total	0	0	1	1	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported			1	1	100.00%
Total	0	0	1	1	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear				0	0.00%
Cloudy				0	0.00%
Rain			1	1	100.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	0	1	1	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet			1	1	100.00%
Dry				0	0.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	0	1	1	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight				0	0.00%
Dawn / Dusk				0	0.00%
Dark-Lighted			1	1	100.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	0	0	1	1	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage	1	2	1	4	100.00%
Total Accidents	1	2	1	4	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1		1		1	25.00%
2	1	1	1	3	75.00%
3				0	0.00%
Other				0	0.00%
Total	1	2	1	4	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle			1	1	25.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.	1	1		2	50.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object		1		1	25.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	2	1	4	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB			1	1	100.00%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	0	0	1	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday		1	1	2	50.00%
Monday		1		1	25.00%
Tuesday	1			1	25.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	1	2	1	4	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January	1	1		2	50.00%
February			1	1	25.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October		1		1	25.00%
November				0	0.00%
December				0	0.00%
Total	1	2	1	4	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM		1		1	25.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM		1		1	25.00%
12 Noon			1	1	25.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM	1			1	25.00%
11 PM				0	0.00%
Total	1	2	1	4	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1	2	1	4	100.00%
Total	1	2	1	4	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1	1		2	50.00%
Cloudy		1		1	25.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported			1	1	25.00%
Total	1	2	1	4	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet		1		1	25.00%
Dry	1	1		2	50.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported			1	1	25.00%
Total	1	2	1	4	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight		1		1	25.00%
Dawn / Dusk				0	0.00%
Dark-Lighted	1	1		2	50.00%
Dark-Unlighted				0	0.00%
Not Reported			1	1	25.00%
Other				0	0.00%
Total	1	2	1	4	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury	1		1	2	50.00%
Property Damage		2		2	50.00%
Total Accidents	1	2	1	4	100.00%
Persons Injured	1		1		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1		1		1	25.00%
2	1	1	1	3	75.00%
3				0	0.00%
Other				0	0.00%
Total	1	2	1	4	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle	1	1	1	3	75.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object		1		1	25.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	2	1	4	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB	1		1	2	66.67%
EB - SB		1		1	33.33%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	1	1	1	3	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday		1		1	25.00%
Tuesday				0	0.00%
Wednesday	1			1	25.00%
Thursday		1		1	25.00%
Friday			1	1	25.00%
Saturday				0	0.00%
Total	1	2	1	4	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March		1		1	25.00%
April				0	0.00%
May	1			1	25.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September			1	1	25.00%
October				0	0.00%
November				0	0.00%
December		1		1	25.00%
Total	1	2	1	4	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM		1		1	25.00%
3 AM		1		1	25.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon	1			1	25.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM			1	1	25.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	1	2	1	4	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1	2	1	4	100.00%
Total	1	2	1	4	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear				0	0.00%
Cloudy				0	0.00%
Rain	1	1	1	3	75.00%
Snow/Sleet		1		1	25.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	2	1	4	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet	1		1	2	50.00%
Dry		1		1	25.00%
Snow / Ice		1		1	25.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	2	1	4	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	1	1		2	50.00%
Dawn / Dusk			1	1	25.00%
Dark-Lighted		1		1	25.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	2	1	4	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage	4		1	5	100.00%
Total Accidents	4	0	1	5	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1	1			1	20.00%
2	3		1	4	80.00%
3				0	0.00%
Other				0	0.00%
Total	4	0	1	5	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle	1			1	20.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.	1			1	20.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped			1	1	20.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.	1			1	20.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object	1			1	20.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	4	0	1	5	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB	1			1	100.00%
EB - SB				0	0.00%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB	1		1	2	100.00%
WB - WB				0	0.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	1	0	1	2	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday	1			1	20.00%
Monday	1			1	20.00%
Tuesday				0	0.00%
Wednesday	2			2	40.00%
Thursday			1	1	20.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	4	0	1	5	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March	2			2	40.00%
April				0	0.00%
May	1			1	20.00%
June	1		1	2	40.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	4	0	1	5	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM	1			1	20.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM	1			1	20.00%
11 AM	1			1	20.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM	1			1	20.00%
5 PM			1	1	20.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	4	0	1	5	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	4		1	5	100.00%
Total	4	0	1	5	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	2			2	40.00%
Cloudy	1		1	2	40.00%
Rain	1			1	20.00%
Snow/Sleet				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	4	0	1	5	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet	1			1	20.00%
Dry	2		1	3	60.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported	1			1	20.00%
Total	4	0	1	5	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	2		1	3	60.00%
Dawn / Dusk	2			2	40.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	4	0	1	5	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury		1	2	3	30.00%
Property Damage	2	1	4	7	70.00%
Total Accidents	2	2	6	10	100.00%
Persons Injured		1	2		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1		2	2	4	40.00%
2	1		4	5	50.00%
3	1		1	2	20.00%
Other				0	0.00%
Total	2	2	6	10	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle			2	2	20.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.	1			1	10.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On			1	1	10.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car		1	2	3	30.00%
B - Backing			1	1	10.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle		1		1	10.00%
O - Other	1			1	10.00%
Total	2	2	6	10	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB			1	1	50.00%
EB - SB			1	1	50.00%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	0	0	2	2	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	0.00%
WB - WB	1			1	100.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday	1		1	2	20.00%
Tuesday				0	0.00%
Wednesday		2	1	3	30.00%
Thursday	1		1	2	20.00%
Friday			3	3	30.00%
Saturday				0	0.00%
Total	2	2	6	10	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March			1	1	10.00%
April	1			1	10.00%
May	1			1	10.00%
June				0	0.00%
July			2	2	20.00%
August		2	1	3	30.00%
September			1	1	10.00%
October				0	0.00%
November				0	0.00%
December			1	1	10.00%
Total	2	2	6	10	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM			1	1	10.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM	1			1	10.00%
8 AM	1			1	10.00%
9 AM			1	1	10.00%
10 AM				0	0.00%
11 AM			1	1	10.00%
12 Noon				0	0.00%
1 PM			1	1	10.00%
2 PM			1	1	10.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM		2	1	3	30.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	2	2	6	10	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	2	2	6	10	100.00%
Total	2	2	6	10	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1	2	6	9	90.00%
Cloudy				0	0.00%
Rain	1			1	10.00%
Snow/Sleet				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	2	2	6	10	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet	1			1	9.09%
Dry	1	2	6	9	81.82%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported	1			1	9.09%
Total	3	2	6	11	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	2	2	5	9	90.00%
Dawn / Dusk				0	0.00%
Dark-Lighted			1	1	10.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	2	2	6	10	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury	1	1		2	28.57%
Property Damage	2		3	5	71.43%
Total Accidents	3	1	3	7	100.00%
Persons Injured	1	1			

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1			2	2	28.57%
2	2	1	1	4	57.14%
3	1			1	14.29%
Other				0	0.00%
Total	3	1	3	7	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle	1	1	1	3	42.86%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.	1			1	14.29%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car			2	2	28.57%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other	1			1	14.29%
Total	3	1	3	7	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB	1	1	1	3	100.00%
EB - SB				0	0.00%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	1	1	1	3	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	0.00%
WB - WB	1			1	100.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday			1	1	14.29%
Monday	1			1	14.29%
Tuesday	1		1	2	28.57%
Wednesday	1			1	14.29%
Thursday			1	1	14.29%
Friday				0	0.00%
Saturday		1		1	14.29%
Total	3	1	3	7	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March			1	1	14.29%
April	1	1	1	3	42.86%
May				0	0.00%
June			1	1	14.29%
July	1			1	14.29%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November	1			1	14.29%
December				0	0.00%
Total	3	1	3	7	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM	1			1	14.29%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM	1			1	14.29%
9 AM				0	0.00%
10 AM	1			1	14.29%
11 AM				0	0.00%
12 Noon			1	1	14.29%
1 PM				0	0.00%
2 PM		1	1	2	28.57%
3 PM			1	1	14.29%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	3	1	3	7	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	3	1	3	7	100.00%
Total	3	1	3	7	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	3	1	2	6	85.71%
Cloudy			1	1	14.29%
Rain				0	0.00%
Snow/Sleet				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	3	1	3	7	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry	3	1	3	7	100.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	3	1	3	7	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	3	1	3	7	100.00%
Dawn / Dusk				0	0.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	3	1	3	7	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury			1	1	20.00%
Property Damage	1		3	4	80.00%
Total Accidents	1	0	4	5	100.00%
Persons Injured			1		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1			2	2	40.00%
2	1		2	3	60.00%
3			0	0	0.00%
Other			0	0	0.00%
Total	1	0	4	5	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle	1		1	2	40.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.			1	1	20.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object			1	1	20.00%
PC - Hit Parked Car			1	1	20.00%
B - Backing				0	0.00%
PE - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	0	4	5	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB	1			1	50.00%
WB - NB				0	0.00%
WB - SB			1	1	50.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	1	0	1	2	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday			1	1	20.00%
Monday				0	0.00%
Tuesday			1	1	20.00%
Wednesday			1	1	20.00%
Thursday				0	0.00%
Friday	1		1	2	40.00%
Saturday				0	0.00%
Total	1	0	4	5	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June			1	1	20.00%
July				0	0.00%
August	1			1	20.00%
September				0	0.00%
October			1	1	20.00%
November			2	2	40.00%
December				0	0.00%
Total	1	0	4	5	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM			1	1	20.00%
9 AM			1	1	20.00%
10 AM				0	0.00%
11 AM			1	1	20.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM			1	1	20.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM	1			1	20.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	1	0	4	5	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1		4	5	100.00%
Total	1	0	4	5	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1		4	5	100.00%
Cloudy				0	0.00%
Rain				0	0.00%
Snow/Sleet				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	0	4	5	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry	1		4	5	100.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	0	4	5	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight			2	2	40.00%
Dawn / Dusk				0	0.00%
Dark-Lighted	1		2	3	60.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	0	4	5	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury	2	1	2	5	23.81%
Property Damage	4	5	7	16	76.19%
Total Accidents	6	6	9	21	100.00%
Persons Injured	3	1	4		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1	3		2	5	23.81%
2	3	6	7	16	76.19%
3				0	0.00%
Other				0	0.00%
Total	6	6	9	21	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn		1		1	4.76%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.	2		2	4	19.05%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped			2	2	9.52%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn		1		1	4.76%
SSP - Side Swipe Passing Same Dir.	1	3	2	6	28.57%
SSP - Side Swipe Passing Opp Dir.		1	1	2	9.52%
HO - Head On				0	0.00%
FO - Hit Fixed Object			1	1	4.76%
PC - Hit Parked Car	1		1	2	9.52%
B - Backing				0	0.00%
PED - Pedestrian	2			2	9.52%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	6	6	9	21	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB				0	0.00%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning		1		1	100.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB		1		1	14.29%
WB - WB	2		3	5	71.43%
NB - NB			1	1	14.29%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	2	1	4	7	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday			1	1	4.76%
Monday	3	1	1	5	23.81%
Tuesday	2		2	4	19.05%
Wednesday			1	1	4.76%
Thursday		1		1	4.76%
Friday		2	3	5	23.81%
Saturday	1	2	1	4	19.05%
Total	6	6	9	21	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February	1		1	2	9.52%
March	3			3	14.29%
April				0	0.00%
May		2	2	4	19.05%
June				0	0.00%
July	1	1		2	9.52%
August		1	1	2	9.52%
September			1	1	4.76%
October		1	1	2	9.52%
November	1		3	4	19.05%
December		1		1	4.76%
Total	6	6	9	21	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM		1		1	4.76%
8 AM			1	1	4.76%
9 AM	1		1	2	9.52%
10 AM		1	1	2	9.52%
11 AM	1		2	3	14.29%
12 Noon	2		1	3	14.29%
1 PM	1			1	4.76%
2 PM			1	1	4.76%
3 PM		1	1	2	9.52%
4 PM	1	1	1	3	14.29%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM		2		2	9.52%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	6	6	9	21	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each	
	2006	2007	2008			
No Defect				0	0.00%	
Holes / Bumps				0	0.00%	
Foreign Object on Surf				0	0.00%	
Defect on Shoulder				0	0.00%	
Construction				0	0.00%	
Other				0	0.00%	
Not Reported		6	6	9	21	100.00%
Total	6	6	9	21	100.00%	

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	4	4	6	14	66.67%
Cloudy			2	2	9.52%
Rain	1	1		2	9.52%
Snow/Sleet	1	1	1	3	14.29%
Other				0	0.00%
Not Reported				0	0.00%
Total	6	6	9	21	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet	1			1	4.76%
Dry	4	5	7	16	76.19%
Snow / Ice	1	1	1	3	14.29%
Other				0	0.00%
Not Reported			1	1	4.76%
Total	6	6	9	21	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	5	4	8	17	80.95%
Dawn / Dusk		2		2	9.52%
Dark-Lighted	1		1	2	9.52%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	6	6	9	21	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage	1	1		2	100.00%
Total Accidents	1	1	0	2	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1	1	1		2	100.00%
2				0	0.00%
3				0	0.00%
Other				0	0.00%
Total	1	1	0	2	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object	1			1	50.00%
PC - Hit Parked Car		1		1	50.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	1	0	2	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday		1		1	50.00%
Monday				0	0.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday	1			1	50.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	1	1	0	2	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January	1			1	50.00%
February				0	0.00%
March				0	0.00%
April		1		1	50.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	1	1	0	2	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon		1		1	50.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM	1			1	50.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	1	1	0	2	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1	1		2	100.00%
Total	1	1	0	2	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1	1		2	100.00%
Cloudy				0	0.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	1	0	2	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry	1	1		2	100.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	1	0	2	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight		1		1	50.00%
Dawn / Dusk	1			1	50.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	1	0	2	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury		2	3	5	29.41%
Property Damage	3	6	3	12	70.59%
Total Accidents	3	8	6	17	100.00%
Persons Injured		4	3		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1		1		1	5.88%
2	2	7	5	14	82.35%
3	1		1	2	11.76%
Other				0	0.00%
Total	3	8	6	17	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle		1		1	5.88%
CML - Cross Mov. Left Turn		1	2	3	17.65%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.	2	1		3	17.65%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped		2	1	3	17.65%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.		2	2	4	23.53%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On			1	1	5.88%
FO - Hit Fixed Object		1		1	5.88%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other	1			1	5.88%
Total	3	8	6	17	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB				0	0.00%
WB - NB			1	1	25.00%
WB - SB		2		2	50.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning			1	1	25.00%
Not Reported				0	0.00%
Total	0	2	2	4	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB	1			1	16.67%
WB - WB			1	1	16.67%
NB - NB	1	1		2	33.33%
SB - SB		1		1	16.67%
Not Reported		1		1	16.67%
Total	2	3	1	6	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday		3		3	17.65%
Tuesday	1		2	3	17.65%
Wednesday		3		3	17.65%
Thursday		1		1	5.88%
Friday		1	3	4	23.53%
Saturday	2		1	3	17.65%
Total	3	8	6	17	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February			1	1	5.88%
March		1		1	5.88%
April				0	0.00%
May	1		2	3	17.65%
June	1	1	1	3	17.65%
July				0	0.00%
August	1	1		2	11.76%
September		1		1	5.88%
October		2		2	11.76%
November		1	1	2	11.76%
December		1	1	2	11.76%
Total	3	8	6	17	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM			1	1	5.88%
2 AM		1		1	5.88%
3 AM			1	1	5.88%
4 AM		1		1	5.88%
5 AM		1		1	5.88%
6 AM		1		1	5.88%
7 AM		1		1	5.88%
8 AM		1		1	5.88%
9 AM				0	0.00%
10 AM	1			1	5.88%
11 AM	1			1	5.88%
12 Noon			2	2	11.76%
1 PM				0	0.00%
2 PM	1			1	5.88%
3 PM		1		1	5.88%
4 PM		1	1	2	11.76%
5 PM				0	0.00%
6 PM			1	1	5.88%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	3	8	6	17	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	3	8	6	17	100.00%
Total	3	8	6	17	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1	5	4	10	58.82%
Cloudy		1	2	3	17.65%
Rain	2	2		4	23.53%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	3	8	6	17	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet	2	3	1	6	35.29%
Dry	1	4	5	10	58.82%
Snow / Ice			1	1	5.88%
Other				0	0.00%
Not Reported				0	0.00%
Total	3	8	6	17	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	3	6	5	14	82.35%
Dawn / Dusk		1		1	5.88%
Dark-Lighted		1	1	2	11.76%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	3	8	6	17	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage			1	1	100.00%
Total Accidents	0	0	1	1	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2			1	1	100.00%
3				0	0.00%
Other				0	0.00%
Total	0	0	1	1	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle			1	1	100.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	0	0	1	1	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB				0	0.00%
WB - NB			1	1	100.00%
WB - SB				0	0.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	0	0	1	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday			1	1	100.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	0	0	1	1	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May			1	1	100.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	0	0	1	1	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM			1	1	100.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	0	0	1	1	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported			1	1	100.00%
Total	0	0	1	1	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear				0	0.00%
Cloudy				0	0.00%
Rain			1	1	100.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	0	1	1	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet			1	1	100.00%
Dry				0	0.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	0	1	1	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight				0	0.00%
Dawn / Dusk			1	1	100.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	0	0	1	1	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury			1	1	33.33%
Property Damage	2			2	66.67%
Total Accidents	2	0	1	3	100.00%
Persons Injured			5		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1			1	1	33.33%
2	2			2	66.67%
3				0	0.00%
Other				0	0.00%
Total	2	0	1	3	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.	2			2	66.67%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object			1	1	33.33%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	2	0	1	3	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB	2			2	100.00%
WB - WB				0	0.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	2	0	0	2	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday			1	1	33.33%
Monday	1			1	33.33%
Tuesday				0	0.00%
Wednesday	1			1	33.33%
Thursday				0	0.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	2	0	1	3	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March	1			1	50.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August			1	1	50.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	1	0	1	2	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM	1			1	33.33%
10 AM				0	0.00%
11 AM	1			1	33.33%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM			1	1	33.33%
10 PM				0	0.00%
11 PM				0	0.00%
Total	2	0	1	3	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	2		1	3	100.00%
Total	2	0	1	3	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	2		1	3	100.00%
Cloudy				0	0.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	2	0	1	3	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry	2		1	3	100.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	2	0	1	3	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	2			2	66.67%
Dawn / Dusk				0	0.00%
Dark-Lighted			1	1	33.33%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	2	0	1	3	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal			1	1	50.00%
Personal Injury			0	0	0.00%
Property Damage			1	1	50.00%
Total Accidents	0	0	2	2	100.00%
Persons Injured/Killed			1		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1			1	1	50.00%
2			1	1	50.00%
3			0	0	0.00%
Other			0	0	0.00%
Total	0	0	2	2	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle			1	1	50.00%
CML - Cross Mov. Left Turn			0	0	0.00%
CMR - Cross Mov. Right Turn			0	0	0.00%
RE - Rear End Both Same Dir.			0	0	0.00%
REB - Rear End One Backing			0	0	0.00%
RES - Rear End One Stopped			0	0	0.00%
RER - Rear End Right Turn			0	0	0.00%
REL - Rear End Left Turn			0	0	0.00%
SSP - Side Swipe Passing Same Dir.			0	0	0.00%
SSP - Side Swipe Passing Opp Dir.			0	0	0.00%
HO - Head On			0	0	0.00%
FO - Hit Fixed Object			0	0	0.00%
PC - Hit Parked Car			0	0	0.00%
B - Backing			0	0	0.00%
PED - Pedestrian			1	1	50.00%
BIC - Bicycle			0	0	0.00%
O - Other			0	0	0.00%
Total	0	0	2	2	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB			1	1	100.00%
EB - SB			0	0	0.00%
WB - NB			0	0	0.00%
WB - SB			0	0	0.00%
EB - WB Turning			0	0	0.00%
WB - EB Turning			0	0	0.00%
NB - SB Turning			0	0	0.00%
SB - NB Turning			0	0	0.00%
Not Reported			0	0	0.00%
Total	0	0	1	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB	2			2	100.00%
WB - WB				0	0.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	2	0	0	2	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday			1	1	50.00%
Friday			1	1	50.00%
Saturday				0	0.00%
Total	0	0	2	2	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April			1	1	50.00%
May				0	0.00%
June			1	1	50.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	0	0	2	2	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM			1	1	50.00%
10 AM				0	0.00%
11 AM			1	1	50.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	0	0	2	2	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported			2	2	100.00%
Total	0	0	2	2	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear			1	1	50.00%
Cloudy				0	0.00%
Rain			1	1	50.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	0	2	2	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet			1	1	50.00%
Dry			1	1	50.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	0	2	2	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight			1	1	50.00%
Dawn / Dusk				0	0.00%
Dark-Lighted			1	1	50.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	0	0	2	2	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury	1			1	100.00%
Property Damage				0	0.00%
Total Accidents	1	0	0	1	100.00%
Persons Injured	1				

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1	1			1	100.00%
2				0	0.00%
3				0	0.00%
Other				0	0.00%
Total	1	0	0	1	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object	1			1	100.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	0	0	1	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday	1			1	100.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	1	0	0	1	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May	1			1	100.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	1	0	0	1	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM	1			1	100.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	1	0	0	1	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1			1	100.00%
Total	1	0	0	1	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear				0	0.00%
Cloudy				0	0.00%
Rain	1			1	100.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet	1			1	100.00%
Dry				0	0.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight				0	0.00%
Dawn / Dusk				0	0.00%
Dark-Lighted	1			1	100.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	0	0	1	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage		1		1	100.00%
Total Accidents	0	1	0	1	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2		1		1	100.00%
3				0	0.00%
Other				0	0.00%
Total	0	1	0	1	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn		1		1	100.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	0	1	0	1	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	0.00%
WB - WB		1		1	100.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday		1		1	100.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	0	1	0	1	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April		1		1	100.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	0	1	0	1	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM		1		1	100.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	0	1	0	1	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported		1		1	100.00%
Total	0	1	0	1	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear		1		1	100.00%
Cloudy				0	0.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry		1		1	100.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight		1		1	100.00%
Dawn / Dusk				0	0.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	0	1	0	1	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage	1		1	2	100.00%
Total Accidents	1	0	1	2	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2	1		1	2	100.00%
3				0	0.00%
Other				0	0.00%
Total	1	0	1	2	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.			1	1	50.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other	1			1	50.00%
Total	1	0	1	2	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	0.00%
WB - WB		1		1	100.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday	1			1	50.00%
Monday				0	0.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday			1	1	50.00%
Total	1	0	1	2	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August			1	1	50.00%
September	1			1	50.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	1	0	1	2	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM			1	1	50.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM	1			1	50.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	1	0	1	2	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1		1	2	100.00%
Total	1	0	1	2	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1		1	2	100.00%
Cloudy				0	0.00%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	0	1	2	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry	1		1	2	100.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	0	1	2	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight			1	1	50.00%
Dawn / Dusk				0	0.00%
Dark-Lighted	1			1	50.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	0	1	2	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage		1	1	2	100.00%
Total Accidents	0	1	1	2	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2		1	1	2	100.00%
3				0	0.00%
Other				0	0.00%
Total	0	1	1	2	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle		1		1	50.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.			1	1	50.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	0	1	1	2	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB				0	0.00%
WB - NB		1		1	100.00%
WB - SB				0	0.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	0.00%
WB - WB			1	1	100.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	0	0	1	1	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday			1	1	50.00%
Monday		1		1	50.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	0	1	1	2	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October				0	0.00%
November		1	1	2	100.00%
December				0	0.00%
Total	0	1	1	2	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM		1	1	2	100.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	0	1	1	2	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported		1	1	2	100.00%
Total	0	1	1	2	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear				0	0.00%
Cloudy				0	0.00%
Rain		1	1	2	100.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	1	1	2	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet		1	1	2	100.00%
Dry				0	0.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	0	1	1	2	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight				0	0.00%
Dawn / Dusk				0	0.00%
Dark-Lighted		1	1	2	100.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	0	1	1	2	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury	1		1	2	66.67%
Property Damage		1		1	33.33%
Total Accidents	1	1	1	3	100.00%
Persons Injured	1		1		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1	1		1	2	66.67%
2				0	0.00%
3		1		1	33.33%
Other				0	0.00%
Total	1	1	1	3	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.		1		1	33.33%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object			1	1	33.33%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian	1			1	33.33%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	1	1	3	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Not Reported				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	0.00%
WB - WB		1		1	100.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday	1			1	33.33%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday		1		1	33.33%
Friday				0	0.00%
Saturday			1	1	33.33%
Total	1	1	1	3	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August		1		1	33.33%
September	1			1	33.33%
October				0	0.00%
November				0	0.00%
December			1	1	33.33%
Total	1	1	1	3	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM			1	1	33.33%
5 AM				0	0.00%
6 AM		1		1	33.33%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM	1			1	33.33%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	1	1	1	3	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1	1	1	3	100.00%
Total	1	1	1	3	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1			1	33.33%
Cloudy		1	1	2	66.67%
Rain				0	0.00%
Snow				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	1	1	3	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet			1	1	33.33%
Dry	1	1		2	66.67%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	1	1	3	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	1	1		2	66.67%
Dawn / Dusk				0	0.00%
Dark-Lighted			1	1	33.33%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	1	1	3	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury				0	0.00%
Property Damage		2	1	3	100.00%
Total Accidents	0	2	1	3	100.00%
Persons Injured					

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1			1	1	33.33%
2		2		2	66.67%
3				0	0.00%
Other				0	0.00%
Total	0	2	1	3	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object			1	1	33.33%
PC - Hit Parked Car				0	0.00%
B - Backing		2		2	66.67%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	0	2	1	3	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	#DIV/0!
EB - SB				0	#DIV/0!
WB - NB				0	#DIV/0!
WB - SB				0	#DIV/0!
EB - WB Turning				0	#DIV/0!
WB - EB Turning				0	#DIV/0!
NB - SB Turning				0	#DIV/0!
SB - NB Turning				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	#DIV/0!
WB - WB				0	#DIV/0!
NB - NB				0	#DIV/0!
SB - SB				0	#DIV/0!
Total	0	0	0	0	#DIV/0!

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday			1	1	33.33%
Monday		1		1	33.33%
Tuesday				0	0.00%
Wednesday		1		1	33.33%
Thursday				0	0.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	0	2	1	3	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May			1	1	33.33%
June				0	0.00%
July				0	0.00%
August		1		1	33.33%
September		1		1	33.33%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	0	2	1	3	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM			1	1	33.33%
7 AM		1		1	33.33%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM		1		1	33.33%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	0	2	1	3	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported		2	1	3	100.00%
Total	0	2	1	3	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear		1		1	33.33%
Cloudy				0	0.00%
Rain			1	1	33.33%
Snow				0	0.00%
Other/Not Reported		1		1	33.33%
Total	0	2	1	3	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet			1	1	50.00%
Dry				0	0.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported		1		1	50.00%
Total	0	1	1	2	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight				0	0.00%
Dawn / Dusk			1	1	50.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported		1		1	50.00%
Other				0	0.00%
Total	0	1	1	2	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury	3	1		4	50.00%
Property Damage	1	2	1	4	50.00%
Total Accidents	4	3	1	8	100.00%
Persons Injured/Killed			1		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1		1	1	2	25.00%
2	4	2		6	75.00%
3				0	0.00%
Other				0	0.00%
Total	4	3	1	8	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle	3			3	37.50%
CML - Cross Mov. Left Turn		1		1	12.50%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.		1		1	12.50%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.	1			1	12.50%
SSP - Side Swipe Passing Opp Dir.		1		1	12.50%
HO - Head On				0	0.00%
FO - Hit Fixed Object			1	1	12.50%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	4	3	1	8	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB	2			2	50.00%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning		1		1	25.00%
Not Reported	1			1	25.00%
Total	3	1	0	4	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB	2			2	66.67%
WB - WB				0	0.00%
NB - NB				0	0.00%
SB - SB		1		1	33.33%
Not Reported				0	0.00%
Total	2	1	0	3	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday		1		1	12.50%
Monday	1			1	12.50%
Tuesday	1		1	2	25.00%
Wednesday				0	0.00%
Thursday	1	1		2	25.00%
Friday	1			1	12.50%
Saturday		1		1	12.50%
Total	4	3	1	8	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January		3		3	37.50%
February	1			1	12.50%
March	1			1	12.50%
April			1	1	12.50%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August	2			2	25.00%
September				0	0.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	4	3	1	8	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM	1			1	12.50%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM			1	1	12.50%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM	1	1		2	25.00%
3 PM				0	0.00%
4 PM	1	1		2	25.00%
5 PM				0	0.00%
6 PM	1	1		2	25.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	4	3	1	8	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	4	3	1	8	100.00%
Total	4	3	1	8	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	4	2		6	75.00%
Cloudy			1	1	12.50%
Rain				0	0.00%
Snow/Sleet		1		1	12.50%
Other				0	0.00%
Not Reported				0	0.00%
Total	4	3	1	8	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet	1	1	1	3	37.50%
Dry	3	2		5	62.50%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	4	3	1	8	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	3	2		5	62.50%
Dawn / Dusk		1		1	12.50%
Dark-Lighted	1		1	2	25.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	4	3	1	8	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury			1	1	50.00%
Property Damage	1			1	50.00%
Total Accidents	1	0	1	2	100.00%
Persons Injured/Killed			1		

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1				0	0.00%
2	1		1	2	100.00%
3				0	0.00%
Other				0	0.00%
Total	1	0	1	2	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle				0	0.00%
CML - Cross Mov. Left Turn	1			1	50.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing				0	0.00%
RES - Rear End One Stopped			1	1	50.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object				0	0.00%
PC - Hit Parked Car				0	0.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	0	1	2	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB				0	0.00%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning	1			1	100.00%
Not Reported				0	0.00%
Total	1	0	0	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB				0	0.00%
WB - WB				0	0.00%
NB - NB				0	0.00%
SB - SB			1	1	100.00%
Not Reported				0	0.00%
Total	0	0	1	1	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday				0	0.00%
Monday				0	0.00%
Tuesday				0	0.00%
Wednesday	1		1	2	100.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday				0	0.00%
Total	1	0	1	2	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January	1			1	50.00%
February				0	0.00%
March				0	0.00%
April				0	0.00%
May				0	0.00%
June				0	0.00%
July				0	0.00%
August				0	0.00%
September			1	1	50.00%
October				0	0.00%
November				0	0.00%
December				0	0.00%
Total	1	0	1	2	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM	1			1	50.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon				0	0.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM				0	0.00%
5 PM				0	0.00%
6 PM			1	1	50.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM				0	0.00%
11 PM				0	0.00%
Total	1	0	1	2	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1		1	2	100.00%
Total	1	0	1	2	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear			1	1	50.00%
Cloudy	1			1	50.00%
Rain				0	0.00%
Snow/Sleet				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	0	1	2	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry	1		1	2	100.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	0	1	2	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	1		1	2	100.00%
Dawn / Dusk				0	0.00%
Dark-Lighted				0	0.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	0	1	2	100.00%



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CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
Fatal				0	0.00%
Personal Injury		2		2	50.00%
Property Damage	1	1		2	50.00%
Total Accidents	1	3	0	4	100.00%
Persons Injured/Killed		3			

NO. OF VEHICLES	Time Period			Total	% Of Each
	2006	2007	2008		
1	1	1		2	50.00%
2		2		2	50.00%
3				0	0.00%
Other				0	0.00%
Total	1	3	0	4	100.00%

CRASH TYPE	Time Period			Total	% Of Each
	2006	2007	2008		
CM - Cross Mov. Right Angle		1		1	25.00%
CML - Cross Mov. Left Turn				0	0.00%
CMR - Cross Mov. Right Turn				0	0.00%
RE - Rear End Both Same Dir.				0	0.00%
REB - Rear End One Backing		1		1	25.00%
RES - Rear End One Stopped				0	0.00%
RER - Rear End Right Turn				0	0.00%
REL - Rear End Left Turn				0	0.00%
SSP - Side Swipe Passing Same Dir.				0	0.00%
SSP - Side Swipe Passing Opp Dir.				0	0.00%
HO - Head On				0	0.00%
FO - Hit Fixed Object	1			1	25.00%
PC - Hit Parked Car		1		1	25.00%
B - Backing				0	0.00%
PED - Pedestrian				0	0.00%
BIC - Bicycle				0	0.00%
O - Other				0	0.00%
Total	1	3	0	4	100.00%

DIRECTIONS OF ANGLE CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - NB				0	0.00%
EB - SB		1		1	100.00%
WB - NB				0	0.00%
WB - SB				0	0.00%
EB - WB Turning				0	0.00%
WB - EB Turning				0	0.00%
NB - SB Turning				0	0.00%
SB - NB Turning				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

DIRECTIONS OF REAR END CRASHES	Time Period			Total	% Of Each
	2006	2007	2008		
EB - EB		1		1	100.00%
WB - WB				0	0.00%
NB - NB				0	0.00%
SB - SB				0	0.00%
Not Reported				0	0.00%
Total	0	1	0	1	100.00%

DAY	Time Period			Total	% Of Each
	2006	2007	2008		
Sunday	1	1		2	50.00%
Monday		1		1	25.00%
Tuesday				0	0.00%
Wednesday				0	0.00%
Thursday				0	0.00%
Friday				0	0.00%
Saturday		1		1	25.00%
Total	1	3	0	4	100.00%

MONTH	Time Period			Total	% Of Each
	2006	2007	2008		
January				0	0.00%
February				0	0.00%
March	1			1	25.00%
April				0	0.00%
May				0	0.00%
June		1		1	25.00%
July				0	0.00%
August				0	0.00%
September				0	0.00%
October		2		2	50.00%
November				0	0.00%
December				0	0.00%
Total	1	3	0	4	100.00%

HOUR	Time Period			Total	% Of Each
	2006	2007	2008		
12 Mid.				0	0.00%
1 AM				0	0.00%
2 AM				0	0.00%
3 AM				0	0.00%
4 AM				0	0.00%
5 AM				0	0.00%
6 AM				0	0.00%
7 AM				0	0.00%
8 AM				0	0.00%
9 AM				0	0.00%
10 AM				0	0.00%
11 AM				0	0.00%
12 Noon	1			1	25.00%
1 PM				0	0.00%
2 PM				0	0.00%
3 PM				0	0.00%
4 PM		2		2	50.00%
5 PM				0	0.00%
6 PM				0	0.00%
7 PM				0	0.00%
8 PM				0	0.00%
9 PM				0	0.00%
10 PM		1		1	25.00%
11 PM				0	0.00%
Total	1	3	0	4	100.00%

ROAD CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
No Defect				0	0.00%
Holes / Bumps				0	0.00%
Foreign Object on Surf				0	0.00%
Defect on Shoulder				0	0.00%
Construction				0	0.00%
Other				0	0.00%
Not Reported	1	3		4	100.00%
Total	1	3	0	4	100.00%

WEATHER CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Clear	1	2		3	75.00%
Cloudy				0	0.00%
Rain		1		1	25.00%
Snow/Sleet				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	3	0	4	100.00%

ROAD SURFACE	Time Period			Total	% Of Each
	2006	2007	2008		
Wet				0	0.00%
Dry	1	3		4	100.00%
Snow / Ice				0	0.00%
Other				0	0.00%
Not Reported				0	0.00%
Total	1	3	0	4	100.00%

LIGHT CONDITIONS	Time Period			Total	% Of Each
	2006	2007	2008		
Daylight	1	2		3	75.00%
Dawn / Dusk				0	0.00%
Dark-Lighted		1		1	25.00%
Dark-Unlighted				0	0.00%
Not Reported				0	0.00%
Other				0	0.00%
Total	1	3	0	4	100.00%



300 TradeCenter, Suite 5580
Woburn, MA 01801-5580
Phone: 781.933.4800



INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Watertown COUNT DATE : May-07

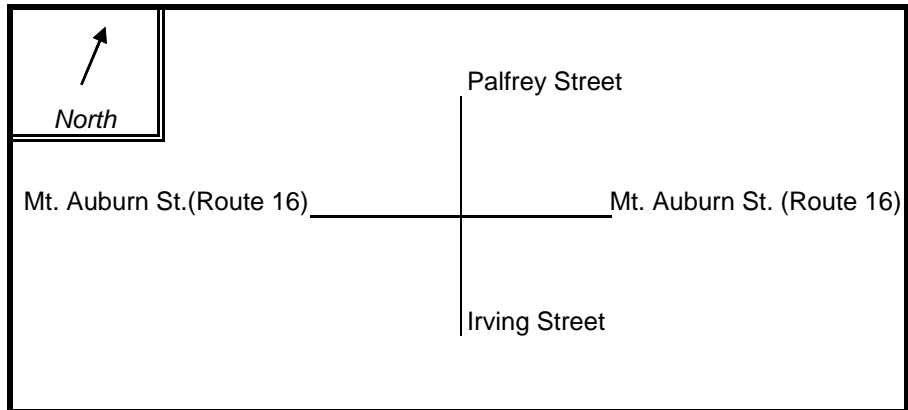
DISTRICT : 4 UNSIGNALIZED : SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Mt. Auburn St. (Route 16)

MINOR STREET(S) : Irving Street and Palfrey Street

**INTERSECTION
DIAGRAM
(Label Approaches)**



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM) :	1,028	807	332	0		

" K " FACTOR : INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES : # OF YEARS : AVERAGE # OF CRASHES PER YEAR (A) :

CRASH RATE CALCULATION :

0.45

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Crash Rate is lower than Statewide and District 4 averages

Project Title & Date: Mount Auburn Street Corridor Study, January 2011



INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Watertown COUNT DATE : Jun-10

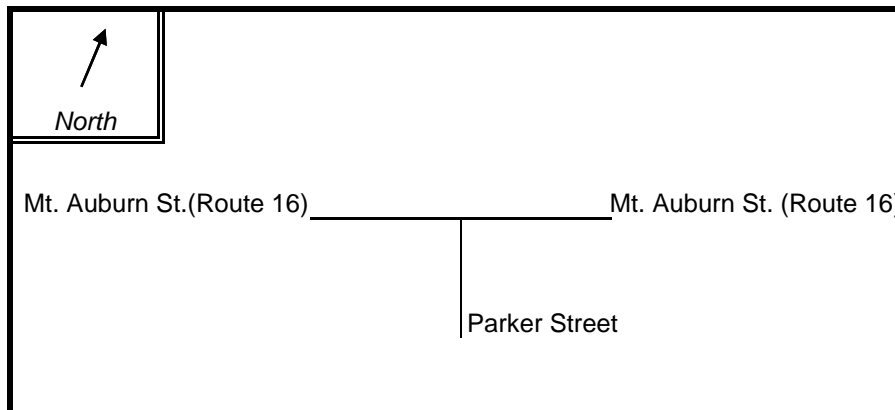
DISTRICT : 4 UNSIGNALIZED : SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Mt. Auburn St. (Route 16)

MINOR STREET(S) : Parker Street

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	SB			
PEAK HOURLY VOLUMES (AM/PM) :	780	847	555			

" K " FACTOR :

0.075

INTERSECTION ADT (V) = TOTAL DAILY
APPROACH VOLUME :

29,132

TOTAL # OF CRASHES :

7

OF
YEARS :

3

AVERAGE # OF
CRASHES PER YEAR (A) :

2.33

CRASH RATE CALCULATION :

0.22

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Crash Rate is lower than Statewide and District 4 averages

Project Title & Date: Mount Auburn Street Corridor Study, January 2011



INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Watertown COUNT DATE : Jun-10

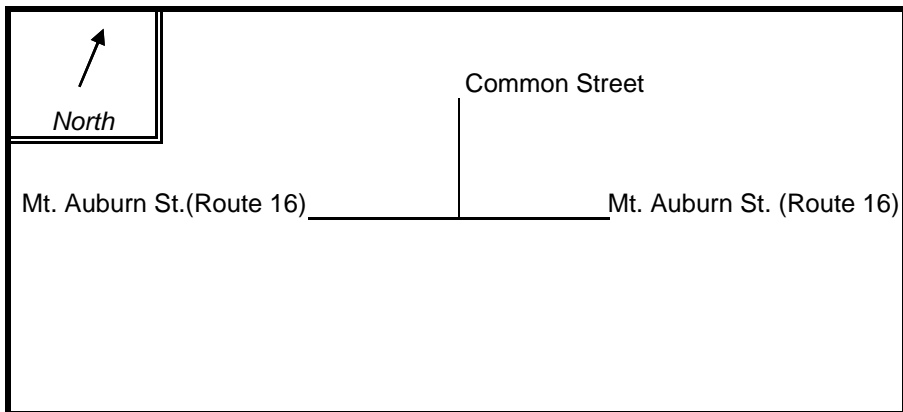
DISTRICT : 4 UNSIGNALIZED : SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Mt. Auburn St. (Route 16)

MINOR STREET(S) : Common Street

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	SB			
PEAK HOURLY VOLUMES (AM/PM) :	780	847	555			

" K " FACTOR : INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES : # OF YEARS : AVERAGE # OF CRASHES PER YEAR (A) :

CRASH RATE CALCULATION :

0.22

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Crash Rate is lower than Statewide and District 4 averages

Project Title & Date: Mount Auburn Street Corridor Study, January 2011



INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Watertown COUNT DATE : May-07

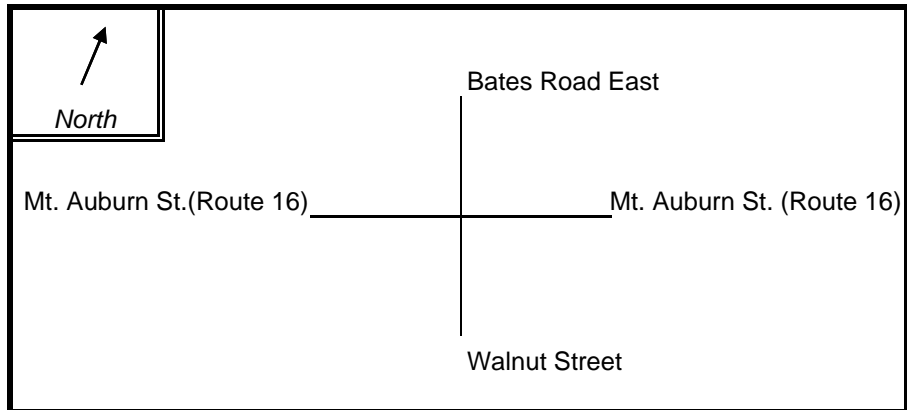
DISTRICT : 4 UNSIGNALIZED : SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Mt. Auburn St. (Route 16)

MINOR STREET(S) : Bates Road East and Walnut Street

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM) :	853	785	326	21		

" K " FACTOR : INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES : # OF YEARS : AVERAGE # OF CRASHES PER YEAR (A) :

CRASH RATE CALCULATION :

0.07

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Crash Rate is lower than Statewide and District 4 averages

Project Title & Date: Mount Auburn Street Corridor Study, January 2011



INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Watertown COUNT DATE : May-07

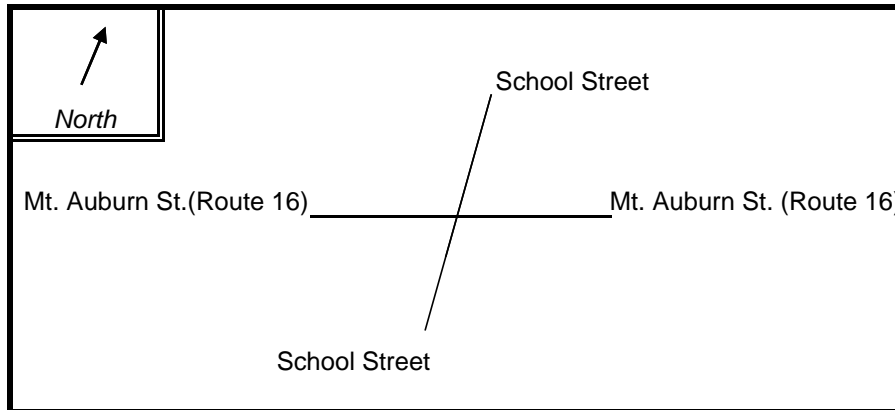
DISTRICT : 4 UNSIGNALIZED : SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Mt. Auburn St. (Route 16)

MINOR STREET(S) : School Street

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM) :	700	755	460	335		

" K " FACTOR : INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES : # OF YEARS : AVERAGE # OF CRASHES PER YEAR (**A**) :

CRASH RATE CALCULATION :

0.42

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Crash Rate is lower than Statewide and District 4 averages

Project Title & Date: Mount Auburn Street Corridor Study, January 2011



INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Watertown COUNT DATE : May-07

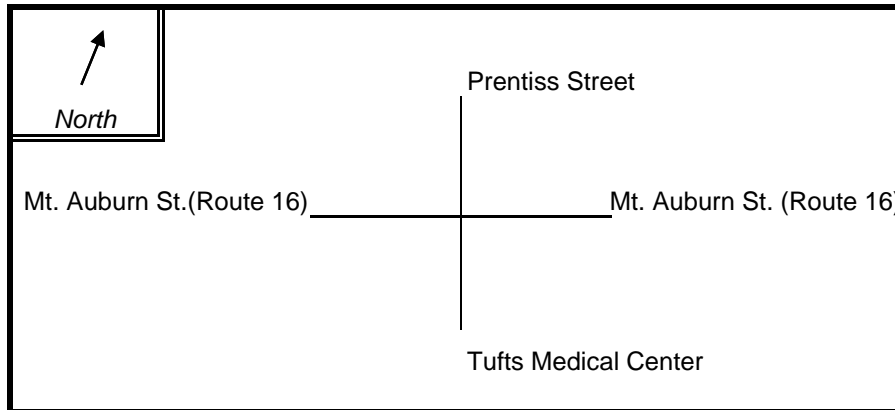
DISTRICT : 4 UNSIGNALIZED : SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Mt. Auburn St. (Route 16)

MINOR STREET(S) : Prentiss Street and Tufts Medical Center Driveway

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM) :	673	684	100	40		1,497

" K " FACTOR :

0.078

INTERSECTION ADT (**V**) = TOTAL DAILY
APPROACH VOLUME :

19,242

TOTAL # OF CRASHES :

1

OF
YEARS :

3

AVERAGE # OF
CRASHES PER YEAR (**A**) :

0.33

CRASH RATE CALCULATION :

0.05

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Crash Rate is lower than Statewide and District 4 averages

Project Title & Date: Mount Auburn Street Corridor Study, January 2011



INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Watertown COUNT DATE : May-07

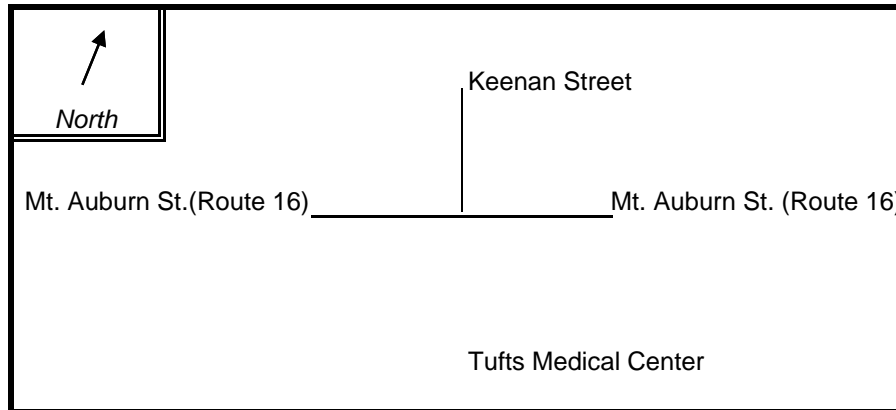
DISTRICT : 4 UNSIGNALIZED : SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Mt. Auburn St. (Route 16)

MINOR STREET(S) : Keenan Street

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	SB			
PEAK HOURLY VOLUMES (AM/PM) :	673	684	40			

" K " FACTOR :

0.078

INTERSECTION ADT (V) = TOTAL DAILY
APPROACH VOLUME :

17,956

TOTAL # OF CRASHES :

3

OF
YEARS :

3

AVERAGE # OF
CRASHES PER YEAR (A) :

1.00

CRASH RATE CALCULATION :

0.15

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Crash Rate is lower than Statewide and District 4 averages

Project Title & Date: Mount Auburn Street Corridor Study, January 2011



INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Watertown COUNT DATE : May-07

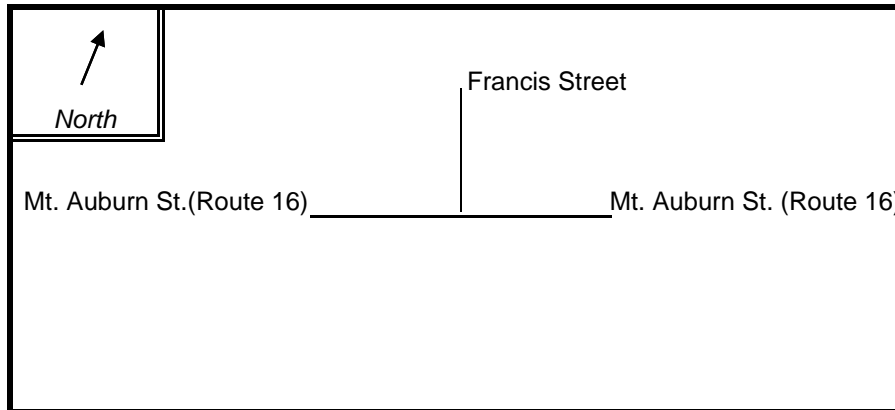
DISTRICT : 4 UNSIGNALIZED : SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Mt. Auburn St. (Route 16)

MINOR STREET(S) : Francis Street

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	SB			
PEAK HOURLY VOLUMES (AM/PM) :	673	684	40			

" K " FACTOR :

0.078

INTERSECTION ADT (**V**) = TOTAL DAILY
APPROACH VOLUME :

17,956

TOTAL # OF CRASHES :

1

OF
YEARS :

3

AVERAGE # OF
CRASHES PER YEAR (**A**) :

0.33

CRASH RATE CALCULATION :

0.05

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Crash Rate is lower than Statewide and District 4 averages

Project Title & Date: Mount Auburn Street Corridor Study, January 2011



INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Watertown COUNT DATE : May-07

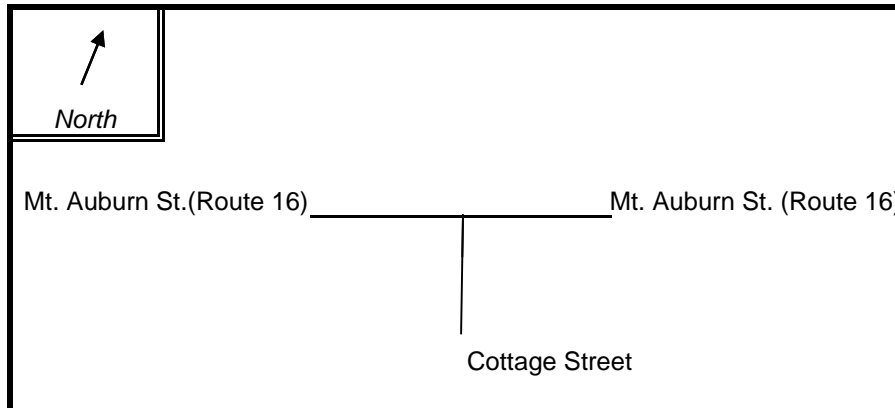
DISTRICT : 4 UNSIGNALIZED : SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Mt. Auburn St. (Route 16)

MINOR STREET(S) : Cottage Street

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB			
PEAK HOURLY VOLUMES (AM/PM) :	673	684	74			

" K " FACTOR :

0.078

INTERSECTION ADT (V) = TOTAL DAILY
APPROACH VOLUME :

18,399

TOTAL # OF CRASHES :

3

OF
YEARS :

3

AVERAGE # OF
CRASHES PER YEAR (A) :

1.00

CRASH RATE CALCULATION :

0.15

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Crash Rate is lower than Statewide and District 4 averages

Project Title & Date: Mount Auburn Street Corridor Study, January 2011



INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Watertown COUNT DATE : Oct-05

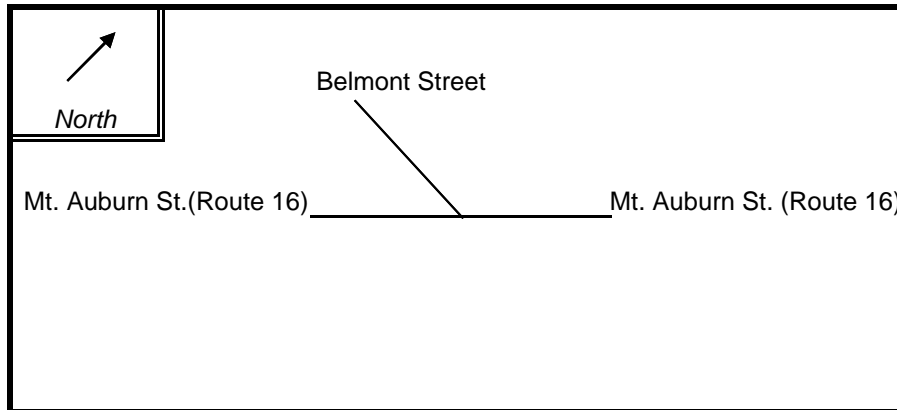
DISTRICT : 4 UNSIGNALIZED : SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Mt. Auburn St. (Route 16)

MINOR STREET(S) : Belmont Street

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	SB			
PEAK HOURLY VOLUMES (AM/PM) :	673	1,410	551			

" K " FACTOR : INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES : # OF YEARS : AVERAGE # OF CRASHES PER YEAR (A) :

CRASH RATE CALCULATION :

0.08

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Crash Rate is lower than Statewide and District 4 averages

Project Title & Date: Mount Auburn Street Corridor Study, January 2011

5.0 APPENDIX

5.3 MUTCD Warrant Analysis Work Sheets

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 AM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1662**

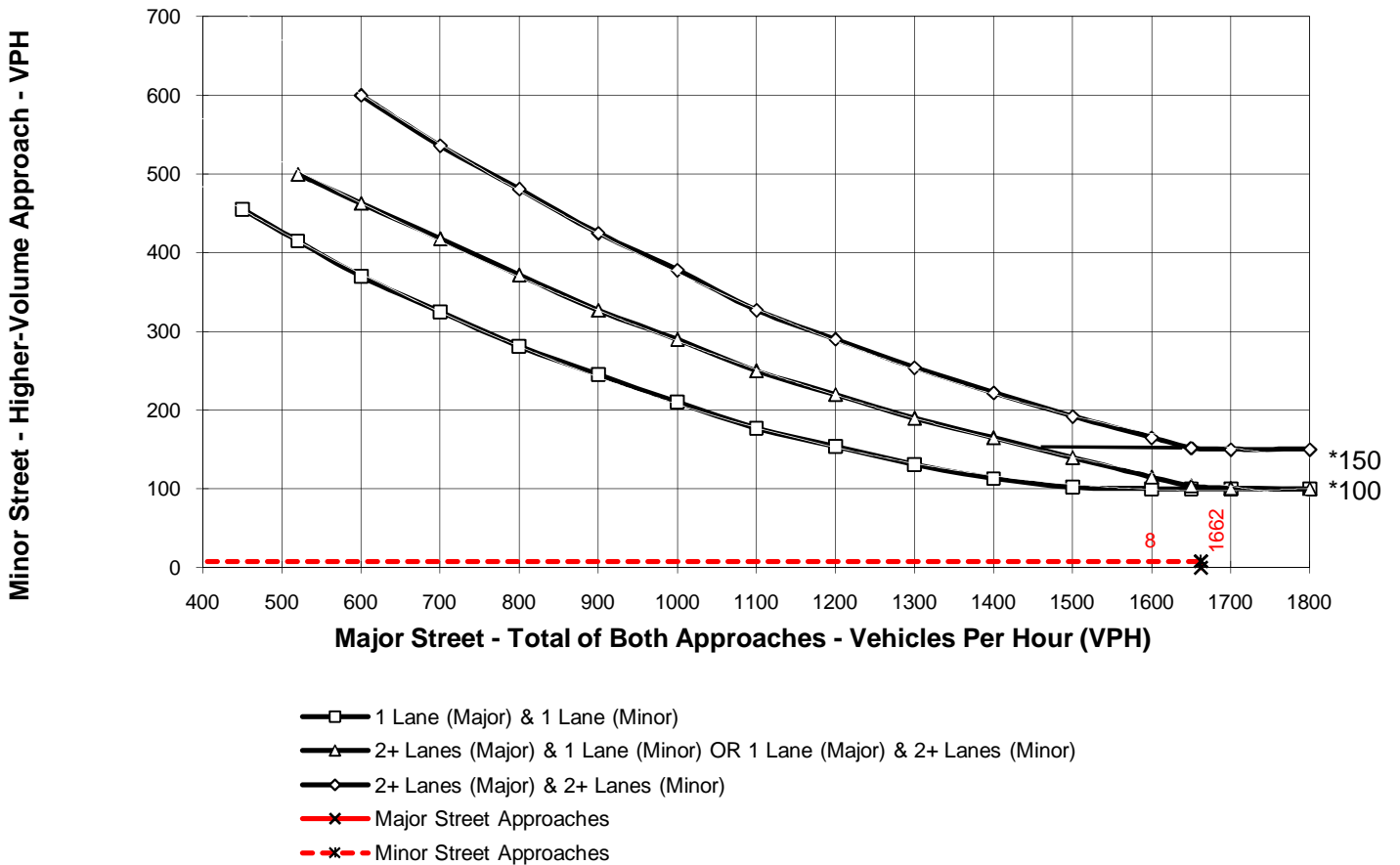
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Phillips Street**

High Volume Approach (VPH) = **8**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 PM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1640**

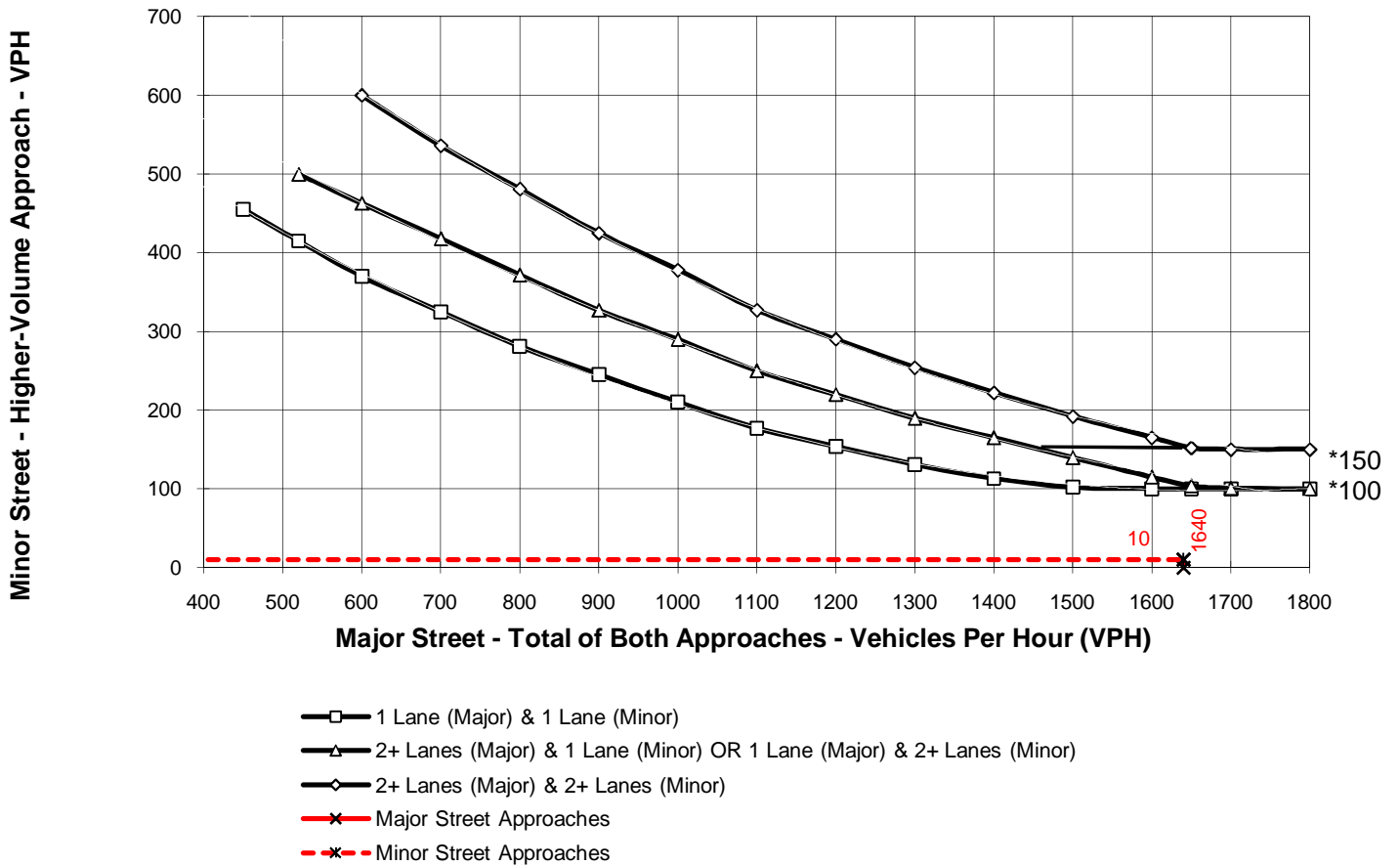
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Phillips Street**

High Volume Approach (VPH) = **10**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 AM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1479**

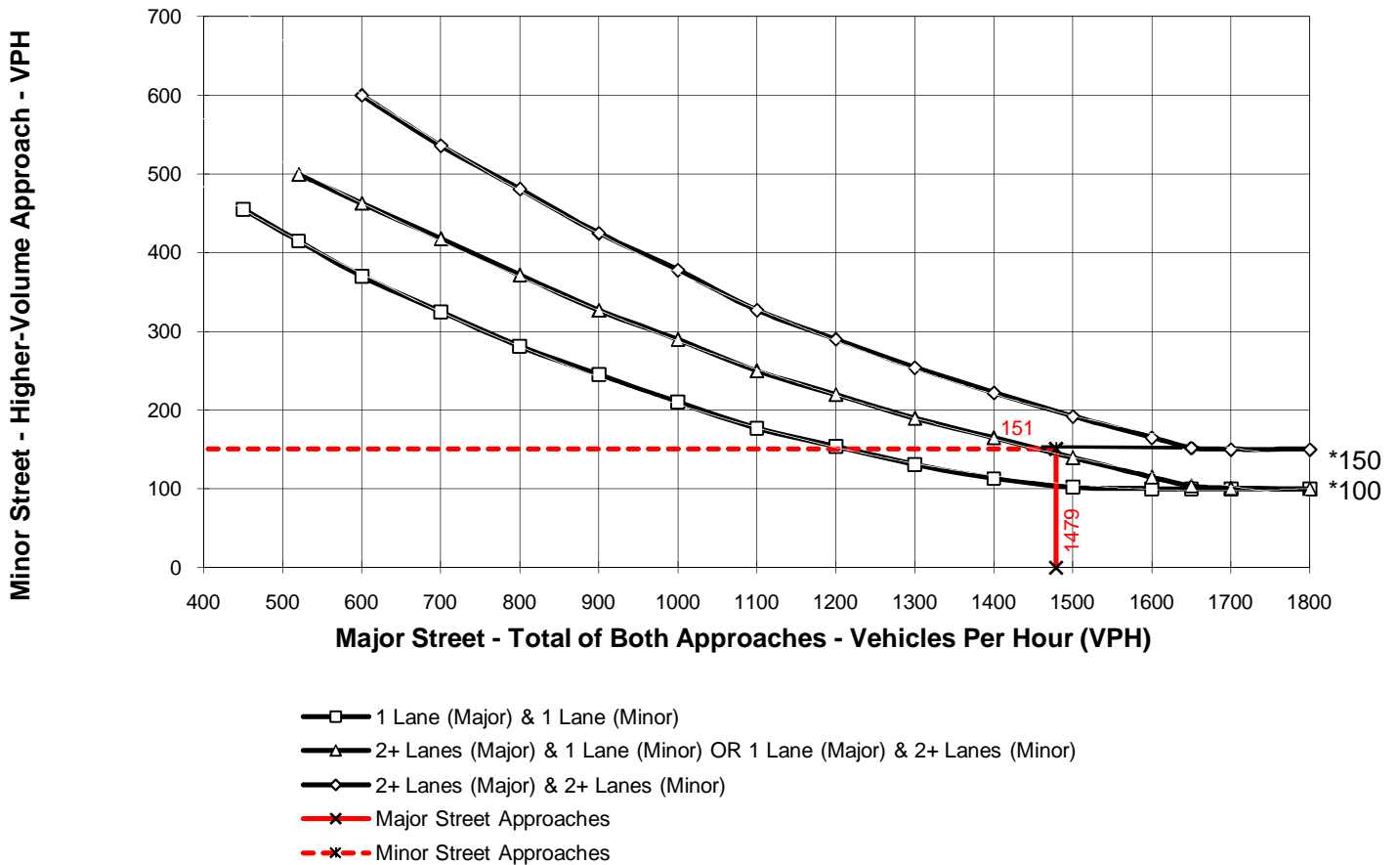
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Boylston Street**

High Volume Approach (VPH) = **151**

Number of Approach Lanes On Minor Street = **1**

WARRANTED FOR A SIGNAL



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 PM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1562**

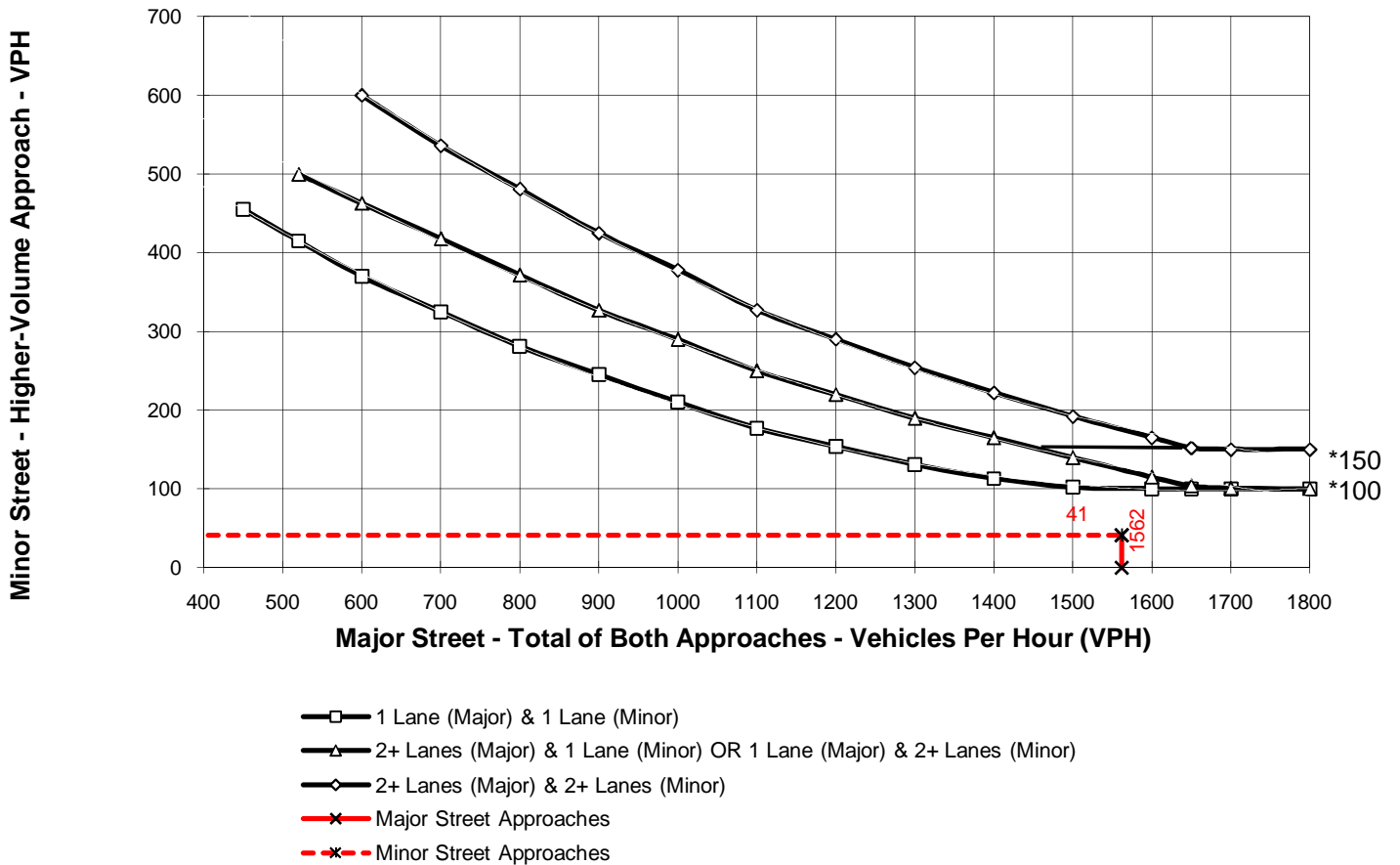
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Boylston Street**

High Volume Approach (VPH) = **41**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 AM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1433**

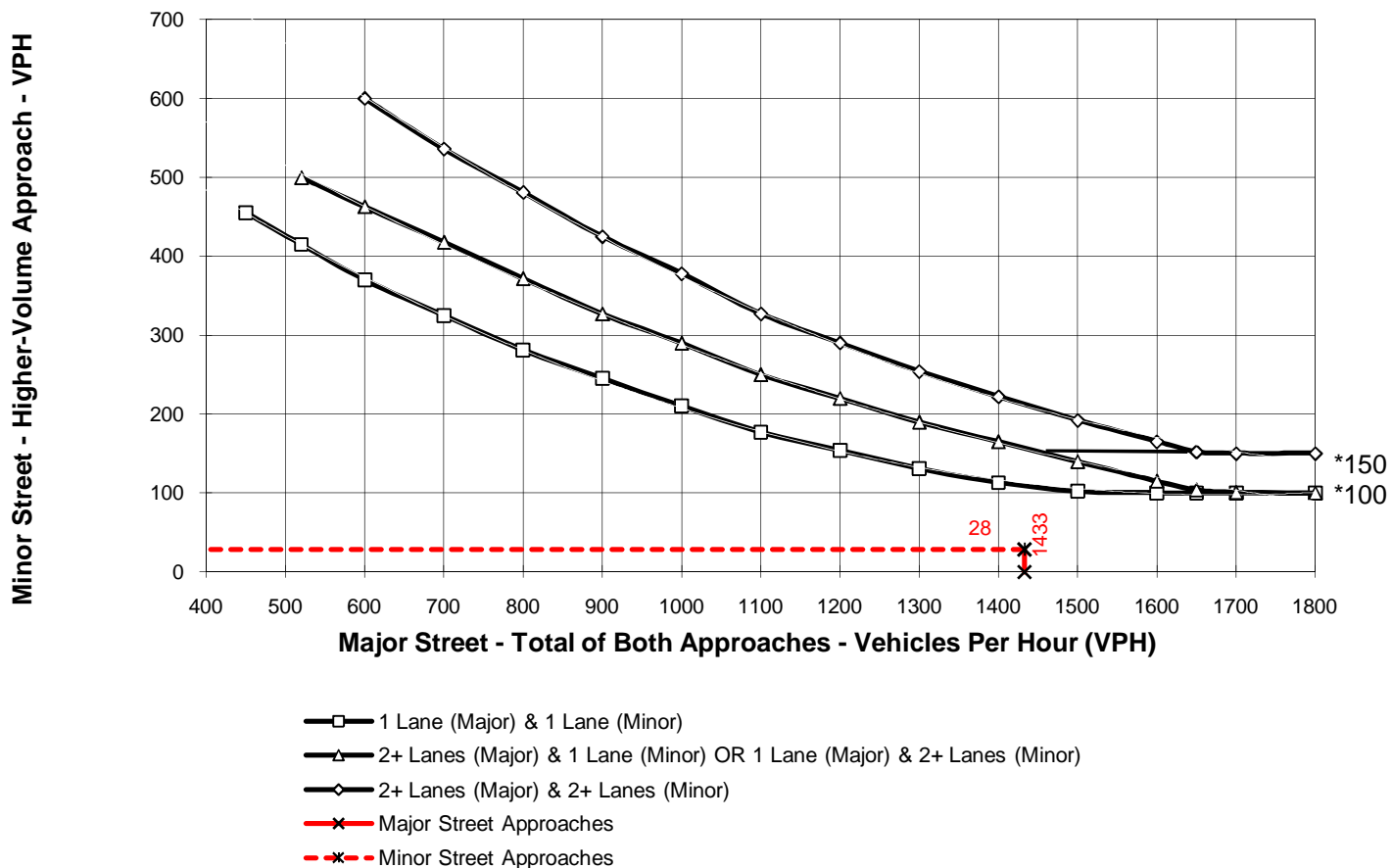
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Winthrop Street**

High Volume Approach (VPH) = **28**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 PM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1533**

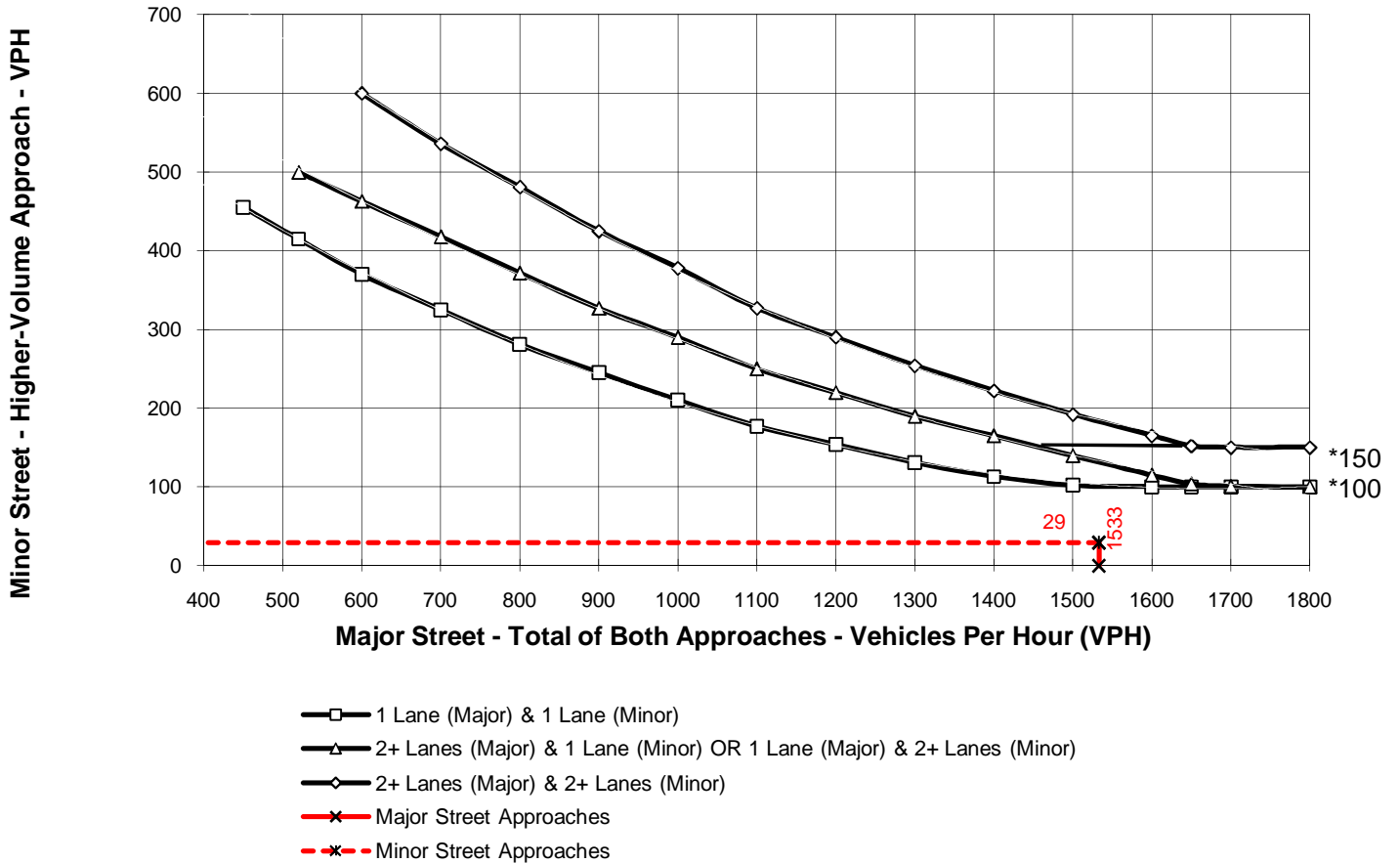
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Winthrop Street**

High Volume Approach (VPH) = **29**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 AM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1442**

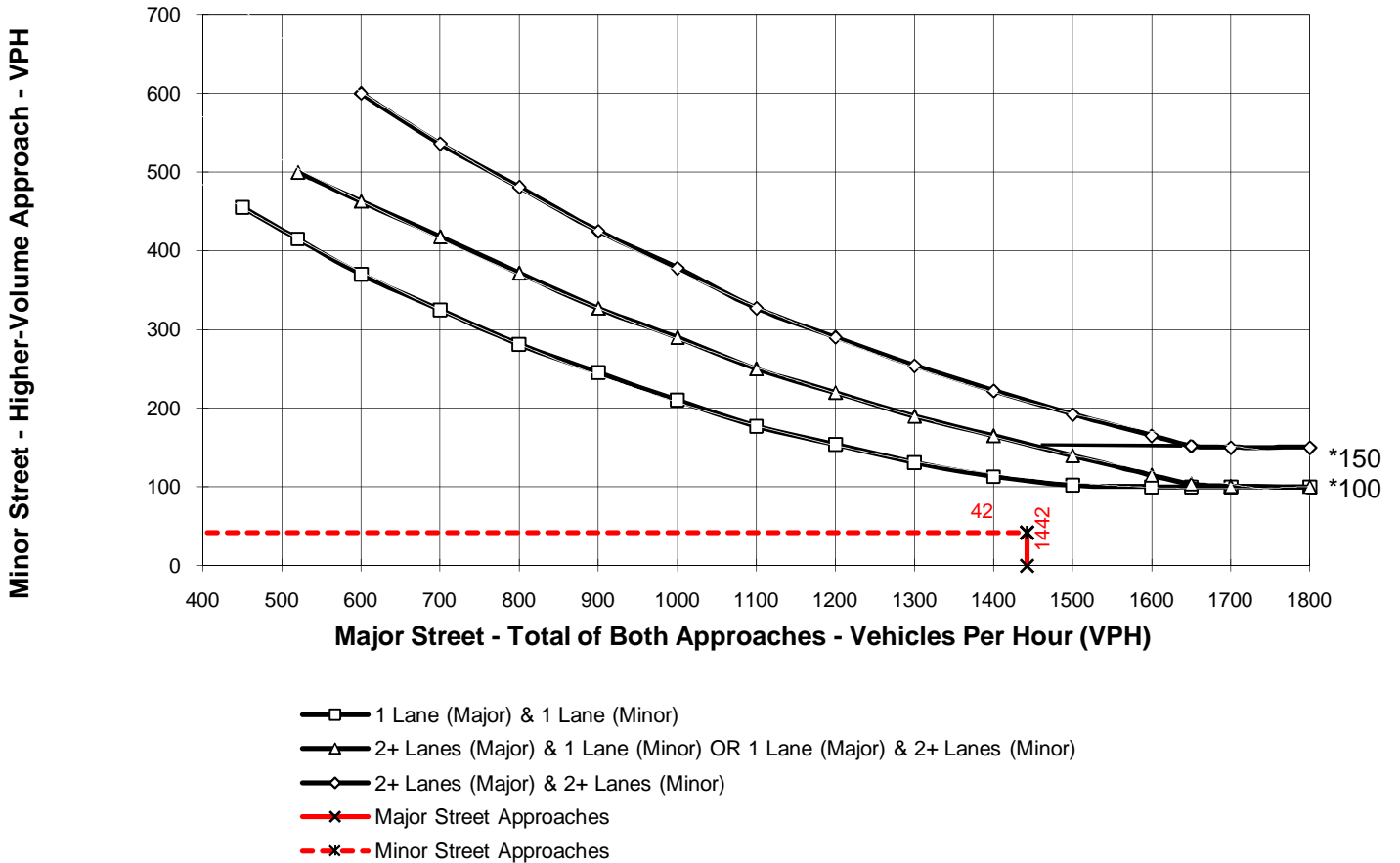
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Chauncey Street**

High Volume Approach (VPH) = **42**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 PM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1524**

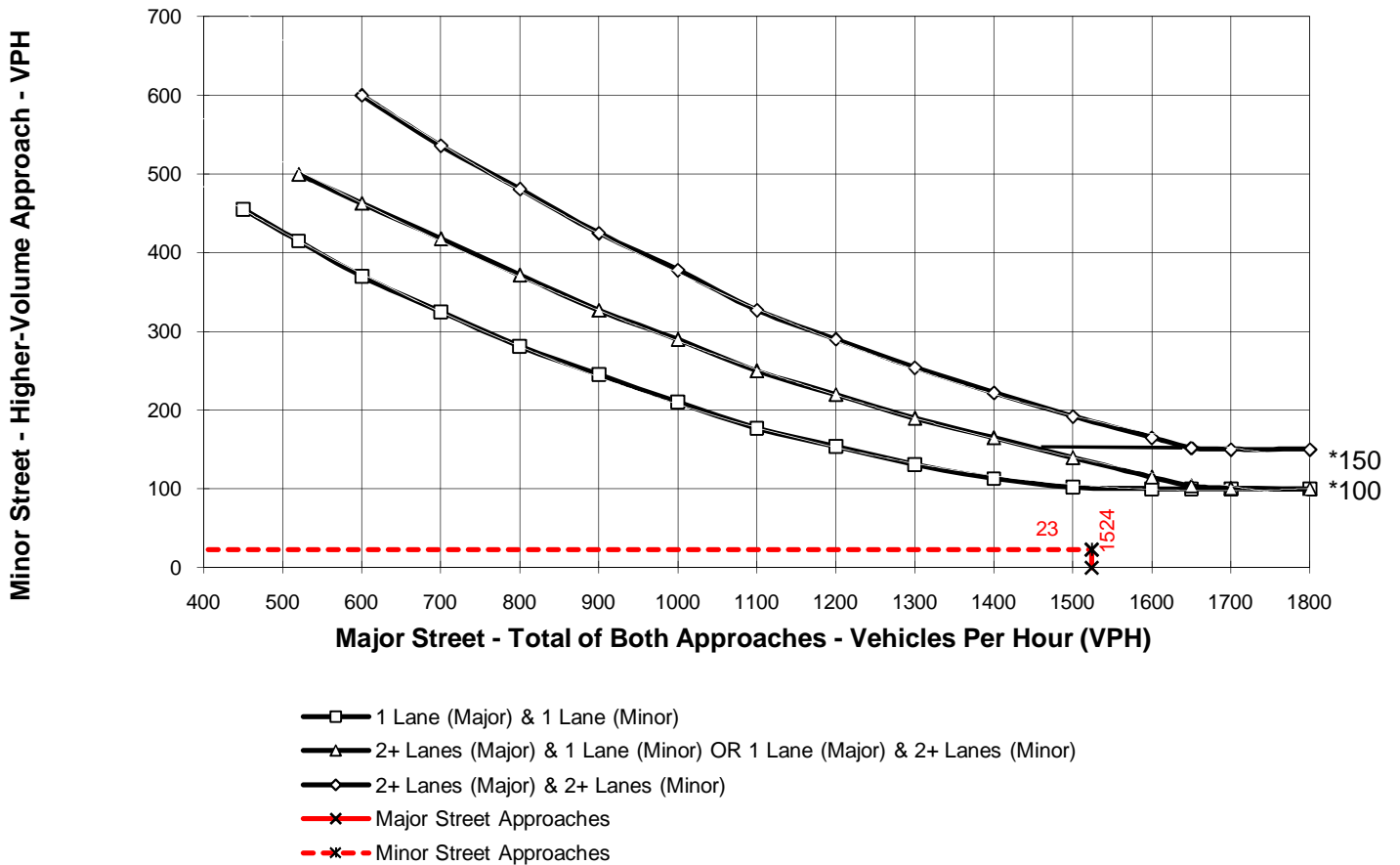
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Chauncey Street**

High Volume Approach (VPH) = **23**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 AM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1374**

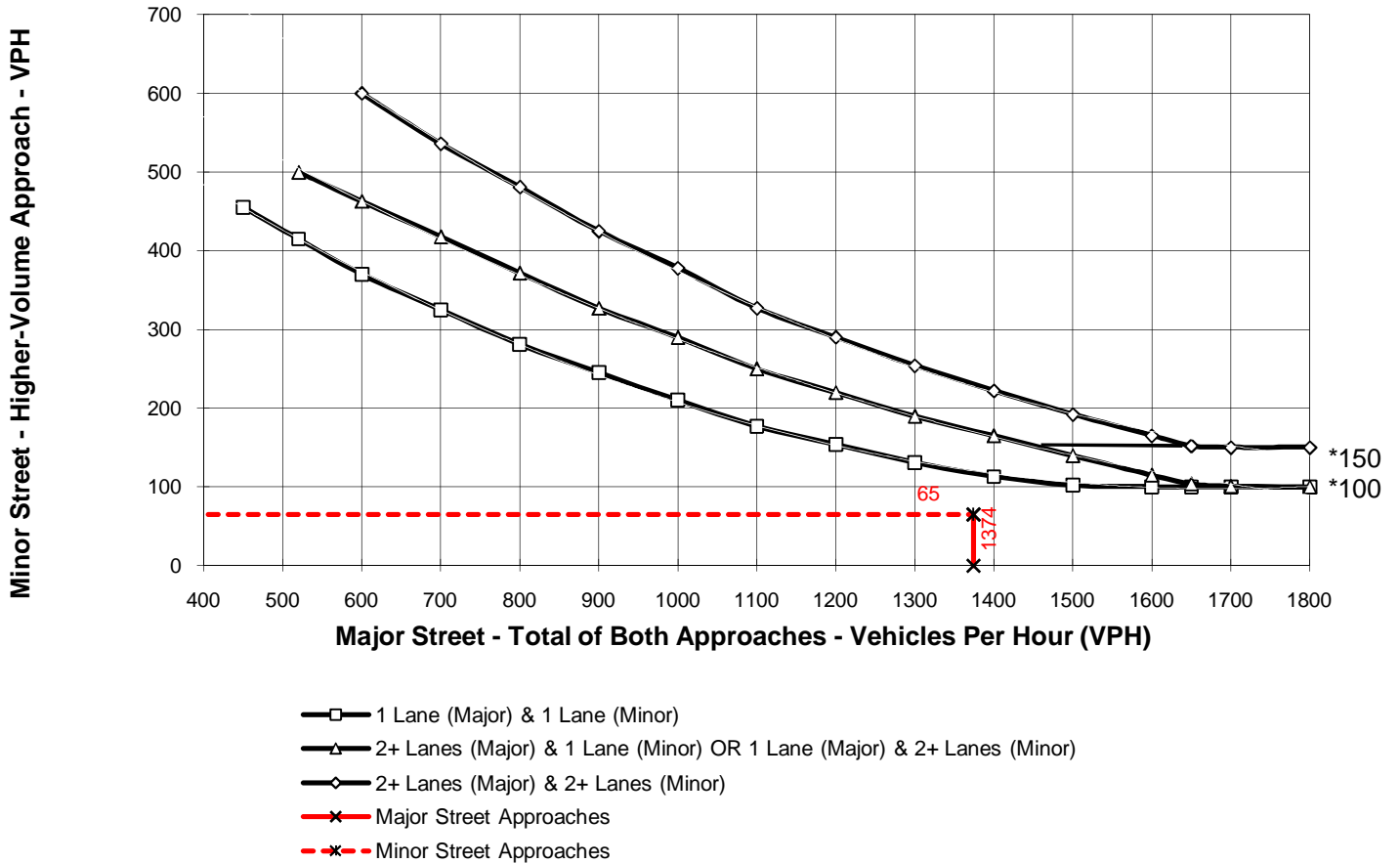
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Upland Rd/Dexter Ave**

High Volume Approach (VPH) = **65**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 PM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1410**

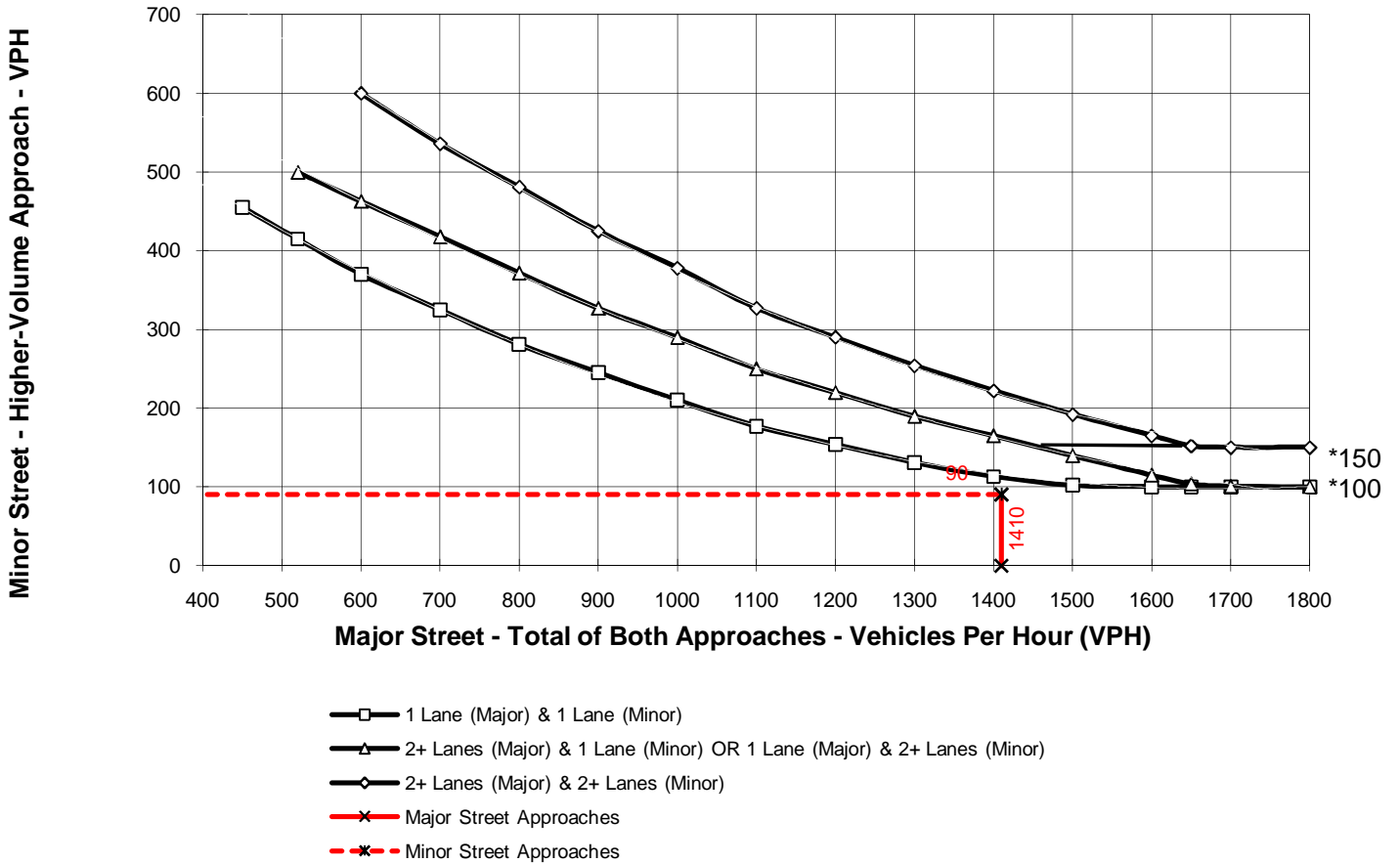
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Upland Rd/Dexter Ave**

High Volume Approach (VPH) = **90**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 AM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1538**

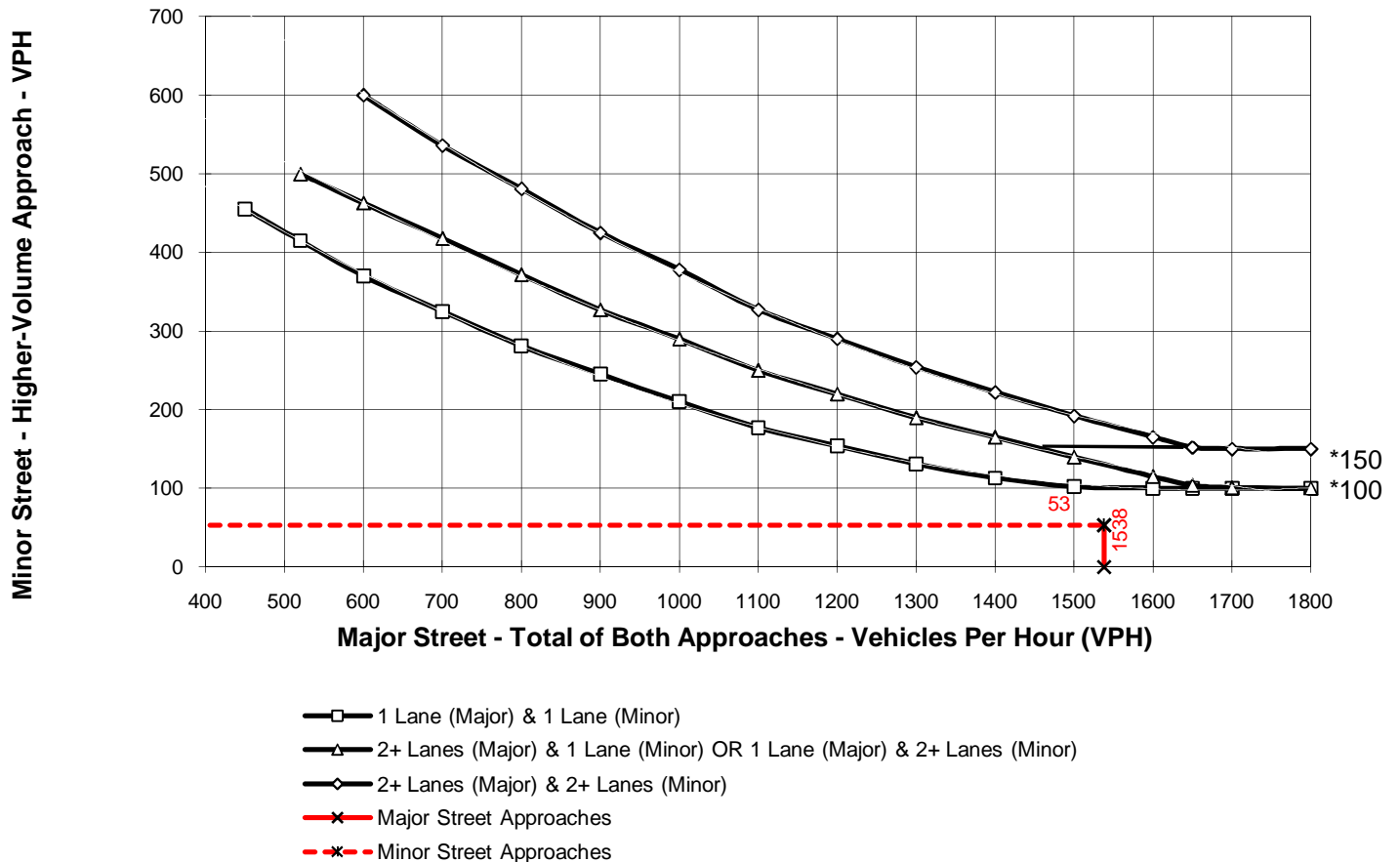
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Melendy Avenue**

High Volume Approach (VPH) = **53**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 PM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1604**

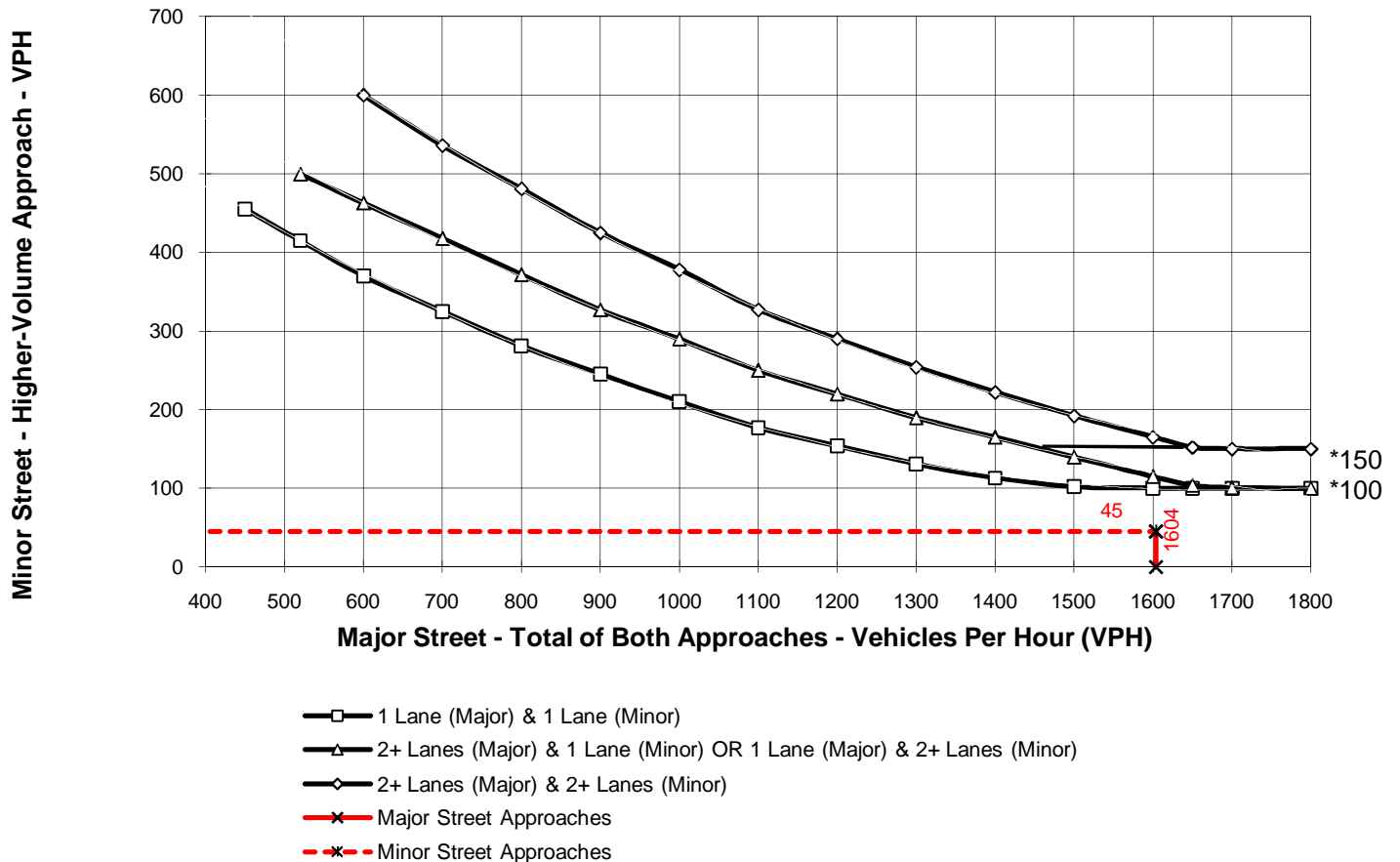
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Melendy Avenue**

High Volume Approach (VPH) = **45**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 AM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1467**

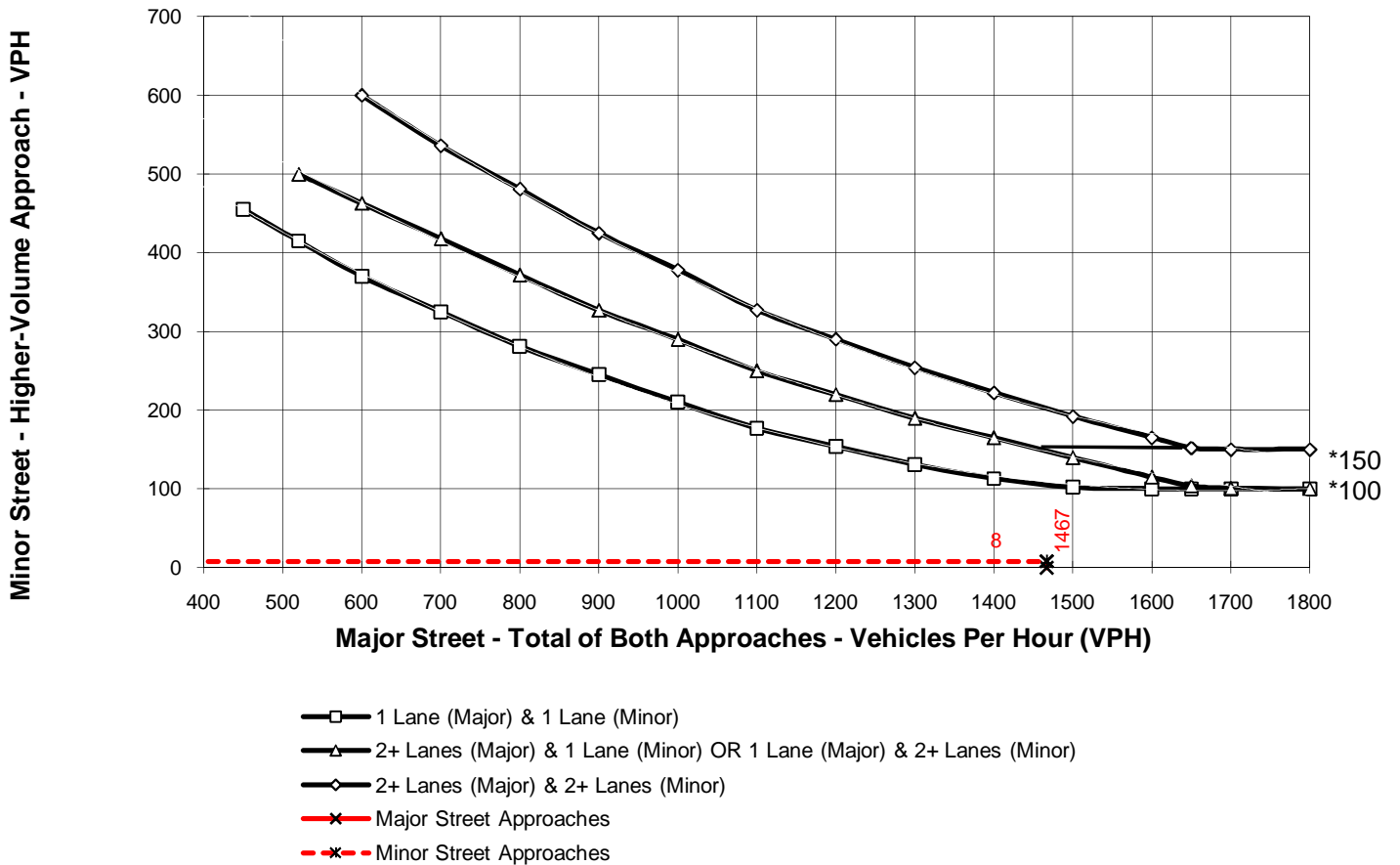
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Lloyd Road**

High Volume Approach (VPH) = **8**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 PM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1561**

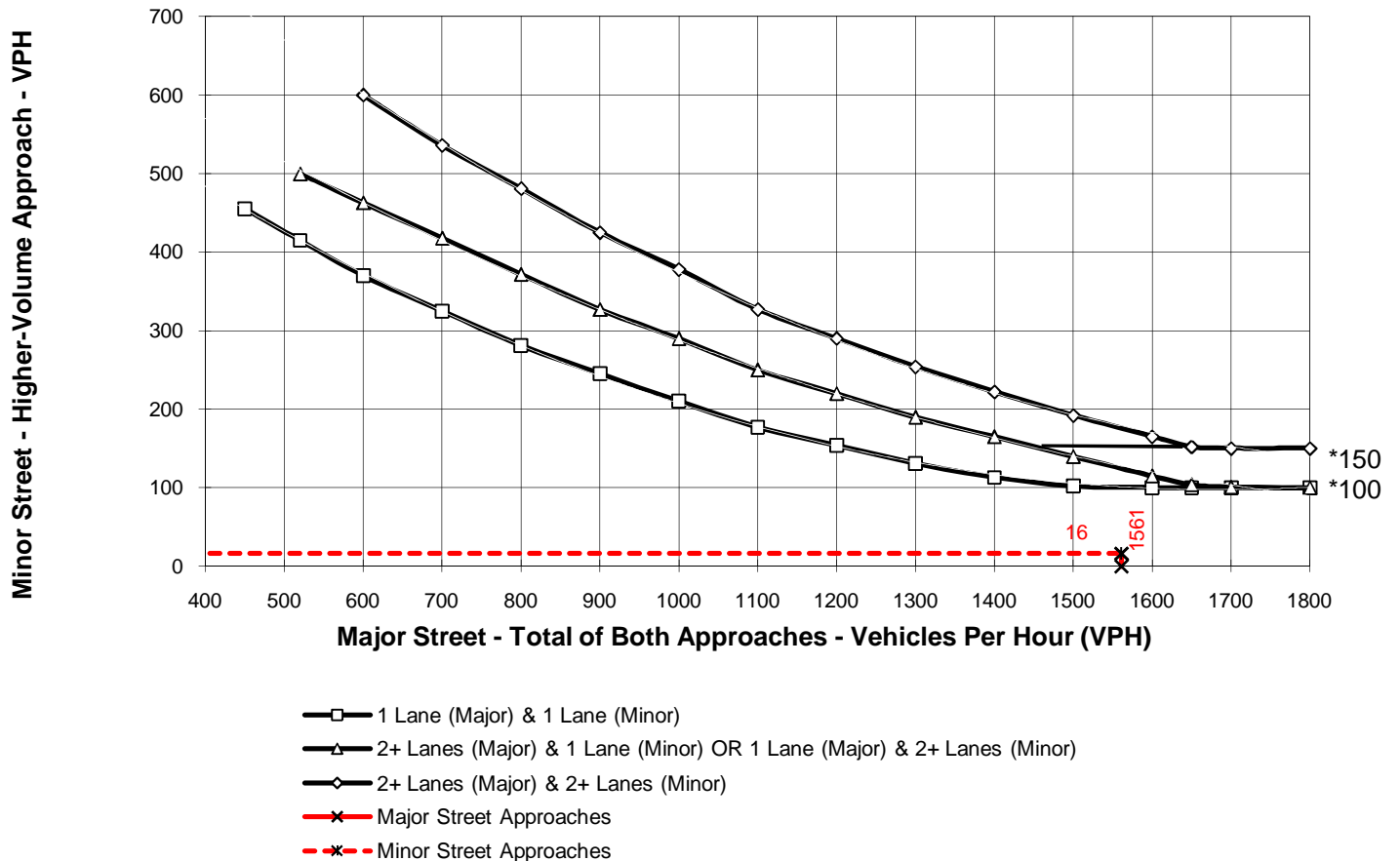
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Lloyd Road**

High Volume Approach (VPH) = **16**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 AM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1464**

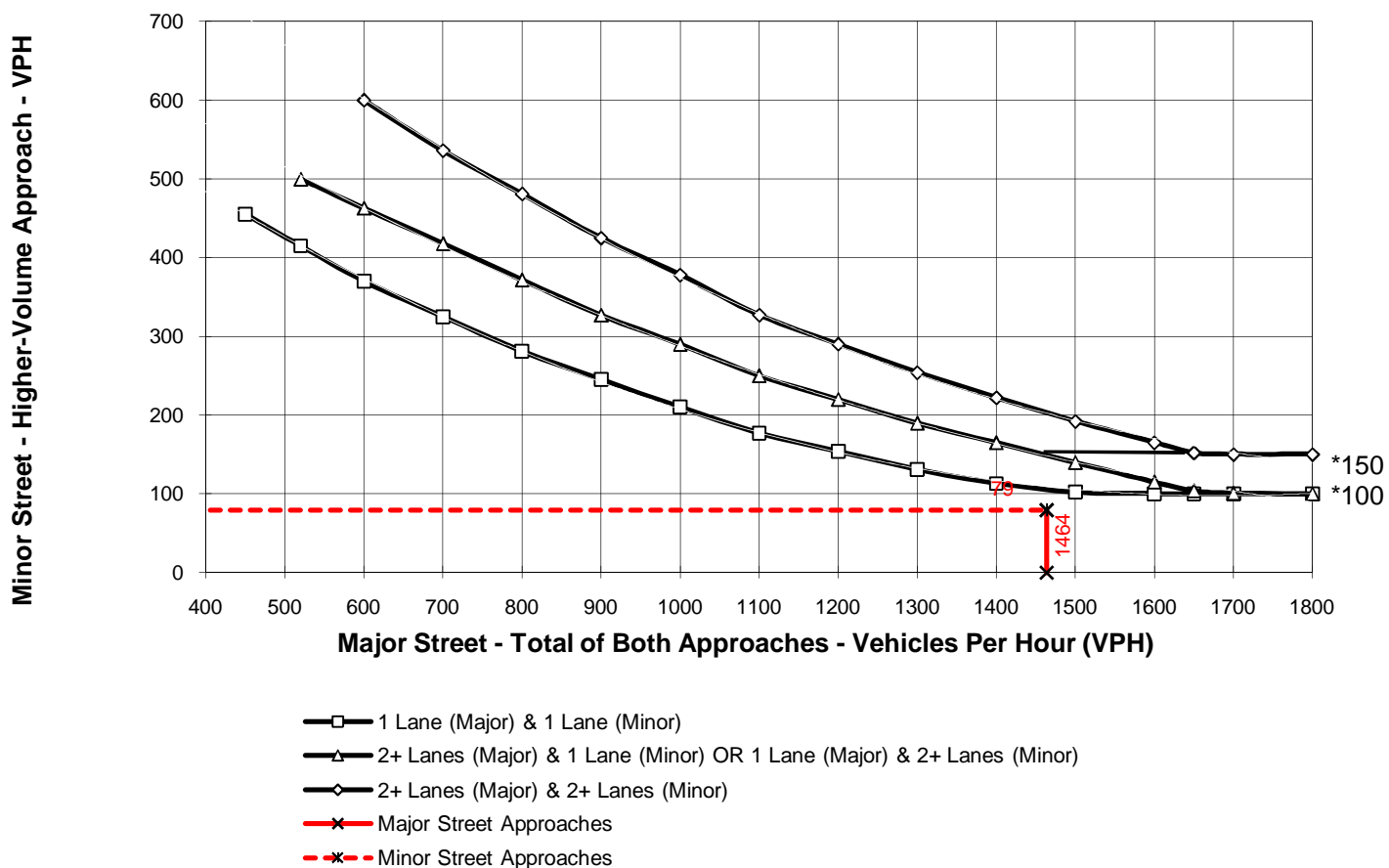
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Irma Avenue**

High Volume Approach (VPH) = **79**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 PM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1558**

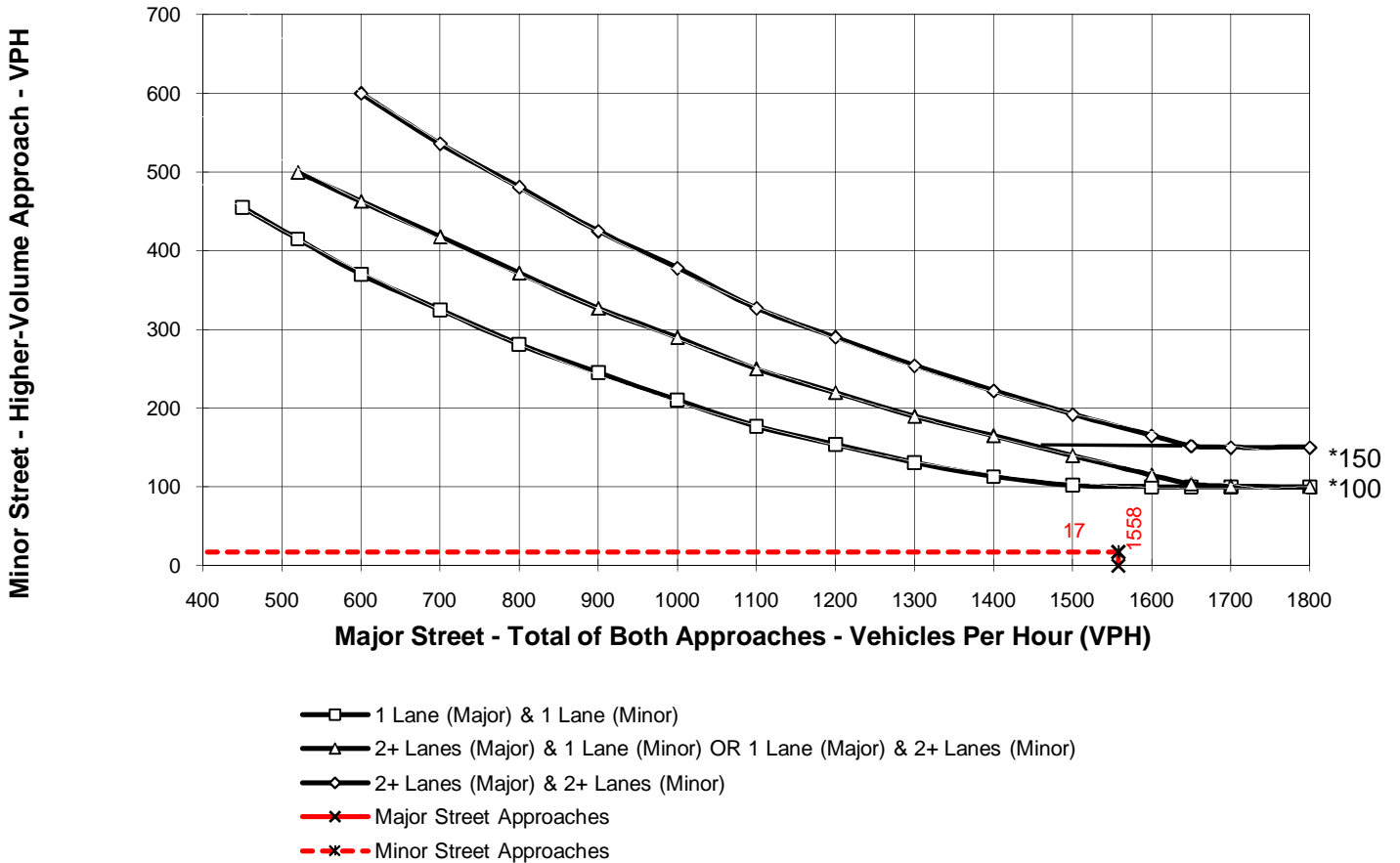
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Irma Avenue**

High Volume Approach (VPH) = **17**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 AM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1536**

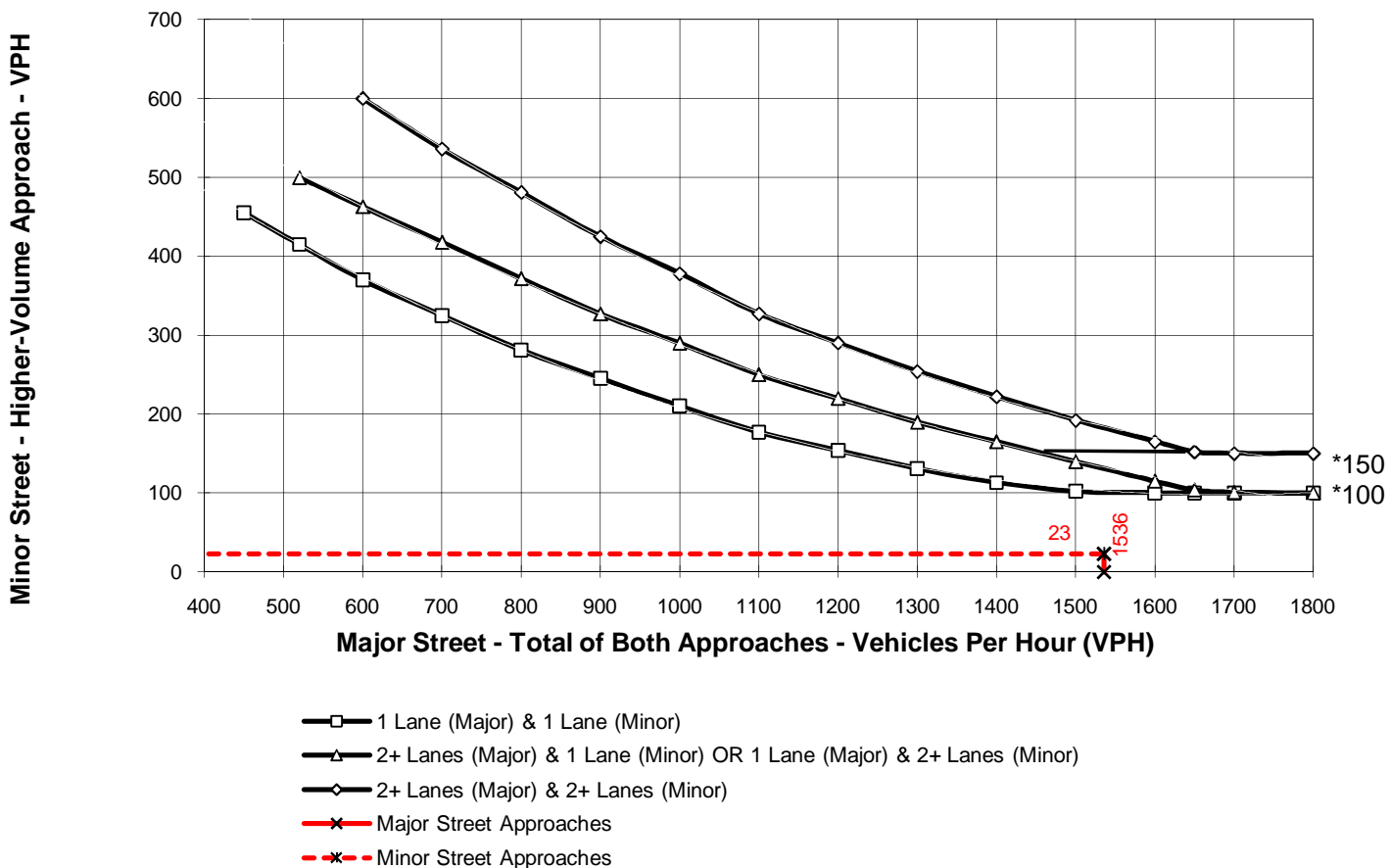
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Templeton Parkway**

High Volume Approach (VPH) = **23**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 PM PEAK**

Major Street Name = **Mount Auburn St (Route 16)**

Total of Both Approaches (VPH) = **1553**

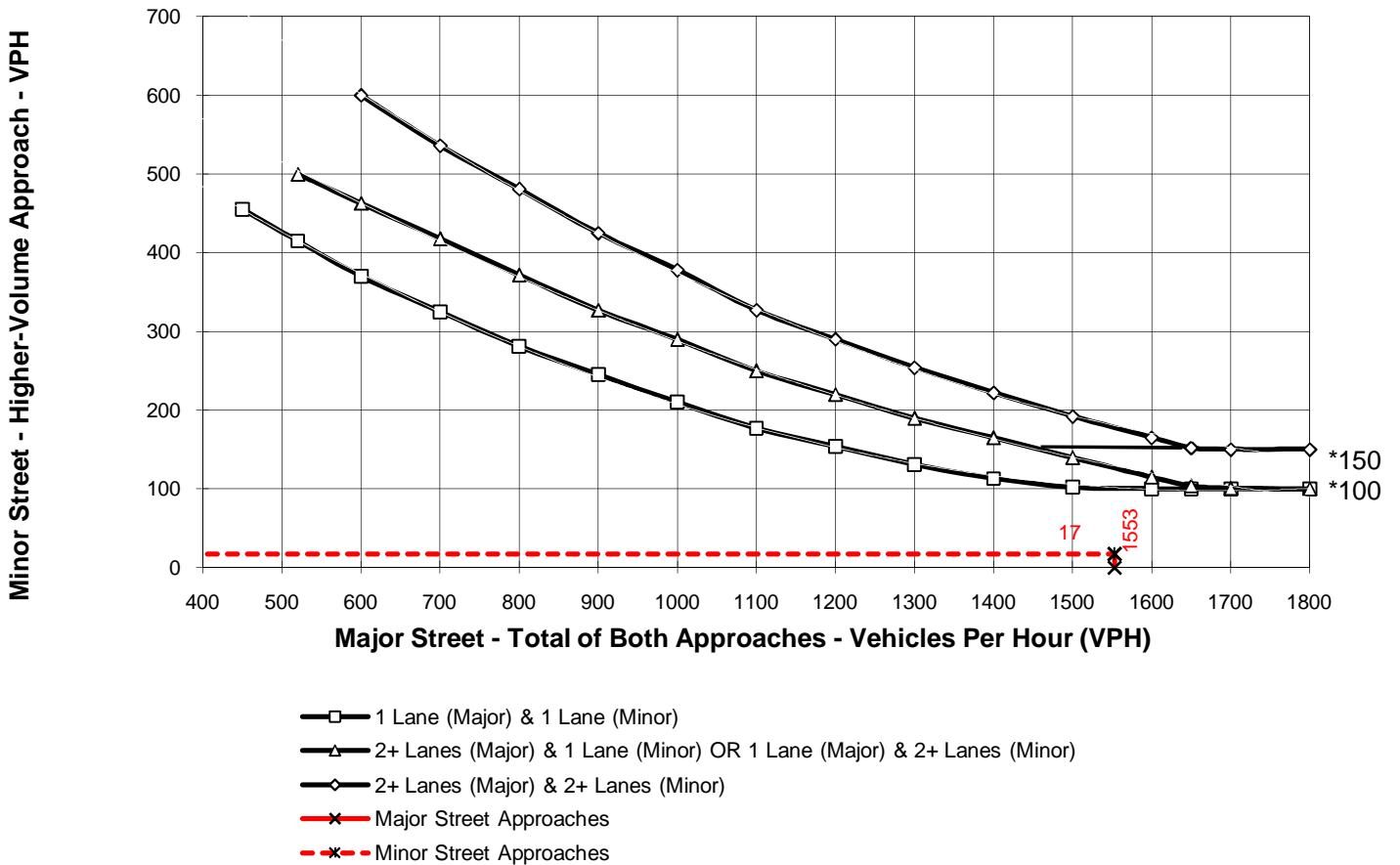
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Templeton Parkway**

High Volume Approach (VPH) = **17**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 AM PEAK**

Major Street Name = **Arlington St/Grove St**

Total of Both Approaches (VPH) = **1267**

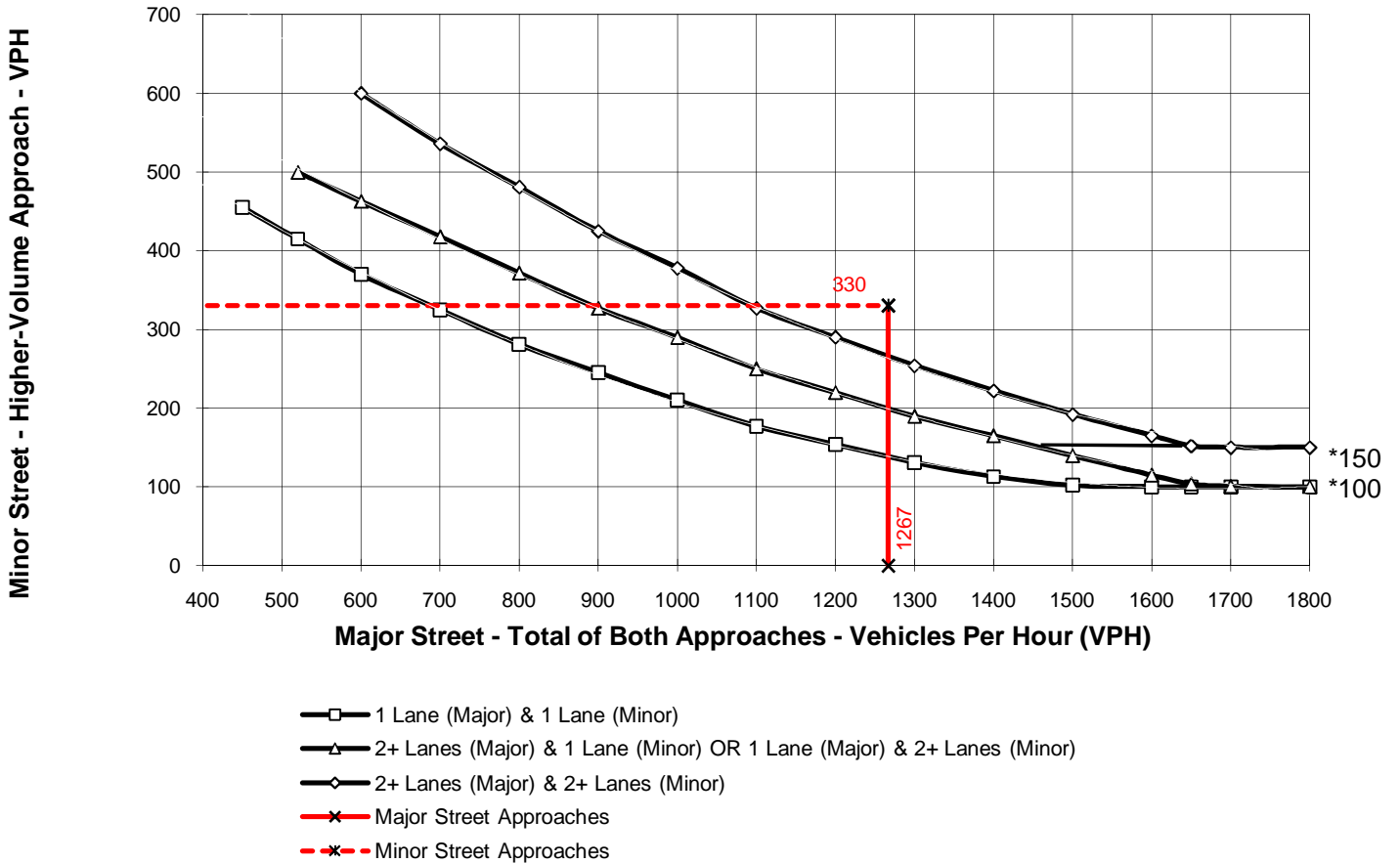
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Arlington St**

High Volume Approach (VPH) = **330**

Number of Approach Lanes On Minor Street = **2**

WARRANTED FOR A SIGNAL



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 PM PEAK**

Major Street Name = **Arlington St/Grove St**

Total of Both Approaches (VPH) = **1261**

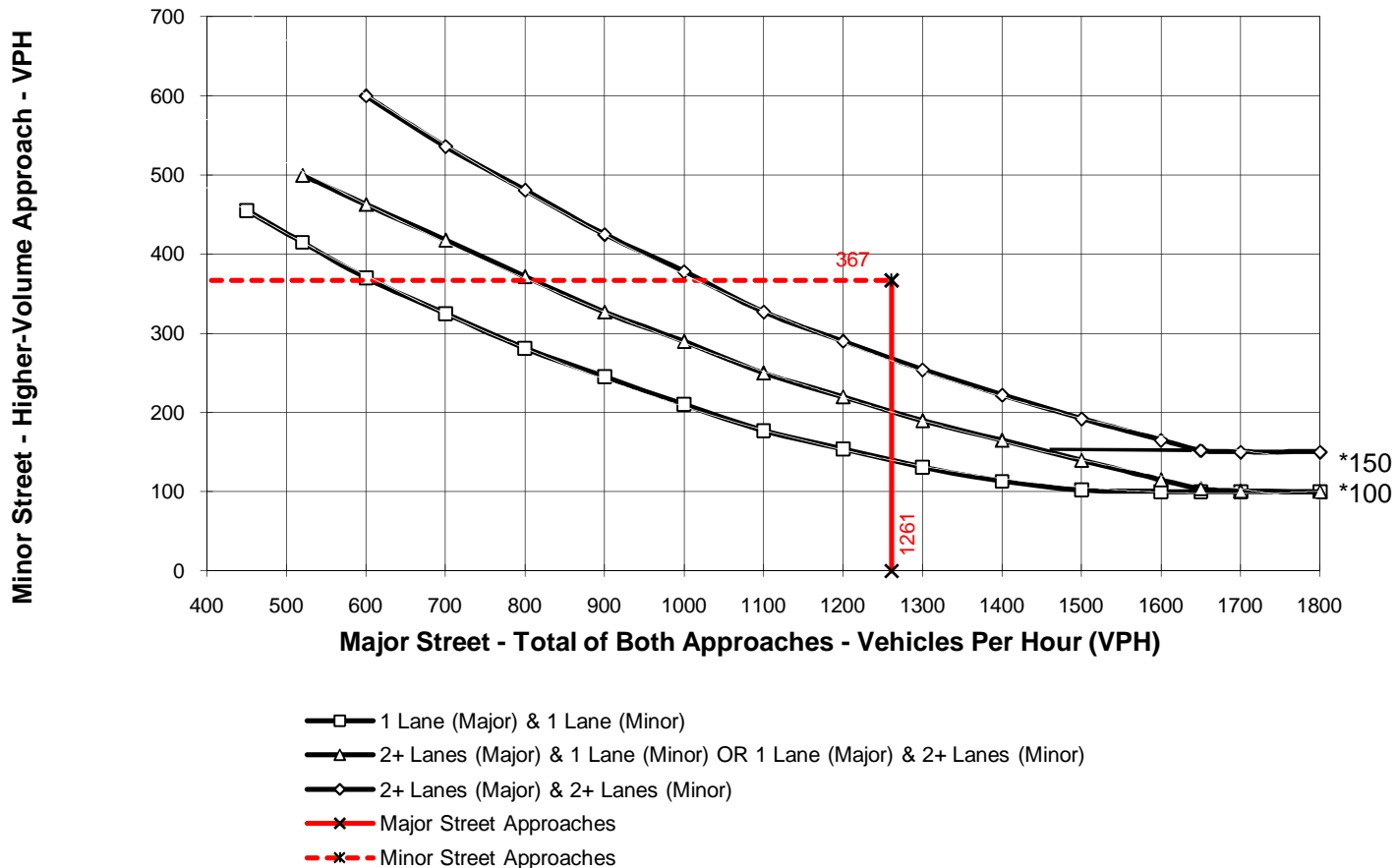
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Arlington St**

High Volume Approach (VPH) = **367**

Number of Approach Lanes On Minor Street = **2**

WARRANTED FOR A SIGNAL



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 AM PEAK**

Major Street Name = **Grove Street**

Total of Both Approaches (VPH) = **898**

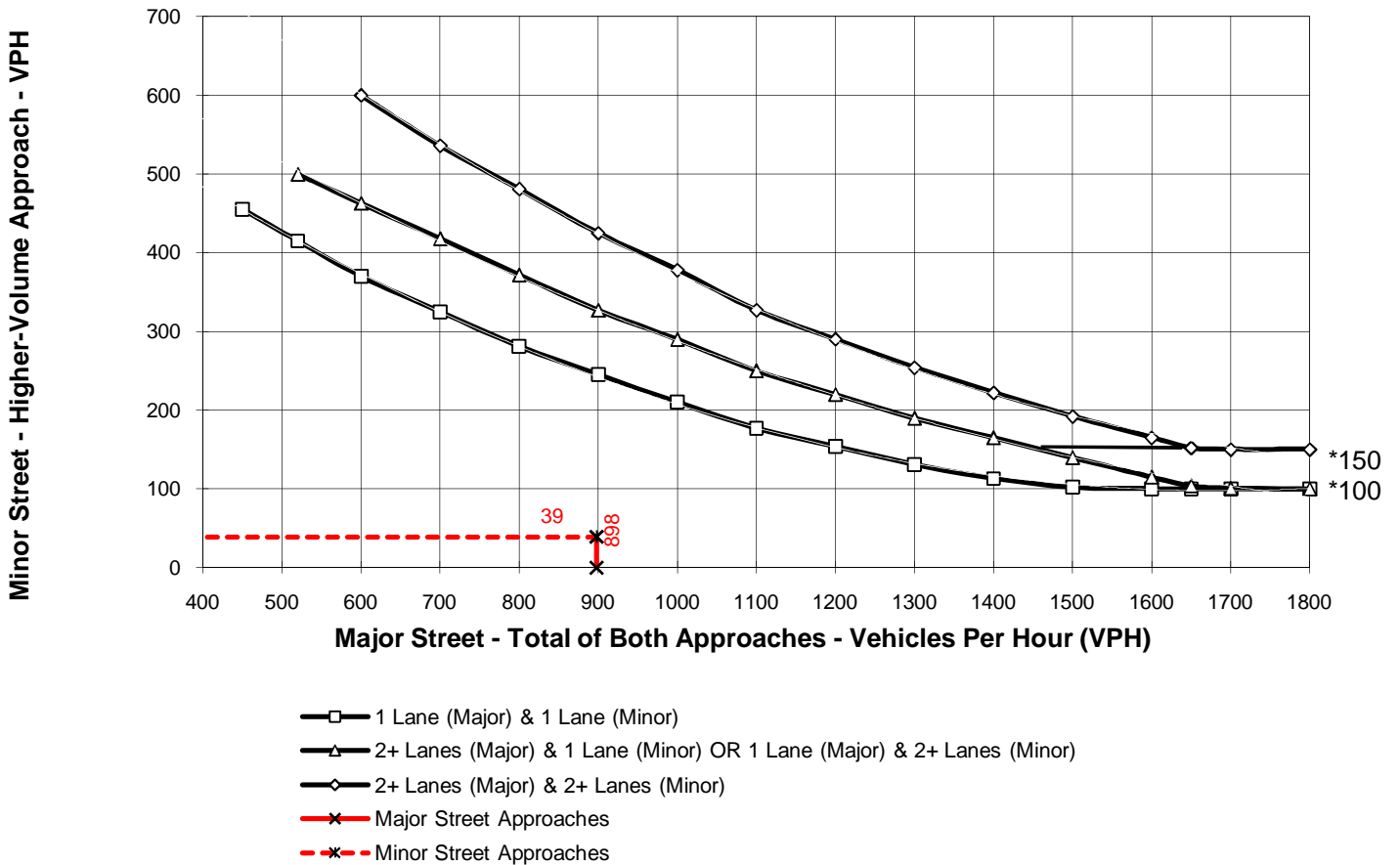
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Tufts Medical Center**

High Volume Approach (VPH) = **39**

Number of Approach Lanes On Minor Street = **2**

SIGNAL WARRANT NOT SATISFIED



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

WARRANT 3, PEAK HOUR (Urban Areas)

Traffic Conditions = **EXISTING 2010 PM PEAK**

Major Street Name = **Grove Street**

Total of Both Approaches (VPH) = **898**

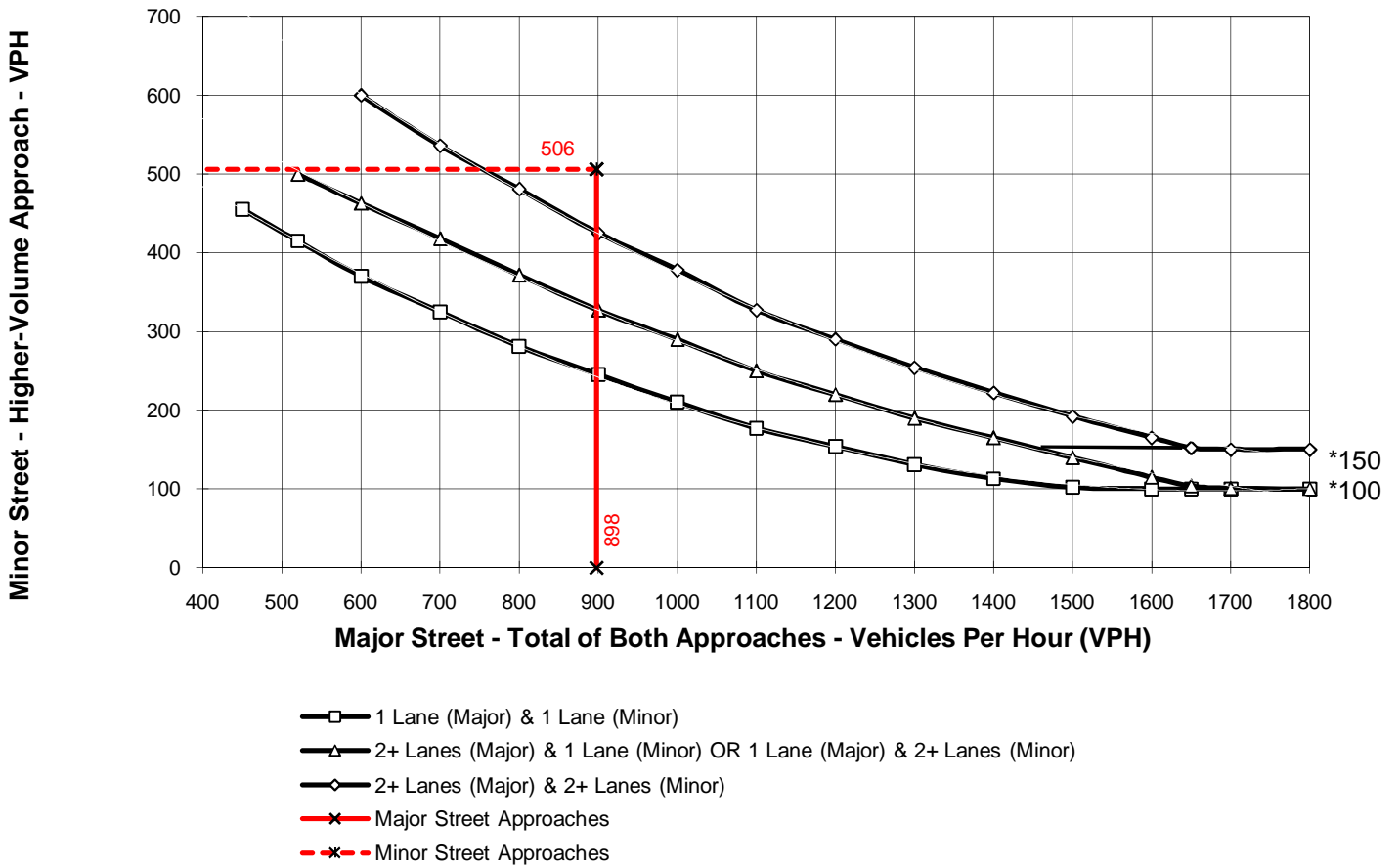
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Tufts Medical Center**

High Volume Approach (VPH) = **506**

Number of Approach Lanes On Minor Street = **2**

WARRANTED FOR A SIGNAL

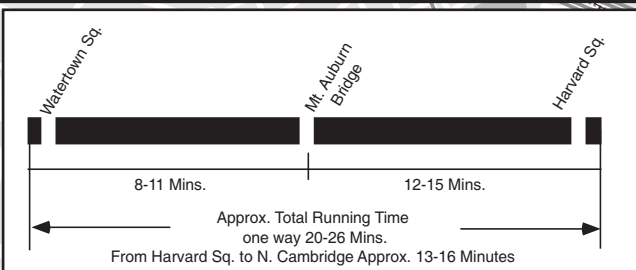
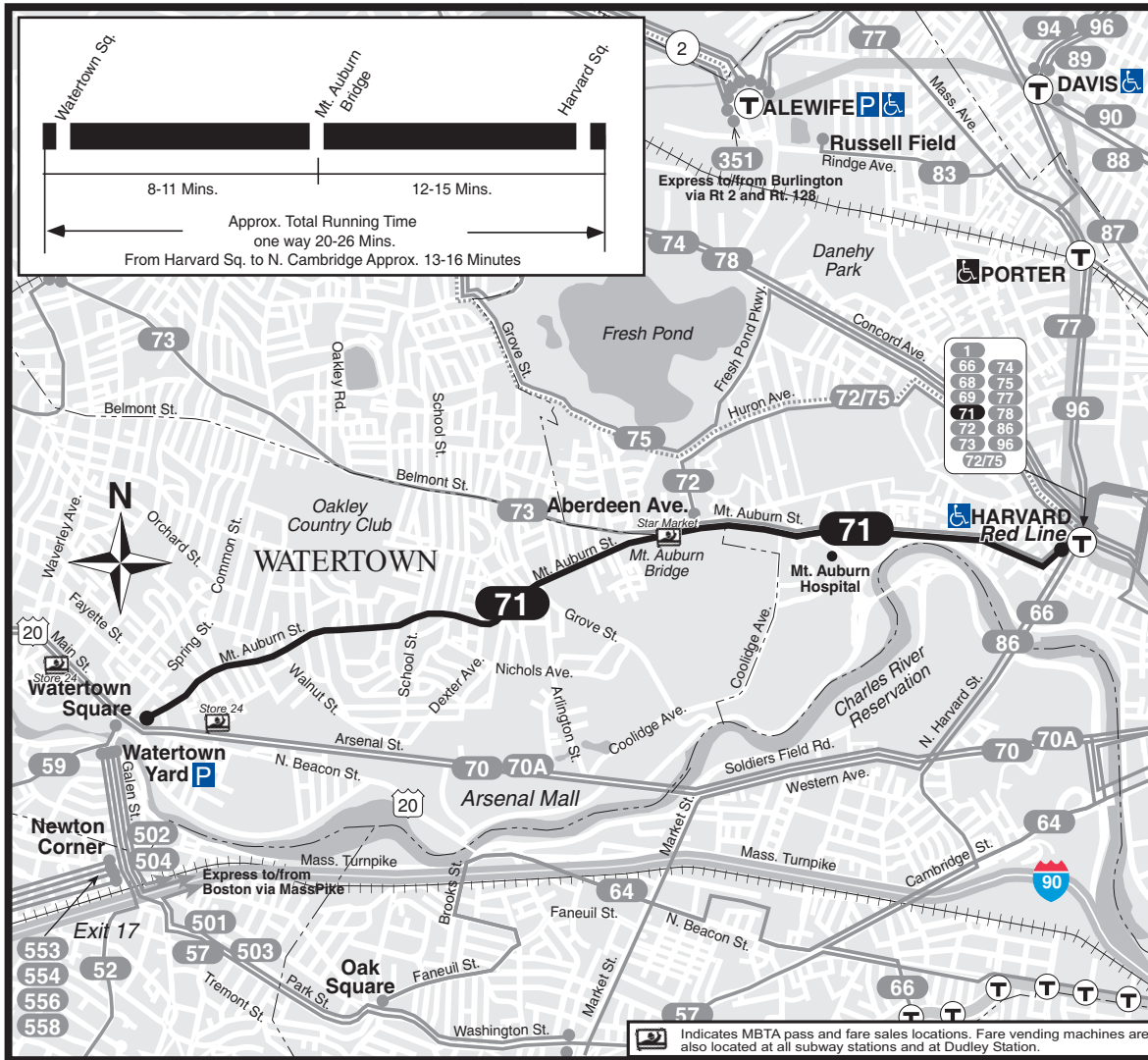


* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

5.0 APPENDIX

5.4 Public Transportation Data – MBTA Route 71

T **Route 71** Watertown Square - Harvard Station via Mt. Auburn Street



71

WINTER January 1, 2011 - March 18, 2011

Watertown Square - Harvard Station via Mt. Auburn St.

Serving: Mt. Auburn Hospital, Harvard University and connections to the Red Line



Arrive times are approximate, subject to traffic.

Customer Service/Travel Info..617-222-3200
Toll Free.....1-800-392-6100
Hearing Impaired (TTY).....617-222-5146

For more schedule or travel information, visit:
www.mbta.com

Richard A. Davey, General Manager
 and Rail & Transit Administrator

71 WEEKDAY					
INBOUND			OUTBOUND		
Leave Watertown Square	Arrive Mt. Auburn Bridge	Arrive Harvard Station	Leave Harvard Station	Arrive Mt. Auburn Bridge	Arrive Watertown Square
5:13A	5:22A	5:28A	4:51A	4:58A	5:08A
5:33	5:42	5:48	5:11	5:18	5:28
5:53	6:02	6:08	5:31	5:38	5:48
6:06	6:15	6:21	5:38	5:45	5:55
6:14	6:23	6:29	5:48	5:55	6:05
★	★	★	★	★	★
9:44	9:54	10:01	8:57	9:05	9:18
9:57	10:07	10:14	9:10	9:18	9:31
10:10	10:20	10:27	9:20	9:28	9:41
10:23	10:33	10:40	9:33	9:41	9:54
10:36	10:46	10:53	9:46	9:54	10:07
10:49	10:59	11:06	9:59	10:07	10:20
11:02	11:12	11:19	10:12	10:20	10:33
11:15	11:25	11:32	10:25	10:33	10:46
11:28	11:38	11:45	10:38	10:46	10:59
11:41	11:51	11:58	10:51	10:59	11:12
11:54	12:04P	12:11P	11:04	11:12	11:25
			11:17	11:25	11:38
12:07P	12:17P	12:24P	11:30	11:38	11:51
12:20	12:30	12:37	11:43	11:51	12:04P
12:33	12:43	12:50	11:56	12:04P	12:17
12:46	12:56	1:03			
12:59	1:09	1:16	12:09P	12:17P	12:30P
1:11	1:21	1:28	12:22	12:30	12:43
1:23	1:33	1:40	12:35	12:43	12:56
1:34	1:44	1:51	12:48	12:56	1:09
1:44	1:54	2:01	12:57	1:05	1:18
1:55	2:05	2:12	1:08	1:16	1:29
2:07	2:17	2:24	1:19	1:27	1:40
2:20	2:30	2:37	1:31	1:39	1:52
2:30	2:40	2:47	1:43	1:51	2:04
★	★	★	★	★	★
6:23	6:32	6:39	5:56	6:07	6:21
6:32	6:41	6:48	6:05	6:16	6:30
6:41	6:50	6:57	6:14	6:25	6:39
6:49	6:58	7:05	6:23	6:34	6:48
6:57	7:06	7:13	6:32	6:43	6:57
7:05	7:14	7:21	6:41	6:52	7:04
7:12	7:21	7:28	6:50	7:01	7:12
7:23	7:32	7:39	7:01	7:10	7:21
7:34	7:43	7:50	7:11	7:20	7:31
7:44	7:53	8:00	7:23	7:32	7:43
7:57	8:06	8:13	7:37	7:46	7:57
8:14	8:23	8:30	7:51	8:00	8:11
8:27	8:36	8:43	8:06	8:15	8:26
8:40	8:49	8:56	8:20	8:29	8:40
9:00	9:09	9:16	8:36	8:45	8:56
9:20	9:29	9:36	8:56	9:05	9:16
9:40	9:49	9:56	9:16	9:25	9:36
10:00	10:09	10:16	9:36	9:45	9:56
10:20	10:29	10:36	9:56	10:04	10:14
10:40	10:49	10:56	10:16	10:24	10:34
11:00	11:07	11:12	10:36	10:44	10:54
11:20	11:27	11:32	10:56	11:04	11:14
11:40	11:47	11:52	11:16	11:24	11:34
12:00N	12:07A	12:12A	11:36	11:44	11:54
12:20A	12:27	12:32	12:01A	12:09A	12:19A
12:44	12:51	12:56	12:25	12:33	12:43
12:59	1:06	1:11	12:41	12:49	12:59
1:19	1:26	1:31	w 1:01	1:09	1:19

71 SATURDAY					
INBOUND			OUTBOUND		
Leave Watertown Square	Arrive Mt. Auburn Bridge	Arrive Harvard Station	Leave Harvard Station	Arrive Mt. Auburn Bridge	Arrive Watertown Square
5:13A	5:20A	5:26A	4:57A	5:04A	5:13A
5:33	5:40	5:46	5:17	5:24	5:33
5:53	6:00	6:06	5:36	5:43	5:52
6:13	6:20	6:26	5:56	6:03	6:12
6:33	6:40	6:46	6:16	6:23	6:32
6:53	7:00	7:06	6:36	6:43	6:52
7:05	7:12	7:18	6:49	6:56	7:05
7:20	7:27	7:33	6:56	7:03	7:12
7:35	7:42	7:48	7:16	7:23	7:32
Every	15 Mins.	Until	Every	15 Mins.	Until
9:05	9:14	9:21	9:01	9:09	9:21
9:21	9:30	9:37	9:16	9:24	9:36
9:36	9:45	9:52	9:31	9:39	9:51
9:51	10:00	10:07	9:46	9:54	10:06
10:06	10:15	10:22	9:55	10:03	10:15
10:18	10:27	10:34	10:01	10:09	10:21
10:30	10:39	10:46	10:16	10:24	10:36
10:42	10:51	10:58	10:31	10:39	10:51
10:54	11:03	11:10	10:43	10:51	11:03
Every	12 Mins.	Until	Every	12 Mins.	Until
11:54	12:03P	12:10P	11:55	12:03P	12:15P
12:06P	12:15P	12:22P	12:07P	12:15P	12:27P
Every	12 Mins.	Until	Every	12 Mins.	Until
6:54	7:02	7:08	6:31	6:39	6:51
7:06	7:14	7:20	6:43	6:51	7:03
7:23	7:31	7:37	6:59	7:07	7:19
7:40	7:48	7:54	7:17	7:25	7:37
8:00	8:08	8:14	7:36	7:44	7:56
8:20	8:28	8:34	7:56	8:04	8:14
8:40	8:48	8:54	8:16	8:24	8:34
9:00	9:08	9:14	8:36	8:44	8:54
9:20	9:28	9:34	8:56	9:04	9:14
9:40	9:48	9:54	9:16	9:24	9:34
10:00	10:08	10:14	9:36	9:44	9:54
10:20	10:28	10:34	9:56	10:04	10:14
10:40	10:48	10:54	10:16	10:24	10:34
11:00	11:08	11:14	10:36	10:44	10:54
11:20	11:28	11:34	10:56	11:04	11:14
11:37	11:45	11:51	11:16	11:24	11:34
11:55	12:03A	12:09A	11:36	11:44	11:54
12:20A	12:28	12:34	12:01A	12:09A	12:19A
12:40	12:48	12:54	12:21	12:29	12:39
12:59	1:07	1:13	12:41	12:49	12:59
1:19	1:27	1:33	w 1:01	1:09	1:19

71 SUNDAY					
INBOUND			OUTBOUND		
Leave Watertown Square	Arrive Mt. Auburn Bridge	Arrive Harvard Station	Leave Harvard Station	Arrive Mt. Auburn Bridge	Arrive Watertown Square
6:30A	6:37A	6:47A	7:04A	7:16A	7:23A
6:50	6:57	7:07	7:24	7:36	7:43
7:10	7:17	7:27	7:44	7:56	8:03
7:30	7:37	7:47	8:04	8:16	8:23
7:50	7:57	8:07	8:24	8:36	8:43
8:10	8:17	8:27	8:44	8:56	9:04
8:30	8:37	8:47	9:04	9:18	9:26
8:50	8:57	9:08	9:24	9:38	9:46
Every	20 Mins.	Until	Every	20 Mins.	Until
11:10	11:18	11:29	11:04	11:18	11:26
11:30	11:38	11:49	11:24	11:38	11:46
11:50	11:58	12:09P	11:44	11:58	12:06P
12:10P	12:18P	12:29P	12:04P	12:18P	12:26P
12:30	12:38	12:49	12:24	12:38	12:46
12:50	12:58	1:09	12:44	12:58	1:06
Every	20 Mins.	Until	1:04	1:18	1:26
6:50	6:58	7:08	1:24	1:39	1:47
7:10	7:18	7:28	1:44	1:59	2:07
7:30	7:38	7:48	2:04	2:19	2:27
7:50	7:58	8:08	2:24	2:39	2:47
8:10	8:18	8:28	2:44	2:59	3:07
8:30	8:38	8:48	3:04	3:19	3:27
8:50	8:58	9:08	3:24	3:39	3:47
9:10	9:18	9:28	3:44	3:59	4:07
9:30	9:38	9:48	4:04	4:19	4:27
9:50	9:58	10:08	4:24	4:39	4:47
10:10	10:18	10:28	4:44	4:59	5:07
10:30	10:37	10:47	5:04	5:19	5:27
10:50	10:57	11:07	5:24	5:39	5:47
11:10	11:17	11:27	Every	20 Mins.	Until
11:30	11:37	11:47	11:24	11:36	11:43
11:50	11:57	12:07A	11:44	11:56	12:03A
12:10A	12:17A	12:27	12:19A	12:31A	12:38
12:45	12:52	1:02	w 1:03	1:15	1:22

FARES			
PAYING WITH...	1-BUS TRIP	2-BUS TRIP	BUS + SUBWAY TRIP
CharlieCard	\$1.25	\$1.25	\$1.70
CharlieTicket	\$1.50	\$1.50	\$3.50
Cashonboard	\$1.50	\$3.00	\$3.50
Student CharlieCard*	60¢	60¢	85¢
Senior/TAP CharlieCard**	40¢	40¢	60¢

Children 11 and under ride free when accompanied by an adult.
Blind Access CharlieCard customers ride free. If accompanied by sighted guide, guide also rides free.

VALID PASSES: Local Bus Pass (\$40/mo.); LinkPass (\$59/mo.); Student Pass* (\$20/mo.); Senior/TAP Pass** (\$20/mo.); and express bus, zoned, interzoned, and boat passes.

* Available to students through participating middle schools and high schools.
** Available to Medicare cardholders, seniors 65+ and persons with disabilities.

w - Waits for last train to arrive at Harvard Sta.
★ EVERY 10 MINUTES OR LESS

 ALL BUSES ARE ACCESSIBLE TO PERSONS WITH DISABILITIES.

Route 71
Watertown Square - Harvard Station
via Mt. Auburn St.

Winter 2011 Holidays
January 1: See Sunday January 17, February 21: See Saturday



Route 71 Watertown Square - Harvard Station via Mount Auburn Street
Weekday Inbound

All Day

Fall, 2006

Route Variation(s)	Stop Number	Stop Description	Total Ons	Total Offs	Change	Load Out From Stop	Cum. Ons	Cum. Offs
71.0,1,2	0	BOL Dummy	4	0	0	4	4	0
71.0,1,2	8178	Watertown Sq Terminal	782	0	782	786	786	0
71.0,1,2	2048	Mt Auburn St @ Main St	133	0	133	919	919	0
71.0,1,2	2049	Mt Auburn St @ Patten St	111	5	106	1025	1030	5
71.0,1,2	2050	Mt Auburn St @ Parker St	146	10	136	1161	1176	15
71.0,1,2	2051	Mt Auburn St @ Franklin St	97	9	88	1249	1273	24
71.0,1,2	2052	Mt Auburn St @ Walnut St	68	9	59	1308	1341	33
71.0,1,2	2053	Mt Auburn St @ Lincoln St	13	2	11	1319	1354	35
71.0,1,2	2054	Mt Auburn St @ Boylston St	59	20	39	1358	1413	55
71.0,1,2	2055	Mt Auburn St @ opp Oakley Rd	20	7	13	1371	1433	62
71.0,1,2	2056	Mt Auburn St @ Chauncy St	73	18	55	1426	1506	80
71.0,1,2	2057	Mt Auburn St @ School St	106	55	51	1477	1612	135
71.0,1,2	2058	Mt Auburn St @ Adams St	150	51	99	1576	1762	186
71.0,1,2	2060	Mt Auburn St @ Bigelow Ave	290	73	217	1793	2052	259
71.0,1,2	2061	Mt Auburn St @ opp Keenan St	182	35	147	1940	2234	294
71.0,1,2	2062	Mt Auburn St @ Ralph Piteri Terr	70	30	40	1980	2304	324
71.0,1,2	2064	Mt Auburn St @ opp Homer Ave	184	73	111	2091	2488	397
71.0,1,2	2065	Mt Auburn St @ Aberdeen Ave	32	4	28	2119	2520	401
71.0,1,2	2066	Mt Auburn St @ opp Brattle St	15	0	15	2134	2535	401
71.0,1,2	2067	Mt Auburn St @ Coolidge Ave	16	6	10	2144	2551	407
71.0,1,2	2068	Mt Auburn St @ opp Traill St	20	13	7	2151	2571	420
71.0,1,2	2070	Mt Auburn St @ Mt Auburn Hospital	143	54	89	2240	2714	474
71.0,1,2	2071	Mt Auburn St @ opp Sparks St	13	11	2	2242	2727	485
71.0,1,2	2072	Mt Auburn St @ opp Willard St	5	7	-2	2240	2732	492
71.0,1,2	2073	Mt Auburn St @ Brewer St	2	65	-63	2177	2734	557
71.0,1,2	2074	114 Mt Auburn St	3	340	-337	1840	2737	897
71.0,2	2169	NOT A STOP FOR ITINERARY	0	24	-24	1816	2737	921
71.0,1	20761	Harvard Upper Busway @ Red Line	0	1813	-1813	3	2737	2734
71.0	20760	NOT A STOP FOR ITINERARY	0	0	0	3	2737	2734
71.0	12614	Waterhouse St @ Massachusetts Ave	0	0	0	3	2737	2734
71.0,1,2	99999	EOL Dummy	0	3	-3	0	2737	2737

Totals: 2737 2737
Net Ridership: 2734



Route 71 Watertown Square - Harvard Station via Mount Auburn Street
Weekday Outbound

All Day

Fall, 2006

Route Variation(s)	Stop Number	Stop Description	Total Ons	Total Offs	Change	Load Out From Stop	Cum. Ons	Cum. Offs
71.0,1	0	BOL Dummy	3	0	3	3	3	0
71.0	12614	Waterhouse St @ Massachusetts Ave	18	0	18	21	21	0
71.0	20760	NOT A STOP FOR ITINERARY	0	0	0	21	21	0
71.0,1	2076	Harvard Lower Busway @ Red Line	1811	0	1811	1832	1832	0
71.0	2169	NOT A STOP FOR ITINERARY	0	0	0	1832	1832	0
71.0,1	2020	Mt Auburn St @ Story St	312	2	310	2142	2144	2
71.0,1	2021	Mt Auburn St @ Ash St	32	2	30	2172	2176	4
71.0,1	2022	Mt Auburn St @ Willard St	9	4	5	2177	2185	8
71.0,1	2023	Mt Auburn St @ Sparks St	9	20	-11	2166	2194	28
71.0,1	2025	Mt Auburn St @ Longfellow Rd	42	134	-92	2074	2236	162
71.0,1	2026	Mt Auburn St @ Traill St	17	26	-9	2065	2253	188
71.0,1	2027	Mt Auburn St @ Lowell Pk	7	28	-21	2044	2260	216
71.0,1	2028	Mt Auburn St @ Brattle St	1	17	-16	2028	2261	233
71.0,1	2029	Mt Auburn St @ Aberdeen Ave	5	54	-49	1979	2266	287
71.0,1	2030	Mt Auburn St @ Homer Ave	101	215	-114	1865	2367	502
71.0,1	2031	818 Mt Auburn St	26	74	-48	1817	2393	576
71.0,1	2032	Mt Auburn St @ Saint Marys St	26	32	-6	1811	2419	608
71.0,1	2033	Mt Auburn St @ Keenan St	32	143	-111	1700	2451	751
71.0,1	2034	Mt Auburn St @ Kimball Rd	41	230	-189	1511	2492	981
71.0,1	2035	Mt Auburn St @ Lloyd Rd	47	86	-39	1472	2539	1067
71.0,1	2036	Mt Auburn St @ Upland Rd	29	90	-61	1411	2568	1157
71.0,1	2037	Mt Auburn St @ Winsor Ave	26	99	-73	1338	2594	1256
71.0,1	2038	Mt Auburn St @ Adams Ave	10	47	-37	1301	2604	1303
71.0,1	2039	Mt Auburn St @ Oakley Rd	14	42	-28	1273	2618	1345
71.0,1	2040	Mt Auburn St @ Amherst Rd	7	42	-35	1238	2625	1387
71.0,1	2041	Mt Auburn St @ Bailey Rd	1	27	-26	1212	2626	1414
71.0,1	2047	Mt Auburn St @ Bates Rd E	6	69	-63	1149	2632	1483
71.0,1	2042	Mt Auburn St @ Russell Ave	5	79	-74	1075	2637	1562
71.0,1	2043	Mt Auburn St @ Marshall St	5	162	-157	918	2642	1724
71.0,1	2044	Mt Auburn St @ Summer St	5	139	-134	784	2647	1863
71.0,1	2046	Mt Auburn St @ Main St	1	306	-305	479	2648	2169
71.0,1	8178	Watertown Sq Terminal	0	475	-475	4	2648	2644
71.0,1	99999	EOL Dummy	0	4	-4	0	2648	2648
Totals:			2648	2648				
Net Ridership:			2644					



Route 71 Watertown Square - Harvard Station via Mount Auburn Street
Saturday Inbound

All Day

Fall, 2006

Route Variation(s)	Stop Number	Stop Description	Total Ons	Total Offs	Change	Load Out From Stop	Cum. Ons	Cum. Offs
71.0,1	0	BOL Dummy	4	0	0	4	4	0
71.0,1	8178	Watertown Sq Terminal	396	1	395	399	400	1
71.0,1	2048	Mt Auburn St @ Main St	65	0	65	464	465	1
71.0,1	2049	Mt Auburn St @ Patten St	83	2	81	545	548	3
71.0,1	2050	Mt Auburn St @ Parker St	75	5	70	615	623	8
71.0,1	2051	Mt Auburn St @ Franklin St	42	1	41	656	665	9
71.0,1	2052	Mt Auburn St @ Walnut St	17	1	16	672	682	10
71.0,1	2053	Mt Auburn St @ Lincoln St	11	4	7	679	693	14
71.0,1	2054	Mt Auburn St @ Boylston St	31	11	20	699	724	25
71.0,1	2055	Mt Auburn St @ opp Oakley Rd	7	2	5	704	731	27
71.0,1	2056	Mt Auburn St @ Chauncy St	15	5	10	714	746	32
71.0,1	2057	Mt Auburn St @ School St	72	8	64	778	818	40
71.0,1	2058	Mt Auburn St @ Adams St	69	23	46	824	887	63
71.0,1	2060	Mt Auburn St @ Bigelow Ave	160	39	121	945	1047	102
71.0,1	2061	Mt Auburn St @ opp Keenan St	30	1	29	974	1077	103
71.0,1	2062	Mt Auburn St @ Ralph Piteri Terr	18	26	-8	966	1095	129
71.0,1	2064	Mt Auburn St @ opp Homer Ave	95	56	39	1005	1190	185
71.0,1	2065	Mt Auburn St @ Aberdeen Ave	11	6	5	1010	1201	191
71.0,1	2066	Mt Auburn St @ opp Brattle St	4	1	3	1013	1205	192
71.0,1	2067	Mt Auburn St @ Coolidge Ave	5	2	3	1016	1210	194
71.0,1	2068	Mt Auburn St @ opp Traill St	6	6	0	1016	1216	200
71.0,1	2070	Mt Auburn St @ Mt Auburn Hospital	32	15	17	1033	1248	215
71.0,1	2071	Mt Auburn St @ opp Sparks St	4	3	1	1034	1252	218
71.0,1	2072	Mt Auburn St @ opp Willard St	0	2	-2	1032	1252	220
71.0,1	2073	Mt Auburn St @ Brewer St	0	12	-12	1020	1252	232
71.0,1	2074	114 Mt Auburn St	0	214	-214	806	1252	446
71.0	2169	NOT A STOP FOR ITINERARY	0	25	-25	781	1252	471
71.0,1	20761	Harvard Upper Busway @ Red Line	0	779	-779	2	1252	1250
71.0	20760	NOT A STOP FOR ITINERARY	0	0	0	2	1252	1250
71.0	12614	Waterhouse St @ Massachusetts Ave	0	2	-2	0	1252	1252
71.0,1	99999	EOL Dummy	0	0	0	0	1252	1252
Totals:			1252	1252				
Net Ridership:			1252					



Route 71 Watertown Square - Harvard Station via Mount Auburn Street
Saturday Outbound

All Day

Fall, 2006

Route Variation(s)	Stop Number	Stop Description	Total Ons	Total Offs	Change	Load Out From Stop	Cum. Ons	Cum. Offs
71.0,1		0 BOL Dummy	1	0	1	1	1	0
71.0	12614	Waterhouse St @ Massachusetts Ave	6	0	6	7	7	0
71.0	20760	NOT A STOP FOR ITINERARY	0	0	0	7	7	0
71.0,1	2076	Harvard Lower Busway @ Red Line	812	1	811	818	819	1
71.0	2169	NOT A STOP FOR ITINERARY	0	1	-1	817	819	2
71.0,1	2020	Mt Auburn St @ Story St	175	3	172	989	994	5
71.0,1	2021	Mt Auburn St @ Ash St	7	1	6	995	1001	6
71.0,1	2022	Mt Auburn St @ Willard St	2	2	0	995	1003	8
71.0,1	2023	Mt Auburn St @ Sparks St	7	9	-2	993	1010	17
71.0,1	2025	Mt Auburn St @ Longfellow Rd	16	31	-15	978	1026	48
71.0,1	2026	Mt Auburn St @ Traill St	3	15	-12	966	1029	63
71.0,1	2027	Mt Auburn St @ Lowell Pk	1	3	-2	964	1030	66
71.0,1	2028	Mt Auburn St @ Brattle St	2	4	-2	962	1032	70
71.0,1	2029	Mt Auburn St @ Aberdeen Ave	3	20	-17	945	1035	90
71.0,1	2030	Mt Auburn St @ Homer Ave	78	123	-45	900	1113	213
71.0,1	2031	818 Mt Auburn St	14	49	-35	865	1127	262
71.0,1	2032	Mt Auburn St @ Saint Marys St	3	14	-11	854	1130	276
71.0,1	2033	Mt Auburn St @ Keenan St	9	40	-31	823	1139	316
71.0,1	2034	Mt Auburn St @ Kimball Rd	44	120	-76	747	1183	436
71.0,1	2035	Mt Auburn St @ Lloyd Rd	22	44	-22	725	1205	480
71.0,1	2036	Mt Auburn St @ Upland Rd	10	34	-24	701	1215	514
71.0,1	2037	Mt Auburn St @ Winsor Ave	10	62	-52	649	1225	576
71.0,1	2038	Mt Auburn St @ Adams Ave	6	28	-22	627	1231	604
71.0,1	2039	Mt Auburn St @ Oakley Rd	3	12	-9	618	1234	616
71.0,1	2040	Mt Auburn St @ Amherst Rd	12	17	-5	613	1246	633
71.0,1	2041	Mt Auburn St @ Bailey Rd	3	8	-5	608	1249	641
71.0,1	2047	Mt Auburn St @ Bates Rd E	1	18	-17	591	1250	659
71.0,1	2042	Mt Auburn St @ Russell Ave	1	32	-31	560	1251	691
71.0,1	2043	Mt Auburn St @ Marshall St	2	65	-63	497	1253	756
71.0,1	2044	Mt Auburn St @ Summer St	0	76	-76	421	1253	832
71.0,1	2046	Mt Auburn St @ Main St	0	143	-143	278	1253	975
71.0,1	8178	Watertown Sq Terminal	0	274	-274	4	1253	1249
71.0,1	99999	EOL Dummy	0	4	-4	0	1253	1253
<i>Totals:</i>			1253	1253				
<i>Net Ridership:</i>			1249					

5.0 APPENDIX

5.5 Level-of-Service Analyses - Existing Conditions

HCM Signalized Intersection Capacity Analysis

33: Mt. Auburn Street & Summer Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	51	661	10	27	577	229	5	6	25	219	1	156
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	10	10	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.5			5.5			5.5			5.5	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frt		1.00			0.96			0.91			0.94	
Flt Protected		1.00			1.00			0.99			0.97	
Satd. Flow (prot)		3458			3566			1800			1799	
Flt Permitted		0.78			0.91			0.94			0.79	
Satd. Flow (perm)		2701			3239			1705			1463	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.67	0.67	0.67	0.90	0.90	0.90
Adj. Flow (vph)	58	751	11	30	641	254	7	9	37	243	1	173
RTOR Reduction (vph)	0	1	0	0	39	0	0	25	0	0	28	0
Lane Group Flow (vph)	0	819	0	0	886	0	0	28	0	0	389	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5			5			10			
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		30.7			30.7			23.2			23.2	
Effective Green, g (s)		30.7			30.7			23.2			23.2	
Actuated g/C Ratio		0.43			0.43			0.33			0.33	
Clearance Time (s)		5.5			5.5			5.5			5.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1165			1397			556			477	
v/s Ratio Prot												
v/s Ratio Perm		c0.30			0.27			0.02			c0.27	
v/c Ratio		0.70			0.63			0.05			0.81	
Uniform Delay, d1		16.5			15.9			16.5			22.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.9			1.0			0.0			10.3	
Delay (s)		18.5			16.8			16.5			32.3	
Level of Service		B			B			B			C	
Approach Delay (s)		18.5			16.8			16.5			32.3	
Approach LOS		B			B			B			C	

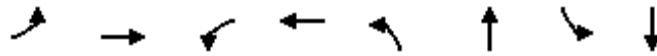
Intersection Summary

HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	71.2	Sum of lost time (s)	17.3
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Queues

33: Mt. Auburn Street & Summer Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations		↕↕		↕↕		↕		↕	
Volume (vph)	51	661	27	577	5	6	219	1	
Lane Group Flow (vph)	0	820	0	925	0	53	0	417	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		2		6		8		4	9
Permitted Phases	2		6		8		4		
Detector Phase	2	2	6	6	8	8	4	4	
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0	5.0
Minimum Split (s)	17.5	17.5	17.5	17.5	11.5	11.5	11.5	11.5	19.0
Total Split (s)	37.0	37.0	37.0	37.0	33.0	33.0	33.0	33.0	19.0
Total Split (%)	41.6%	41.6%	41.6%	41.6%	37.1%	37.1%	37.1%	37.1%	21%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Min	Min	Min	Min	None	None	None	None	None
v/c Ratio		0.67		0.62		0.09		0.79	
Control Delay		20.7		17.2		9.4		32.7	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		20.7		17.2		9.4		32.7	
Queue Length 50th (ft)		126		127		4		131	
Queue Length 95th (ft)		#315		300		19		#371	
Internal Link Dist (ft)		709		491		38		726	
Turn Bay Length (ft)									
Base Capacity (vph)		1287		1579		730		632	
Starvation Cap Reductn		0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.64		0.59		0.07		0.66	

Intersection Summary

Cycle Length: 89

Actuated Cycle Length: 68.2

Natural Cycle: 90

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Mt. Auburn Street & Summer Street

HCM Signalized Intersection Capacity Analysis

36: Mt. Auburn Street & Palfrey Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕				
Volume (vph)	100	670	135	50	773	77	60	153	51	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	16	16	16	12	12	12
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		0.95			0.95			1.00				
Frbp, ped/bikes		1.00			1.00			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		0.98			0.99			0.97				
Flt Protected		0.99			1.00			0.99				
Satd. Flow (prot)		3607			3666			2133				
Flt Permitted		0.72			0.84			0.99				
Satd. Flow (perm)		2618			3101			2133				
Peak-hour factor, PHF	0.92	0.89	0.89	0.94	0.94	0.92	0.67	0.92	0.67	0.92	0.92	0.92
Adj. Flow (vph)	109	753	152	53	822	84	90	166	76	0	0	0
RTOR Reduction (vph)	0	14	0	0	7	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1000	0	0	952	0	0	332	0	0	0	0
Confl. Peds. (#/hr)			10	10			10		10			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Split					
Protected Phases		1			1		3	3				
Permitted Phases	1			1								
Actuated Green, G (s)		49.3			49.3			16.3				
Effective Green, g (s)		49.3			49.3			16.3				
Actuated g/C Ratio		0.62			0.62			0.21				
Clearance Time (s)		4.0			4.0			4.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1634			1935			440				
v/s Ratio Prot								c0.16				
v/s Ratio Perm		c0.38			0.31							
v/c Ratio		0.61			0.49			0.75				
Uniform Delay, d1		9.0			8.1			29.5				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		1.7			0.9			7.2				
Delay (s)		10.8			9.0			36.7				
Level of Service		B			A			D				
Approach Delay (s)		10.8			9.0			36.7			0.0	
Approach LOS		B			A			D			A	
Intersection Summary												
HCM Average Control Delay			13.7				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			79.0				Sum of lost time (s)		13.4			
Intersection Capacity Utilization			72.6%				ICU Level of Service			C		
Analysis Period (min)			15									

c Critical Lane Group

Queues

36: Mt. Auburn Street & Palfrey Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBT	ø2
Lane Configurations		↔↔		↔↔	↔	
Volume (vph)	100	670	50	773	153	
Lane Group Flow (vph)	0	1014	0	959	332	
Turn Type	Perm		Perm			
Protected Phases		1		1	3	2
Permitted Phases	1		1			
Detector Phase	1	1	1	1	3	
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	7.0
Minimum Split (s)	17.0	17.0	17.0	17.0	20.0	15.0
Total Split (s)	44.0	44.0	44.0	44.0	20.0	15.0
Total Split (%)	55.7%	55.7%	55.7%	55.7%	25.3%	19%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
v/c Ratio		0.59		0.47	0.75	
Control Delay		10.6		8.9	41.8	
Queue Delay		0.0		0.0	0.0	
Total Delay		10.6		8.9	41.8	
Queue Length 50th (ft)		114		98	151	
Queue Length 95th (ft)		265		223	#276	
Internal Link Dist (ft)		491		175	368	
Turn Bay Length (ft)						
Base Capacity (vph)		1727		2037	463	
Starvation Cap Reductn		0		0	0	
Spillback Cap Reductn		0		0	0	
Storage Cap Reductn		0		0	0	
Reduced v/c Ratio		0.59		0.47	0.72	

Intersection Summary

Cycle Length: 79

Actuated Cycle Length: 79

Offset: 40 (51%), Referenced to phase 1:EBWB, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 36: Mt. Auburn Street & Palfrey Street

HCM Unsignalized Intersection Capacity Analysis
 15: Mt. Auburn Street & Phillips Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	716	5	41	899	1	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.94	0.94	0.67	0.67
Hourly flow rate (vph)	804	6	44	956	1	10
Pedestrians	25			18		
Lane Width (ft)	11.0			13.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	2			2		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	255			208		
pX, platoon unblocked				0.89	0.90	0.89
vC, conflicting volume				810	1398	423
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				526	633	89
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				95	100	99
cM capacity (veh/h)				918	348	834

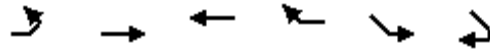
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	536	274	362	638	12
Volume Left	0	0	44	0	1
Volume Right	0	6	0	0	10
cSH	1700	1700	918	1700	710
Volume to Capacity	0.32	0.16	0.05	0.38	0.02
Queue Length 95th (ft)	0	0	4	0	1
Control Delay (s)	0.0	0.0	1.6	0.0	10.2
Lane LOS	A			B	
Approach Delay (s)	0.0		0.6	10.2	
Approach LOS				B	

Intersection Summary					
Average Delay			0.4		
Intersection Capacity Utilization			61.5%	ICU Level of Service	B
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis

17: Mt. Auburn Street & Marshall Street

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↕↕	↕↕			
Volume (veh/h)	26	697	940	33	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.94	0.94	0.67	0.67
Hourly flow rate (vph)	29	783	1000	35	0	0
Pedestrians		25	18		12	
Lane Width (ft)		12.0	12.0		0.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		2	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		347	116			
pX, platoon unblocked	0.84				0.89	0.84
vC, conflicting volume	1047				1498	555
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	664				787	75
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	100
cM capacity (veh/h)	753				280	800

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	290	522	667	368
Volume Left	29	0	0	0
Volume Right	0	0	0	35
cSH	753	1700	1700	1700
Volume to Capacity	0.04	0.31	0.39	0.22
Queue Length 95th (ft)	3	0	0	0
Control Delay (s)	1.4	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.5		0.0	
Approach LOS				

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		52.0%	ICU Level of Service
Analysis Period (min)		15	A

HCM Signalized Intersection Capacity Analysis

19: Mt. Auburn Street & Parker Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (vph)	691	6	8	962	11	15
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	2.0			5.0	5.0	
Lane Util. Factor	0.95			0.95	1.00	
Frbp, ped/bikes	1.00			1.00	0.95	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.92	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	3579			3586	1690	
Flt Permitted	1.00			0.95	0.98	
Satd. Flow (perm)	3579			3427	1690	
Peak-hour factor, PHF	0.81	0.81	0.92	0.92	0.70	0.70
Adj. Flow (vph)	853	7	9	1046	16	21
RTOR Reduction (vph)	1	0	0	0	20	0
Lane Group Flow (vph)	859	0	0	1055	17	0
Confl. Peds. (#/hr)		19	19		14	10
Heavy Vehicles (%)	6%	6%	4%	4%	2%	2%
Bus Blockages (#/hr)	0	9	0	9	0	0
Parking (#/hr)		5				1
Turn Type		custom				
Protected Phases	9		3	13	4	
Permitted Phases	1		1			
Actuated Green, G (s)	39.2			60.8	4.2	
Effective Green, g (s)	39.2			60.8	4.2	
Actuated g/C Ratio	0.39			0.61	0.04	
Clearance Time (s)	2.0				5.0	
Vehicle Extension (s)	0.2				5.0	
Lane Grp Cap (vph)	1475			2138	71	
v/s Ratio Prot	c0.07			c0.17	c0.01	
v/s Ratio Perm	0.17			0.13		
v/c Ratio	0.58			0.49	0.24	
Uniform Delay, d1	24.0			11.0	46.4	
Progression Factor	1.00			0.16	1.00	
Incremental Delay, d2	1.7			0.6	3.6	
Delay (s)	25.6			2.3	50.0	
Level of Service	C			A	D	
Approach Delay (s)	25.6			2.3	50.0	
Approach LOS	C			A	D	

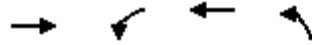
Intersection Summary

HCM Average Control Delay	13.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.2
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Queues

19: Mt. Auburn Street & Parker Street

1/27/2011

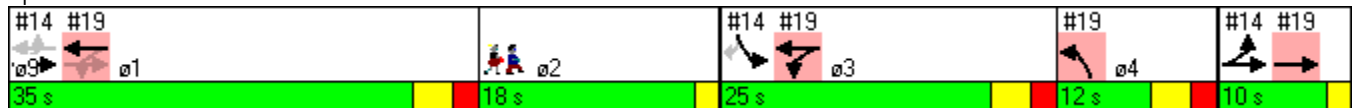


Lane Group	EBT	WBL	WBT	NBL	ø1	ø2
Lane Configurations	↑↑		↑↑	↘		
Volume (vph)	691	8	962	11		
Lane Group Flow (vph)	860	0	1055	37		
Turn Type	custom					
Protected Phases	9	3	13	4	1	2
Permitted Phases	1	1				
Detector Phase	9	3	13	4		
Switch Phase						
Minimum Initial (s)	8.0	4.0		3.0	23.0	1.0
Minimum Split (s)	10.0	9.0		8.0	28.0	18.0
Total Split (s)	10.0	25.0	60.0	12.0	35.0	18.0
Total Split (%)	10.0%	25.0%	60.0%	12.0%	35%	18%
Yellow Time (s)	2.0	3.0		3.0	3.0	2.0
All-Red Time (s)	0.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		
Total Lost Time (s)	2.0	5.0	5.0	5.0		
Lead/Lag		Lead		Lag	Lead	Lag
Lead-Lag Optimize?		Yes		Yes	Yes	Yes
Recall Mode	Max	Max		None	C-Min	None
v/c Ratio	0.50		0.47	0.26		
Control Delay	20.2		1.5	30.5		
Queue Delay	0.4		0.8	673.6		
Total Delay	20.6		2.3	704.2		
Queue Length 50th (ft)	211		6	10		
Queue Length 95th (ft)	234		30	29		
Internal Link Dist (ft)	36		48	431		
Turn Bay Length (ft)						
Base Capacity (vph)	1712		2262	140		
Starvation Cap Reductn	338		820	0		
Spillback Cap Reductn	349		0	133		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.63		0.73	5.29		

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated

Splits and Phases: 19: Mt. Auburn Street & Parker Street



HCM Signalized Intersection Capacity Analysis

14: Mt. Auburn Street & Common Street

1/27/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↔		↔	↔
Volume (vph)	147	559	651	135	438	319
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	10	10
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frbp, ped/bikes		1.00	0.99		1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	0.97		1.00	0.85
Flt Protected		0.99	1.00		0.95	1.00
Satd. Flow (prot)		3265	3531		1739	1524
Flt Permitted		0.53	1.00		0.95	1.00
Satd. Flow (perm)		1761	3531		1739	1524
Peak-hour factor, PHF	0.81	0.81	0.92	0.92	0.97	0.97
Adj. Flow (vph)	181	690	708	147	452	329
RTOR Reduction (vph)	0	0	18	0	0	0
Lane Group Flow (vph)	0	871	837	0	452	329
Confl. Peds. (#/hr)	14			14	14	10
Heavy Vehicles (%)	6%	6%	4%	4%	2%	2%
Bus Blockages (#/hr)	0	9	0	9	0	0
Parking (#/hr)		5				
Turn Type	custom			Perm		
Protected Phases	9	1 9			3	
Permitted Phases	1		1			3
Actuated Green, G (s)		39.2	26.4		34.4	34.4
Effective Green, g (s)		39.2	26.4		34.4	34.4
Actuated g/C Ratio		0.39	0.26		0.34	0.34
Clearance Time (s)			5.0		5.0	5.0
Vehicle Extension (s)			8.0		3.0	3.0
Lane Grp Cap (vph)		883	932		598	524
v/s Ratio Prot		c0.13			c0.26	
v/s Ratio Perm		0.26	c0.24			0.22
v/c Ratio		0.99	0.90		0.76	0.63
Uniform Delay, d1		30.1	35.5		29.1	27.4
Progression Factor		0.47	1.00		1.00	1.00
Incremental Delay, d2		25.3	13.2		8.6	5.6
Delay (s)		39.5	48.7		37.7	33.1
Level of Service		D	D		D	C
Approach Delay (s)		39.5	48.7		35.8	
Approach LOS		D	D		D	

Intersection Summary

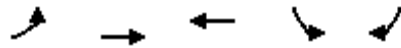
HCM Average Control Delay	41.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	29.4
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

14: Mt. Auburn Street & Common Street

1/27/2011

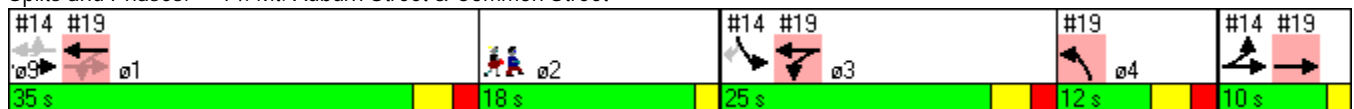


Lane Group	EBL	EBT	WBT	SBL	SBR	ø2	ø4
Lane Configurations		↕↕	↕↔	↔	↔		
Volume (vph)	147	559	651	438	319		
Lane Group Flow (vph)	0	871	855	452	329		
Turn Type	custom				Perm		
Protected Phases	9	19		3		2	4
Permitted Phases	1		1		3		
Detector Phase	9	19	1	3	3		
Switch Phase							
Minimum Initial (s)	8.0		23.0	4.0	4.0	1.0	3.0
Minimum Split (s)	10.0		28.0	9.0	9.0	18.0	8.0
Total Split (s)	10.0	45.0	35.0	25.0	25.0	18.0	12.0
Total Split (%)	10.0%	45.0%	35.0%	25.0%	25.0%	18%	12%
Yellow Time (s)	2.0		3.0	3.0	3.0	2.0	3.0
All-Red Time (s)	0.0		2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	2.0	5.0	5.0	5.0	5.0		
Lead/Lag			Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Recall Mode	Max		C-Min	Max	Max	None	None
v/c Ratio		1.03	0.79	0.76	0.63		
Control Delay		56.1	37.6	40.5	36.5		
Queue Delay		9.8	0.1	0.0	0.0		
Total Delay		65.9	37.7	40.5	36.5		
Queue Length 50th (ft)		~326	255	238	164		
Queue Length 95th (ft)		#365	331	#563	#408		
Internal Link Dist (ft)		48	1077	686			
Turn Bay Length (ft)							
Base Capacity (vph)		849	1077	598	521		
Starvation Cap Reductn		23	0	0	0		
Spillback Cap Reductn		0	6	0	0		
Storage Cap Reductn		0	0	0	0		
Reduced v/c Ratio		1.05	0.80	0.76	0.63		

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 14: Mt. Auburn Street & Common Street



HCM Signalized Intersection Capacity Analysis
 21: Mt. Auburn Street & Bates Road East

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↕	↔↕		↔↕			↔↕			↔↕	
Volume (vph)	1	762	309	17	802	7	157	1	15	13	9	5
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0	6.0		6.0			6.0			6.0	
Lane Util. Factor		0.95	1.00		0.95			1.00			1.00	
Frbp, ped/bikes		1.00	0.96		1.00			1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00			0.99			1.00	
Frt		1.00	0.85		1.00			0.99			0.97	
Flt Protected		1.00	1.00		1.00			0.96			0.98	
Satd. Flow (prot)		3725	1381		3715			1876			1897	
Flt Permitted		0.95	1.00		0.93			0.72			0.81	
Satd. Flow (perm)		3554	1381		3448			1416			1568	
Peak-hour factor, PHF	0.90	0.90	0.90	0.98	0.98	0.98	0.74	0.74	0.74	0.85	0.85	0.85
Adj. Flow (vph)	1	847	343	17	818	7	212	1	20	15	11	6
RTOR Reduction (vph)	0	0	51	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	848	292	0	841	0	0	233	0	0	32	0
Confl. Peds. (#/hr)	17		20	20		17	7		1	1		7
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			0									0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		3			3			1				1
Permitted Phases	3		3	3			1			1		
Actuated Green, G (s)		18.7	18.7		18.7			12.8			12.8	
Effective Green, g (s)		18.7	18.7		18.7			12.8			12.8	
Actuated g/C Ratio		0.40	0.40		0.40			0.27			0.27	
Clearance Time (s)		6.0	6.0		6.0			6.0			6.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		1405	546		1363			383			424	
v/s Ratio Prot												
v/s Ratio Perm		0.24	0.21		c0.24			c0.16			0.02	
v/c Ratio		0.60	0.53		0.62			0.61			0.08	
Uniform Delay, d1		11.4	11.0		11.4			15.1			12.8	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		1.9	3.7		2.1			2.7			0.1	
Delay (s)		13.3	14.7		13.5			17.8			12.9	
Level of Service		B	B		B			B			B	
Approach Delay (s)		13.7			13.5			17.8			12.9	
Approach LOS		B			B			B			B	

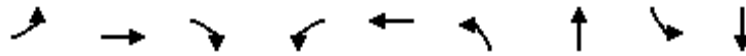
Intersection Summary

HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	47.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

21: Mt. Auburn Street & Bates Road East

1/27/2011



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations		↔↕	↗		↕↔		↕↔		↕↔	
Volume (vph)	1	762	309	17	802	157	1	13	9	
Lane Group Flow (vph)	0	848	343	0	842	0	233	0	32	
Turn Type	Perm		Perm	Perm		Perm		Perm		
Protected Phases		3			3		1		1	2
Permitted Phases	3		3	3		1		1		
Detector Phase	3	3	3	3	3	1	1	1	1	
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0
Minimum Split (s)	17.0	17.0	17.0	17.0	17.0	18.5	18.5	18.5	18.5	15.0
Total Split (s)	24.0	24.0	24.0	24.0	24.0	44.0	44.0	44.0	44.0	15.0
Total Split (%)	28.9%	28.9%	28.9%	28.9%	28.9%	53.0%	53.0%	53.0%	53.0%	18%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag						Lead	Lead	Lead	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None	None
v/c Ratio		0.59	0.57		0.60		0.59		0.07	
Control Delay		16.0	16.5		16.4		21.9		13.6	
Queue Delay		0.0	0.0		0.0		0.0		0.0	
Total Delay		16.0	16.5		16.4		21.9		13.6	
Queue Length 50th (ft)		72	40		72		47		5	
Queue Length 95th (ft)		#275	#232		#281		107		24	
Internal Link Dist (ft)		1077			987		295		217	
Turn Bay Length (ft)			25							
Base Capacity (vph)		1445	600		1403		1218		1346	
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		0.59	0.57		0.60		0.19		0.02	

Intersection Summary

Cycle Length: 83

Actuated Cycle Length: 46.1

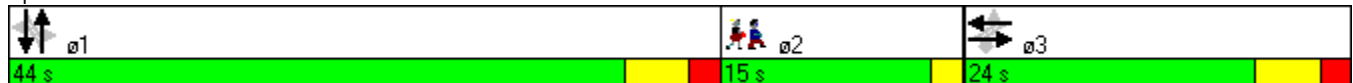
Natural Cycle: 60

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Mt. Auburn Street & Bates Road East



HCM Unsignalized Intersection Capacity Analysis

24: Mt. Auburn Street & Boylston Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	718	93	20	648	86	65
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.43	0.43
Hourly flow rate (vph)	780	101	21	689	200	151
Pedestrians	1			16		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	1067					
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			898		1235	457
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			708		1076	227
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		0	79
cM capacity (veh/h)			802		191	708

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	520	361	251	460	351
Volume Left	0	0	21	0	200
Volume Right	0	101	0	0	151
cSH	1700	1700	802	1700	279
Volume to Capacity	0.31	0.21	0.03	0.27	1.26
Queue Length 95th (ft)	0	0	2	0	421
Control Delay (s)	0.0	0.0	1.1	0.0	179.7
Lane LOS			A	F	
Approach Delay (s)	0.0		0.4	179.7	
Approach LOS				F	

Intersection Summary					
Average Delay			32.6		
Intersection Capacity Utilization			45.7%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis

31: Mt. Auburn Street & Winthrop Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	748	35	18	632	16	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.93	0.93	0.59	0.59
Hourly flow rate (vph)	796	37	19	680	27	20
Pedestrians				23	14	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				2	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				738		
pX, platoon unblocked					0.96	
vC, conflicting volume				847	1207	453
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				847	1122	453
tC, single (s)				4.2	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				97	85	96
cM capacity (veh/h)				764	187	542

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	530	302	246	453	47
Volume Left	0	0	19	0	27
Volume Right	0	37	0	0	20
cSH	1700	1700	764	1700	260
Volume to Capacity	0.31	0.18	0.03	0.27	0.18
Queue Length 95th (ft)	0	0	2	0	16
Control Delay (s)	0.0	0.0	1.0	0.0	22.0
Lane LOS	A			C	
Approach Delay (s)	0.0		0.4		22.0
Approach LOS				C	

Intersection Summary					
Average Delay			0.8		
Intersection Capacity Utilization			44.3%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis

26: Mt. Auburn Street & Chauncey Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	720	40	50	632	18	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.97	0.97	0.59	0.59
Hourly flow rate (vph)	800	44	52	652	31	41
Pedestrians	6				31	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	1				3	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	439					
pX, platoon unblocked					0.90	
vC, conflicting volume	875			1288 453		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	875			1102 453		
tC, single (s)	4.2			6.9 7.0		
tC, 2 stage (s)						
tF (s)	2.2			3.5 3.3		
p0 queue free %	93			81 92		
cM capacity (veh/h)	735			164 532		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	533	311	269	434	71
Volume Left	0	0	52	0	31
Volume Right	0	44	0	0	41
cSH	1700	1700	735	1700	271
Volume to Capacity	0.31	0.18	0.07	0.26	0.26
Queue Length 95th (ft)	0	0	6	0	26
Control Delay (s)	0.0	0.0	2.6	0.0	23.0
Lane LOS	A			C	
Approach Delay (s)	0.0		1.0		23.0
Approach LOS	C				

Intersection Summary					
Average Delay			1.4		
Intersection Capacity Utilization	51.6%		ICU Level of Service		A
Analysis Period (min)	15				

HCM Signalized Intersection Capacity Analysis

28: Mt. Auburn Street & School Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	69	657	18	41	582	31	17	125	40	80	377	83
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0			6.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.97			0.98	
Flt Protected		1.00			1.00			1.00			0.99	
Satd. Flow (prot)		3582			3572			1809			1890	
Flt Permitted		0.80			0.85			0.90			0.90	
Satd. Flow (perm)		2864			3033			1645			1712	
Peak-hour factor, PHF	0.86	0.86	0.86	0.92	0.92	0.92	0.78	0.78	0.78	0.93	0.93	0.93
Adj. Flow (vph)	80	764	21	45	633	34	22	160	51	86	405	89
RTOR Reduction (vph)	0	2	0	0	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	863	0	0	709	0	0	233	0	0	580	0
Confl. Peds. (#/hr)	26		29	29		26	33		19	19		33
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	6%	6%	6%	2%	2%	2%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		38.3			38.3			25.2			25.2	
Effective Green, g (s)		38.3			38.3			25.2			25.2	
Actuated g/C Ratio		0.48			0.48			0.32			0.32	
Clearance Time (s)		6.0			6.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			0.2			0.2	
Lane Grp Cap (vph)		1380			1461			521			543	
v/s Ratio Prot												
v/s Ratio Perm		c0.30			0.23			0.14			c0.34	
v/c Ratio		0.63			0.49			0.45			1.07	
Uniform Delay, d1		15.3			13.9			21.6			27.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.2			1.2			2.8			58.1	
Delay (s)		17.4			15.1			24.4			85.2	
Level of Service		B			B			C			F	
Approach Delay (s)		17.4			15.1			24.4			85.2	
Approach LOS		B			B			C			F	

Intersection Summary

HCM Average Control Delay	33.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

28: Mt. Auburn Street & School Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations		↕↕		↕↕		↕		↕	
Volume (vph)	69	657	41	582	17	125	80	377	
Lane Group Flow (vph)	0	865	0	712	0	233	0	580	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		1		1		3		3	2
Permitted Phases	1		1		3		3		
Detector Phase	1	1	1	1	3	3	3	3	
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	15.0
Minimum Split (s)	41.0	41.0	41.0	41.0	30.0	30.0	30.0	30.0	20.0
Total Split (s)	44.0	44.0	44.0	44.0	30.0	30.0	30.0	30.0	20.0
Total Split (%)	46.8%	46.8%	46.8%	46.8%	31.9%	31.9%	31.9%	31.9%	21%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lead	Lead	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	None
v/c Ratio		0.61		0.48		0.44		1.05	
Control Delay		18.0		15.6		25.6		80.4	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		18.0		15.6		25.6		80.4	
Queue Length 50th (ft)		135		101		81		~264	
Queue Length 95th (ft)		280		227		163		#645	
Internal Link Dist (ft)		359		1191		1065		1130	
Turn Bay Length (ft)									
Base Capacity (vph)		1409		1493		531		553	
Starvation Cap Reductn		0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.61		0.48		0.44		1.05	

Intersection Summary

Cycle Length: 94

Actuated Cycle Length: 78

Natural Cycle: 95

Control Type: Semi Act-Uncoord

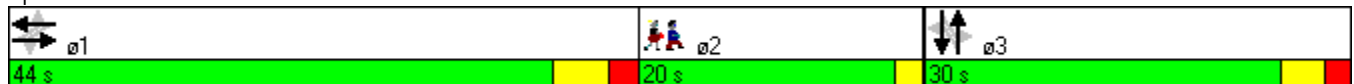
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 28: Mt. Auburn Street & School Street



HCM Unsignalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (veh/h)	9	783	20	36	523	3	25	2	38	5	5	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.74	0.74	0.74	0.75	0.75	0.75
Hourly flow rate (vph)	10	842	22	38	551	3	34	3	51	7	7	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1271			856							
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	0.95
vC, conflicting volume	554			863			1241	1502	432	1121	1511	277
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	554			746			1145	1419	291	1018	1429	277
tC, single (s)	4.1			4.1			7.6	6.8	7.0	7.9	6.5	7.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.2	3.3	3.7	4.0	3.5
p0 queue free %	99			95			74	97	92	95	95	98
cM capacity (veh/h)	1027			826			130	106	660	138	122	675

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	431	442	313	278	88	28
Volume Left	10	0	38	0	34	7
Volume Right	0	22	0	3	51	15
cSH	1027	1700	826	1700	241	225
Volume to Capacity	0.01	0.26	0.05	0.16	0.36	0.12
Queue Length 95th (ft)	1	0	4	0	40	11
Control Delay (s)	0.3	0.0	1.6	0.0	28.2	23.3
Lane LOS	A		A		D	C
Approach Delay (s)	0.1		0.9		28.2	23.3
Approach LOS					D	C

Intersection Summary

Average Delay	2.4
Intersection Capacity Utilization	52.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

2: Mt. Auburn Street & Melendy Avenue

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	814	12	12	553	9	39
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	866	13	13	582	10	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	502					
pX, platoon unblocked					0.99	
vC, conflicting volume	879			1189	439	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	879			1163	439	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			95	93	
cM capacity (veh/h)	765			182	565	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	577	301	207	388	52
Volume Left	0	0	13	0	10
Volume Right	0	13	0	0	42
cSH	1700	1700	765	1700	406
Volume to Capacity	0.34	0.18	0.02	0.23	0.13
Queue Length 95th (ft)	0	0	1	0	11
Control Delay (s)	0.0	0.0	0.8	0.0	15.2
Lane LOS	A			C	
Approach Delay (s)	0.0		0.3		15.2
Approach LOS	C				

Intersection Summary					
Average Delay			0.6		
Intersection Capacity Utilization	32.7%		ICU Level of Service	A	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis

3: Mt. Auburn Street & Lloyd Road

1/27/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	
Volume (veh/h)	7	846	560	1	2	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.50	0.50
Hourly flow rate (vph)	7	900	589	1	4	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			441			
pX, platoon unblocked	0.97				0.97	0.97
vC, conflicting volume	591				1055	295
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	528				1005	225
tC, single (s)	5.1				7.8	6.9
tC, 2 stage (s)						
tF (s)	2.7				4.0	3.3
p0 queue free %	99				98	99
cM capacity (veh/h)	745				164	758

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	307	600	393	198	14
Volume Left	7	0	0	0	4
Volume Right	0	0	0	1	10
cSH	745	1700	1700	1700	372
Volume to Capacity	0.01	0.35	0.23	0.12	0.04
Queue Length 95th (ft)	1	0	0	0	3
Control Delay (s)	0.4	0.0	0.0	0.0	15.1
Lane LOS	A				C
Approach Delay (s)	0.1		0.0		15.1
Approach LOS					C

Intersection Summary

Average Delay		0.2			
Intersection Capacity Utilization		36.9%		ICU Level of Service	A
Analysis Period (min)		15			

HCM Unsignalized Intersection Capacity Analysis

4: Mt. Auburn Street & Elton Avenue

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Volume (veh/h)	758	90	49	561	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.96	0.96	0.25	0.25
Hourly flow rate (vph)	824	98	51	584	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				391		
pX, platoon unblocked					0.95	
vC, conflicting volume				922	1267	461
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				922	1182	461
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				93	100	100
cM capacity (veh/h)				749	162	547

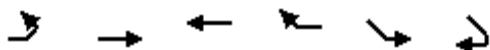
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	549	372	246	390
Volume Left	0	0	51	0
Volume Right	0	98	0	0
cSH	1700	1700	749	1700
Volume to Capacity	0.32	0.22	0.07	0.23
Queue Length 95th (ft)	0	0	5	0
Control Delay (s)	0.0	0.0	2.7	0.0
Lane LOS	A			
Approach Delay (s)	0.0		1.1	
Approach LOS				

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization	45.4%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

5: Mt. Auburn Street & Irma Avenue

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑		↘	
Volume (veh/h)	7	751	560	7	22	50
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.68	0.68
Hourly flow rate (vph)	8	808	636	8	32	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			228			
pX, platoon unblocked	0.93				0.93	0.93
vC, conflicting volume	644				1059	322
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	460				907	112
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				87	91
cM capacity (veh/h)	1031				257	852

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SE 1
Volume Total	277	538	424	220	106
Volume Left	8	0	0	0	32
Volume Right	0	0	0	8	74
cSH	1031	1700	1700	1700	499
Volume to Capacity	0.01	0.32	0.25	0.13	0.21
Queue Length 95th (ft)	1	0	0	0	20
Control Delay (s)	0.3	0.0	0.0	0.0	14.1
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		14.1
Approach LOS					B

Intersection Summary					
Average Delay			1.0		
Intersection Capacity Utilization			35.1%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis

6: Mt. Auburn Street & Kimball Road

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	10	696	67	42	525	17	31	26	90	37	51	11
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frt		0.99			1.00			0.92			0.99	
Flt Protected		1.00			1.00			0.99			0.98	
Satd. Flow (prot)		2992			3242			1559			1723	
Flt Permitted		0.95			0.83			0.91			0.71	
Satd. Flow (perm)		2829			2693			1431			1255	
Peak-hour factor, PHF	0.85	0.85	0.85	0.91	0.91	0.91	0.68	0.68	0.68	0.77	0.77	0.77
Adj. Flow (vph)	12	819	79	46	577	19	46	38	132	48	66	14
RTOR Reduction (vph)	0	5	0	0	1	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	905		0	641		0	216		0	124	
Heavy Vehicles (%)	10%	6%	2%	2%	5%	0%	7%	12%	2%	0%	2%	0%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)		5						5				
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		71.6			71.6			21.4			21.4	
Effective Green, g (s)		71.6			71.6			21.4			21.4	
Actuated g/C Ratio		0.65			0.65			0.19			0.19	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1841			1753			278			244	
v/s Ratio Prot												
v/s Ratio Perm		c0.32			0.24			c0.15			0.10	
v/c Ratio		0.49			0.37			0.78			0.51	
Uniform Delay, d1		9.9			8.8			42.0			39.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.6			12.8			1.7	
Delay (s)		10.8			9.4			54.8			41.3	
Level of Service		B			A			D			D	
Approach Delay (s)		10.8			9.4			54.8			41.3	
Approach LOS		B			A			D			D	

Intersection Summary

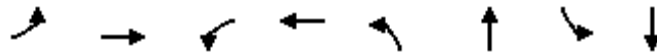
HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

6: Mt. Auburn Street & Kimball Road

1/27/2011

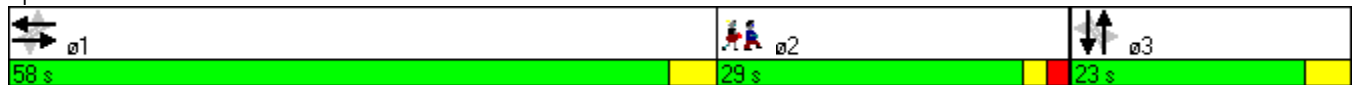


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations		↕↕		↕↕		↕		↕	
Volume (vph)	10	696	42	525	31	26	37	51	
Lane Group Flow (vph)	0	910	0	642	0	216	0	128	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		1		1		3		3	2
Permitted Phases	1		1		3		3		
Detector Phase	1	1	1	1	3	3	3	3	
Switch Phase									
Minimum Initial (s)	8.0	8.0	8.0	8.0	6.0	6.0	6.0	6.0	7.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	29.0
Total Split (s)	58.0	58.0	58.0	58.0	23.0	23.0	23.0	23.0	29.0
Total Split (%)	52.7%	52.7%	52.7%	52.7%	20.9%	20.9%	20.9%	20.9%	26%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None
v/c Ratio		0.47		0.35		0.77		0.51	
Control Delay		11.3		10.0		61.4		45.9	
Queue Delay		0.0		0.5		0.0		0.0	
Total Delay		11.3		10.5		61.4		45.9	
Queue Length 50th (ft)		126		80		141		76	
Queue Length 95th (ft)		285		203		171		120	
Internal Link Dist (ft)		148		118		676		475	
Turn Bay Length (ft)									
Base Capacity (vph)		1927		1833		286		255	
Starvation Cap Reductn		0		741		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.47		0.59		0.76		0.50	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 29 (26%), Referenced to phase 1:EBWB, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated

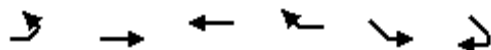
Splits and Phases: 6: Mt. Auburn Street & Kimball Road



HCM Unsignalized Intersection Capacity Analysis

7: Mt. Auburn Street & Templeton Parkway

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑		↘	
Volume (veh/h)	2	821	566	1	3	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.95	0.95	0.79	0.79
Hourly flow rate (vph)	2	912	596	1	4	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		198	170			
pX, platoon unblocked	0.89				0.92	0.89
vC, conflicting volume	597				1057	298
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	314				384	0
tC, single (s)	4.1				7.5	7.3
tC, 2 stage (s)						
tF (s)	2.2				3.8	3.5
p0 queue free %	100				99	98
cM capacity (veh/h)	1125				476	923

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SE 1
Volume Total	306	608	397	200	27
Volume Left	2	0	0	0	4
Volume Right	0	0	0	1	23
cSH	1125	1700	1700	1700	814
Volume to Capacity	0.00	0.36	0.23	0.12	0.03
Queue Length 95th (ft)	0	0	0	0	3
Control Delay (s)	0.1	0.0	0.0	0.0	9.6
Lane LOS	A				A
Approach Delay (s)	0.0		0.0		9.6
Approach LOS					A

Intersection Summary					
Average Delay			0.2		
Intersection Capacity Utilization			32.9%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis

8: Mt. Auburn Street & Arlington Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗			↗	
Volume (vph)	66	414	344	244	464	8	65	224	79	9	902	38
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frt	1.00	0.93		1.00	1.00		1.00	0.96			0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1776	3349		1845	3613		1712	1844			3698	
Flt Permitted	0.47	1.00		0.15	1.00		0.14	1.00			0.95	
Satd. Flow (perm)	879	3349		296	3613		256	1844			3514	
Peak-hour factor, PHF	0.96	0.96	0.96	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	69	431	358	257	488	8	71	243	86	10	991	42
RTOR Reduction (vph)	0	147	0	0	1	0	0	12	0	0	0	0
Lane Group Flow (vph)	69	642	0	257	495	0	71	317	0	0	1043	0
Heavy Vehicles (%)	7%	8%	3%	3%	5%	0%	11%	5%	2%	0%	2%	5%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			pm+pt			pm+pt				Perm	
Protected Phases		2		1	6		3	8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	22.2	22.2		33.2	33.2		33.8	33.8			24.2	
Effective Green, g (s)	22.2	22.2		33.2	33.2		33.8	33.8			24.2	
Actuated g/C Ratio	0.22	0.22		0.32	0.32		0.33	0.33			0.23	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	189	722		201	1165		163	605			826	
v/s Ratio Prot		0.19		c0.09	0.14		0.02	c0.17				
v/s Ratio Perm	0.08			c0.33			0.12				c0.30	
v/c Ratio	0.37	0.89		1.28	0.42		0.44	0.52			1.26	
Uniform Delay, d1	34.4	39.2		32.2	27.4		27.2	28.1			39.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	5.4	15.3		158.0	1.1		1.9	0.8			127.9	
Delay (s)	39.8	54.6		190.2	28.5		29.1	28.9			167.3	
Level of Service	D	D		F	C		C	C			F	
Approach Delay (s)		53.4			83.7			28.9			167.3	
Approach LOS		D			F			C			F	

Intersection Summary

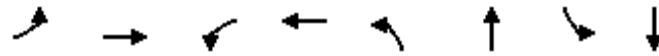
HCM Average Control Delay	96.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	40.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues

8: Mt. Auburn Street & Arlington Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations	↶	↷	↶	↷	↶	↷		↷	
Volume (vph)	66	414	244	464	65	224	9	902	
Lane Group Flow (vph)	69	789	257	496	71	329	0	1043	
Turn Type	Perm		pm+pt		pm+pt		Perm		
Protected Phases		2	1	6	3	8		4	9
Permitted Phases	2		6		8		4		
Detector Phase	2	2	1	6	3	8	4	4	
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	13.0	11.0	13.0	11.0	13.0	13.0	13.0	24.0
Total Split (s)	29.0	29.0	11.0	40.0	11.0	39.0	28.0	28.0	24.0
Total Split (%)	28.2%	28.2%	10.7%	38.8%	10.7%	37.9%	27.2%	27.2%	23%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	6.0	4.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lead		Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	Min	Min	Min	Ped
v/c Ratio	0.35	0.88	1.23	0.42	0.38	0.55		1.26	
Control Delay	39.8	42.3	165.7	28.0	29.7	31.2		163.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	
Total Delay	39.8	42.3	165.7	28.0	29.7	31.2		163.0	
Queue Length 50th (ft)	39	207	~150	132	32	167		~483	
Queue Length 95th (ft)	82	#315	#313	178	65	257		#612	
Internal Link Dist (ft)		90		334		279		435	
Turn Bay Length (ft)	75		150						
Base Capacity (vph)	196	893	209	1195	186	603		826	
Starvation Cap Reductn	0	0	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	
Reduced v/c Ratio	0.35	0.88	1.23	0.42	0.38	0.55		1.26	

Intersection Summary

Cycle Length: 103

Actuated Cycle Length: 103

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 120

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

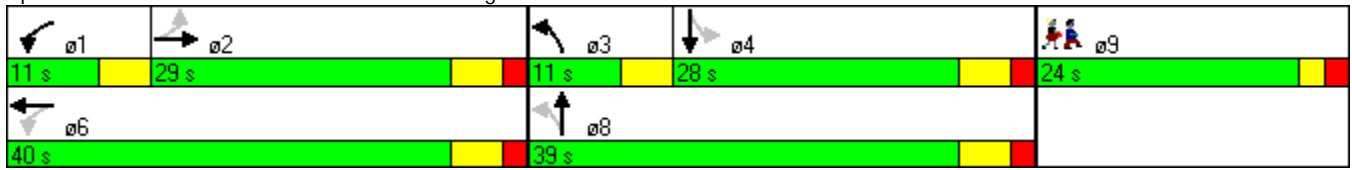
Queue shown is maximum after two cycles.

Queues

8: Mt. Auburn Street & Arlington Street

1/27/2011

Splits and Phases: 8: Mt. Auburn Street & Arlington Street



HCM Unsignalized Intersection Capacity Analysis

9: Arlington Street & Grove Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (veh/h)	956	534	20	171	197	102
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.91	0.91	0.73	0.73
Hourly flow rate (vph)	1028	574	22	188	270	140
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	359					
pX, platoon unblocked			0.69		0.69	0.69
vC, conflicting volume			1028		1260	1028
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			820		1154	820
tC, single (s)			4.3		6.7	6.3
tC, 2 stage (s)						
tF (s)			2.3		3.8	3.4
p0 queue free %			96		0	45
cM capacity (veh/h)			522		127	252
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	1028	574	22	188	270	140
Volume Left	0	0	22	0	270	0
Volume Right	0	574	0	0	0	140
cSH	1700	1700	522	1700	127	252
Volume to Capacity	0.60	0.34	0.04	0.11	2.13	0.55
Queue Length 95th (ft)	0	0	3	0	560	77
Control Delay (s)	0.0	0.0	12.2	0.0	591.2	35.7
Lane LOS			B		F	E
Approach Delay (s)	0.0		1.3		401.7	
Approach LOS					F	
Intersection Summary						
Average Delay			74.2			
Intersection Capacity Utilization			64.8%	ICU Level of Service	C	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Grove Street & Tufts Medical Center

1/27/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	25	1033	162	62	6	29
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.84	0.84	0.86	0.86
Hourly flow rate (vph)	28	1161	193	74	7	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		487				
pX, platoon unblocked					0.71	
vC, conflicting volume	267				1447	230
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	267				1425	230
tC, single (s)	4.5				6.4	6.7
tC, 2 stage (s)						
tF (s)	2.6				3.5	3.7
p0 queue free %	97				93	95
cM capacity (veh/h)	1085				104	712

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	1189	267	7	34
Volume Left	28	0	7	0
Volume Right	0	74	0	34
cSH	1085	1700	104	712
Volume to Capacity	0.03	0.16	0.07	0.05
Queue Length 95th (ft)	2	0	5	4
Control Delay (s)	0.9	0.0	42.0	10.3
Lane LOS	A		E	B
Approach Delay (s)	0.9	0.0	15.7	
Approach LOS			C	

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		78.0%	ICU Level of Service
Analysis Period (min)		15	D

HCM Signalized Intersection Capacity Analysis

33: Mt. Auburn Street & Summer Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	93	825	14	19	663	204	7	6	21	182	5	127
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	10	10	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.5			5.5			5.5			5.5	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frt		1.00			0.97			0.92			0.95	
Flt Protected		1.00			1.00			0.99			0.97	
Satd. Flow (prot)		3452			3593			1814			1802	
Flt Permitted		0.67			0.92			0.92			0.79	
Satd. Flow (perm)		2308			3301			1694			1470	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.67	0.67	0.67	0.90	0.90	0.90
Adj. Flow (vph)	106	938	16	21	737	227	10	9	31	202	6	141
RTOR Reduction (vph)	0	1	0	0	26	0	0	23	0	0	27	0
Lane Group Flow (vph)	0	1059	0	0	959	0	0	27	0	0	322	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5			5			10			
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		36.1			36.1			19.9			19.9	
Effective Green, g (s)		36.1			36.1			19.9			19.9	
Actuated g/C Ratio		0.49			0.49			0.27			0.27	
Clearance Time (s)		5.5			5.5			5.5			5.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1135			1624			459			399	
v/s Ratio Prot												
v/s Ratio Perm		c0.46			0.29			0.02			c0.22	
v/c Ratio		0.93			0.59			0.06			0.81	
Uniform Delay, d1		17.5			13.4			19.8			25.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		13.5			0.6			0.1			11.4	
Delay (s)		31.1			13.9			19.9			36.3	
Level of Service		C			B			B			D	
Approach Delay (s)		31.1			13.9			19.9			36.3	
Approach LOS		C			B			B			D	

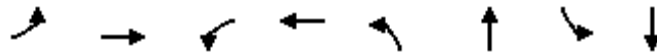
Intersection Summary

HCM Average Control Delay	24.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	73.4	Sum of lost time (s)	17.4
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Queues

33: Mt. Auburn Street & Summer Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations		↕↕		↕↕		↕		↕	
Volume (vph)	93	825	19	663	7	6	182	5	
Lane Group Flow (vph)	0	1060	0	985	0	50	0	349	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		2		6		8		4	9
Permitted Phases	2		6		8		4		
Detector Phase	2	2	6	6	8	8	4	4	
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0	5.0
Minimum Split (s)	17.5	17.5	17.5	17.5	11.5	11.5	11.5	11.5	19.0
Total Split (s)	41.0	41.0	41.0	41.0	29.0	29.0	29.0	29.0	19.0
Total Split (%)	46.1%	46.1%	46.1%	46.1%	32.6%	32.6%	32.6%	32.6%	21%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Min	Min	Min	Min	None	None	None	None	None
v/c Ratio		0.89		0.57		0.10		0.79	
Control Delay		29.5		14.6		12.0		36.2	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		29.5		14.6		12.0		36.2	
Queue Length 50th (ft)		188		126		5		113	
Queue Length 95th (ft)		#484		304		22		#319	
Internal Link Dist (ft)		704		491		38		726	
Turn Bay Length (ft)									
Base Capacity (vph)		1188		1723		597		525	
Starvation Cap Reductn		0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.89		0.57		0.08		0.66	

Intersection Summary

Cycle Length: 89

Actuated Cycle Length: 70.2

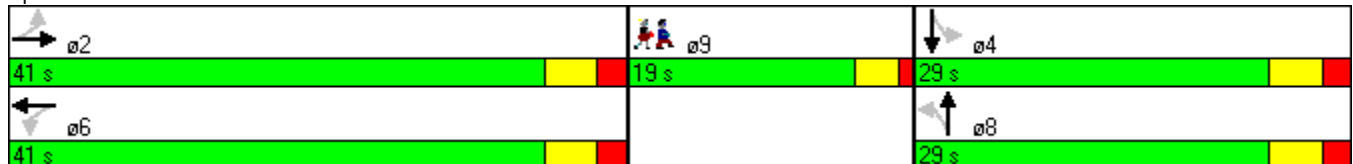
Natural Cycle: 100

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Mt. Auburn Street & Summer Street



HCM Signalized Intersection Capacity Analysis

36: Mt. Auburn Street & Palfrey Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕				
Volume (vph)	124	780	124	30	747	30	139	153	20	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	16	16	16	12	12	12
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		0.95			0.95			1.00				
Frbp, ped/bikes		1.00			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		0.98			0.99			0.99				
Flt Protected		0.99			1.00			0.97				
Satd. Flow (prot)		3624			3697			2166				
Flt Permitted		0.68			0.87			0.97				
Satd. Flow (perm)		2484			3235			2166				
Peak-hour factor, PHF	0.92	0.89	0.89	0.94	0.94	0.92	0.67	0.92	0.67	0.92	0.92	0.92
Adj. Flow (vph)	135	876	139	32	795	33	207	166	30	0	0	0
RTOR Reduction (vph)	0	6	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1144	0	0	858	0	0	403	0	0	0	0
Confl. Peds. (#/hr)			10	10			10		10			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Split					
Protected Phases		1			1		3	3				
Permitted Phases	1			1								
Actuated Green, G (s)		61.0			61.0			24.6				
Effective Green, g (s)		61.0			61.0			24.6				
Actuated g/C Ratio		0.62			0.62			0.25				
Clearance Time (s)		4.0			4.0			4.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1531			1993			538				
v/s Ratio Prot								c0.19				
v/s Ratio Perm		c0.46			0.27							
v/c Ratio		0.75			0.43			0.75				
Uniform Delay, d1		13.5			9.9			34.4				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		3.4			0.7			5.7				
Delay (s)		16.9			10.6			40.0				
Level of Service		B			B			D				
Approach Delay (s)		16.9			10.6			40.0			0.0	
Approach LOS		B			B			D			A	
Intersection Summary												
HCM Average Control Delay			18.5		HCM Level of Service			B				
HCM Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			99.0		Sum of lost time (s)			13.4				
Intersection Capacity Utilization			75.3%		ICU Level of Service			D				
Analysis Period (min)			15									

c Critical Lane Group

Queues

36: Mt. Auburn Street & Palfrey Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBT	ø2
Lane Configurations		↕↕		↕↕	↕↕	
Volume (vph)	124	780	30	747	153	
Lane Group Flow (vph)	0	1150	0	860	403	
Turn Type	Perm		Perm			
Protected Phases		1		1	3	2
Permitted Phases	1		1			
Detector Phase	1	1	1	1	3	
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	7.0
Minimum Split (s)	17.0	17.0	17.0	17.0	20.0	15.0
Total Split (s)	33.0	33.0	33.0	33.0	51.0	15.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	51.5%	15%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
v/c Ratio		0.72		0.41	0.75	
Control Delay		18.1		11.5	42.9	
Queue Delay		0.0		0.0	0.0	
Total Delay		18.1		11.5	42.9	
Queue Length 50th (ft)		204		112	236	
Queue Length 95th (ft)		#535		273	305	
Internal Link Dist (ft)		491		175	368	
Turn Bay Length (ft)						
Base Capacity (vph)		1595		2073	1029	
Starvation Cap Reductn		0		0	0	
Spillback Cap Reductn		0		0	0	
Storage Cap Reductn		0		0	0	
Reduced v/c Ratio		0.72		0.41	0.39	

Intersection Summary

Cycle Length: 99

Actuated Cycle Length: 99

Offset: 40 (40%), Referenced to phase 1:EBWB, Start of Yellow

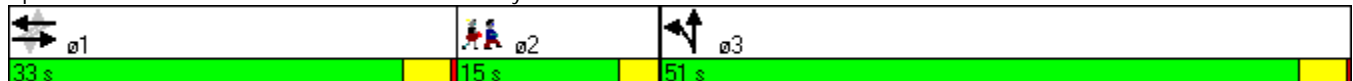
Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 36: Mt. Auburn Street & Palfrey Street



HCM Unsignalized Intersection Capacity Analysis
 15: Mt. Auburn Street & Phillips Street

1/27/2011



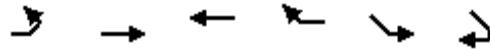
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	789	11	36	804	3	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.92	0.92	0.42	0.42
Hourly flow rate (vph)	813	11	39	874	7	17
Pedestrians	11			11		
Lane Width (ft)	11.0			13.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	1			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	255			208		
pX, platoon unblocked				0.85	0.92	0.85
vC, conflicting volume				825	1345	423
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				445	537	0
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				96	98	98
cM capacity (veh/h)				946	419	920

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	542	282	330	583	24
Volume Left	0	0	39	0	7
Volume Right	0	11	0	0	17
cSH	1700	1700	946	1700	677
Volume to Capacity	0.32	0.17	0.04	0.34	0.04
Queue Length 95th (ft)	0	0	3	0	3
Control Delay (s)	0.0	0.0	1.5	0.0	10.5
Lane LOS	A			B	
Approach Delay (s)	0.0		0.5	10.5	
Approach LOS				B	

Intersection Summary					
Average Delay			0.4		
Intersection Capacity Utilization			59.3%	ICU Level of Service	B
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
 17: Mt. Auburn Street & Marshall Street

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑			
Volume (veh/h)	37	759	840	27	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	782	913	29	0	0
Pedestrians		11	11		20	
Lane Width (ft)		12.0	12.0		0.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		1	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		347	116			
pX, platoon unblocked	0.86				0.93	0.86
vC, conflicting volume	962				1426	502
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	640				658	107
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	100
cM capacity (veh/h)	812				353	798

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	299	522	609	334
Volume Left	38	0	0	0
Volume Right	0	0	0	29
cSH	812	1700	1700	1700
Volume to Capacity	0.05	0.31	0.36	0.20
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	1.7	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.6		0.0	
Approach LOS				

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		59.0%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

19: Mt. Auburn Street & Parker Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (vph)	758	1	2	856	11	22
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	2.0			5.0	5.0	
Lane Util. Factor	0.95			0.95	1.00	
Frbp, ped/bikes	1.00			1.00	0.95	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	3725			3680	1654	
Flt Permitted	1.00			0.95	0.98	
Satd. Flow (perm)	3725			3515	1654	
Peak-hour factor, PHF	0.99	0.99	0.91	0.91	0.83	0.83
Adj. Flow (vph)	766	1	2	941	13	27
RTOR Reduction (vph)	0	0	0	0	26	0
Lane Group Flow (vph)	767	0	0	943	14	0
Confl. Peds. (#/hr)					2	8
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%
Bus Blockages (#/hr)	0	6	0	6	0	0
Parking (#/hr)		5				1
Turn Type			custom			
Protected Phases	9		3	13	4	
Permitted Phases	1		1			
Actuated Green, G (s)	39.4			60.8	4.0	
Effective Green, g (s)	39.4			60.8	4.0	
Actuated g/C Ratio	0.39			0.61	0.04	
Clearance Time (s)	2.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	1542			2194	66	
v/s Ratio Prot	c0.06			c0.15	c0.01	
v/s Ratio Perm	0.14			0.11		
v/c Ratio	0.50			0.43	0.21	
Uniform Delay, d1	22.8			10.4	46.5	
Progression Factor	1.00			0.17	1.00	
Incremental Delay, d2	1.1			0.4	1.6	
Delay (s)	24.0			2.2	48.1	
Level of Service	C			A	D	
Approach Delay (s)	24.0			2.2	48.1	
Approach LOS	C			A	D	

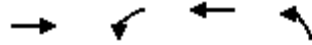
Intersection Summary

HCM Average Control Delay	12.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.2
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Queues

19: Mt. Auburn Street & Parker Street

1/27/2011



Lane Group	EBT	WBL	WBT	NBL	ø1	ø2
Lane Configurations	↑↑		↑↑	↘		
Volume (vph)	758	2	856	11		
Lane Group Flow (vph)	767	0	943	40		
Turn Type	custom					
Protected Phases	9	3	1 3	4	1	2
Permitted Phases	1	1				
Detector Phase	9	3	1 3	4		
Switch Phase						
Minimum Initial (s)	8.0	4.0		3.0	23.0	1.0
Minimum Split (s)	10.0	9.0		8.0	28.0	18.0
Total Split (s)	10.0	25.0	60.0	12.0	35.0	18.0
Total Split (%)	10.0%	25.0%	60.0%	12.0%	35%	18%
Yellow Time (s)	2.0	3.0		3.0	3.0	2.0
All-Red Time (s)	0.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		
Total Lost Time (s)	2.0	5.0	5.0	5.0		
Lead/Lag		Lead		Lag	Lead	Lag
Lead-Lag Optimize?		Yes		Yes	Yes	Yes
Recall Mode	Max	Max		None	C-Min	None
v/c Ratio	0.43		0.41	0.31		
Control Delay	19.0		1.4	29.0		
Queue Delay	0.1		0.8	673.5		
Total Delay	19.1		2.2	702.6		
Queue Length 50th (ft)	177		5	8		
Queue Length 95th (ft)	233		30	36		
Internal Link Dist (ft)	36		48	431		
Turn Bay Length (ft)						
Base Capacity (vph)	1787		2321	143		
Starvation Cap Reductn	0		977	0		
Spillback Cap Reductn	280		0	133		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.51		0.70	4.00		

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 10 (10%), Referenced to phase 1:EBWB, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated

Splits and Phases: 19: Mt. Auburn Street & Parker Street

#14 #19 ø1 35 s	ø2 18 s	#14 #19 ø3 25 s	#19 ø4 12 s	#14 #19 10 s
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HCM Signalized Intersection Capacity Analysis

14: Mt. Auburn Street & Common Street

1/27/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↔		↘	↘
Volume (vph)	203	577	629	218	326	229
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	10	10
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frbp, ped/bikes		1.00	1.00		1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	0.96		1.00	0.85
Flt Protected		0.99	1.00		0.95	1.00
Satd. Flow (prot)		3403	3581		1756	1541
Flt Permitted		0.55	1.00		0.95	1.00
Satd. Flow (perm)		1902	3581		1756	1541
Peak-hour factor, PHF	0.99	0.99	0.91	0.91	0.93	0.93
Adj. Flow (vph)	205	583	691	240	351	246
RTOR Reduction (vph)	0	0	36	0	0	0
Lane Group Flow (vph)	0	788	895	0	351	246
Confl. Peds. (#/hr)	28				2	8
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Bus Blockages (#/hr)	0	6	0	6	0	0
Parking (#/hr)		5				
Turn Type	custom				Perm	
Protected Phases	9	1 9			3	
Permitted Phases	1		1			3
Actuated Green, G (s)		39.4	26.4		34.4	34.4
Effective Green, g (s)		39.4	26.4		34.4	34.4
Actuated g/C Ratio		0.39	0.26		0.34	0.34
Clearance Time (s)			5.0		5.0	5.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)		945	945		604	530
v/s Ratio Prot		c0.11			c0.20	
v/s Ratio Perm		0.22	c0.25			0.16
v/c Ratio		0.83	0.95		0.58	0.46
Uniform Delay, d1		27.3	36.1		26.9	25.6
Progression Factor		0.45	1.00		1.00	1.00
Incremental Delay, d2		8.0	19.0		4.0	2.9
Delay (s)		20.2	55.1		30.9	28.5
Level of Service		C	E		C	C
Approach Delay (s)		20.2	55.1		29.9	
Approach LOS		C	E		C	

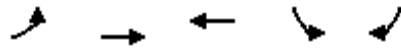
Intersection Summary			
HCM Average Control Delay	36.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	29.2
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

14: Mt. Auburn Street & Common Street

1/27/2011

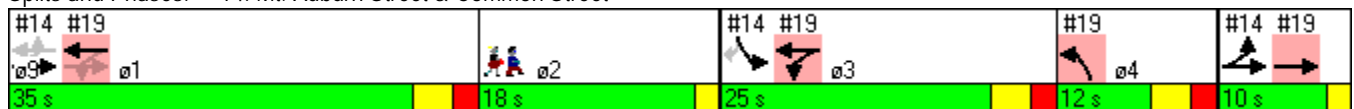


Lane Group	EBL	EBT	WBT	SBL	SBR	ø2	ø4
Lane Configurations		↕↕	↕↔	↔	↔		
Volume (vph)	203	577	629	326	229		
Lane Group Flow (vph)	0	788	931	351	246		
Turn Type	custom				Perm		
Protected Phases	9	19		3		2	4
Permitted Phases	1		1		3		
Detector Phase	9	19	1	3	3		
Switch Phase							
Minimum Initial (s)	8.0		23.0	4.0	4.0	1.0	3.0
Minimum Split (s)	10.0		28.0	9.0	9.0	18.0	8.0
Total Split (s)	10.0	45.0	35.0	25.0	25.0	18.0	12.0
Total Split (%)	10.0%	45.0%	35.0%	25.0%	25.0%	18%	12%
Yellow Time (s)	2.0		3.0	3.0	3.0	2.0	3.0
All-Red Time (s)	0.0		2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	2.0	5.0	5.0	5.0	5.0		
Lead/Lag			Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Recall Mode	Max		C-Min	Max	Max	None	None
v/c Ratio		0.87	0.84	0.58	0.47		
Control Delay		26.1	39.2	34.0	31.8		
Queue Delay		1.0	0.1	0.0	0.0		
Total Delay		27.1	39.3	34.0	31.8		
Queue Length 50th (ft)		~172	277	171	114		
Queue Length 95th (ft)		#376	#358	#409	#277		
Internal Link Dist (ft)		48	1077	686			
Turn Bay Length (ft)							
Base Capacity (vph)		910	1108	604	528		
Starvation Cap Reductn		27	0	0	0		
Spillback Cap Reductn		0	7	0	0		
Storage Cap Reductn		0	0	0	0		
Reduced v/c Ratio		0.89	0.85	0.58	0.47		

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 10 (10%), Referenced to phase 1:EBWB, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 14: Mt. Auburn Street & Common Street



HCM Signalized Intersection Capacity Analysis
 21: Mt. Auburn Street & Bates Road East

1/27/2011



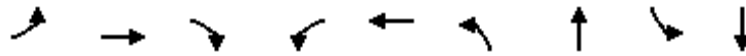
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗		↕↕			↕↕			↕↕	
Volume (vph)	1	676	176	17	759	9	296	5	25	4	3	14
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0	6.0		6.0			6.0			6.0	
Lane Util. Factor		0.95	1.00		0.95			1.00			1.00	
Frbp, ped/bikes		1.00	0.94		1.00			1.00			0.99	
Flpb, ped/bikes		1.00	1.00		1.00			0.99			1.00	
Frt		1.00	0.85		1.00			0.99			0.91	
Flt Protected		1.00	1.00		1.00			0.96			0.99	
Satd. Flow (prot)		3762	1393		3748			1878			1777	
Flt Permitted		0.95	1.00		0.93			0.72			0.92	
Satd. Flow (perm)		3590	1393		3500			1421			1651	
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.87	0.87	0.87	0.70	0.70	0.70
Adj. Flow (vph)	1	697	181	18	825	10	340	6	29	6	4	20
RTOR Reduction (vph)	0	0	28	0	1	0	0	4	0	0	13	0
Lane Group Flow (vph)	0	698	153	0	852	0	0	371	0	0	17	0
Confl. Peds. (#/hr)	32		33	33		32	9		3	3		9
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			0									0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		3			3			1				1
Permitted Phases	3		3	3			1			1		
Actuated Green, G (s)		28.1	28.1		28.1			21.6			21.6	
Effective Green, g (s)		28.1	28.1		28.1			21.6			21.6	
Actuated g/C Ratio		0.43	0.43		0.43			0.33			0.33	
Clearance Time (s)		6.0	6.0		6.0			6.0			6.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		1540	598		1502			469			544	
v/s Ratio Prot												
v/s Ratio Perm		0.19	0.11		0.24			0.26			0.01	
v/c Ratio		0.45	0.26		0.57			0.79			0.03	
Uniform Delay, d1		13.3	12.0		14.1			19.9			14.9	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		1.0	1.0		1.6			8.8			0.0	
Delay (s)		14.2	13.0		15.7			28.7			14.9	
Level of Service		B	B		B			C			B	
Approach Delay (s)		14.0			15.7			28.7			14.9	
Approach LOS		B			B			C			B	

Intersection Summary		
HCM Average Control Delay	17.3	HCM Level of Service
HCM Volume to Capacity ratio	0.62	B
Actuated Cycle Length (s)	65.5	Sum of lost time (s)
Intersection Capacity Utilization	65.8%	12.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C

Queues

21: Mt. Auburn Street & Bates Road East

1/27/2011



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations		↔↔	↔		↔↔		↔↔		↔↔	
Volume (vph)	1	676	176	17	759	296	5	4	3	
Lane Group Flow (vph)	0	698	181	0	853	0	375	0	30	
Turn Type	Perm		Perm	Perm		Perm		Perm		
Protected Phases		3			3		1		1	2
Permitted Phases	3		3	3		1		1		
Detector Phase	3	3	3	3	3	1	1	1	1	
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0
Minimum Split (s)	17.0	17.0	17.0	17.0	17.0	18.5	18.5	18.5	18.5	15.0
Total Split (s)	33.0	33.0	33.0	33.0	33.0	51.0	51.0	51.0	51.0	15.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	51.5%	51.5%	51.5%	51.5%	15%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag						Lead	Lead	Lead	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None	None
v/c Ratio		0.45	0.29		0.56		0.78		0.05	
Control Delay		16.7	13.6		18.4		30.8		8.8	
Queue Delay		0.0	0.0		0.0		0.0		0.0	
Total Delay		16.7	13.6		18.4		30.8		8.8	
Queue Length 50th (ft)		82	26		107		115		2	
Queue Length 95th (ft)		248	121		#324		253		14	
Internal Link Dist (ft)		1077			987		295		217	
Turn Bay Length (ft)			25							
Base Capacity (vph)		1568	622		1529		1039		1210	
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		0.45	0.29		0.56		0.36		0.02	

Intersection Summary

Cycle Length: 99

Actuated Cycle Length: 64.3

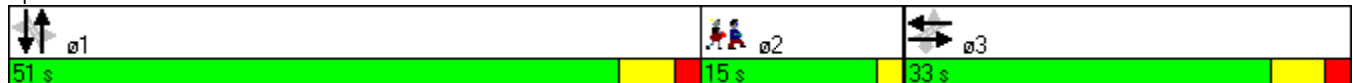
Natural Cycle: 65

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Mt. Auburn Street & Bates Road East



HCM Unsignalized Intersection Capacity Analysis

24: Mt. Auburn Street & Boylston Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	702	44	14	802	27	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.93	0.93	0.77	0.77
Hourly flow rate (vph)	724	45	15	862	35	18
Pedestrians	1			27		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			2		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	1067					
pX, platoon unblocked				0.94	0.94	0.94
vC, conflicting volume				796	1236	412
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				649	1118	239
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				98	81	97
cM capacity (veh/h)				867	182	702

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	482	287	303	575	53
Volume Left	0	0	15	0	35
Volume Right	0	45	0	0	18
cSH	1700	1700	867	1700	244
Volume to Capacity	0.28	0.17	0.02	0.34	0.22
Queue Length 95th (ft)	0	0	1	0	20
Control Delay (s)	0.0	0.0	0.6	0.0	23.8
Lane LOS	A			C	
Approach Delay (s)	0.0		0.2		23.8
Approach LOS				C	

Intersection Summary					
Average Delay			0.9		
Intersection Capacity Utilization	40.5%		ICU Level of Service		A
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis

26: Mt. Auburn Street & Chauncey Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	689	8	11	816	12	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.89	0.89	0.73	0.73
Hourly flow rate (vph)	703	8	12	917	16	15
Pedestrians	3			24		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			2		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	439					
pX, platoon unblocked					0.85	
vC, conflicting volume	735			1217	380	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	735			894	380	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	99			93	98	
cM capacity (veh/h)	849			232	612	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	469	243	318	611	32
Volume Left	0	0	12	0	16
Volume Right	0	8	0	0	15
cSH	1700	1700	849	1700	330
Volume to Capacity	0.28	0.14	0.01	0.36	0.10
Queue Length 95th (ft)	0	0	1	0	8
Control Delay (s)	0.0	0.0	0.5	0.0	17.1
Lane LOS	A			C	
Approach Delay (s)	0.0		0.2	17.1	
Approach LOS				C	

Intersection Summary					
Average Delay			0.4		
Intersection Capacity Utilization	38.8%		ICU Level of Service	A	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis

31: Mt. Auburn Street & Winthrop Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	691	14	9	819	23	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.91	0.91	0.84	0.84
Hourly flow rate (vph)	705	14	10	900	27	7
Pedestrians				4	18	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				738		
pX, platoon unblocked					0.87	
vC, conflicting volume				737	1200	382
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				737	942	382
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				99	88	99
cM capacity (veh/h)				851	226	611

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	470	249	310	600	35
Volume Left	0	0	10	0	27
Volume Right	0	14	0	0	7
cSH	1700	1700	851	1700	260
Volume to Capacity	0.28	0.15	0.01	0.35	0.13
Queue Length 95th (ft)	0	0	1	0	11
Control Delay (s)	0.0	0.0	0.4	0.0	21.0
Lane LOS	A			C	
Approach Delay (s)	0.0		0.1		21.0
Approach LOS				C	

Intersection Summary					
Average Delay			0.5		
Intersection Capacity Utilization			38.8%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
 28: Mt. Auburn Street & School Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	78	592	30	29	696	68	40	350	70	64	181	91
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0			6.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.99			0.98			0.96	
Flt Protected		0.99			1.00			1.00			0.99	
Satd. Flow (prot)		3671			3659			1922			1879	
Flt Permitted		0.71			0.91			0.94			0.71	
Satd. Flow (perm)		2623			3321			1810			1350	
Peak-hour factor, PHF	0.99	0.99	0.99	0.88	0.88	0.88	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	79	598	30	33	791	77	44	389	78	67	191	96
RTOR Reduction (vph)	0	3	0	0	6	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	704	0	0	895	0	0	511	0	0	354	0
Confl. Peds. (#/hr)	13		37	37		13	5		19	19		5
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		38.3			38.3			25.2			25.2	
Effective Green, g (s)		38.3			38.3			25.2			25.2	
Actuated g/C Ratio		0.48			0.48			0.32			0.32	
Clearance Time (s)		6.0			6.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1264			1600			574			428	
v/s Ratio Prot												
v/s Ratio Perm		0.27			c0.27			c0.28			0.26	
v/c Ratio		0.56			0.56			0.89			0.83	
Uniform Delay, d1		14.6			14.6			25.8			25.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.8			1.4			18.5			16.6	
Delay (s)		16.4			16.0			44.3			41.7	
Level of Service		B			B			D			D	
Approach Delay (s)		16.4			16.0			44.3			41.7	
Approach LOS		B			B			D			D	

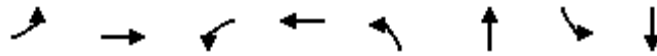
Intersection Summary

HCM Average Control Delay	25.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Queues

28: Mt. Auburn Street & School Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations		↕↕		↕↕		↕		↕	
Volume (vph)	78	592	29	696	40	350	64	181	
Lane Group Flow (vph)	0	707	0	901	0	511	0	354	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		1		1		3		3	2
Permitted Phases	1		1		3		3		
Detector Phase	1	1	1	1	3	3	3	3	
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	15.0
Minimum Split (s)	41.0	41.0	41.0	41.0	30.0	30.0	30.0	30.0	20.0
Total Split (s)	44.0	44.0	44.0	44.0	30.0	30.0	30.0	30.0	20.0
Total Split (%)	46.8%	46.8%	46.8%	46.8%	31.9%	31.9%	31.9%	31.9%	21%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lead	Lead	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	None
v/c Ratio		0.55		0.55		0.88		0.81	
Control Delay		16.9		16.4		44.3		42.5	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		16.9		16.4		44.3		42.5	
Queue Length 50th (ft)		105		133		213		144	
Queue Length 95th (ft)		240		282		#534		#390	
Internal Link Dist (ft)		359		1191		1065		1130	
Turn Bay Length (ft)									
Base Capacity (vph)		1294		1638		584		437	
Starvation Cap Reductn		0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.55		0.55		0.88		0.81	

Intersection Summary

Cycle Length: 94

Actuated Cycle Length: 78

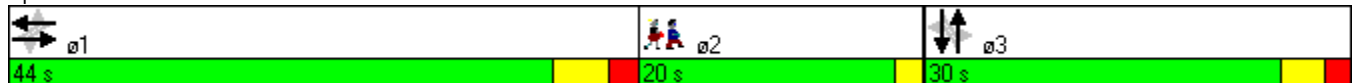
Natural Cycle: 95

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 28: Mt. Auburn Street & School Street



HCM Unsignalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↔↔			↔↔			↔			↔			
Volume (veh/h)	11	642	15	36	695	11	23	6	61	6	2	3		
Sign Control		Free			Free			Stop			Stop			
Grade		0%			0%			0%			0%			
Peak Hour Factor	0.93	0.93	0.93	0.94	0.94	0.94	0.90	0.90	0.90	0.58	0.58	0.58		
Hourly flow rate (vph)	12	690	16	38	739	12	26	7	68	10	3	5		
Pedestrians														
Lane Width (ft)														
Walking Speed (ft/s)														
Percent Blockage														
Right turn flare (veh)														
Median type	None					None								
Median storage (veh)														
Upstream signal (ft)	1271					856								
pX, platoon unblocked	0.95						0.95	0.95				0.95	0.95	0.95
vC, conflicting volume	751	706					1175	1550	353	1262	1552	376		
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	639	706					1084	1477	353	1175	1480	245		
tC, single (s)	4.1	4.1					7.5	6.8	7.0	7.5	6.5	6.9		
tC, 2 stage (s)														
tF (s)	2.2	2.2					3.5	4.2	3.3	3.5	4.0	3.3		
p0 queue free %	99	96					83	93	89	91	97	99		
cM capacity (veh/h)	909	901					154	98	634	115	114	726		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	357	361	408	381	100	19
Volume Left	12	0	38	0	26	10
Volume Right	0	16	0	12	68	5
cSH	909	1700	901	1700	293	149
Volume to Capacity	0.01	0.21	0.04	0.22	0.34	0.13
Queue Length 95th (ft)	1	0	3	0	37	11
Control Delay (s)	0.4	0.0	1.3	0.0	23.5	32.6
Lane LOS	A		A		C	D
Approach Delay (s)	0.2		0.7		23.5	32.6
Approach LOS					C	D

Intersection Summary

Average Delay	2.2	
Intersection Capacity Utilization	52.5%	ICU Level of Service A
Analysis Period (min)	15	

HCM Unsignalized Intersection Capacity Analysis

2: Mt. Auburn Street & Melendy Avenue

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	657	52	16	727	15	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	714	57	17	790	16	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	502					
pX, platoon unblocked					0.90	
vC, conflicting volume	771			1172	385	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	771			979	385	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			93	96	
cM capacity (veh/h)	840			219	613	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	476	295	281	527	43
Volume Left	0	0	17	0	16
Volume Right	0	57	0	0	27
cSH	1700	1700	840	1700	366
Volume to Capacity	0.28	0.17	0.02	0.31	0.12
Queue Length 95th (ft)	0	0	2	0	10
Control Delay (s)	0.0	0.0	0.8	0.0	16.2
Lane LOS	A			C	
Approach Delay (s)	0.0	0.3		16.2	
Approach LOS	C				

Intersection Summary					
Average Delay	0.6				
Intersection Capacity Utilization	40.0%		ICU Level of Service		A
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis

3: Mt. Auburn Street & Lloyd Road

1/27/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	
Volume (veh/h)	24	658	732	16	4	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.50	0.50
Hourly flow rate (vph)	26	700	771	17	8	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			441			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	787				1180	394
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	530				969	91
tC, single (s)	5.1				7.8	6.9
tC, 2 stage (s)						
tF (s)	2.7				4.0	3.3
p0 queue free %	96				95	97
cM capacity (veh/h)	683				155	856

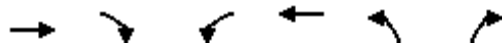
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	259	467	514	274	30
Volume Left	26	0	0	0	8
Volume Right	0	0	0	17	22
cSH	683	1700	1700	1700	389
Volume to Capacity	0.04	0.27	0.30	0.16	0.08
Queue Length 95th (ft)	3	0	0	0	6
Control Delay (s)	1.4	0.0	0.0	0.0	15.0
Lane LOS	A				C
Approach Delay (s)	0.5		0.0		15.0
Approach LOS					C

Intersection Summary					
Average Delay			0.5		
Intersection Capacity Utilization			43.9%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis

4: Mt. Auburn Street & Elton Avenue

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Volume (veh/h)	624	38	32	748	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.93	0.93	0.25	0.25
Hourly flow rate (vph)	637	39	34	804	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				391		
pX, platoon unblocked					0.88	
vC, conflicting volume				676	1127	338
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				676	882	338
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				96	100	100
cM capacity (veh/h)				925	246	664

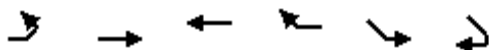
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	424	251	303	536
Volume Left	0	0	34	0
Volume Right	0	39	0	0
cSH	1700	1700	925	1700
Volume to Capacity	0.25	0.15	0.04	0.32
Queue Length 95th (ft)	0	0	3	0
Control Delay (s)	0.0	0.0	1.4	0.0
Lane LOS	A			
Approach Delay (s)	0.0		0.5	
Approach LOS				

Intersection Summary				
Average Delay			0.3	
Intersection Capacity Utilization	44.7%		ICU Level of Service	A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis

5: Mt. Auburn Street & Irma Avenue

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑		↘	
Volume (veh/h)	24	600	770	16	5	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.90	0.90	0.72	0.72
Hourly flow rate (vph)	26	638	856	18	7	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			228			
pX, platoon unblocked	0.87				0.87	0.87
vC, conflicting volume	873				1235	437
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	560				975	59
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				97	98
cM capacity (veh/h)	890				214	872

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SE 1
Volume Total	238	426	570	303	21
Volume Left	26	0	0	0	7
Volume Right	0	0	0	18	14
cSH	890	1700	1700	1700	430
Volume to Capacity	0.03	0.25	0.34	0.18	0.05
Queue Length 95th (ft)	2	0	0	0	4
Control Delay (s)	1.3	0.0	0.0	0.0	13.8
Lane LOS	A				B
Approach Delay (s)	0.4		0.0		13.8
Approach LOS					B

Intersection Summary					
Average Delay			0.4		
Intersection Capacity Utilization			42.4%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis

6: Mt. Auburn Street & Kimball Road

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	14	538	53	23	699	35	73	95	93	10	11	14
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0			4.0			3.0			3.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frt		0.99			0.99			0.95			0.95	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		3078			3300			1658			1634	
Flt Permitted		0.93			0.92			0.90			0.90	
Satd. Flow (perm)		2869			3049			1511			1494	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.78	0.78	0.78	0.69	0.69	0.69
Adj. Flow (vph)	15	585	58	24	736	37	94	122	119	14	16	20
RTOR Reduction (vph)	0	6	0	0	3	0	0	16	0	0	14	0
Lane Group Flow (vph)	0	652	0	0	794	0	0	319	0	0	36	0
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	3%	2%	1%	10%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)		5							5			
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		61.3			61.3			32.1			32.1	
Effective Green, g (s)		61.3			61.3			32.1			32.1	
Actuated g/C Ratio		0.57			0.57			0.30			0.30	
Clearance Time (s)		4.0			4.0			3.0			3.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1628			1731			449			444	
v/s Ratio Prot												
v/s Ratio Perm		0.23			0.26			0.21			0.02	
v/c Ratio		0.40			0.46			0.71			0.08	
Uniform Delay, d1		13.1			13.7			33.8			27.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.7			0.9			5.2			0.1	
Delay (s)		13.8			14.5			39.0			27.4	
Level of Service		B			B			D			C	
Approach Delay (s)		13.8			14.5			39.0			27.4	
Approach LOS		B			B			D			C	

Intersection Summary

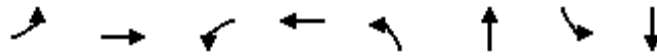
HCM Average Control Delay	19.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

6: Mt. Auburn Street & Kimball Road

1/27/2011

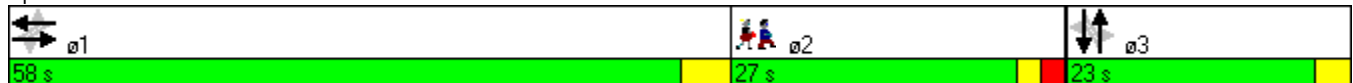


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations		↕↕		↕↕		↕↕		↕↕	
Volume (vph)	14	538	23	699	73	95	10	11	
Lane Group Flow (vph)	0	658	0	797	0	335	0	50	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		1		1		3		3	2
Permitted Phases	1		1		3		3		
Detector Phase	1	1	1	1	3	3	3	3	
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	7.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	27.0
Total Split (s)	58.0	58.0	58.0	58.0	23.0	23.0	23.0	23.0	27.0
Total Split (%)	53.7%	53.7%	53.7%	53.7%	21.3%	21.3%	21.3%	21.3%	25%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	
Lead/Lag	Lead	Lead	Lead	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None
v/c Ratio		0.38		0.44		0.72		0.11	
Control Delay		12.6		13.4		42.8		21.1	
Queue Delay		0.0		1.3		0.0		0.0	
Total Delay		12.6		14.7		42.8		21.1	
Queue Length 50th (ft)		102		131		192		15	
Queue Length 95th (ft)		195		244		#296		34	
Internal Link Dist (ft)		148		118		676		475	
Turn Bay Length (ft)									
Base Capacity (vph)		1718		1823		466		459	
Starvation Cap Reductn		0		766		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.38		0.75		0.72		0.11	

Intersection Summary

Cycle Length: 108
 Actuated Cycle Length: 108
 Offset: 29 (27%), Referenced to phase 1:EBWB, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

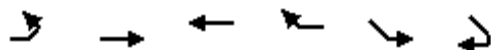
Splits and Phases: 6: Mt. Auburn Street & Kimball Road



HCM Unsignalized Intersection Capacity Analysis

7: Mt. Auburn Street & Templeton Parkway

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑		↑↑	
Volume (veh/h)	16	625	743	21	2	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.93	0.93	0.90	0.90
Hourly flow rate (vph)	17	665	799	23	2	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		198	170			
pX, platoon unblocked	0.91				0.95	0.91
vC, conflicting volume	822				1177	411
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	614				659	164
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	872				372	784

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SE 1
Volume Total	239	443	533	289	18
Volume Left	17	0	0	0	2
Volume Right	0	0	0	23	16
cSH	872	1700	1700	1700	689
Volume to Capacity	0.02	0.26	0.31	0.17	0.03
Queue Length 95th (ft)	1	0	0	0	2
Control Delay (s)	0.8	0.0	0.0	0.0	10.4
Lane LOS	A				B
Approach Delay (s)	0.3		0.0		10.4
Approach LOS					B

Intersection Summary					
Average Delay			0.3		
Intersection Capacity Utilization			37.3%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
 8: Mt. Auburn Street & Arlington Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	84	459	84	193	456	35	264	641	199	15	392	44
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frt	1.00	0.98		1.00	0.99		1.00	0.96			0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1863	3592		1776	3625		1900	1902			3624	
Flt Permitted	0.44	1.00		0.30	1.00		0.25	1.00			0.61	
Satd. Flow (perm)	868	3592		568	3625		500	1902			2226	
Peak-hour factor, PHF	0.96	0.96	0.96	0.88	0.88	0.88	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	88	478	88	219	518	40	293	712	221	17	436	49
RTOR Reduction (vph)	0	13	0	0	4	0	0	11	0	0	0	0
Lane Group Flow (vph)	88	553	0	219	554	0	293	922	0	0	502	0
Heavy Vehicles (%)	2%	3%	5%	7%	4%	0%	0%	0%	6%	7%	3%	3%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			pm+pt			pm+pt				Perm	
Protected Phases		2		1	6		3	8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	34.3	34.3		50.5	50.5		33.5	33.5			22.0	
Effective Green, g (s)	34.3	34.3		50.5	50.5		33.5	33.5			22.0	
Actuated g/C Ratio	0.33	0.33		0.49	0.49		0.32	0.32			0.21	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	286	1185		418	1760		262	613			471	
v/s Ratio Prot		0.15		c0.06	0.15		0.08	c0.48				
v/s Ratio Perm	0.10			c0.19			0.28				0.23	
v/c Ratio	0.31	0.47		0.52	0.31		1.12	1.50			1.07	
Uniform Delay, d1	26.0	27.6		16.6	16.2		33.1	35.2			41.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	2.8	1.3		1.2	0.5		91.2	235.4			60.1	
Delay (s)	28.8	28.9		17.8	16.7		124.3	270.6			101.1	
Level of Service	C	C		B	B		F	F			F	
Approach Delay (s)		28.9			17.0			235.7			101.1	
Approach LOS		C			B			F			F	

Intersection Summary

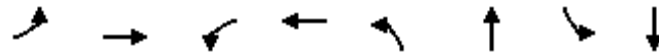
HCM Average Control Delay	117.7	HCM Level of Service	F
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	98.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues

8: Mt. Auburn Street & Arlington Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations	↖	↗	↖	↗	↖	↗		↕	
Volume (vph)	84	459	193	456	264	641	15	392	
Lane Group Flow (vph)	88	566	219	558	293	933	0	502	
Turn Type	Perm		pm+pt		pm+pt		Perm		
Protected Phases		2	1	6	3	8		4	9
Permitted Phases	2		6		8		4		
Detector Phase	2	2	1	6	3	8	4	4	
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	13.0	11.5	13.0	11.5	13.0	13.0	13.0	24.0
Total Split (s)	29.0	29.0	11.5	40.0	11.5	39.0	28.0	28.0	24.0
Total Split (%)	27.9%	27.9%	11.1%	38.5%	11.1%	37.5%	26.9%	26.9%	23%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	6.0	4.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lead		Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	Min	Min	Min	None
v/c Ratio	0.28	0.43	0.49	0.30	1.08	1.50		1.07	
Control Delay	30.0	27.1	21.1	16.4	107.6	260.9		100.4	
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0		0.0	
Total Delay	30.0	27.7	21.1	16.4	107.6	260.9		100.4	
Queue Length 50th (ft)	39	136	65	93	-167	-864		-195	
Queue Length 95th (ft)	103	237	#192	196	#348	#1109		#301	
Internal Link Dist (ft)		90		334		285		435	
Turn Bay Length (ft)	75		150						
Base Capacity (vph)	313	1307	446	1875	272	623		471	
Starvation Cap Reductn	0	364	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	
Reduced v/c Ratio	0.28	0.60	0.49	0.30	1.08	1.50		1.07	

Intersection Summary

Cycle Length: 104

Actuated Cycle Length: 104

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

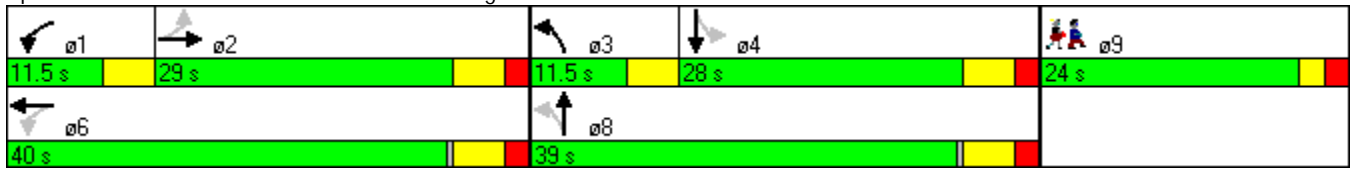
Queue shown is maximum after two cycles.

Queues

8: Mt. Auburn Street & Arlington Street

1/27/2011

Splits and Phases: 8: Mt. Auburn Street & Arlington Street



HCM Unsignalized Intersection Capacity Analysis

9: Arlington Street & Grove Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (veh/h)	287	382	74	781	323	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.80	0.80	0.78	0.78
Hourly flow rate (vph)	334	444	92	976	414	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	365					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			334		1495	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			213		1494	213
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		0	98
cM capacity (veh/h)			1241		114	754

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	334	444	92	976	414	12
Volume Left	0	0	92	0	414	0
Volume Right	0	444	0	0	0	12
cSH	1700	1700	1241	1700	114	754
Volume to Capacity	0.20	0.26	0.07	0.57	3.64	0.02
Queue Length 95th (ft)	0	0	6	0	Err	1
Control Delay (s)	0.0	0.0	8.1	0.0	Err	9.8
Lane LOS			A			A
Approach Delay (s)	0.0		0.7	9728.2		
Approach LOS				F		

Intersection Summary						
Average Delay			1822.6			
Intersection Capacity Utilization			62.7%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Grove Street & Tufts Medical Center

1/27/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Volume (veh/h)	27	269	510	7	115	345
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.95	0.95	0.66	0.66
Hourly flow rate (vph)	31	309	537	7	174	523
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		489				
pX, platoon unblocked					0.92	
vC, conflicting volume	544				912	541
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	544				861	541
tC, single (s)	4.2				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.3
p0 queue free %	97				38	3
cM capacity (veh/h)	990				283	541

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	340	544	174	523
Volume Left	31	0	174	0
Volume Right	0	7	0	523
cSH	990	1700	283	541
Volume to Capacity	0.03	0.32	0.62	0.97
Queue Length 95th (ft)	2	0	94	322
Control Delay (s)	1.1	0.0	36.2	58.2
Lane LOS	A		E	F
Approach Delay (s)	1.1	0.0	52.7	
Approach LOS			F	

Intersection Summary			
Average Delay		23.5	
Intersection Capacity Utilization		52.9%	ICU Level of Service A
Analysis Period (min)		15	

5.0 APPENDIX

5.6 Level-of-Service Analyses - Future Conditions with Existing Geometry

HCM Signalized Intersection Capacity Analysis

33: Mt. Auburn Street & Summer Street

1/27/2011

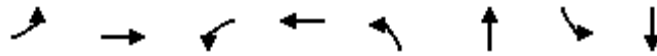


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	56	730	11	30	638	253	6	7	28	242	1	172
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	10	10	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.5			5.5			5.5			5.5	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frt		1.00			0.96			0.91			0.94	
Flt Protected		1.00			1.00			0.99			0.97	
Satd. Flow (prot)		3458			3566			1801			1799	
Flt Permitted		0.71			0.89			0.93			0.79	
Satd. Flow (perm)		2457			3184			1687			1454	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.67	0.67	0.67	0.90	0.90	0.90
Adj. Flow (vph)	64	830	12	33	709	281	9	10	42	269	1	191
RTOR Reduction (vph)	0	1	0	0	25	0	0	28	0	0	26	0
Lane Group Flow (vph)	0	905	0	0	998	0	0	33	0	0	435	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5			5			10			
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		53.6			53.6			37.6			37.6	
Effective Green, g (s)		53.6			53.6			37.6			37.6	
Actuated g/C Ratio		0.49			0.49			0.34			0.34	
Clearance Time (s)		5.5			5.5			5.5			5.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1197			1551			577			497	
v/s Ratio Prot												
v/s Ratio Perm		c0.37			0.31			0.02			c0.30	
v/c Ratio		0.76			0.64			0.06			0.88	
Uniform Delay, d1		22.9			21.1			24.3			34.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.5			2.1			0.0			15.8	
Delay (s)		27.4			23.1			24.3			49.8	
Level of Service		C			C			C			D	
Approach Delay (s)		27.4			23.1			24.3			49.8	
Approach LOS		C			C			C			D	
Intersection Summary												
HCM Average Control Delay			29.7				HCM Level of Service				C	
HCM Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)		18.8			
Intersection Capacity Utilization			89.5%				ICU Level of Service				E	
Analysis Period (min)			15									
c	Critical Lane Group											

Queues

33: Mt. Auburn Street & Summer Street

1/27/2011

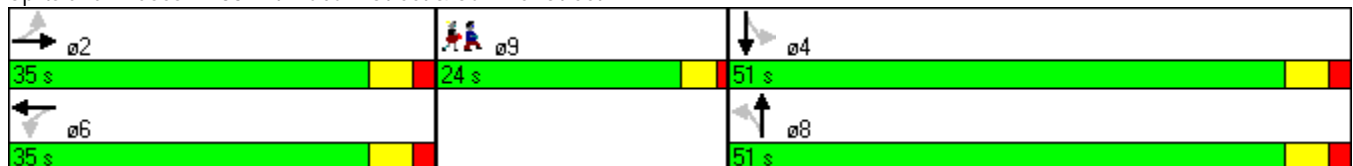


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations		↕↕		↕↕		↕		↕	
Volume (vph)	56	730	30	638	6	7	242	1	
Lane Group Flow (vph)	0	906	0	1023	0	61	0	461	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		2		6		8		4	9
Permitted Phases	2		6		8		4		
Detector Phase	2	2	6	6	8	8	4	4	
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0	5.0
Minimum Split (s)	17.5	17.5	17.5	17.5	11.5	11.5	11.5	11.5	23.0
Total Split (s)	35.0	35.0	35.0	35.0	51.0	51.0	51.0	51.0	24.0
Total Split (%)	31.8%	31.8%	31.8%	31.8%	46.4%	46.4%	46.4%	46.4%	22%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None	Min	Min	None
v/c Ratio		0.71		0.61		0.10		0.88	
Control Delay		27.6		23.2		9.6		49.4	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		27.6		23.2		9.6		49.4	
Queue Length 50th (ft)		229		228		9		278	
Queue Length 95th (ft)		#551		#557		20		382	
Internal Link Dist (ft)		698		491		38		726	
Turn Bay Length (ft)									
Base Capacity (vph)		1270		1668		722		625	
Starvation Cap Reductn		0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.71		0.61		0.08		0.74	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 33: Mt. Auburn Street & Summer Street



HCM Signalized Intersection Capacity Analysis

36: Mt. Auburn Street & Palfrey Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕				
Volume (vph)	110	741	149	55	854	85	67	169	57	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	16	16	16	12	12	12
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		0.95			0.95			1.00				
Frbp, ped/bikes		1.00			1.00			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		0.98			0.99			0.97				
Flt Protected		0.99			1.00			0.99				
Satd. Flow (prot)		3608			3666			2133				
Flt Permitted		0.66			0.81			0.99				
Satd. Flow (perm)		2376			2984			2133				
Peak-hour factor, PHF	0.92	0.89	0.89	0.94	0.94	0.92	0.67	0.92	0.67	0.92	0.92	0.92
Adj. Flow (vph)	120	833	167	59	909	92	100	184	85	0	0	0
RTOR Reduction (vph)	0	12	0	0	6	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1108	0	0	1054	0	0	369	0	0	0	0
Confl. Peds. (#/hr)			10	10			10		10			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Split					
Protected Phases		1			1		3	3				
Permitted Phases	1			1								
Actuated Green, G (s)		54.2			54.2			20.8				
Effective Green, g (s)		54.2			54.2			20.8				
Actuated g/C Ratio		0.60			0.60			0.23				
Clearance Time (s)		4.0			4.0			4.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1431			1797			493				
v/s Ratio Prot								c0.17				
v/s Ratio Perm		c0.47			0.35							
v/c Ratio		0.77			0.59			0.75				
Uniform Delay, d1		13.3			11.0			32.2				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		4.1			1.4			6.1				
Delay (s)		17.5			12.4			38.3				
Level of Service		B			B			D				
Approach Delay (s)		17.5			12.4			38.3			0.0	
Approach LOS		B			B			D			A	
Intersection Summary												
HCM Average Control Delay			18.4		HCM Level of Service			B				
HCM Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)			15.0				
Intersection Capacity Utilization			79.1%		ICU Level of Service			D				
Analysis Period (min)			15									

c Critical Lane Group

Queues

36: Mt. Auburn Street & Palfrey Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBT	ø2
Lane Configurations		↔↔		↔↔	↔	
Volume (vph)	110	741	55	854	169	
Lane Group Flow (vph)	0	1120	0	1060	369	
Turn Type	Perm		Perm			
Protected Phases		1		1	3	2
Permitted Phases	1		1			
Detector Phase	1	1	1	1	3	
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	7.0
Minimum Split (s)	17.0	17.0	17.0	17.0	20.0	23.0
Total Split (s)	47.0	47.0	47.0	47.0	20.0	23.0
Total Split (%)	52.2%	52.2%	52.2%	52.2%	22.2%	26%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes
Recall Mode	C-Min	C-Min	C-Min	C-Min	Min	None
v/c Ratio		0.74		0.56	0.75	
Control Delay		17.5		12.4	44.1	
Queue Delay		0.0		0.5	0.0	
Total Delay		17.5		12.8	44.1	
Queue Length 50th (ft)		187		147	189	
Queue Length 95th (ft)		#457		322	#385	
Internal Link Dist (ft)		491		175	368	
Turn Bay Length (ft)						
Base Capacity (vph)		1506		1884	492	
Starvation Cap Reductn		0		366	0	
Spillback Cap Reductn		0		0	0	
Storage Cap Reductn		0		0	0	
Reduced v/c Ratio		0.74		0.70	0.75	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Yellow

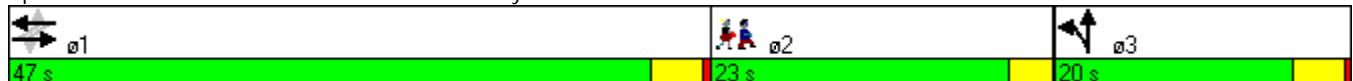
Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 36: Mt. Auburn Street & Palfrey Street



HCM Unsignalized Intersection Capacity Analysis
 15: Mt. Auburn Street & Phillips Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	791	7	45	993	1	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.94	0.94	0.67	0.67
Hourly flow rate (vph)	889	8	48	1056	1	12
Pedestrians	25			18		
Lane Width (ft)	11.0			13.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	2			2		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	255			208		
pX, platoon unblocked				0.85	0.92	0.85
vC, conflicting volume				897	1542	466
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				520	698	13
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				95	100	99
cM capacity (veh/h)				884	324	894

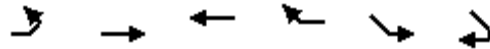
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	593	304	400	704	13
Volume Left	0	0	48	0	1
Volume Right	0	8	0	0	12
cSH	1700	1700	884	1700	748
Volume to Capacity	0.35	0.18	0.05	0.41	0.02
Queue Length 95th (ft)	0	0	4	0	1
Control Delay (s)	0.0	0.0	1.7	0.0	9.9
Lane LOS	A			A	
Approach Delay (s)	0.0		0.6	9.9	
Approach LOS	A				

Intersection Summary					
Average Delay	0.4				
Intersection Capacity Utilization	66.1%		ICU Level of Service		C
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis

17: Mt. Auburn Street & Marshall Street

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑			
Volume (veh/h)	29	770	1038	37	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.94	0.94	0.67	0.67
Hourly flow rate (vph)	33	865	1104	39	0	0
Pedestrians		25	18		12	
Lane Width (ft)		12.0	12.0		0.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		2	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		347	116			
pX, platoon unblocked	0.85				0.92	0.85
vC, conflicting volume	1156				1652	609
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	834				848	192
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	100
cM capacity (veh/h)	661				263	687

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	321	577	736	407
Volume Left	33	0	0	0
Volume Right	0	0	0	39
cSH	661	1700	1700	1700
Volume to Capacity	0.05	0.34	0.43	0.24
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	1.7	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.6		0.0	
Approach LOS				

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		56.0%	ICU Level of Service
Analysis Period (min)		15	B

HCM Signalized Intersection Capacity Analysis
 19: Mt. Auburn Street & Parker Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (vph)	763	7	9	1063	12	18
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	2.0			5.0	5.0	
Lane Util. Factor	0.95			0.95	1.00	
Frbp, ped/bikes	1.00			1.00	0.88	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.92	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	3578			3586	1557	
Flt Permitted	1.00			0.95	0.98	
Satd. Flow (perm)	3578			3427	1557	
Peak-hour factor, PHF	0.81	0.81	0.92	0.92	0.70	0.70
Adj. Flow (vph)	942	9	10	1155	17	26
RTOR Reduction (vph)	1	0	0	0	26	0
Lane Group Flow (vph)	950	0	0	1165	17	0
Confl. Peds. (#/hr)		19	19		14	10
Heavy Vehicles (%)	6%	6%	4%	4%	2%	2%
Bus Blockages (#/hr)	0	9	0	9	0	0
Parking (#/hr)		5				1
Turn Type		custom				
Protected Phases	9		3	13	4	
Permitted Phases	1		1			
Actuated Green, G (s)	71.2			104.0	2.4	
Effective Green, g (s)	71.2			104.0	2.4	
Actuated g/C Ratio	0.47			0.69	0.02	
Clearance Time (s)	2.0				5.0	
Vehicle Extension (s)	0.2				5.0	
Lane Grp Cap (vph)	1746			2432	25	
v/s Ratio Prot	c0.07			c0.17	c0.01	
v/s Ratio Perm	0.19			0.16		
v/c Ratio	0.54			0.48	0.70	
Uniform Delay, d1	27.9			10.6	73.4	
Progression Factor	1.00			0.09	1.00	
Incremental Delay, d2	1.2			0.1	72.2	
Delay (s)	29.1			1.1	145.7	
Level of Service	C			A	F	
Approach Delay (s)	29.1			1.1	145.7	
Approach LOS	C			A	F	

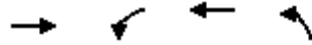
Intersection Summary

HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Queues

19: Mt. Auburn Street & Parker Street

1/27/2011



Lane Group	EBT	WBL	WBT	NBL	ø1	ø2
Lane Configurations	↑↑		↑↑	↘		
Volume (vph)	763	9	1063	12		
Lane Group Flow (vph)	951	0	1165	43		
Turn Type	custom					
Protected Phases	9	3	13	4	1	2
Permitted Phases	1	1				
Detector Phase	9	3	13	4		
Switch Phase						
Minimum Initial (s)	6.0	4.0		3.0	23.0	7.0
Minimum Split (s)	8.0	9.0		8.0	28.0	23.0
Total Split (s)	20.0	39.0	99.0	8.0	60.0	23.0
Total Split (%)	13.3%	26.0%	66.0%	5.3%	40%	15%
Yellow Time (s)	2.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		
Total Lost Time (s)	2.0	5.0	5.0	5.0		
Lead/Lag		Lead		Lag	Lead	Lag
Lead-Lag Optimize?		Yes		Yes	Yes	Yes
Recall Mode	Max	Min		None	C-Max	None
v/c Ratio	0.50		0.46	0.75		
Control Delay	23.9		1.0	97.4		
Queue Delay	3.1		0.6	651.1		
Total Delay	27.0		1.7	748.5		
Queue Length 50th (ft)	312		7	17		
Queue Length 95th (ft)	321		22	#52		
Internal Link Dist (ft)	36		48	431		
Turn Bay Length (ft)						
Base Capacity (vph)	1900		2510	57		
Starvation Cap Reductn	816		878	0		
Spillback Cap Reductn	181		0	45		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.88		0.71	3.58		

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Yellow, Master Intersection
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 19: Mt. Auburn Street & Parker Street



HCM Signalized Intersection Capacity Analysis

14: Mt. Auburn Street & Common Street

1/27/2011



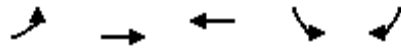
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↔		↗	↗
Volume (vph)	163	618	719	149	484	353
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	10	10
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frbp, ped/bikes		1.00	0.99		1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	0.97		1.00	0.85
Flt Protected		0.99	1.00		0.95	1.00
Satd. Flow (prot)		3265	3535		1739	1524
Flt Permitted		0.50	1.00		0.95	1.00
Satd. Flow (perm)		1652	3535		1739	1524
Peak-hour factor, PHF	0.81	0.81	0.92	0.92	0.97	0.97
Adj. Flow (vph)	201	763	782	162	499	364
RTOR Reduction (vph)	0	0	12	0	0	0
Lane Group Flow (vph)	0	964	932	0	499	364
Confl. Peds. (#/hr)	14			14	14	10
Heavy Vehicles (%)	6%	6%	4%	4%	2%	2%
Bus Blockages (#/hr)	0	9	0	9	0	0
Parking (#/hr)		5				
Turn Type	custom				Perm	
Protected Phases	9	1 9			3	
Permitted Phases	1		1			3
Actuated Green, G (s)		71.2	51.6		52.4	52.4
Effective Green, g (s)		71.2	51.6		52.4	52.4
Actuated g/C Ratio		0.47	0.34		0.35	0.35
Clearance Time (s)			5.0		5.0	5.0
Vehicle Extension (s)			8.0		3.0	3.0
Lane Grp Cap (vph)		995	1216		607	532
v/s Ratio Prot		c0.13			c0.29	
v/s Ratio Perm		0.33	c0.26			0.24
v/c Ratio		0.97	0.77		0.82	0.68
Uniform Delay, d1		38.3	43.8		44.5	41.7
Progression Factor		0.37	1.00		1.00	1.00
Incremental Delay, d2		20.2	4.7		8.8	3.6
Delay (s)		34.4	48.5		53.3	45.4
Level of Service		C	D		D	D
Approach Delay (s)		34.4	48.5		50.0	
Approach LOS		C	D		D	
Intersection Summary						
HCM Average Control Delay			44.0		HCM Level of Service	D
HCM Volume to Capacity ratio			0.84			
Actuated Cycle Length (s)			150.0		Sum of lost time (s)	29.4
Intersection Capacity Utilization			82.3%		ICU Level of Service	E
Analysis Period (min)			15			

c Critical Lane Group

Queues

14: Mt. Auburn Street & Common Street

1/27/2011



Lane Group	EBL	EBT	WBT	SBL	SBR	ø2	ø4
Lane Configurations		↕↕	↕↔	↔	↔		
Volume (vph)	163	618	719	484	353		
Lane Group Flow (vph)	0	964	944	499	364		
Turn Type	custom				Perm		
Protected Phases	9	19		3		2	4
Permitted Phases	1		1		3		
Detector Phase	9	19	1	3	3		
Switch Phase							
Minimum Initial (s)	6.0		23.0	4.0	4.0	7.0	3.0
Minimum Split (s)	8.0		28.0	9.0	9.0	23.0	8.0
Total Split (s)	20.0	80.0	60.0	39.0	39.0	23.0	8.0
Total Split (%)	13.3%	53.3%	40.0%	26.0%	26.0%	15%	5%
Yellow Time (s)	2.0		3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0		2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	2.0	5.0	5.0	5.0	5.0		
Lead/Lag			Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Recall Mode	Max		C-Max	Min	Min	None	None
v/c Ratio		1.00	0.72	0.82	0.69		
Control Delay		41.6	43.9	56.5	50.2		
Queue Delay		4.0	0.0	0.0	0.0		
Total Delay		45.6	43.9	56.5	50.2		
Queue Length 50th (ft)		~223	410	423	289		
Queue Length 95th (ft)		#61	492	#840	#597		
Internal Link Dist (ft)		48	1077	686			
Turn Bay Length (ft)							
Base Capacity (vph)		967	1308	608	530		
Starvation Cap Reductn		15	0	0	0		
Spillback Cap Reductn		0	0	0	0		
Storage Cap Reductn		0	0	0	0		
Reduced v/c Ratio		1.01	0.72	0.82	0.69		

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Yellow, Master Intersection
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 14: Mt. Auburn Street & Common Street



HCM Signalized Intersection Capacity Analysis

21: Mt. Auburn Street & Bates Road East

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗		↕↕			↕			↕	
Volume (vph)	1	842	341	19	886	8	173	1	17	14	10	6
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0	6.0		6.0			6.0			6.0	
Lane Util. Factor		0.95	1.00		0.95			1.00			1.00	
Frbp, ped/bikes		1.00	0.96		1.00			1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00			0.99			1.00	
Frt		1.00	0.85		1.00			0.99			0.97	
Flt Protected		1.00	1.00		1.00			0.96			0.98	
Satd. Flow (prot)		3725	1384		3715			1875			1894	
Flt Permitted		0.95	1.00		0.92			0.72			0.82	
Satd. Flow (perm)		3555	1384		3436			1412			1592	
Peak-hour factor, PHF	0.90	0.90	0.90	0.98	0.98	0.98	0.74	0.74	0.74	0.85	0.85	0.85
Adj. Flow (vph)	1	936	379	19	904	8	234	1	23	16	12	7
RTOR Reduction (vph)	0	0	62	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	937	317	0	930	0	0	258	0	0	35	0
Confl. Peds. (#/hr)	17		20	20		17	7		1	1		7
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			0									0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		3			3			1				1
Permitted Phases	3		3	3			1			1		
Actuated Green, G (s)		24.7	24.7		24.7			14.9			14.9	
Effective Green, g (s)		24.7	24.7		24.7			14.9			14.9	
Actuated g/C Ratio		0.43	0.43		0.43			0.26			0.26	
Clearance Time (s)		6.0	6.0		6.0			6.0			6.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		1527	595		1476			366			413	
v/s Ratio Prot												
v/s Ratio Perm		0.26	0.23		c0.27			c0.18			0.02	
v/c Ratio		0.61	0.53		0.63			0.70			0.08	
Uniform Delay, d1		12.7	12.1		12.8			19.3			16.1	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		1.9	3.4		2.1			6.1			0.1	
Delay (s)		14.6	15.5		14.9			25.4			16.2	
Level of Service		B	B		B			C			B	
Approach Delay (s)		14.8			14.9			25.4			16.2	
Approach LOS		B			B			C			B	

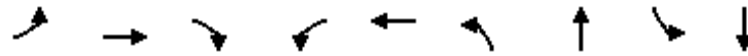
Intersection Summary

HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	57.5	Sum of lost time (s)	17.9
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

21: Mt. Auburn Street & Bates Road East

1/27/2011



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations		↕↕	↗		↕↕		↕↕		↕↕	
Volume (vph)	1	842	341	19	886	173	1	14	10	
Lane Group Flow (vph)	0	937	379	0	931	0	258	0	35	
Turn Type	Perm		Perm	Perm		Perm		Perm		
Protected Phases		3			3		1		1	2
Permitted Phases	3		3	3		1		1		
Detector Phase	3	3	3	3	3	1	1	1	1	
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	23.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	22.0	22.0	22.0	22.0	23.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	29.3%	29.3%	29.3%	29.3%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag						Lead	Lead	Lead	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None	None
v/c Ratio		0.59	0.56		0.61		0.68		0.08	
Control Delay		15.8	14.6		16.3		31.8		18.6	
Queue Delay		0.0	0.0		0.0		0.0		0.0	
Total Delay		15.8	14.6		16.3		31.8		18.6	
Queue Length 50th (ft)		102	52		102		66		7	
Queue Length 95th (ft)		#289	#243		#312		#173		34	
Internal Link Dist (ft)		1077			987		295		217	
Turn Bay Length (ft)			25							
Base Capacity (vph)		1585	673		1534		419		474	
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		0.59	0.56		0.61		0.62		0.07	

Intersection Summary

Cycle Length: 75

Actuated Cycle Length: 55.3

Natural Cycle: 75

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Mt. Auburn Street & Bates Road East



HCM Unsignalized Intersection Capacity Analysis

24: Mt. Auburn Street & Boylston Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	793	103	22	716	95	72
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.43	0.43
Hourly flow rate (vph)	862	112	23	762	221	167
Pedestrians	1			16		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	1067					
pX, platoon unblocked			0.85		0.85	0.85
vC, conflicting volume			990		1363	503
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			633		1072	60
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		0	80
cM capacity (veh/h)			792		178	838

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	575	399	277	508	388
Volume Left	0	0	23	0	221
Volume Right	0	112	0	0	167
cSH	1700	1700	792	1700	269
Volume to Capacity	0.34	0.23	0.03	0.30	1.44
Queue Length 95th (ft)	0	0	2	0	541
Control Delay (s)	0.0	0.0	1.1	0.0	254.8
Lane LOS			A	F	
Approach Delay (s)	0.0		0.4	254.8	
Approach LOS				F	

Intersection Summary					
Average Delay			46.2		
Intersection Capacity Utilization			49.8%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis

31: Mt. Auburn Street & Winthrop Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	826	39	20	698	18	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.93	0.93	0.59	0.59
Hourly flow rate (vph)	879	41	22	751	31	22
Pedestrians				23	14	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				2	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	738					
pX, platoon unblocked					0.88	
vC, conflicting volume	934			1332	497	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	934			1108	497	
tC, single (s)	4.2			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	97			83	96	
cM capacity (veh/h)	708			175	508	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	586	334	272	500	53
Volume Left	0	0	22	0	31
Volume Right	0	41	0	0	22
cSH	1700	1700	708	1700	241
Volume to Capacity	0.34	0.20	0.03	0.29	0.22
Queue Length 95th (ft)	0	0	2	0	20
Control Delay (s)	0.0	0.0	1.1	0.0	24.0
Lane LOS	A			C	
Approach Delay (s)	0.0		0.4		24.0
Approach LOS	C				

Intersection Summary					
Average Delay	0.9				
Intersection Capacity Utilization	47.4%		ICU Level of Service	A	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis

26: Mt. Auburn Street & Chauncey Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	795	44	55	698	20	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.97	0.97	0.59	0.59
Hourly flow rate (vph)	883	49	57	720	34	46
Pedestrians	6				31	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	1				3	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	439					
pX, platoon unblocked					0.86	
vC, conflicting volume	963			1418 497		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	963			1157 497		
tC, single (s)	4.2			6.9 7.0		
tC, 2 stage (s)						
tF (s)	2.2			3.5 3.3		
p0 queue free %	92			76 91		
cM capacity (veh/h)	680			141 497		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	589	343	297	480	80
Volume Left	0	0	57	0	34
Volume Right	0	49	0	0	46
cSH	1700	1700	680	1700	240
Volume to Capacity	0.35	0.20	0.08	0.28	0.33
Queue Length 95th (ft)	0	0	7	0	35
Control Delay (s)	0.0	0.0	2.9	0.0	27.3
Lane LOS	A			D	
Approach Delay (s)	0.0		1.1		27.3
Approach LOS	D				

Intersection Summary					
Average Delay	1.7				
Intersection Capacity Utilization	55.5%		ICU Level of Service		B
Analysis Period (min)	15				

HCM Signalized Intersection Capacity Analysis
 28: Mt. Auburn Street & School Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	76	726	20	45	642	34	19	138	44	88	417	92
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0			6.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.97			0.98	
Flt Protected		1.00			1.00			1.00			0.99	
Satd. Flow (prot)		3582			3572			1812			1893	
Flt Permitted		0.67			0.72			0.92			0.89	
Satd. Flow (perm)		2406			2591			1670			1690	
Peak-hour factor, PHF	0.86	0.86	0.86	0.92	0.92	0.92	0.78	0.78	0.78	0.93	0.93	0.93
Adj. Flow (vph)	88	844	23	49	698	37	24	177	56	95	448	99
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	954	0	0	782	0	0	257	0	0	642	0
Confl. Peds. (#/hr)	26		29	29		26	33		19	19		33
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	6%	6%	6%	2%	2%	2%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		59.3			59.3			57.3			57.3	
Effective Green, g (s)		59.3			59.3			57.3			57.3	
Actuated g/C Ratio		0.44			0.44			0.43			0.43	
Clearance Time (s)		6.0			6.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1064			1146			714			722	
v/s Ratio Prot												
v/s Ratio Perm		c0.40			0.30			0.15			c0.38	
v/c Ratio		0.90			0.68			0.36			0.89	
Uniform Delay, d1		34.6			29.9			26.0			35.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		11.7			3.3			1.4			15.3	
Delay (s)		46.3			33.2			27.4			50.8	
Level of Service		D			C			C			D	
Approach Delay (s)		46.3			33.2			27.4			50.8	
Approach LOS		D			C			C			D	

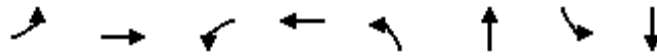
Intersection Summary

HCM Average Control Delay	41.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	134.1	Sum of lost time (s)	17.5
Intersection Capacity Utilization	102.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Queues

28: Mt. Auburn Street & School Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations		⇄		⇄		⇄		⇄	
Volume (vph)	76	726	45	642	19	138	88	417	
Lane Group Flow (vph)	0	955	0	784	0	257	0	642	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		1		1		3		3	2
Permitted Phases	1		1		3		3		
Detector Phase	1	1	1	1	3	3	3	3	
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	7.0
Minimum Split (s)	40.0	40.0	40.0	40.0	30.0	30.0	30.0	30.0	23.0
Total Split (s)	65.0	65.0	65.0	65.0	62.0	62.0	62.0	62.0	23.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	41.3%	41.3%	41.3%	41.3%	15%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lead	Lead	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	None
v/c Ratio		0.88		0.67		0.35		0.87	
Control Delay		44.2		33.0		27.9		48.8	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		44.2		33.0		27.9		48.8	
Queue Length 50th (ft)		358		253		135		461	
Queue Length 95th (ft)		#600		433		222		#893	
Internal Link Dist (ft)		359		1191		1065		1130	
Turn Bay Length (ft)									
Base Capacity (vph)		1085		1169		727		735	
Starvation Cap Reductn		0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.88		0.67		0.35		0.87	

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 131.6

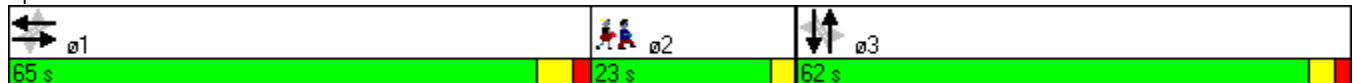
Natural Cycle: 145

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 28: Mt. Auburn Street & School Street



HCM Unsignalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Rd

1/27/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	865	22	40	578	3	28	2	42	6	6	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.74	0.74	0.74	0.75	0.75	0.75
Hourly flow rate (vph)	11	930	24	42	608	3	38	3	57	8	8	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (ft)	1271					856						
pX, platoon unblocked				0.84			0.84			0.84		
vC, conflicting volume	612			954			1372			1659		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	612			551			1051			1395		
tC, single (s)	4.1			4.1			7.6			6.8		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.2		
p0 queue free %	99			95			71			97		
cM capacity (veh/h)	977			860			131			97		
Direction, Lane #												
	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	476	489	346	307	97	32						
Volume Left	11	0	42	0	38	8						
Volume Right	0	24	0	3	57	16						
cSH	977	1700	860	1700	256	214						
Volume to Capacity	0.01	0.29	0.05	0.18	0.38	0.15						
Queue Length 95th (ft)	1	0	4	0	42	13						
Control Delay (s)	0.3	0.0	1.6	0.0	27.4	24.8						
Lane LOS	A		A		D		C					
Approach Delay (s)	0.2		0.9		27.4		24.8					
Approach LOS					D		C					
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			56.5%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: Mt. Auburn Street & Melendy Avenue

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	900	13	14	611	10	43
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	957	14	15	643	11	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				502		
pX, platoon unblocked					0.96	
vC, conflicting volume			971		1315	486
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			971		1250	486
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		93	91
cM capacity (veh/h)			705		155	527

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	638	333	229	429	58
Volume Left	0	0	15	0	11
Volume Right	0	14	0	0	47
cSH	1700	1700	705	1700	363
Volume to Capacity	0.38	0.20	0.02	0.25	0.16
Queue Length 95th (ft)	0	0	2	0	14
Control Delay (s)	0.0	0.0	0.9	0.0	16.8
Lane LOS			A		C
Approach Delay (s)	0.0		0.3		16.8
Approach LOS					C

Intersection Summary					
Average Delay			0.7		
Intersection Capacity Utilization			35.6%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis

3: Mt. Auburn Street & Lloyd Road

1/31/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	
Volume (veh/h)	8	935	619	1	2	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.50	0.50
Hourly flow rate (vph)	9	995	652	1	4	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			441			
pX, platoon unblocked	0.95				0.95	0.95
vC, conflicting volume	653				1166	326
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	538				1077	196
tC, single (s)	5.1				7.8	6.9
tC, 2 stage (s)						
tF (s)	2.7				4.0	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	721				141	775

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	340	663	434	218	16
Volume Left	9	0	0	0	4
Volume Right	0	0	0	1	12
cSH	721	1700	1700	1700	365
Volume to Capacity	0.01	0.39	0.26	0.13	0.04
Queue Length 95th (ft)	1	0	0	0	3
Control Delay (s)	0.4	0.0	0.0	0.0	15.3
Lane LOS	A				C
Approach Delay (s)	0.1		0.0		15.3
Approach LOS					C

Intersection Summary					
Average Delay			0.2		
Intersection Capacity Utilization			39.9%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis

4: Mt. Auburn Street & Elton Avenue

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Volume (veh/h)	838	99	54	620	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.96	0.96	0.25	0.25
Hourly flow rate (vph)	911	108	56	646	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				391		
pX, platoon unblocked				0.94		
vC, conflicting volume	1018			1400	509	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1018			1290	509	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	92			100	100	
cM capacity (veh/h)	689			133	509	

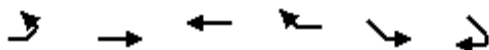
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	607	411	272	431
Volume Left	0	0	56	0
Volume Right	0	108	0	0
cSH	1700	1700	689	1700
Volume to Capacity	0.36	0.24	0.08	0.25
Queue Length 95th (ft)	0	0	7	0
Control Delay (s)	0.0	0.0	3.0	0.0
Lane LOS	A			
Approach Delay (s)	0.0		1.2	
Approach LOS				

Intersection Summary				
Average Delay			0.5	
Intersection Capacity Utilization	49.4%		ICU Level of Service	A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis

5: Mt. Auburn Street & Irma Avenue

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↕↕	↕↔		↔↔	
Volume (veh/h)	8	830	619	8	24	55
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.68	0.68
Hourly flow rate (vph)	9	892	703	9	35	81
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			228			
pX, platoon unblocked	0.92				0.92	0.92
vC, conflicting volume	712				1171	356
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	500				1002	111
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				84	90
cM capacity (veh/h)	983				220	843

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SE 1
Volume Total	306	595	469	244	116
Volume Left	9	0	0	0	35
Volume Right	0	0	0	9	81
cSH	983	1700	1700	1700	453
Volume to Capacity	0.01	0.35	0.28	0.14	0.26
Queue Length 95th (ft)	1	0	0	0	25
Control Delay (s)	0.3	0.0	0.0	0.0	15.7
Lane LOS	A				C
Approach Delay (s)	0.1		0.0		15.7
Approach LOS					C

Intersection Summary					
Average Delay			1.1		
Intersection Capacity Utilization			38.3%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis

6: Mt. Auburn Street & Kimball Road

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Volume (vph)	11	769	74	46	581	19	34	29	99	41	56	12
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0			6.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frt		0.99			1.00			0.92			0.98	
Flt Protected		1.00			1.00			0.99			0.98	
Satd. Flow (prot)		2992			3242			1559			1722	
Flt Permitted		0.94			0.79			0.88			0.65	
Satd. Flow (perm)		2820			2566			1392			1147	
Peak-hour factor, PHF	0.85	0.85	0.85	0.91	0.91	0.91	0.68	0.68	0.68	0.77	0.77	0.77
Adj. Flow (vph)	13	905	87	51	638	21	50	43	146	53	73	16
RTOR Reduction (vph)	0	3	0	0	1	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	1002		0	0	709	0	0	239	0	0	138
Heavy Vehicles (%)	10%	6%	2%	2%	5%	0%	7%	12%	2%	0%	2%	0%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)		5							5			
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		85.5			85.5			26.0			26.0	
Effective Green, g (s)		85.5			85.5			26.0			26.0	
Actuated g/C Ratio		0.66			0.66			0.20			0.20	
Clearance Time (s)		6.0			6.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1855			1688			278			229	
v/s Ratio Prot												
v/s Ratio Perm		c0.36			0.28			c0.17			0.12	
v/c Ratio		0.54			0.42			0.86			0.60	
Uniform Delay, d1		11.8			10.5			50.2			47.3	
Progression Factor		1.00			0.59			1.00			1.00	
Incremental Delay, d2		1.1			0.7			22.3			4.4	
Delay (s)		12.9			6.9			72.5			51.7	
Level of Service		B			A			E			D	
Approach Delay (s)		12.9			6.9			72.5			51.7	
Approach LOS		B			A			E			D	

Intersection Summary

HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

6: Mt. Auburn Street & Kimball Road

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations		↕↕		↕↕		↕		↕	
Volume (vph)	11	769	46	581	34	29	41	56	
Lane Group Flow (vph)	0	1005	0	710	0	239	0	142	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		1		1		3		3	2
Permitted Phases	1		1		3		3		
Detector Phase	1	1	1	1	3	3	3	3	
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	7.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	27.5
Total Split (s)	66.5	66.5	66.5	66.5	36.0	36.0	36.0	36.0	27.5
Total Split (%)	51.2%	51.2%	51.2%	51.2%	27.7%	27.7%	27.7%	27.7%	21%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None
v/c Ratio		0.53		0.41		0.86		0.61	
Control Delay		14.4		7.7		77.2		56.2	
Queue Delay		0.0		0.1		0.0		0.0	
Total Delay		14.4		7.8		77.2		56.2	
Queue Length 50th (ft)		181		57		194		105	
Queue Length 95th (ft)		393		m85		201		142	
Internal Link Dist (ft)		148		118		676		475	
Turn Bay Length (ft)									
Base Capacity (vph)		1910		1736		332		278	
Starvation Cap Reductn		0		224		0		0	
Spillback Cap Reductn		16		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.53		0.47		0.72		0.51	

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 8 (6%), Referenced to phase 1:EBWB, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

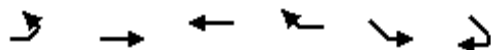
Splits and Phases: 6: Mt. Auburn Street & Kimball Road



HCM Unsignalized Intersection Capacity Analysis

7: Mt. Auburn Street & Templeton Parkway

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑		↑↑	
Volume (veh/h)	2	907	626	1	3	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.95	0.95	0.79	0.79
Hourly flow rate (vph)	2	1008	659	1	4	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		198	170			
pX, platoon unblocked	0.88				0.91	0.88
vC, conflicting volume	660				1168	330
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	347				391	0
tC, single (s)	4.1				7.5	7.3
tC, 2 stage (s)						
tF (s)	2.2				3.8	3.5
p0 queue free %	100				99	97
cM capacity (veh/h)	1079				462	910
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SE 1	
Volume Total	338	672	439	221	29	
Volume Left	2	0	0	0	4	
Volume Right	0	0	0	1	25	
cSH	1079	1700	1700	1700	808	
Volume to Capacity	0.00	0.40	0.26	0.13	0.04	
Queue Length 95th (ft)	0	0	0	0	3	
Control Delay (s)	0.1	0.0	0.0	0.0	9.6	
Lane LOS	A				A	
Approach Delay (s)	0.0		0.0		9.6	
Approach LOS					A	
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			35.1%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

8: Mt. Auburn Street & Arlington Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗			↗	↖
Volume (vph)	73	457	380	270	513	9	72	247	87	10	997	42
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		4.0	6.0		4.0	6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frt	1.00	0.93		1.00	1.00		1.00	0.96			0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1776	3349		1845	3613		1712	1844			3698	
Flt Permitted	0.45	1.00		0.13	1.00		0.09	1.00			0.95	
Satd. Flow (perm)	835	3349		257	3613		156	1844			3514	
Peak-hour factor, PHF	0.96	0.96	0.96	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	76	476	396	284	540	9	78	268	95	11	1096	46
RTOR Reduction (vph)	0	117	0	0	1	0	0	10	0	0	0	0
Lane Group Flow (vph)	76	755	0	284	548	0	78	353	0	0	1153	0
Heavy Vehicles (%)	7%	8%	3%	3%	5%	0%	11%	5%	2%	0%	2%	5%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			pm+pt			pm+pt			Perm		
Protected Phases		2		1	6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	26.2	26.2		43.2	43.2		51.8	51.8			42.2	
Effective Green, g (s)	26.2	26.2		43.2	43.2		51.8	51.8			42.2	
Actuated g/C Ratio	0.20	0.20		0.33	0.33		0.40	0.40			0.32	
Clearance Time (s)	6.0	6.0		4.0	6.0		4.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	168	675		244	1201		129	735			1141	
v/s Ratio Prot		0.23		c0.12	0.15		c0.03	0.19				
v/s Ratio Perm	0.09			c0.27			0.21				c0.33	
v/c Ratio	0.45	1.12		1.16	0.46		0.60	0.48			1.01	
Uniform Delay, d1	45.6	51.9		36.8	34.2		31.8	29.1			43.9	
Progression Factor	0.86	0.92		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	7.3	69.9		109.2	1.3		7.8	0.5			29.3	
Delay (s)	46.7	117.5		145.9	35.4		39.6	29.6			73.2	
Level of Service	D	F		F	D		D	C			E	
Approach Delay (s)		111.8			73.1			31.4			73.2	
Approach LOS		F			E			C			E	

Intersection Summary

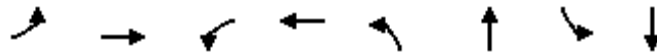
HCM Average Control Delay	78.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	37.0
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Queues

8: Mt. Auburn Street & Arlington Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations	↖	↗	↖	↗	↖	↗		↖↗	
Volume (vph)	73	457	270	513	72	247	10	997	
Lane Group Flow (vph)	76	872	284	549	78	363	0	1153	
Turn Type	Perm		pm+pt		pm+pt		Perm		
Protected Phases		2	1	6	3	8		4	9
Permitted Phases	2		6		8		4		
Detector Phase	2	2	1	6	3	8	4	4	
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	4.0	7.0	4.0	7.0	7.0	7.0
Minimum Split (s)	13.0	13.0	11.0	10.0	11.0	10.0	13.0	13.0	23.0
Total Split (s)	33.0	33.0	17.0	50.0	11.0	57.0	46.0	46.0	23.0
Total Split (%)	25.4%	25.4%	13.1%	38.5%	8.5%	43.8%	35.4%	35.4%	18%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	4.0	6.0	4.0	6.0	6.0	6.0	
Lead/Lag	Lag	Lag	Lead		Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	Min	Min	Min	Ped
v/c Ratio	0.44	1.08	1.14	0.45	0.53	0.50		1.01	
Control Delay	46.6	89.0	132.3	34.9	37.0	31.2		73.0	
Queue Delay	0.0	31.8	0.0	0.0	0.0	0.0		0.0	
Total Delay	46.6	120.8	132.3	34.9	37.0	31.2		73.0	
Queue Length 50th (ft)	58	~376	~221	188	40	218		~564	
Queue Length 95th (ft)	m90	#497	#404	243	75	312		#701	
Internal Link Dist (ft)		90		334		284		435	
Turn Bay Length (ft)	75		150						
Base Capacity (vph)	174	811	249	1224	148	733		1141	
Starvation Cap Reductn	0	54	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	
Reduced v/c Ratio	0.44	1.15	1.14	0.45	0.53	0.50		1.01	

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.








m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Mt. Auburn Street & Arlington Street

1/27/2011

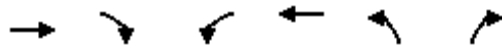
Splits and Phases: 8: Mt. Auburn Street & Arlington Street

 ø1	 ø2	 ø3	 ø4	 ø9
17 s	33 s	11 s	46 s	23 s
 ø6	 ø8			
50 s	57 s			

HCM Unsignalized Intersection Capacity Analysis

9: Arlington Street & Grove Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (veh/h)	1056	591	22	189	217	113
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.91	0.91	0.73	0.73
Hourly flow rate (vph)	1135	635	24	208	297	155
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	364					
pX, platoon unblocked			0.60		0.60	0.60
vC, conflicting volume			1135		1392	1135
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			897		1320	897
tC, single (s)			4.3		6.7	6.3
tC, 2 stage (s)						
tF (s)			2.3		3.8	3.4
p0 queue free %			94		0	22
cM capacity (veh/h)			424		85	198

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	1135	635	24	208	297	155
Volume Left	0	0	24	0	297	0
Volume Right	0	635	0	0	0	155
cSH	1700	1700	424	1700	85	198
Volume to Capacity	0.67	0.37	0.06	0.12	3.49	0.78
Queue Length 95th (ft)	0	0	5	0	Err	135
Control Delay (s)	0.0	0.0	14.0	0.0	Err	68.1
Lane LOS			B			F
Approach Delay (s)	0.0		1.5	6598.4		
Approach LOS				F		

Intersection Summary						
Average Delay			1215.2			
Intersection Capacity Utilization			70.9%	ICU Level of Service		C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Grove Street & Tufts Medical Center

1/27/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Volume (veh/h)	28	1141	179	69	7	32
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.84	0.84	0.86	0.86
Hourly flow rate (vph)	31	1282	213	82	8	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		488				
pX, platoon unblocked					0.62	
vC, conflicting volume	295				1599	254
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	295				1661	254
tC, single (s)	4.5				6.4	6.7
tC, 2 stage (s)						
tF (s)	2.6				3.5	3.7
p0 queue free %	97				87	95
cM capacity (veh/h)	1057				65	689

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	1313	295	8	37
Volume Left	31	0	8	0
Volume Right	0	82	0	37
cSH	1057	1700	65	689
Volume to Capacity	0.03	0.17	0.13	0.05
Queue Length 95th (ft)	2	0	10	4
Control Delay (s)	1.2	0.0	68.4	10.5
Lane LOS	A		F	B
Approach Delay (s)	1.2	0.0	20.9	
Approach LOS			C	

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		84.8%	ICU Level of Service E
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

33: Mt. Auburn Street & Summer Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	103	912	15	21	733	225	8	7	23	201	6	140
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	10	10	12	12	12	12	12	12	12	12	12
Total Lost time (s)		5.5			5.5			5.5			5.5	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frt		1.00			0.97			0.92			0.95	
Flt Protected		1.00			1.00			0.99			0.97	
Satd. Flow (prot)		3452			3593			1817			1802	
Flt Permitted		0.60			0.90			0.91			0.79	
Satd. Flow (perm)		2090			3251			1673			1471	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.67	0.67	0.67	0.90	0.90	0.90
Adj. Flow (vph)	117	1036	17	23	814	250	12	10	34	223	7	156
RTOR Reduction (vph)	0	0	0	0	14	0	0	25	0	0	17	0
Lane Group Flow (vph)	0	1170	0	0	1073	0	0	31	0	0	369	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5			5			10			
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		67.8			67.8			32.9			32.9	
Effective Green, g (s)		67.8			67.8			32.9			32.9	
Actuated g/C Ratio		0.57			0.57			0.28			0.28	
Clearance Time (s)		5.5			5.5			5.5			5.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1195			1858			464			408	
v/s Ratio Prot												
v/s Ratio Perm		c0.56			0.33			0.02			c0.25	
v/c Ratio		0.98			0.58			0.07			0.90	
Uniform Delay, d1		24.7			16.2			31.6			41.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		20.8			0.4			0.1			22.8	
Delay (s)		45.5			16.7			31.6			64.1	
Level of Service		D			B			C			E	
Approach Delay (s)		45.5			16.7			31.6			64.1	
Approach LOS		D			B			C			E	
Intersection Summary												
HCM Average Control Delay			36.3				HCM Level of Service				D	
HCM Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			118.6				Sum of lost time (s)			17.9		
Intersection Capacity Utilization			93.3%				ICU Level of Service			F		
Analysis Period (min)			15									
c	Critical Lane Group											

Queues

33: Mt. Auburn Street & Summer Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations		↕↕		↕↕		↕		↕	
Volume (vph)	103	912	21	733	8	7	201	6	
Lane Group Flow (vph)	0	1170	0	1087	0	56	0	386	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		2		6		8		4	9
Permitted Phases	2		6		8		4		
Detector Phase	2	2	6	6	8	8	4	4	
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0	5.0
Minimum Split (s)	17.5	17.5	17.5	17.5	11.5	11.5	11.5	11.5	23.0
Total Split (s)	72.0	72.0	72.0	72.0	54.0	54.0	54.0	54.0	24.0
Total Split (%)	48.0%	48.0%	48.0%	48.0%	36.0%	36.0%	36.0%	36.0%	16%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Min	Min	Min	Min	None	None	None	None	None
v/c Ratio		0.95		0.57		0.11		0.89	
Control Delay		41.8		18.7		16.1		59.8	
Queue Delay		0.0		0.6		0.0		0.0	
Total Delay		41.8		19.3		16.1		59.8	
Queue Length 50th (ft)		362		214		11		242	
Queue Length 95th (ft)		#860		529		30		458	
Internal Link Dist (ft)		739		491		38		726	
Turn Bay Length (ft)									
Base Capacity (vph)		1227		1923		736		643	
Starvation Cap Reductn		0		427		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.95		0.73		0.08		0.60	

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 115.6

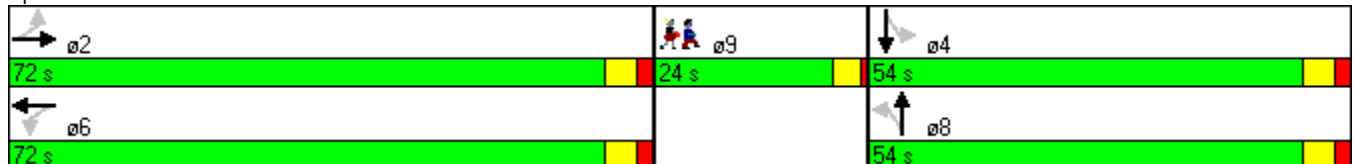
Natural Cycle: 150

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 33: Mt. Auburn Street & Summer Street



HCM Signalized Intersection Capacity Analysis

36: Mt. Auburn Street & Palfrey Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕				
Volume (vph)	137	862	137	33	825	34	154	169	22	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	16	16	16	12	12	12
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		0.95			0.95			1.00				
Frbp, ped/bikes		1.00			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		0.98			0.99			0.99				
Flt Protected		0.99			1.00			0.97				
Satd. Flow (prot)		3624			3697			2166				
Flt Permitted		0.62			0.84			0.97				
Satd. Flow (perm)		2258			3106			2166				
Peak-hour factor, PHF	0.92	0.89	0.89	0.94	0.94	0.92	0.67	0.92	0.67	0.92	0.92	0.92
Adj. Flow (vph)	149	969	154	35	878	37	230	184	33	0	0	0
RTOR Reduction (vph)	0	7	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1265	0	0	948	0	0	447	0	0	0	0
Confl. Peds. (#/hr)			10	10			10		10			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Split					
Protected Phases		1			1		3	3				
Permitted Phases	1			1								
Actuated Green, G (s)		89.2			89.2			35.8				
Effective Green, g (s)		89.2			89.2			35.8				
Actuated g/C Ratio		0.64			0.64			0.26				
Clearance Time (s)		4.0			4.0			4.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1439			1979			554				
v/s Ratio Prot								c0.21				
v/s Ratio Perm		c0.56			0.31							
v/c Ratio		0.88			0.48			0.81				
Uniform Delay, d1		21.0			13.3			48.9				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		8.0			0.8			8.4				
Delay (s)		28.9			14.1			57.3				
Level of Service		C			B			E				
Approach Delay (s)		28.9			14.1			57.3			0.0	
Approach LOS		C			B			E			A	

Intersection Summary

HCM Average Control Delay	28.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

36: Mt. Auburn Street & Palfrey Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBT	ø2
Lane Configurations		↕↕		↕↕	↕↕	
Volume (vph)	137	862	33	825	169	
Lane Group Flow (vph)	0	1272	0	950	447	
Turn Type	Perm		Perm			
Protected Phases		1		1	3	2
Permitted Phases	1		1			
Detector Phase	1	1	1	1	3	
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	7.0
Minimum Split (s)	17.0	17.0	17.0	17.0	20.0	23.0
Total Split (s)	85.0	85.0	85.0	85.0	32.0	23.0
Total Split (%)	60.7%	60.7%	60.7%	60.7%	22.9%	16%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
v/c Ratio		0.86		0.47	0.81	
Control Delay		26.9		13.5	61.1	
Queue Delay		8.9		1.4	0.0	
Total Delay		35.7		14.9	61.1	
Queue Length 50th (ft)		417		197	376	
Queue Length 95th (ft)		#733		322	#651	
Internal Link Dist (ft)		491		175	368	
Turn Bay Length (ft)						
Base Capacity (vph)		1483		2034	554	
Starvation Cap Reductn		194		825	0	
Spillback Cap Reductn		0		0	0	
Storage Cap Reductn		0		0	0	
Reduced v/c Ratio		0.99		0.79	0.81	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Yellow
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 36: Mt. Auburn Street & Palfrey Street



HCM Unsignalized Intersection Capacity Analysis
 15: Mt. Auburn Street & Phillips Street

1/27/2011



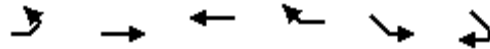
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	872	12	40	888	4	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.92	0.92	0.42	0.42
Hourly flow rate (vph)	899	12	43	965	10	19
Pedestrians	11			11		
Lane Width (ft)	11.0			13.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	1			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	255			208		
pX, platoon unblocked				0.82	0.90	0.82
vC, conflicting volume				911	1486	467
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				467	454	0
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				95	98	98
cM capacity (veh/h)				899	461	891

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	599	312	365	643	29
Volume Left	0	0	43	0	10
Volume Right	0	12	0	0	19
cSH	1700	1700	899	1700	679
Volume to Capacity	0.35	0.18	0.05	0.38	0.04
Queue Length 95th (ft)	0	0	4	0	3
Control Delay (s)	0.0	0.0	1.6	0.0	10.5
Lane LOS	A			B	
Approach Delay (s)	0.0		0.6	10.5	
Approach LOS				B	

Intersection Summary					
Average Delay			0.5		
Intersection Capacity Utilization			64.1%	ICU Level of Service	C
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
 17: Mt. Auburn Street & Marshall Street

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑			
Volume (veh/h)	41	839	928	30	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	865	1009	33	0	0
Pedestrians		11	11		20	
Lane Width (ft)		12.0	12.0		0.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		1	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		347	116			
pX, platoon unblocked	0.82				0.90	0.82
vC, conflicting volume	1061				1573	552
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	625				583	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	100
cM capacity (veh/h)	778				378	882

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	331	577	672	369
Volume Left	42	0	0	0
Volume Right	0	0	0	33
cSH	778	1700	1700	1700
Volume to Capacity	0.05	0.34	0.40	0.22
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	1.8	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.7		0.0	
Approach LOS				

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		63.9%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

19: Mt. Auburn Street & Parker Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (vph)	838	1	2	946	12	24
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	2.0			5.0	5.0	
Lane Util. Factor	0.95			0.95	1.00	
Frbp, ped/bikes	1.00			1.00	0.97	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	3725			3680	1690	
Flt Permitted	1.00			0.95	0.98	
Satd. Flow (perm)	3725			3515	1690	
Peak-hour factor, PHF	0.99	0.99	0.91	0.91	0.83	0.83
Adj. Flow (vph)	846	1	2	1040	14	29
RTOR Reduction (vph)	0	0	0	0	27	0
Lane Group Flow (vph)	847	0	0	1042	16	0
Confl. Peds. (#/hr)					2	8
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%
Bus Blockages (#/hr)	0	6	0	6	0	0
Parking (#/hr)		5				1
Turn Type			custom			
Protected Phases	9		3	1 3	4	
Permitted Phases	1		1			
Actuated Green, G (s)	32.4			45.5	7.1	
Effective Green, g (s)	32.4			45.5	7.1	
Actuated g/C Ratio	0.39			0.54	0.08	
Clearance Time (s)	2.0				5.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	1525			1946	143	
v/s Ratio Prot	c0.05			c0.14	c0.01	
v/s Ratio Perm	0.17			0.15		
v/c Ratio	0.56			0.54	0.12	
Uniform Delay, d1	20.2			12.4	35.5	
Progression Factor	1.00			0.24	1.00	
Incremental Delay, d2	1.5			0.1	1.6	
Delay (s)	21.6			3.1	37.2	
Level of Service	C			A	D	
Approach Delay (s)	21.6			3.1	37.2	
Approach LOS	C			A	D	

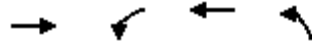
Intersection Summary

HCM Average Control Delay	12.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Queues

19: Mt. Auburn Street & Parker Street

1/27/2011



Lane Group	EBT	WBL	WBT	NBL	ø1	ø2
Lane Configurations	↑↑		↑↑	↘		
Volume (vph)	838	2	946	12		
Lane Group Flow (vph)	847	0	1042	43		
Turn Type	custom					
Protected Phases	9	3	1 3	4	1	2
Permitted Phases	1	1				
Detector Phase	9	3	1 3	4		
Switch Phase						
Minimum Initial (s)	8.0	4.0		8.0	4.0	7.0
Minimum Split (s)	10.0	20.0		13.0	20.0	23.0
Total Split (s)	10.0	26.0	55.0	12.0	29.0	23.0
Total Split (%)	10.0%	26.0%	55.0%	12.0%	29%	23%
Yellow Time (s)	2.0	3.0		3.0	3.0	3.0
All-Red Time (s)	0.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		
Total Lost Time (s)	2.0	5.0	5.0	5.0		
Lead/Lag		Lead		Lag	Lead	Lag
Lead-Lag Optimize?		Yes		Yes	Yes	Yes
Recall Mode	Max	Min		Max	Max	None
v/c Ratio	0.50		0.52	0.25		
Control Delay	18.0		2.3	24.0		
Queue Delay	0.4		1.9	0.2		
Total Delay	18.4		4.3	24.2		
Queue Length 50th (ft)	136		5	6		
Queue Length 95th (ft)	293		m38	38		
Internal Link Dist (ft)	36		48	431		
Turn Bay Length (ft)						
Base Capacity (vph)	1708		2003	172		
Starvation Cap Reductn	270		764	0		
Spillback Cap Reductn	383		0	14		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.64		0.84	0.27		

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 81.6
 Natural Cycle: 110
 Control Type: Semi Act-Uncoord
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Mt. Auburn Street & Parker Street

#14 #19	#14 #19	#14 #19	#14 #19	#14 #19
29 s	23 s	26 s	12 s	10 s

HCM Signalized Intersection Capacity Analysis

14: Mt. Auburn Street & Common Street

1/27/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↔		↔	↔
Volume (vph)	224	638	695	241	360	253
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	10	10
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frbp, ped/bikes		1.00	1.00		1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	0.96		1.00	0.85
Flt Protected		0.99	1.00		0.95	1.00
Satd. Flow (prot)		3404	3582		1756	1537
Flt Permitted		0.56	1.00		0.95	1.00
Satd. Flow (perm)		1922	3582		1756	1537
Peak-hour factor, PHF	0.99	0.99	0.91	0.91	0.93	0.93
Adj. Flow (vph)	226	644	764	265	387	272
RTOR Reduction (vph)	0	0	32	0	0	0
Lane Group Flow (vph)	0	870	997	0	387	272
Confl. Peds. (#/hr)	28				2	8
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Bus Blockages (#/hr)	0	6	0	6	0	0
Parking (#/hr)		5				
Turn Type	custom			Perm		
Protected Phases	4 9	1 4 9			3	
Permitted Phases	1		1			3
Actuated Green, G (s)		44.5	24.3		21.2	21.2
Effective Green, g (s)		44.5	24.3		21.2	21.2
Actuated g/C Ratio		0.53	0.29		0.25	0.25
Clearance Time (s)			5.0		5.0	5.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)		1375	1036		443	388
v/s Ratio Prot		c0.15			c0.22	
v/s Ratio Perm		0.18	c0.28			0.18
v/c Ratio		0.63	0.96		0.87	0.70
Uniform Delay, d1		14.0	29.4		30.1	28.5
Progression Factor		1.48	1.00		1.00	1.00
Incremental Delay, d2		2.0	20.2		17.1	5.6
Delay (s)		22.7	49.6		47.2	34.2
Level of Service		C	D		D	C
Approach Delay (s)		22.7	49.6		41.8	
Approach LOS		C	D		D	

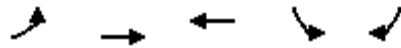
Intersection Summary			
HCM Average Control Delay	38.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

14: Mt. Auburn Street & Common Street

1/27/2011

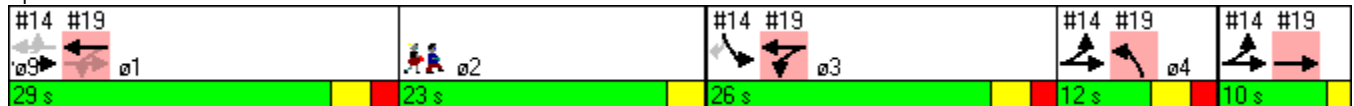


Lane Group	EBL	EBT	WBT	SBL	SBR	ø2	ø4	ø9
Lane Configurations		↕↕	↕↔	↖	↗			
Volume (vph)	224	638	695	360	253			
Lane Group Flow (vph)	0	870	1029	387	272			
Turn Type	custom				Perm			
Protected Phases	4 9	1 4 9		3		2	4	9
Permitted Phases	1		1		3			
Detector Phase	4 9	1 4 9	1	3	3			
Switch Phase								
Minimum Initial (s)			4.0	4.0	4.0	7.0	8.0	8.0
Minimum Split (s)			20.0	20.0	20.0	23.0	13.0	10.0
Total Split (s)	22.0	51.0	29.0	26.0	26.0	23.0	12.0	10.0
Total Split (%)	22.0%	51.0%	29.0%	26.0%	26.0%	23%	12%	10%
Yellow Time (s)			3.0	3.0	3.0	3.0	3.0	2.0
All-Red Time (s)			2.0	2.0	2.0	0.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0			
Lead/Lag			Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes	
Recall Mode			Max	Min	Min	None	Max	Max
v/c Ratio		0.68	0.94	0.85	0.68			
Control Delay		21.3	44.5	48.9	39.2			
Queue Delay		41.3	3.4	0.0	0.0			
Total Delay		62.6	47.9	48.9	39.2			
Queue Length 50th (ft)		134	235	172	115			
Queue Length 95th (ft)		#303	#528	#452	#308			
Internal Link Dist (ft)		48	1077	686				
Turn Bay Length (ft)								
Base Capacity (vph)		1288	1096	457	400			
Starvation Cap Reductn		480	0	0	0			
Spillback Cap Reductn		0	35	0	0			
Storage Cap Reductn		0	0	0	0			
Reduced v/c Ratio		1.08	0.97	0.85	0.68			

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 81.6
 Natural Cycle: 110
 Control Type: Semi Act-Uncoord
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 14: Mt. Auburn Street & Common Street



HCM Signalized Intersection Capacity Analysis
 21: Mt. Auburn Street & Bates Road East

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↑	↔		↔↑			↔			↔	
Volume (vph)	1	747	194	19	839	10	327	6	28	4	3	15
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0	6.0		6.0			6.0			6.0	
Lane Util. Factor		0.95	1.00		0.95			1.00			1.00	
Frbp, ped/bikes		1.00	0.94		1.00			1.00			0.99	
Flpb, ped/bikes		1.00	1.00		1.00			0.99			1.00	
Frt		1.00	0.85		1.00			0.99			0.91	
Flt Protected		1.00	1.00		1.00			0.96			0.99	
Satd. Flow (prot)		3762	1387		3748			1879			1776	
Flt Permitted		0.95	1.00		0.93			0.72			0.92	
Satd. Flow (perm)		3589	1387		3473			1421			1655	
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.87	0.87	0.87	0.70	0.70	0.70
Adj. Flow (vph)	1	770	200	21	912	11	376	7	32	6	4	21
RTOR Reduction (vph)	0	0	34	0	1	0	0	3	0	0	13	0
Lane Group Flow (vph)	0	771	166	0	943	0	0	412	0	0	18	0
Confl. Peds. (#/hr)	32		33	33		32	9		3	3		9
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			0									0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		3			3			1				1
Permitted Phases	3		3	3			1			1		
Actuated Green, G (s)		27.6	27.6		27.6			25.7				25.7
Effective Green, g (s)		27.6	27.6		27.6			25.7				25.7
Actuated g/C Ratio		0.39	0.39		0.39			0.36				0.36
Clearance Time (s)		6.0	6.0		6.0			6.0				6.0
Vehicle Extension (s)		3.0	3.0		3.0			3.0				3.0
Lane Grp Cap (vph)		1387	536		1343			511				596
v/s Ratio Prot												
v/s Ratio Perm		0.21	0.12		c0.27			c0.29				0.01
v/c Ratio		0.56	0.31		0.70			0.81				0.03
Uniform Delay, d1		17.1	15.3		18.4			20.6				14.8
Progression Factor		1.00	1.00		1.00			1.00				1.00
Incremental Delay, d2		1.6	1.5		3.1			9.0				0.0
Delay (s)		18.7	16.8		21.5			29.6				14.8
Level of Service		B	B		C			C				B
Approach Delay (s)		18.3			21.5			29.6				14.8
Approach LOS		B			C			C				B

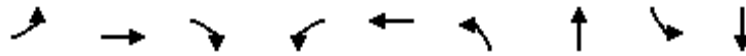
Intersection Summary

HCM Average Control Delay	21.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	18.1
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

21: Mt. Auburn Street & Bates Road East

1/27/2011



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations		↔↔	↔		↔↔		↔↔		↔↔	
Volume (vph)	1	747	194	19	839	327	6	4	3	
Lane Group Flow (vph)	0	771	200	0	944	0	415	0	31	
Turn Type	Perm		Perm	Perm		Perm		Perm		
Protected Phases		3			3		1		1	2
Permitted Phases	3		3	3		1		1		
Detector Phase	3	3	3	3	3	1	1	1	1	
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0
Minimum Split (s)	17.0	17.0	17.0	17.0	17.0	18.5	18.5	18.5	18.5	23.0
Total Split (s)	33.0	33.0	33.0	33.0	33.0	34.0	34.0	34.0	34.0	23.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	37.8%	37.8%	37.8%	37.8%	26%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag						Lead	Lead	Lead	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None	None
v/c Ratio		0.54	0.34		0.68		0.78		0.05	
Control Delay		19.6	14.8		22.7		32.9		10.2	
Queue Delay		0.0	0.0		0.0		0.0		0.0	
Total Delay		19.6	14.8		22.7		32.9		10.2	
Queue Length 50th (ft)		120	37		158		132		2	
Queue Length 95th (ft)		271	128		#388		#386		16	
Internal Link Dist (ft)		1077			987		295		217	
Turn Bay Length (ft)			25							
Base Capacity (vph)		1432	580		1387		591		697	
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		0.54	0.34		0.68		0.70		0.04	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 69.1

Natural Cycle: 90

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Mt. Auburn Street & Bates Road East



HCM Unsignalized Intersection Capacity Analysis

24: Mt. Auburn Street & Boylston Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	776	49	15	886	30	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.93	0.93	0.77	0.77
Hourly flow rate (vph)	800	51	16	953	39	19
Pedestrians	1				27	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				2	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	1067					
pX, platoon unblocked			0.88		0.88	0.88
vC, conflicting volume			878		1362	452
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			578		1130	92
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		77	98
cM capacity (veh/h)			862		167	814

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	533	317	334	635	58
Volume Left	0	0	16	0	39
Volume Right	0	51	0	0	19
cSH	1700	1700	862	1700	227
Volume to Capacity	0.31	0.19	0.02	0.37	0.26
Queue Length 95th (ft)	0	0	1	0	25
Control Delay (s)	0.0	0.0	0.7	0.0	26.2
Lane LOS	A			D	
Approach Delay (s)	0.0		0.2		26.2
Approach LOS	D				

Intersection Summary					
Average Delay			0.9		
Intersection Capacity Utilization			43.4%	ICU Level of Service	A
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis

31: Mt. Auburn Street & Winthrop Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	763	15	10	905	25	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.91	0.91	0.84	0.84
Hourly flow rate (vph)	779	15	11	995	30	8
Pedestrians				4	18	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				738		
pX, platoon unblocked					0.83	
vC, conflicting volume				812	1323	419
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				812	972	419
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				99	85	99
cM capacity (veh/h)				798	204	578

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	519	275	342	663	38
Volume Left	0	0	11	0	30
Volume Right	0	15	0	0	8
cSH	1700	1700	798	1700	237
Volume to Capacity	0.31	0.16	0.01	0.39	0.16
Queue Length 95th (ft)	0	0	1	0	14
Control Delay (s)	0.0	0.0	0.5	0.0	23.1
Lane LOS	A			C	
Approach Delay (s)	0.0		0.2		23.1
Approach LOS				C	

Intersection Summary					
Average Delay			0.6		
Intersection Capacity Utilization			41.7%	ICU Level of Service	A
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis

26: Mt. Auburn Street & Chauncey Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (veh/h)	761	9	11	902	13	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.89	0.89	0.73	0.73
Hourly flow rate (vph)	777	9	12	1013	18	16
Pedestrians	3			24		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			2		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	439					
pX, platoon unblocked					0.81	
vC, conflicting volume	810			1340	417	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	810			959	417	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			91	97	
cM capacity (veh/h)	796			202	579	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	518	268	350	676	34
Volume Left	0	0	12	0	18
Volume Right	0	9	0	0	16
cSH	1700	1700	796	1700	294
Volume to Capacity	0.30	0.16	0.02	0.40	0.12
Queue Length 95th (ft)	0	0	1	0	10
Control Delay (s)	0.0	0.0	0.5	0.0	18.8
Lane LOS	A			C	
Approach Delay (s)	0.0		0.2		18.8
Approach LOS	C				

Intersection Summary					
Average Delay	0.4				
Intersection Capacity Utilization	41.1%		ICU Level of Service	A	
Analysis Period (min)	15				

HCM Signalized Intersection Capacity Analysis
 28: Mt. Auburn Street & School Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	86	654	33	32	769	75	44	387	77	71	200	100
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.99			0.98			0.96	
Flt Protected		0.99			1.00			1.00			0.99	
Satd. Flow (prot)		3671			3659			1923			1880	
Flt Permitted		0.62			0.89			0.92			0.67	
Satd. Flow (perm)		2272			3265			1777			1273	
Peak-hour factor, PHF	0.99	0.99	0.99	0.88	0.88	0.88	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	87	661	33	36	874	85	49	430	86	75	211	105
RTOR Reduction (vph)	0	2	0	0	4	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	779	0	0	991	0	0	565	0	0	391	0
Confl. Peds. (#/hr)	13		37	37		13	5		19	19		5
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		55.8			55.8			42.6			42.6	
Effective Green, g (s)		55.8			55.8			42.6			42.6	
Actuated g/C Ratio		0.48			0.48			0.37			0.37	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1086			1561			649			465	
v/s Ratio Prot												
v/s Ratio Perm		c0.34			0.30			c0.32			0.31	
v/c Ratio		0.72			0.63			0.87			0.84	
Uniform Delay, d1		24.2			22.8			34.5			33.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.1			2.0			12.2			12.9	
Delay (s)		28.3			24.8			46.7			46.8	
Level of Service		C			C			D			D	
Approach Delay (s)		28.3			24.8			46.7			46.8	
Approach LOS		C			C			D			D	

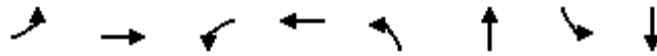
Intersection Summary

HCM Average Control Delay	33.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	116.7	Sum of lost time (s)	18.3
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

28: Mt. Auburn Street & School Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations		⇄		⇄		⇄		⇄	
Volume (vph)	86	654	32	769	44	387	71	200	
Lane Group Flow (vph)	0	781	0	995	0	565	0	391	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		1		1		3		3	2
Permitted Phases	1		1		3		3		
Detector Phase	1	1	1	1	3	3	3	3	
Switch Phase									
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0
Minimum Split (s)	17.0	17.0	17.0	17.0	18.5	18.5	18.5	18.5	23.0
Total Split (s)	61.0	61.0	61.0	61.0	56.0	56.0	56.0	56.0	23.0
Total Split (%)	43.6%	43.6%	43.6%	43.6%	40.0%	40.0%	40.0%	40.0%	16%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	Max	Max	Max	Max	None	None	None	None	None
v/c Ratio		0.70		0.62		0.85		0.82	
Control Delay		29.7		26.0		47.2		48.9	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		29.7		26.0		47.2		48.9	
Queue Length 50th (ft)		221		265		351		239	
Queue Length 95th (ft)		#461		479		#699		#516	
Internal Link Dist (ft)		359		1191		1065		1130	
Turn Bay Length (ft)									
Base Capacity (vph)		1112		1598		788		565	
Starvation Cap Reductn		0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.70		0.62		0.72		0.69	

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 114.3

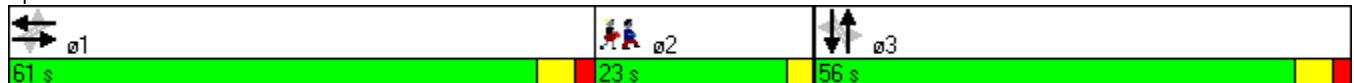
Natural Cycle: 120

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 28: Mt. Auburn Street & School Street



HCM Unsignalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (veh/h)	12	709	17	40	768	12	25	7	67	7	2	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.94	0.94	0.94	0.90	0.90	0.90	0.58	0.58	0.58
Hourly flow rate (vph)	13	762	18	43	817	13	28	8	74	12	3	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1271			856							
pX, platoon unblocked	0.92			0.93			0.95	0.95	0.93	0.95	0.95	0.92
vC, conflicting volume	830			781			1298	1712	390	1394	1715	415
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	631			618			886	1322	199	987	1325	179
tC, single (s)	4.1			4.1			7.5	6.8	7.0	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.2	3.3	3.5	4.0	3.3
p0 queue free %	99			95			87	94	90	92	98	99
cM capacity (veh/h)	880			906			214	122	745	159	140	769

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	394	399	451	421	110	21
Volume Left	13	0	43	0	28	12
Volume Right	0	18	0	13	74	5
cSH	880	1700	906	1700	375	193
Volume to Capacity	0.01	0.23	0.05	0.25	0.29	0.11
Queue Length 95th (ft)	1	0	4	0	30	9
Control Delay (s)	0.5	0.0	1.4	0.0	18.5	25.9
Lane LOS	A		A		C	D
Approach Delay (s)	0.2		0.7		18.5	25.9
Approach LOS					C	D

Intersection Summary

Average Delay		1.9				
Intersection Capacity Utilization		56.8%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

2: Mt. Auburn Street & Melendy Avenue

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	726	57	18	803	17	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	789	62	20	873	18	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	502					
pX, platoon unblocked					0.88	
vC, conflicting volume	851			1296	426	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	851			1067	426	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			90	95	
cM capacity (veh/h)	783			186	577	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	526	325	311	582	49
Volume Left	0	0	20	0	18
Volume Right	0	62	0	0	30
cSH	1700	1700	783	1700	322
Volume to Capacity	0.31	0.19	0.02	0.34	0.15
Queue Length 95th (ft)	0	0	2	0	13
Control Delay (s)	0.0	0.0	0.9	0.0	18.2
Lane LOS	A			C	
Approach Delay (s)	0.0	0.3		18.2	
Approach LOS	C				

Intersection Summary					
Average Delay	0.6				
Intersection Capacity Utilization	43.3%		ICU Level of Service		A
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis

3: Mt. Auburn Street & Lloyd Road

1/27/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	
Volume (veh/h)	27	727	809	18	4	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.50	0.50
Hourly flow rate (vph)	29	773	852	19	8	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			441			
pX, platoon unblocked	0.88				0.88	0.88
vC, conflicting volume	871				1305	435
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	568				1064	70
tC, single (s)	5.1				7.8	6.9
tC, 2 stage (s)						
tF (s)	2.7				4.0	3.3
p0 queue free %	96				94	97
cM capacity (veh/h)	641				128	862

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	287	516	568	303	32
Volume Left	29	0	0	0	8
Volume Right	0	0	0	19	24
cSH	641	1700	1700	1700	354
Volume to Capacity	0.04	0.30	0.33	0.18	0.09
Queue Length 95th (ft)	4	0	0	0	7
Control Delay (s)	1.6	0.0	0.0	0.0	16.2
Lane LOS	A				C
Approach Delay (s)	0.6		0.0		16.2
Approach LOS					C

Intersection Summary					
Average Delay			0.6		
Intersection Capacity Utilization			47.8%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis

4: Mt. Auburn Street & Elton Avenue

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Volume (veh/h)	689	42	35	827	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.93	0.93	0.25	0.25
Hourly flow rate (vph)	703	43	38	889	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				391		
pX, platoon unblocked				0.87		
vC, conflicting volume	746			1244		373
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	746			973		373
tC, single (s)	4.1			6.8		6.9
tC, 2 stage (s)						
tF (s)	2.2			3.5		3.3
p0 queue free %	96			100		100
cM capacity (veh/h)	871			210		630

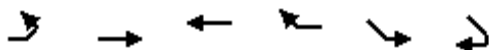
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	469	277	334	593
Volume Left	0	0	38	0
Volume Right	0	43	0	0
cSH	1700	1700	871	1700
Volume to Capacity	0.28	0.16	0.04	0.35
Queue Length 95th (ft)	0	0	3	0
Control Delay (s)	0.0	0.0	1.5	0.0
Lane LOS	A			
Approach Delay (s)	0.0		0.5	
Approach LOS				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

5: Mt. Auburn Street & Irma Avenue

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑		↘	
Volume (veh/h)	26	663	851	18	6	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.90	0.90	0.72	0.72
Hourly flow rate (vph)	28	705	946	20	8	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			228			
pX, platoon unblocked	0.86				0.86	0.86
vC, conflicting volume	966				1364	483
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	626				1090	62
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				95	98
cM capacity (veh/h)	827				176	854

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SE 1
Volume Total	263	470	630	335	24
Volume Left	28	0	0	0	8
Volume Right	0	0	0	20	15
cSH	827	1700	1700	1700	362
Volume to Capacity	0.03	0.28	0.37	0.20	0.07
Queue Length 95th (ft)	3	0	0	0	5
Control Delay (s)	1.3	0.0	0.0	0.0	15.6
Lane LOS	A				C
Approach Delay (s)	0.5		0.0		15.6
Approach LOS					C

Intersection Summary					
Average Delay			0.4		
Intersection Capacity Utilization			45.5%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis

6: Mt. Auburn Street & Kimball Road

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	15	595	59	25	772	39	81	105	103	11	12	16
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frt		0.99			0.99			0.95			0.94	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		3078			3300			1658			1630	
Flt Permitted		0.92			0.91			0.89			0.85	
Satd. Flow (perm)		2845			3012			1494			1398	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.78	0.78	0.78	0.69	0.69	0.69
Adj. Flow (vph)	16	647	64	26	813	41	104	135	132	16	17	23
RTOR Reduction (vph)	0	4	0	0	2	0	0	16	0	0	17	0
Lane Group Flow (vph)	0	723	0	0	878	0	0	355	0	0	39	0
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	3%	2%	1%	10%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)		5							5			
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Actuated Green, G (s)		79.2			79.2			36.3			36.3	
Effective Green, g (s)		79.2			79.2			36.3			36.3	
Actuated g/C Ratio		0.59			0.59			0.27			0.27	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1669			1767			402			376	
v/s Ratio Prot												
v/s Ratio Perm		0.25			0.29			0.24			0.03	
v/c Ratio		0.43			0.50			0.88			0.10	
Uniform Delay, d1		15.5			16.3			47.3			37.1	
Progression Factor		1.00			0.80			1.00			1.00	
Incremental Delay, d2		0.8			0.9			19.8			0.1	
Delay (s)		16.3			13.9			67.1			37.2	
Level of Service		B			B			E			D	
Approach Delay (s)		16.3			13.9			67.1			37.2	
Approach LOS		B			B			E			D	

Intersection Summary

HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

6: Mt. Auburn Street & Kimball Road

1/27/2011

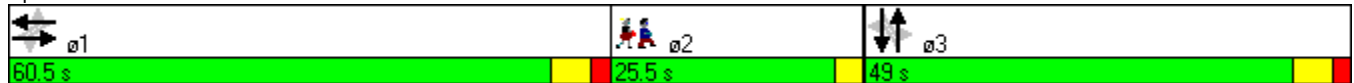


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations		↕↕		↕↕		↕↕		↕↕	
Volume (vph)	15	595	25	772	81	105	11	12	
Lane Group Flow (vph)	0	727	0	880	0	371	0	56	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		1		1		3		3	2
Permitted Phases	1		1		3		3		
Detector Phase	1	1	1	1	3	3	3	3	
Switch Phase									
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0
Minimum Split (s)	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	25.5
Total Split (s)	60.5	60.5	60.5	60.5	49.0	49.0	49.0	49.0	25.5
Total Split (%)	44.8%	44.8%	44.8%	44.8%	36.3%	36.3%	36.3%	36.3%	19%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None
v/c Ratio		0.42		0.48		0.89		0.14	
Control Delay		17.8		15.2		67.1		23.0	
Queue Delay		0.0		0.1		0.0		0.0	
Total Delay		17.8		15.3		67.1		23.0	
Queue Length 50th (ft)		153		156		293		21	
Queue Length 95th (ft)		332		208		326		38	
Internal Link Dist (ft)		148		118		676		475	
Turn Bay Length (ft)									
Base Capacity (vph)		1723		1822		491		461	
Starvation Cap Reductn		0		212		0		0	
Spillback Cap Reductn		75		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.44		0.55		0.76		0.12	

Intersection Summary

Cycle Length: 135
 Actuated Cycle Length: 135
 Offset: 6 (4%), Referenced to phase 1:EBWB, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated

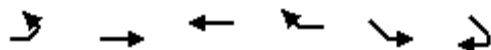
Splits and Phases: 6: Mt. Auburn Street & Kimball Road



HCM Unsignalized Intersection Capacity Analysis

7: Mt. Auburn Street & Templeton Parkway

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑		↘	
Volume (veh/h)	18	691	821	23	2	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.93	0.93	0.90	0.90
Hourly flow rate (vph)	19	735	883	25	2	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		198	170			
pX, platoon unblocked	0.88				0.93	0.88
vC, conflicting volume	908				1301	454
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	618				644	102
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	836				374	826

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SE 1
Volume Total	264	490	589	319	19
Volume Left	19	0	0	0	2
Volume Right	0	0	0	25	17
cSH	836	1700	1700	1700	723
Volume to Capacity	0.02	0.29	0.35	0.19	0.03
Queue Length 95th (ft)	2	0	0	0	2
Control Delay (s)	0.9	0.0	0.0	0.0	10.1
Lane LOS	A				B
Approach Delay (s)	0.3		0.0		10.1
Approach LOS					B

Intersection Summary					
Average Delay			0.3		
Intersection Capacity Utilization			40.4%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis

8: Mt. Auburn Street & Arlington Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗			↗	
Volume (vph)	93	507	93	213	504	39	291	708	220	17	433	49
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frt	1.00	0.98		1.00	0.99		1.00	0.96			0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1863	3593		1776	3625		1900	1902			3624	
Flt Permitted	0.42	1.00		0.13	1.00		0.31	1.00			0.66	
Satd. Flow (perm)	820	3593		252	3625		613	1902			2414	
Peak-hour factor, PHF	0.96	0.96	0.96	0.88	0.88	0.88	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	97	528	97	242	573	44	323	787	244	19	481	54
RTOR Reduction (vph)	0	11	0	0	4	0	0	8	0	0	0	0
Lane Group Flow (vph)	97	614	0	242	613	0	323	1023	0	0	554	0
Heavy Vehicles (%)	2%	3%	5%	7%	4%	0%	0%	0%	6%	7%	3%	3%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			pm+pt			pm+pt				Perm	
Protected Phases		2		1	6		3	8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	25.7	25.7		52.0	52.0		68.0	68.0			49.3	
Effective Green, g (s)	25.7	25.7		52.0	52.0		68.0	68.0			49.3	
Actuated g/C Ratio	0.19	0.19		0.39	0.39		0.50	0.50			0.37	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	156	684		349	1396		449	958			882	
v/s Ratio Prot		c0.17		c0.11	0.17		0.08	c0.54				
v/s Ratio Perm	0.12			0.15			0.28				0.23	
v/c Ratio	0.62	0.90		0.69	0.44		0.72	1.07			0.63	
Uniform Delay, d1	50.2	53.4		32.2	30.7		21.6	33.5			35.3	
Progression Factor	0.75	0.81		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	15.6	15.4		5.9	1.0		5.5	48.8			1.4	
Delay (s)	53.1	58.4		38.1	31.7		27.1	82.3			36.7	
Level of Service	D	E		D	C		C	F			D	
Approach Delay (s)		57.7			33.5			69.1			36.7	
Approach LOS		E			C			E			D	

Intersection Summary

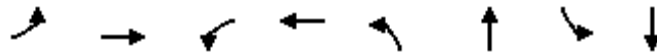
HCM Average Control Delay	52.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	102.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Queues

8: Mt. Auburn Street & Arlington Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations	↖	↗	↖	↗	↖	↗		↖↗	
Volume (vph)	93	507	213	504	291	708	17	433	
Lane Group Flow (vph)	97	625	242	617	323	1031	0	554	
Turn Type	Perm		pm+pt		pm+pt		Perm		
Protected Phases		2	1	6	3	8		4	9
Permitted Phases	2		6		8		4		
Detector Phase	2	2	1	6	3	8	4	4	
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	7.0
Minimum Split (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	23.0
Total Split (s)	32.0	32.0	8.0	40.0	19.0	72.0	53.0	53.0	23.0
Total Split (%)	23.7%	23.7%	5.9%	29.6%	14.1%	53.3%	39.3%	39.3%	17%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lag	Lag	Lead		Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	None	C-Max	None	Min	Min	Min	None
v/c Ratio	0.57	0.82	0.69	0.42	0.72	1.07		0.63	
Control Delay	48.7	49.4	44.1	31.3	30.7	80.7		39.3	
Queue Delay	0.0	4.5	0.0	0.0	0.0	0.0		0.0	
Total Delay	48.7	53.9	44.1	31.3	30.7	80.7		39.3	
Queue Length 50th (ft)	80	278	136	188	165	~990		210	
Queue Length 95th (ft)	m111	302	#497	307	234	#1255		276	
Internal Link Dist (ft)		90		334		285		435	
Turn Bay Length (ft)	75		150						
Base Capacity (vph)	171	760	353	1464	451	967		881	
Starvation Cap Reductn	0	82	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	
Reduced v/c Ratio	0.57	0.92	0.69	0.42	0.72	1.07		0.63	

Intersection Summary

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.








m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Mt. Auburn Street & Arlington Street

1/27/2011

Splits and Phases: 8: Mt. Auburn Street & Arlington Street

 ø1  ø2 8 s 32 s	 ø3 19 s	 ø4 53 s	 ø9 23 s
 ø6 40 s	 ø8 72 s		

HCM Unsignalized Intersection Capacity Analysis

9: Arlington Street & Grove Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (veh/h)	317	422	82	862	357	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.80	0.80	0.78	0.78
Hourly flow rate (vph)	369	491	102	1078	458	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	365					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			369		1651	369
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			258		1666	258
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		0	98
cM capacity (veh/h)			1201		89	716

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	369	491	102	1078	458	13
Volume Left	0	0	102	0	458	0
Volume Right	0	491	0	0	0	13
cSH	1700	1700	1201	1700	89	716
Volume to Capacity	0.22	0.29	0.09	0.63	5.17	0.02
Queue Length 95th (ft)	0	0	7	0	Err	1
Control Delay (s)	0.0	0.0	8.3	0.0	Err	10.1
Lane LOS			A			B
Approach Delay (s)	0.0		0.7		9726.8	
Approach LOS					F	

Intersection Summary						
Average Delay			1823.8			
Intersection Capacity Utilization			68.6%	ICU Level of Service		C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Grove Street & Tufts Medical Center

1/27/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Volume (veh/h)	30	297	563	8	125	381
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.95	0.95	0.66	0.66
Hourly flow rate (vph)	34	341	593	8	189	577
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		489				
pX, platoon unblocked					0.92	
vC, conflicting volume	601				1007	597
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	601				965	597
tC, single (s)	4.2				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.3
p0 queue free %	96				22	0
cM capacity (veh/h)	943				244	503

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	376	601	189	577
Volume Left	34	0	189	0
Volume Right	0	8	0	577
cSH	943	1700	244	503
Volume to Capacity	0.04	0.35	0.78	1.15
Queue Length 95th (ft)	3	0	142	502
Control Delay (s)	1.2	0.0	57.3	114.7
Lane LOS	A		F	F
Approach Delay (s)	1.2	0.0	100.5	
Approach LOS			F	

Intersection Summary			
Average Delay		44.4	
Intersection Capacity Utilization		57.7%	ICU Level of Service B
Analysis Period (min)		15	

5.0 APPENDIX

5.7 Level-of-Service Analyses - Alternative 1

HCM Signalized Intersection Capacity Analysis

36: Mt. Auburn Street & Palfrey Street

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕				
Volume (vph)	110	741	149	55	848	85	73	169	65	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	16	16	16	12	12	12
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		0.95			0.95			1.00				
Frbp, ped/bikes		1.00			1.00			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		0.98			0.99			0.97				
Flt Protected		0.99			1.00			0.99				
Satd. Flow (prot)		3608			3622			2127				
Flt Permitted		0.64			0.80			0.99				
Satd. Flow (perm)		2334			2888			2127				
Peak-hour factor, PHF	0.92	0.89	0.89	0.94	0.94	0.92	0.67	0.92	0.67	0.92	0.92	0.92
Adj. Flow (vph)	120	833	167	59	902	92	109	184	97	0	0	0
RTOR Reduction (vph)	0	10	0	0	5	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1110	0	0	1048	0	0	390	0	0	0	0
Confl. Peds. (#/hr)			10	10			10		10			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	6	0	6	0	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Split					
Protected Phases		1			1		8	8				
Permitted Phases	1			1								
Actuated Green, G (s)		69.8			69.8			25.2				
Effective Green, g (s)		69.8			69.8			25.2				
Actuated g/C Ratio		0.63			0.63			0.23				
Clearance Time (s)		4.0			4.0			4.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1481			1833			487				
v/s Ratio Prot								c0.18				
v/s Ratio Perm		c0.48			0.36							
v/c Ratio		0.75			0.57			0.80				
Uniform Delay, d1		14.0			11.5			40.0				
Progression Factor		0.69			0.79			1.00				
Incremental Delay, d2		2.5			1.1			9.2				
Delay (s)		12.2			10.2			49.2				
Level of Service		B			B			D				
Approach Delay (s)		12.2			10.2			49.2			0.0	
Approach LOS		B			B			D			A	
Intersection Summary												
HCM Average Control Delay		17.0			HCM Level of Service			B				
HCM Volume to Capacity ratio		0.76										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		79.8%			ICU Level of Service			D				
Analysis Period (min)		15										

c Critical Lane Group

Queues

36: Mt. Auburn Street & Palfrey Street

1/28/2011



Lane Group	EBL	EBT	WBL	WBT	NBT	ø2
Lane Configurations		↕↕		↕↕	↕	
Volume (vph)	110	741	55	848	169	
Lane Group Flow (vph)	0	1120	0	1053	390	
Turn Type	Perm		Perm			
Protected Phases		1		1	8	2
Permitted Phases	1		1			
Detector Phase	1	1	1	1	8	
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	4.0	7.0
Minimum Split (s)	17.0	17.0	17.0	17.0	20.0	23.0
Total Split (s)	62.0	62.0	62.0	62.0	25.0	23.0
Total Split (%)	56.4%	56.4%	56.4%	56.4%	22.7%	21%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	None
v/c Ratio		0.73		0.55	0.80	
Control Delay		12.5		10.2	53.8	
Queue Delay		0.0		0.0	0.0	
Total Delay		12.5		10.2	53.8	
Queue Length 50th (ft)		124		133	253	
Queue Length 95th (ft)		m#295		237	#464	
Internal Link Dist (ft)		491		164	368	
Turn Bay Length (ft)						
Base Capacity (vph)		1542		1899	487	
Starvation Cap Reductn		3		42	0	
Spillback Cap Reductn		1		0	0	
Storage Cap Reductn		0		0	0	
Reduced v/c Ratio		0.73		0.57	0.80	

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 108 (98%), Referenced to phase 1:EBWB, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 36: Mt. Auburn Street & Palfrey Street



HCM Unsignalized Intersection Capacity Analysis
 15: Mt. Auburn Street & Phillips Street

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	799	7	45	981	7	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.94	0.94	0.67	0.67
Hourly flow rate (vph)	898	8	48	1044	10	27
Pedestrians	25			18		
Lane Width (ft)	11.0			13.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	2			2		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	244			343		
pX, platoon unblocked				0.86	0.88	0.86
vC, conflicting volume				906	1544	471
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				556	612	49
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				94	97	97
cM capacity (veh/h)				866	350	856

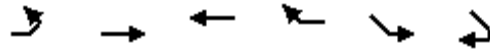
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	599	307	396	696	37
Volume Left	0	0	48	0	10
Volume Right	0	8	0	0	27
cSH	1700	1700	866	1700	609
Volume to Capacity	0.35	0.18	0.06	0.41	0.06
Queue Length 95th (ft)	0	0	4	0	5
Control Delay (s)	0.0	0.0	1.7	0.0	11.3
Lane LOS	A			B	
Approach Delay (s)	0.0		0.6	11.3	
Approach LOS				B	

Intersection Summary					
Average Delay			0.5		
Intersection Capacity Utilization			66.0%	ICU Level of Service	C
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis

17: Mt. Auburn Street & Marshall Street

1/28/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑			
Volume (veh/h)	29	788	1026	37	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.94	0.94	0.67	0.67
Hourly flow rate (vph)	33	885	1091	39	0	0
Pedestrians		25	18		12	
Lane Width (ft)		12.0	12.0		0.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		2	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		347	240			
pX, platoon unblocked	0.80				0.86	0.80
vC, conflicting volume	1143				1649	602
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	674				745	0
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	100
cM capacity (veh/h)	713				288	853

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	328	590	728	403
Volume Left	33	0	0	0
Volume Right	0	0	0	39
cSH	713	1700	1700	1700
Volume to Capacity	0.05	0.35	0.43	0.24
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	1.5	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.5		0.0	
Approach LOS				

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		56.4%	ICU Level of Service
Analysis Period (min)		15	B

HCM Unsignalized Intersection Capacity Analysis
 19: Mt. Auburn Street & Parker Street

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Volume (veh/h)	781	7	9	1063	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.92	0.92	0.70	0.70
Hourly flow rate (vph)	964	9	10	1155	0	0
Pedestrians	14			10	19	
Lane Width (ft)	12.0			12.0	0.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	485			102		
pX, platoon unblocked				0.89	0.85	0.89
vC, conflicting volume				992	1599	515
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				732	738	194
tC, single (s)				4.2	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				99	100	100
cM capacity (veh/h)				757	292	716

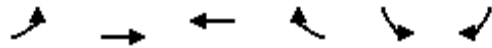
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	643	330	395	770
Volume Left	0	0	10	0
Volume Right	0	9	0	0
cSH	1700	1700	757	1700
Volume to Capacity	0.38	0.19	0.01	0.45
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.0	0.0	0.4	0.0
Lane LOS	A			
Approach Delay (s)	0.0		0.1	
Approach LOS				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis

14: Mt. Auburn Street & Common Street

1/28/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	163	618	719	149	484	353
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1792	1592	3537		1863	1648
Flt Permitted	0.15	1.00	1.00		0.95	1.00
Satd. Flow (perm)	280	1592	3537		1863	1648
Peak-hour factor, PHF	0.81	0.81	0.92	0.92	0.97	0.97
Adj. Flow (vph)	201	763	782	162	499	364
RTOR Reduction (vph)	0	0	14	0	0	0
Lane Group Flow (vph)	201	763	930	0	499	364
Confl. Peds. (#/hr)	14			14	14	10
Heavy Vehicles (%)	6%	6%	4%	4%	2%	2%
Bus Blockages (#/hr)	0	9	0	9	0	0
Parking (#/hr)		5				
Turn Type	pm+pt				pm+ov	
Protected Phases	1	6	2		3	1
Permitted Phases	6					3
Actuated Green, G (s)	69.3	69.3	44.8		32.7	53.2
Effective Green, g (s)	69.3	69.3	44.8		32.7	53.2
Actuated g/C Ratio	0.63	0.63	0.41		0.30	0.48
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	458	1003	1441		554	857
v/s Ratio Prot	0.08	c0.48	0.26		c0.27	0.08
v/s Ratio Perm	0.19					0.14
v/c Ratio	0.44	0.76	0.65		0.90	0.42
Uniform Delay, d1	12.8	14.5	26.2		37.1	18.5
Progression Factor	1.45	0.47	1.00		1.00	1.00
Incremental Delay, d2	0.5	4.2	2.2		17.7	0.3
Delay (s)	19.1	11.0	28.5		54.8	18.8
Level of Service	B	B	C		D	B
Approach Delay (s)		12.7	28.5		39.6	
Approach LOS		B	C		D	

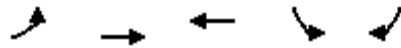
Intersection Summary

HCM Average Control Delay	26.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

14: Mt. Auburn Street & Common Street

1/28/2011



Lane Group	EBL	EBT	WBT	SBL	SBR	ø9
Lane Configurations						
Volume (vph)	163	618	719	484	353	
Lane Group Flow (vph)	201	763	944	499	364	
Turn Type	pm+pt				pm+ov	
Protected Phases	1	6	2	3	1	9
Permitted Phases	6				3	
Detector Phase	1	6	2	3	1	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	7.0
Minimum Split (s)	8.0	20.0	20.0	8.0	8.0	23.0
Total Split (s)	10.0	48.0	38.0	39.0	10.0	23.0
Total Split (%)	9.1%	43.6%	34.5%	35.5%	9.1%	21%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead		Lag		Lead	
Lead-Lag Optimize?	Yes		Yes		Yes	
Recall Mode	None	C-Max	C-Max	Min	None	None
v/c Ratio	0.44	0.76	0.65	0.90	0.46	
Control Delay	16.7	11.8	28.7	57.6	18.1	
Queue Delay	0.0	0.5	0.0	0.0	0.0	
Total Delay	16.7	12.2	28.7	57.6	18.1	
Queue Length 50th (ft)	37	192	273	327	150	
Queue Length 95th (ft)	m94	176	366	#503	205	
Internal Link Dist (ft)		22	1076	686		
Turn Bay Length (ft)						
Base Capacity (vph)	458	1003	1452	593	797	
Starvation Cap Reductn	0	44	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.44	0.80	0.65	0.84	0.46	

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.






m Volume for 95th percentile queue is metered by upstream signal.

Queues

14: Mt. Auburn Street & Common Street

1/28/2011

Splits and Phases: 14: Mt. Auburn Street & Common Street

 ø1	 ø2	 ø3	 ø9
10 s	38 s	39 s	23 s
 ø6			
48 s			

HCM Signalized Intersection Capacity Analysis

21: Mt. Auburn Street & Bates Road East

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	842	341	19	886	8	173	1	17	14	10	6
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99			1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.99			0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96			0.98	
Satd. Flow (prot)	1857	1961	1392	1857	1958			1861			1888	
Flt Permitted	0.11	1.00	1.00	0.09	1.00			0.72			0.85	
Satd. Flow (perm)	211	1961	1392	179	1958			1402			1646	
Peak-hour factor, PHF	0.90	0.90	0.90	0.98	0.98	0.98	0.74	0.74	0.74	0.85	0.85	0.85
Adj. Flow (vph)	1	936	379	19	904	8	234	1	23	16	12	7
RTOR Reduction (vph)	0	0	65	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	936	314	19	912	0	0	258	0	0	35	0
Confl. Peds. (#/hr)	17		20	20		17	7		1	1		7
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			0									0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		3			3			1				1
Permitted Phases	3		3	3			1			1		
Actuated Green, G (s)	46.4	46.4	46.4	46.4	46.4			18.4			18.4	
Effective Green, g (s)	46.4	46.4	46.4	46.4	46.4			18.4			18.4	
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56			0.22			0.22	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	119	1103	783	101	1101			313			367	
v/s Ratio Prot		c0.48			0.47							
v/s Ratio Perm	0.00		0.23	0.11				c0.18			0.02	
v/c Ratio	0.01	0.85	0.40	0.19	0.83			0.82			0.10	
Uniform Delay, d1	7.9	15.1	10.2	8.8	14.8			30.5			25.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	8.2	1.5	4.1	7.2			16.0			0.1	
Delay (s)	8.1	23.3	11.7	12.9	22.0			46.5			25.6	
Level of Service	A	C	B	B	C			D			C	
Approach Delay (s)		19.9			21.8			46.5			25.6	
Approach LOS		B			C			D			C	

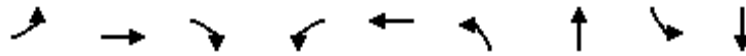
Intersection Summary

HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	82.5	Sum of lost time (s)	17.7
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

21: Mt. Auburn Street & Bates Road East

1/28/2011



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations										
Volume (vph)	1	842	341	19	886	173	1	14	10	
Lane Group Flow (vph)	1	936	379	19	912	0	258	0	35	
Turn Type	Perm		Perm	Perm		Perm		Perm		
Protected Phases		3			3		1		1	2
Permitted Phases	3		3	3		1		1		
Detector Phase	3	3	3	3	3	1	1	1	1	
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	1.0
Minimum Split (s)	17.0	17.0	17.0	17.0	17.0	16.0	16.0	16.0	16.0	19.0
Total Split (s)	52.0	52.0	52.0	52.0	52.0	24.4	24.4	24.4	24.4	19.0
Total Split (%)	54.5%	54.5%	54.5%	54.5%	54.5%	25.6%	25.6%	25.6%	25.6%	20%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag						Lead	Lead	Lead	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	Min	Min	Min	Min	None
v/c Ratio	0.01	0.82	0.44	0.18	0.80		0.80		0.09	
Control Delay	11.0	23.2	8.4	16.3	22.1		51.1		27.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	11.0	23.2	8.4	16.3	22.1		51.1		27.5	
Queue Length 50th (ft)	0	304	47	4	289		114		13	
Queue Length 95th (ft)	3	#823	169	25	#795		#224		42	
Internal Link Dist (ft)		1076			987		295		217	
Turn Bay Length (ft)	75		100	75						
Base Capacity (vph)	122	1136	867	104	1135		324		381	
Starvation Cap Reductn	0	0	0	0	0		0		0	
Spillback Cap Reductn	0	0	0	0	0		0		0	
Storage Cap Reductn	0	0	0	0	0		0		0	
Reduced v/c Ratio	0.01	0.82	0.44	0.18	0.80		0.80		0.09	

Intersection Summary

Cycle Length: 95.4

Actuated Cycle Length: 80

Natural Cycle: 90

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Mt. Auburn Street & Bates Road East



HCM Signalized Intersection Capacity Analysis
 24: Mt. Auburn Street & Boylston Street

1/28/2011

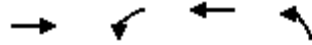


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻		↻	↻	↻	
Volume (vph)	793	103	22	716	95	72
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.94	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	1904		1859	1890	1832	
Flt Permitted	1.00		0.09	1.00	0.97	
Satd. Flow (perm)	1904		178	1890	1832	
Peak-hour factor, PHF	0.92	0.92	0.94	0.94	0.43	0.43
Adj. Flow (vph)	862	112	23	762	221	167
RTOR Reduction (vph)	4	0	0	0	29	0
Lane Group Flow (vph)	970	0	23	762	359	0
Confl. Peds. (#/hr)		16	16		1	
Heavy Vehicles (%)	3%	3%	2%	2%	0%	0%
Bus Blockages (#/hr)	0	9	0	9	0	0
Parking (#/hr)		0				
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	44.0		44.0	44.0	17.2	
Effective Green, g (s)	44.0		44.0	44.0	17.2	
Actuated g/C Ratio	0.58		0.58	0.58	0.23	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1101		103	1093	414	
v/s Ratio Prot	c0.51			0.40	c0.20	
v/s Ratio Perm			0.13			
v/c Ratio	0.88		0.22	0.70	0.87	
Uniform Delay, d1	13.8		7.8	11.3	28.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	8.4		1.1	2.0	17.2	
Delay (s)	22.2		8.9	13.3	45.6	
Level of Service	C		A	B	D	
Approach Delay (s)	22.2			13.2	45.6	
Approach LOS	C			B	D	
Intersection Summary						
HCM Average Control Delay			23.1		HCM Level of Service	C
HCM Volume to Capacity ratio			0.88			
Actuated Cycle Length (s)			76.1		Sum of lost time (s)	14.9
Intersection Capacity Utilization			61.6%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Queues

24: Mt. Auburn Street & Boylston Street

1/28/2011



Lane Group	EBT	WBL	WBT	NBL	ø9
Lane Configurations	↔	↔	↔	↔	
Volume (vph)	793	22	716	95	
Lane Group Flow (vph)	974	23	762	388	
Turn Type	Perm				
Protected Phases	4		8	2	9
Permitted Phases		8			
Detector Phase	4	8	8	2	
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	22.0
Total Split (s)	47.0	47.0	47.0	21.0	22.0
Total Split (%)	52.2%	52.2%	52.2%	23.3%	24%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Min	Min	Min	None	None
v/c Ratio	0.84	0.21	0.67	0.84	
Control Delay	22.6	16.4	15.6	43.8	
Queue Delay	0.0	0.0	0.0	0.0	
Total Delay	22.6	16.4	15.6	43.8	
Queue Length 50th (ft)	260	4	169	137	
Queue Length 95th (ft)	#854	30	#589	116	
Internal Link Dist (ft)	987		740	495	
Turn Bay Length (ft)		75			
Base Capacity (vph)	1153	108	1141	461	
Starvation Cap Reductn	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	
Storage Cap Reductn	0	0	0	0	
Reduced v/c Ratio	0.84	0.21	0.67	0.84	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 72.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 24: Mt. Auburn Street & Boylston Street



HCM Unsignalized Intersection Capacity Analysis

31: Mt. Auburn Street & Winthrop Street

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻		↻	↻	↻	
Volume (veh/h)	826	39	20	698	18	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.93	0.93	0.59	0.59
Hourly flow rate (vph)	879	41	22	751	31	22
Pedestrians				23	14	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				2	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	820			738		
pX, platoon unblocked			0.55		0.71	0.55
vC, conflicting volume			934		1707	936
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			476		768	480
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		88	93
cM capacity (veh/h)			587		254	316

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	920	22	751	53
Volume Left	0	22	0	31
Volume Right	41	0	0	22
cSH	1700	587	1700	277
Volume to Capacity	0.54	0.04	0.44	0.19
Queue Length 95th (ft)	0	3	0	17
Control Delay (s)	0.0	11.4	0.0	21.0
Lane LOS		B		C
Approach Delay (s)	0.0	0.3		21.0
Approach LOS				C

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		59.0%	ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

26: Mt. Auburn Street & Chauncey Street

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩		↩	↩	↩	↩
Volume (veh/h)	795	44	55	698	20	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.97	0.97	0.59	0.59
Hourly flow rate (vph)	883	49	57	720	34	46
Pedestrians	6				31	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	1				3	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	1119			439		
pX, platoon unblocked			0.59		0.76	0.59
vC, conflicting volume			963		1778	939
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			592		886	551
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		83	85
cM capacity (veh/h)			561		205	304

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	932	57	720	80
Volume Left	0	57	0	34
Volume Right	49	0	0	46
cSH	1700	561	1700	252
Volume to Capacity	0.55	0.10	0.42	0.32
Queue Length 95th (ft)	0	8	0	33
Control Delay (s)	0.0	12.1	0.0	25.7
Lane LOS		B		D
Approach Delay (s)	0.0	0.9		25.7
Approach LOS				D

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		53.4%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

28: Mt. Auburn Street & School Street

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	726	20	45	642	34	19	138	44	88	417	92
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)	4.0	6.0		6.0	6.0	4.0	6.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	0.97	1.00		0.99	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1809	1895		1798	1905	1504	1743	1791		1729	1759	
Flt Permitted	0.11	1.00		0.08	1.00	1.00	0.24	1.00		0.37	1.00	
Satd. Flow (perm)	212	1895		154	1905	1504	433	1791		666	1759	
Peak-hour factor, PHF	0.86	0.86	0.86	0.92	0.92	0.92	0.78	0.78	0.78	0.93	0.93	0.93
Adj. Flow (vph)	88	844	23	49	698	37	24	177	56	95	448	99
RTOR Reduction (vph)	0	0	0	0	0	6	0	0	0	0	0	0
Lane Group Flow (vph)	88	867	0	49	698	31	24	233	0	95	547	0
Confl. Peds. (#/hr)	26		29	29		26	33		19	19		33
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	6%	6%	6%	2%	2%	2%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	pm+pt			Perm		pm+ov	Perm			pm+pt		
Protected Phases	1	6			2	4		3		4	8	
Permitted Phases	6			2		2	3			8		
Actuated Green, G (s)	57.2	57.2		49.2	49.2	60.0	23.9	23.9		38.7	38.7	
Effective Green, g (s)	57.2	57.2		49.2	49.2	60.0	23.9	23.9		38.7	38.7	
Actuated g/C Ratio	0.51	0.51		0.44	0.44	0.53	0.21	0.21		0.34	0.34	
Clearance Time (s)	4.0	6.0		6.0	6.0	4.0	6.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	164	959		67	829	799	92	379		330	602	
v/s Ratio Prot	0.02	c0.46			0.37	0.00		0.13		0.03	c0.31	
v/s Ratio Perm	0.25			0.32		0.02	0.06			0.07		
v/c Ratio	0.54	0.90		0.73	0.84	0.04	0.26	0.61		0.29	0.91	
Uniform Delay, d1	21.9	25.4		26.4	28.4	12.7	37.2	40.4		26.5	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.4	13.4		51.3	10.1	0.0	1.5	3.0		0.5	17.5	
Delay (s)	25.2	38.8		77.8	38.6	12.7	38.7	43.3		26.9	53.0	
Level of Service	C	D		E	D	B	D	D		C	D	
Approach Delay (s)		37.6			39.8			42.9			49.1	
Approach LOS		D			D			D			D	

Intersection Summary

HCM Average Control Delay	41.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	109.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

28: Mt. Auburn Street & School Street

1/28/2011

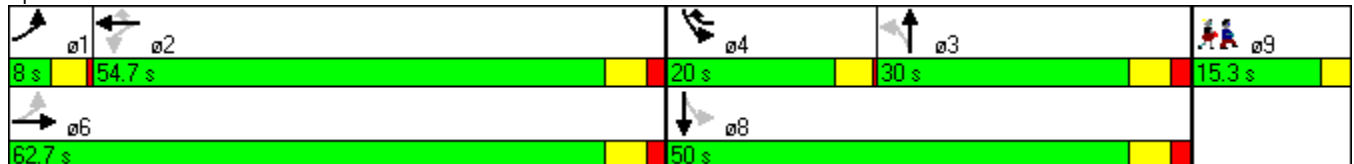


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	76	726	45	642	34	19	138	88	417	
Lane Group Flow (vph)	88	867	49	698	37	24	233	95	547	
Turn Type	pm+pt		Perm		pm+ov	Perm		pm+pt		
Protected Phases	1	6		2	4		3	4	8	9
Permitted Phases	6		2		2	3		8		
Detector Phase	1	6	2	2	4	3	3	4	8	
Switch Phase										
Minimum Initial (s)	4.0	20.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	1.0
Minimum Split (s)	8.0	40.0	30.0	30.0	20.0	30.0	30.0	20.0	20.0	15.3
Total Split (s)	8.0	62.7	54.7	54.7	20.0	30.0	30.0	20.0	50.0	15.3
Total Split (%)	6.3%	49.0%	42.7%	42.7%	15.6%	23.4%	23.4%	15.6%	39.1%	12%
Yellow Time (s)	3.5	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	3.0
All-Red Time (s)	0.5	2.0	2.0	2.0	0.5	2.0	2.0	0.5	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	Max	Max	Max	None	Min	Min	None	Min	None
v/c Ratio	0.51	0.88	0.72	0.83	0.04	0.26	0.61	0.27	0.89	
Control Delay	28.1	37.9	85.3	38.5	9.1	45.9	47.2	26.1	52.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	28.1	37.9	85.3	38.5	9.1	45.9	47.2	26.1	52.2	
Queue Length 50th (ft)	29	524	28	423	7	14	143	42	346	
Queue Length 95th (ft)	70	#946	#120	#814	27	39	226	94	#644	
Internal Link Dist (ft)		359		1191			1065		1130	
Turn Bay Length (ft)	100		100		75	75		75		
Base Capacity (vph)	171	980	68	846	921	103	426	400	706	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.51	0.88	0.72	0.83	0.04	0.23	0.55	0.24	0.77	

Intersection Summary

Cycle Length: 128
 Actuated Cycle Length: 110.6
 Natural Cycle: 130
 Control Type: Semi Act-Uncoord
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.




















Splits and Phases: 28: Mt. Auburn Street & School Street



HCM Unsignalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

1/28/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	865	22	40	578	3	28	2	42	6	6	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.74	0.74	0.74	0.75	0.75	0.75
Hourly flow rate (vph)	11	930	24	42	608	3	38	3	57	8	8	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (ft)	1271					856						
pX, platoon unblocked	0.85			0.56			0.63	0.63	0.56	0.63	0.63	0.85
vC, conflicting volume	612			954			1676	1659	942	1704	1669	610
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	459			521			1257	1230	500	1301	1246	457
tC, single (s)	4.1			4.1			7.1	6.7	6.2	7.3	6.5	6.4
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.2	3.3	3.7	4.0	3.5
p0 queue free %	99			93			52	97	82	87	92	97
cM capacity (veh/h)	950			589			79	96	315	60	101	488
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	11	954	42	612	97	32						
Volume Left	11	0	42	0	38	8						
Volume Right	0	24	0	3	57	16						
cSH	950	1700	589	1700	141	131						
Volume to Capacity	0.01	0.56	0.07	0.36	0.69	0.24						
Queue Length 95th (ft)	1	0	6	0	97	23						
Control Delay (s)	8.8	0.0	11.6	0.0	73.4	41.3						
Lane LOS	A		B		F	E						
Approach Delay (s)	0.1		0.7		73.4	41.3						
Approach LOS					F	E						
Intersection Summary												
Average Delay			5.2									
Intersection Capacity Utilization			57.7%		ICU Level of Service		B					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	865	22	40	578	3	28	2	42	6	6	12
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.92			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1900	1900		1900	1941			1722			1616	
Flt Permitted	0.42	1.00		0.27	1.00			0.92			0.97	
Satd. Flow (perm)	847	1900		539	1941			1618			1580	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.74	0.74	0.74	0.75	0.75	0.75
Adj. Flow (vph)	11	930	24	42	608	3	38	3	57	8	8	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	9	0	0	3	0
Lane Group Flow (vph)	11	954	0	42	611	0	0	89	0	0	29	0
Heavy Vehicles (%)	0%	5%	0%	0%	3%	0%	4%	17%	5%	20%	0%	18%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5									5
Turn Type	custom			custom			custom			custom		
Protected Phases												
Permitted Phases	2!	2!		2!	2!		6!	6!		6!	6!	
Actuated Green, G (s)	51.0	51.0		51.0	51.0			51.0			51.0	
Effective Green, g (s)	51.0	51.0		51.0	51.0			51.0			51.0	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.84			0.84	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	708	1589		451	1623			1353			1321	
v/s Ratio Prot												
v/s Ratio Perm	0.01	c0.50		0.08	0.31			0.05			0.02	
v/c Ratio	0.02	0.60		0.09	0.38			0.07			0.02	
Uniform Delay, d1	0.8	1.6		0.9	1.2			0.9			0.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	1.7		0.4	0.7			0.1			0.0	
Delay (s)	0.9	3.3		1.3	1.9			1.0			0.9	
Level of Service	A	A		A	A			A			A	
Approach Delay (s)		3.3			1.8			1.0			0.9	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	2.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Queues

1: Mt. Auburn Street & Upland Road

1/28/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations	↖	↗	↖	↗		↕		↕	
Volume (vph)	10	865	40	578	28	2	6	6	
Lane Group Flow (vph)	11	954	42	611	0	98	0	32	
Turn Type	custom		custom		custom		custom		
Protected Phases									9
Permitted Phases	2!	2!	2!	2!	6!	6!	6!	6!	
Detector Phase	2	2	2	2	6	6	6	6	
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	23.0
Total Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	23.0
Total Split (%)	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	37%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	None
v/c Ratio	0.01	0.54	0.08	0.34		0.07		0.02	
Control Delay	2.6	4.6	2.9	2.8		1.5		1.8	
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	2.6	4.6	2.9	2.8		1.5		1.8	
Queue Length 50th (ft)	0	0	0	0		0		0	
Queue Length 95th (ft)	7	445	19	199		15		8	
Internal Link Dist (ft)		1191		274		506		50	
Turn Bay Length (ft)	50		50						
Base Capacity (vph)	789	1766	502	1804		1507		1469	
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	0.01	0.54	0.08	0.34		0.07		0.02	

Intersection Summary

Cycle Length: 62

Actuated Cycle Length: 58.6

Natural Cycle: 65

Control Type: Semi Act-Uncoord

! Phase conflict between lane groups.

Splits and Phases: 1: Mt. Auburn Street & Upland Road



HCM Unsignalized Intersection Capacity Analysis

2: Mt. Auburn Street & Melendy Avenue

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	900	13	14	611	10	43
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	957	14	15	643	11	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	354			502		
pX, platoon unblocked			0.76		0.86	0.76
vC, conflicting volume			971		1637	964
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			804		1127	795
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		94	84
cM capacity (veh/h)			623		190	294

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	971	658	58
Volume Left	0	15	11
Volume Right	14	0	47
cSH	1700	623	267
Volume to Capacity	0.57	0.02	0.22
Queue Length 95th (ft)	0	2	20
Control Delay (s)	0.0	0.7	22.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.7	22.2
Approach LOS			C

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		55.7%	ICU Level of Service
Analysis Period (min)		15	B

HCM Unsignalized Intersection Capacity Analysis

3: Mt. Auburn Street & Lloyd Road

1/28/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	8	935	619	1	2	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.50	0.50
Hourly flow rate (vph)	9	995	652	1	4	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		415	441			
pX, platoon unblocked	0.79				0.87	0.79
vC, conflicting volume	653				1664	652
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	428				1146	427
tC, single (s)	4.6				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.7				4.0	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	725				153	496

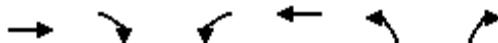
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1003	653	16
Volume Left	9	0	4
Volume Right	0	1	12
cSH	725	1700	318
Volume to Capacity	0.01	0.38	0.05
Queue Length 95th (ft)	1	0	4
Control Delay (s)	0.4	0.0	16.9
Lane LOS	A		C
Approach Delay (s)	0.4	0.0	16.9
Approach LOS			C

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		62.8%	ICU Level of Service
Analysis Period (min)		15	B

HCM Unsignalized Intersection Capacity Analysis

4: Mt. Auburn Street & Elton Avenue

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←		
Volume (veh/h)	838	99	54	620	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.96	0.96	0.25	0.25
Hourly flow rate (vph)	911	108	56	646	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	465			391		
pX, platoon unblocked			0.76		0.88	0.76
vC, conflicting volume			1018		1723	965
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			871		1178	800
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		100	100
cM capacity (veh/h)			599		168	294

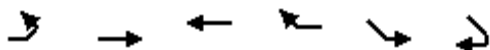
Direction, Lane #	EB 1	WB 1
Volume Total	1018	702
Volume Left	0	56
Volume Right	108	0
cSH	1700	599
Volume to Capacity	0.60	0.09
Queue Length 95th (ft)	0	8
Control Delay (s)	0.0	2.6
Lane LOS		A
Approach Delay (s)	0.0	2.6
Approach LOS		

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

5: Mt. Auburn Street & Irma Avenue

1/28/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↔	↔		↔	
Volume (veh/h)	8	830	619	8	24	55
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.68	0.68
Hourly flow rate (vph)	9	892	703	9	35	81
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		628	228			
pX, platoon unblocked	0.76				0.84	0.76
vC, conflicting volume	712				1618	708
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	463				1228	457
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				79	82
cM capacity (veh/h)	842				164	458

Direction, Lane #	EB 1	WB 1	SE 1
Volume Total	901	712	116
Volume Left	9	0	35
Volume Right	0	9	81
cSH	842	1700	297
Volume to Capacity	0.01	0.42	0.39
Queue Length 95th (ft)	1	0	45
Control Delay (s)	0.3	0.0	24.7
Lane LOS	A		C
Approach Delay (s)	0.3	0.0	24.7
Approach LOS			C

Intersection Summary			
Average Delay		1.8	
Intersection Capacity Utilization		58.7%	ICU Level of Service
Analysis Period (min)		15	B

HCM Signalized Intersection Capacity Analysis

6: Mt. Auburn Street & Kimball Road

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↗		↖	↗			↕			↕	
Volume (vph)	11	769	74	46	581	19	34	29	99	41	56	12
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1555	2995		1676	1709			1559			1722	
Flt Permitted	0.30	1.00		0.24	1.00			0.91			0.72	
Satd. Flow (perm)	486	2995		418	1709			1428			1271	
Peak-hour factor, PHF	0.85	0.85	0.85	0.91	0.91	0.91	0.68	0.68	0.68	0.77	0.77	0.77
Adj. Flow (vph)	13	905	87	51	638	21	50	43	146	53	73	16
RTOR Reduction (vph)	0	5	0	0	1	0	0	0	0	0	4	0
Lane Group Flow (vph)	13	987	0	51	658	0	0	239	0	0	138	0
Heavy Vehicles (%)	10%	6%	2%	2%	5%	0%	7%	12%	2%	0%	2%	0%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)		5							5			
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	71.4	71.4		71.4	71.4			27.0			27.0	
Effective Green, g (s)	71.4	71.4		71.4	71.4			27.0			27.0	
Actuated g/C Ratio	0.62	0.62		0.62	0.62			0.23			0.23	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	302	1860		260	1061			335			298	
v/s Ratio Prot		0.33			c0.39							
v/s Ratio Perm	0.03			0.12				c0.17			0.11	
v/c Ratio	0.04	0.53		0.20	0.62			0.71			0.46	
Uniform Delay, d1	8.5	12.3		9.4	13.4			40.4			37.8	
Progression Factor	1.00	1.00		0.47	0.41			1.00			1.00	
Incremental Delay, d2	0.3	1.1		1.4	2.3			7.0			5.1	
Delay (s)	8.8	13.4		5.9	7.9			47.5			42.9	
Level of Service	A	B		A	A			D			D	
Approach Delay (s)		13.4			7.7			47.5			42.9	
Approach LOS		B			A			D			D	

Intersection Summary

HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

6: Mt. Auburn Street & Kimball Road

1/28/2011

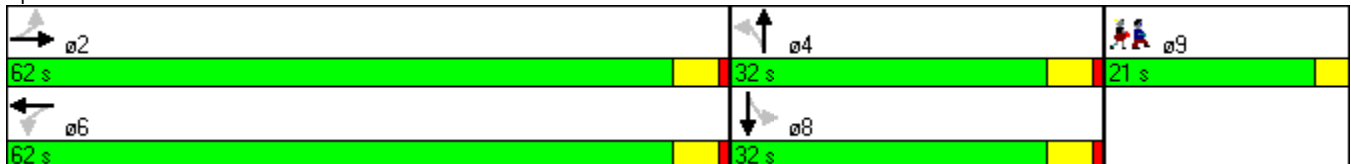


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations									
Volume (vph)	11	769	46	581	34	29	41	56	
Lane Group Flow (vph)	13	992	51	659	0	239	0	142	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		2		6		4		8	9
Permitted Phases	2		6		4		8		
Detector Phase	2	2	6	6	4	4	8	8	
Switch Phase									
Minimum Initial (s)	7.0	7.0	8.0	8.0	8.0	8.0	8.0	8.0	1.0
Minimum Split (s)	23.0	23.0	20.0	20.0	13.0	13.0	13.0	13.0	21.0
Total Split (s)	62.0	62.0	62.0	62.0	32.0	32.0	32.0	32.0	21.0
Total Split (%)	53.9%	53.9%	53.9%	53.9%	27.8%	27.8%	27.8%	27.8%	18%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Max	Max	None
v/c Ratio	0.04	0.52	0.19	0.60		0.71		0.47	
Control Delay	11.3	13.4	7.0	8.0		53.5		42.5	
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	11.3	13.5	7.0	8.0		53.5		42.5	
Queue Length 50th (ft)	3	166	7	94		163		88	
Queue Length 95th (ft)	15	322	m15	m135		180		127	
Internal Link Dist (ft)		148		118		676		475	
Turn Bay Length (ft)	75		75						
Base Capacity (vph)	312	1926	269	1097		336		302	
Starvation Cap Reductn	0	0	0	9		0		0	
Spillback Cap Reductn	0	34	0	0		0		0	
Storage Cap Reductn	0	0	0	0		0		0	
Reduced v/c Ratio	0.04	0.52	0.19	0.61		0.71		0.47	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 9 (8%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

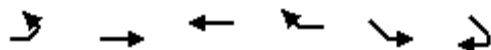
Splits and Phases: 6: Mt. Auburn Street & Kimball Road



HCM Unsignalized Intersection Capacity Analysis

7: Mt. Auburn Street & Templeton Parkway

1/28/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↔↑	↔		↔	
Volume (veh/h)	2	907	626	1	3	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.95	0.95	0.79	0.79
Hourly flow rate (vph)	2	1008	659	1	4	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		198	170			
pX, platoon unblocked	0.77				0.85	0.77
vC, conflicting volume	660				1168	659
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	411				381	410
tC, single (s)	4.1				7.5	7.3
tC, 2 stage (s)						
tF (s)	2.2				3.8	3.5
p0 queue free %	100				99	94
cM capacity (veh/h)	894				443	421

Direction, Lane #	EB 1	EB 2	WB 1	SE 1
Volume Total	338	672	660	29
Volume Left	2	0	0	4
Volume Right	0	0	1	25
cSH	894	1700	1700	423
Volume to Capacity	0.00	0.40	0.39	0.07
Queue Length 95th (ft)	0	0	0	6
Control Delay (s)	0.1	0.0	0.0	14.1
Lane LOS	A			B
Approach Delay (s)	0.0		0.0	14.1
Approach LOS				B

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		41.4%	ICU Level of Service
Analysis Period (min)		15	A

HCM Signalized Intersection Capacity Analysis

8: Mt. Auburn Street & Arlington Street

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	73	457	380	270	513	9	72	247	87	10	997	42
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		3.0	4.0		3.0	4.0	3.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00	1.00		0.95	
Frt	1.00	0.93		1.00	1.00		1.00	1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1776	3349		1845	1902		1712	1905	1667		3698	
Flt Permitted	0.46	1.00		0.13	1.00		0.10	1.00	1.00		0.95	
Satd. Flow (perm)	858	3349		259	1902		183	1905	1667		3520	
Peak-hour factor, PHF	0.96	0.96	0.96	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	76	476	396	284	540	9	78	268	95	11	1096	46
RTOR Reduction (vph)	0	135	0	0	0	0	0	0	37	0	0	0
Lane Group Flow (vph)	76	737	0	284	549	0	78	268	58	0	1153	0
Heavy Vehicles (%)	7%	8%	3%	3%	5%	0%	11%	5%	2%	0%	2%	5%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Turn Type	Perm			pm+pt			pm+pt			pm+ov	Perm	
Protected Phases		2		1	6		3	8	1			4
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	27.0	27.0		57.8	57.8		42.6	42.6	70.4			36.4
Effective Green, g (s)	27.0	27.0		57.8	57.8		42.6	42.6	70.4			36.4
Actuated g/C Ratio	0.23	0.23		0.50	0.50		0.37	0.37	0.61			0.32
Clearance Time (s)	4.0	4.0		3.0	4.0		3.0	4.0	3.0			4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	201	786		514	956		110	706	1020			1114
v/s Ratio Prot		c0.22		0.13	c0.29		c0.02	0.14	0.01			
v/s Ratio Perm	0.09			0.14			0.24		0.02			c0.33
v/c Ratio	0.38	0.94		0.55	0.57		0.71	0.38	0.06			1.04
Uniform Delay, d1	36.9	43.2		21.8	20.0		31.3	26.5	9.0			39.3
Progression Factor	0.80	0.83		1.00	1.00		1.00	1.00	1.00			1.00
Incremental Delay, d2	4.6	17.9		4.2	2.5		18.8	0.3	0.0			36.4
Delay (s)	34.0	53.5		26.1	22.5		50.1	26.9	9.0			75.7
Level of Service	C	D		C	C		D	C	A			E
Approach Delay (s)		52.0			23.7			27.1				75.7
Approach LOS		D			C			C				E

Intersection Summary

HCM Average Control Delay	49.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

8: Mt. Auburn Street & Arlington Street

1/28/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø9
Lane Configurations	↖	↕	↖	↗	↖	↕	↗		↕	
Volume (vph)	73	457	270	513	72	247	87	10	997	
Lane Group Flow (vph)	76	872	284	549	78	268	95	0	1153	
Turn Type	Perm		pm+pt		pm+pt		pm+ov	Perm		
Protected Phases		2	1	6	3	8	1		4	9
Permitted Phases	2		6		8		8	4		
Detector Phase	2	2	1	6	3	8	1	4	4	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	10.0	3.0	10.0	4.0	4.0	4.0	7.0
Minimum Split (s)	34.0	34.0	7.0	18.0	7.0	18.0	7.0	20.0	20.0	21.0
Total Split (s)	34.0	34.0	14.0	48.0	7.0	46.0	14.0	39.0	39.0	21.0
Total Split (%)	29.6%	29.6%	12.2%	41.7%	6.1%	40.0%	12.2%	33.9%	33.9%	18%
Yellow Time (s)	3.5	3.5	3.0	3.5	3.0	3.5	3.0	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.0	0.5	0.0	0.5	0.0	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	4.0	
Lead/Lag	Lag	Lag	Lead		Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	Max	C-Max	None	Min	Max	Max	Max	None
v/c Ratio	0.34	0.87	0.54	0.55	0.64	0.39	0.09		1.04	
Control Delay	31.8	35.8	25.2	22.4	49.7	29.0	1.8		75.7	
Queue Delay	0.0	5.4	0.0	0.0	0.0	1.2	0.0		0.0	
Total Delay	31.8	41.3	25.2	22.4	49.7	30.2	1.8		75.7	
Queue Length 50th (ft)	48	276	107	235	38	145	0		~501	
Queue Length 95th (ft)	m60	#307	#357	487	#88	219	16		#636	
Internal Link Dist (ft)		90		521		344			1269	
Turn Bay Length (ft)	100		400		360					
Base Capacity (vph)	224	1005	523	1006	122	696	1095		1114	
Starvation Cap Reductn	0	92	0	0	0	241	0		0	
Spillback Cap Reductn	0	0	0	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0	0	0	0		0	
Reduced v/c Ratio	0.34	0.96	0.54	0.55	0.64	0.59	0.09		1.04	

Intersection Summary








Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Mt. Auburn Street & Arlington Street

1/28/2011

Splits and Phases: 8: Mt. Auburn Street & Arlington Street

 ø1	 ø2	 ø3	 ø4	 ø9
14 s	34 s	7 s	39 s	21 s
 ø6	 ø8			
48 s	46 s			

HCM Signalized Intersection Capacity Analysis
 10: Arlington Street & Tufts Medical Center

1/28/2011



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕	↕	↕	↕		↕	↕		↕	↕	
Volume (vph)	22	1034	591	21	158	69	217	6	107	7	1	31
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		0.95	0.95		1.00	1.00	
Frt		1.00	0.85	1.00	0.95		1.00	0.90		1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (prot)		1960	1589	1638	1746		1367	1452		1900	1180	
Flt Permitted		0.99	1.00	0.08	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (perm)		1945	1589	136	1746		1367	1452		1900	1180	
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.73	0.73	0.73	0.86	0.86	0.86
Adj. Flow (vph)	24	1112	635	23	174	76	297	8	147	8	1	36
RTOR Reduction (vph)	0	0	149	0	13	0	0	75	0	0	35	0
Lane Group Flow (vph)	0	1136	486	23	237	0	235	142	0	8	2	0
Heavy Vehicles (%)	45%	1%	7%	16%	6%	17%	32%	0%	10%	0%	0%	46%
Turn Type	Perm	pm+ov		Perm			Split				Split	
Protected Phases		6	4		2		4	4		8	8	
Permitted Phases	6	6		2								
Actuated Green, G (s)		50.6	64.8	50.6	50.6		14.2	14.2		2.3	2.3	
Effective Green, g (s)		50.6	64.8	50.6	50.6		14.2	14.2		2.3	2.3	
Actuated g/C Ratio		0.60	0.77	0.60	0.60		0.17	0.17		0.03	0.03	
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1163	1292	81	1044		229	244		52	32	
v/s Ratio Prot			0.06		0.14		c0.17	0.10		c0.00	0.00	
v/s Ratio Perm		c0.58	0.24	0.17								
v/c Ratio		0.98	0.38	0.28	0.23		1.03	0.58		0.15	0.06	
Uniform Delay, d1		16.4	3.3	8.2	7.9		35.2	32.5		40.2	40.1	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		21.4	0.8	1.9	0.1		66.4	9.8		1.4	0.8	
Delay (s)		37.8	4.1	10.2	8.0		101.6	42.2		41.6	40.9	
Level of Service		D	A	B	A		F	D		D	D	
Approach Delay (s)		25.7		8.2		73.1		41.0				
Approach LOS		C		A		E		D				

Intersection Summary

HCM Average Control Delay	32.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	84.6	Sum of lost time (s)	17.5
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

10: Arlington Street & Tufts Medical Center

1/28/2011



Lane Group	SEL	SET	SER	NWL	NWT	NEL	NET	SWL	SWT	ø9
Lane Configurations										
Volume (vph)	22	1034	591	21	158	217	6	7	1	
Lane Group Flow (vph)	0	1136	635	23	250	235	217	8	37	
Turn Type	Perm		pm+ov	Perm		Split		Split		
Protected Phases		6	4		2	4	4	8	8	9
Permitted Phases	6		6	2						
Detector Phase	6	6	4	2	2	4	4	8	8	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	18.0
Total Split (s)	54.0	54.0	18.0	54.0	54.0	18.0	18.0	8.0	8.0	18.0
Total Split (%)	55.1%	55.1%	18.4%	55.1%	55.1%	18.4%	18.4%	8.2%	8.2%	18%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Min	Min	Max	Max	None	None	None
v/c Ratio		0.93	0.43	0.27	0.23	0.98	0.66	0.08	0.39	
Control Delay		30.4	1.3	21.3	7.8	89.7	30.7	43.1	28.1	
Queue Delay		59.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		90.0	1.8	21.3	7.8	89.7	30.7	43.1	28.1	
Queue Length 50th (ft)		456	0	5	41	124	61	4	1	
Queue Length 95th (ft)		#1083	30	35	122	#254	117	19	#32	
Internal Link Dist (ft)		344			505		69		101	
Turn Bay Length (ft)				125				150		
Base Capacity (vph)		1224	1473	85	1111	241	330	96	94	
Starvation Cap Reductn		222	405	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		1.13	0.59	0.27	0.23	0.98	0.66	0.08	0.39	

Intersection Summary

Cycle Length: 98

Actuated Cycle Length: 80.4

Natural Cycle: 140

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 10: Arlington Street & Tufts Medical Center

ø2	ø4	ø8	ø9
54 s	18 s	8 s	18 s
ø6			
54 s			

HCM Signalized Intersection Capacity Analysis
 36: Mt. Auburn Street & Palfrey Street

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕				
Volume (vph)	137	862	137	33	825	34	154	169	34	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	16	16	16	12	12	12
Total Lost time (s)		5.5			5.5			5.5				
Lane Util. Factor		0.95			0.95			1.00				
Frbp, ped/bikes		0.99			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		0.98			0.99			0.99				
Flt Protected		0.99			1.00			0.98				
Satd. Flow (prot)		3613			3653			2163				
Flt Permitted		0.61			0.85			0.98				
Satd. Flow (perm)		2204			3102			2163				
Peak-hour factor, PHF	0.92	0.97	0.97	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.92	0.92
Adj. Flow (vph)	149	889	141	36	897	37	171	184	38	0	0	0
RTOR Reduction (vph)	0	8	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1171	0	0	968	0	0	393	0	0	0	0
Confl. Peds. (#/hr)			10	10			10		10			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	6	0	6	0	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Split					
Protected Phases		4			8		2	2				
Permitted Phases	4			8								
Actuated Green, G (s)		78.7			78.7			33.3				
Effective Green, g (s)		78.7			78.7			33.3				
Actuated g/C Ratio		0.61			0.61			0.26				
Clearance Time (s)		5.5			5.5			5.5				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1334			1878			554				
v/s Ratio Prot								c0.18				
v/s Ratio Perm		c0.53			0.31							
v/c Ratio		0.88			0.52			0.71				
Uniform Delay, d1		21.6			14.7			44.0				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		8.4			1.0			4.2				
Delay (s)		30.0			15.7			48.1				
Level of Service		C			B			D				
Approach Delay (s)		30.0			15.7			48.1			0.0	
Approach LOS		C			B			D			A	

Intersection Summary

HCM Average Control Delay	27.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

36: Mt. Auburn Street & Palfrey Street

1/28/2011



Lane Group	EBL	EBT	WBL	WBT	NBT	ø9
Lane Configurations		↕↕		↕↕	↕↕	
Volume (vph)	137	862	33	825	169	
Lane Group Flow (vph)	0	1179	0	970	393	
Turn Type	Perm		Perm			
Protected Phases		4		8	2	9
Permitted Phases	4		8			
Detector Phase	4	4	8	8	2	
Switch Phase						
Minimum Initial (s)	7.0	7.0	4.0	4.0	7.0	7.0
Minimum Split (s)	25.5	25.5	20.0	20.0	25.5	23.0
Total Split (s)	81.5	81.5	81.5	81.5	25.5	23.0
Total Split (%)	62.7%	62.7%	62.7%	62.7%	19.6%	18%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	None
v/c Ratio		0.85		0.50	0.71	
Control Delay		27.0		14.5	53.0	
Queue Delay		4.8		0.7	0.0	
Total Delay		31.8		15.2	53.0	
Queue Length 50th (ft)		355		200	300	
Queue Length 95th (ft)		#623		304	#600	
Internal Link Dist (ft)		491		175	368	
Turn Bay Length (ft)						
Base Capacity (vph)		1382		1938	554	
Starvation Cap Reductn		148		568	0	
Spillback Cap Reductn		0		0	0	
Storage Cap Reductn		0		0	0	
Reduced v/c Ratio		0.96		0.71	0.71	

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 36 (28%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 36: Mt. Auburn Street & Palfrey Street



HCM Unsignalized Intersection Capacity Analysis
 15: Mt. Auburn Street & Phillips Street

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	884	12	42	876	16	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.92	0.92	0.42	0.42
Hourly flow rate (vph)	911	12	46	952	38	48
Pedestrians	11			11		
Lane Width (ft)	11.0			13.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	1			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	255			336		
pX, platoon unblocked				0.82	0.88	0.82
vC, conflicting volume				924	1496	473
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				482	400	0
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				95	92	95
cM capacity (veh/h)				888	484	890

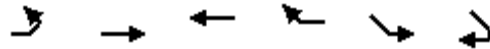
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	608	316	363	635	86
Volume Left	0	0	46	0	38
Volume Right	0	12	0	0	48
cSH	1700	1700	888	1700	648
Volume to Capacity	0.36	0.19	0.05	0.37	0.13
Queue Length 95th (ft)	0	0	4	0	11
Control Delay (s)	0.0	0.0	1.7	0.0	11.4
Lane LOS	A			B	
Approach Delay (s)	0.0		0.6		11.4
Approach LOS	B				

Intersection Summary					
Average Delay			0.8		
Intersection Capacity Utilization			64.1%	ICU Level of Service	C
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis

17: Mt. Auburn Street & Marshall Street

1/28/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑			
Volume (veh/h)	41	863	918	30	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	890	998	33	0	0
Pedestrians		11	11		20	
Lane Width (ft)		12.0	12.0		0.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		1	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		347	244			
pX, platoon unblocked	0.79				0.87	0.79
vC, conflicting volume	1050				1575	546
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	521				501	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	100
cM capacity (veh/h)	819				412	850

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	339	593	665	365
Volume Left	42	0	0	0
Volume Right	0	0	0	33
cSH	819	1700	1700	1700
Volume to Capacity	0.05	0.35	0.39	0.21
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	1.7	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.6		0.0	
Approach LOS				

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		64.5%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 19: Mt. Auburn Street & Parker Street

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Volume (veh/h)	862	1	0	948	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.99	0.99	0.91	0.91	0.83	0.83
Hourly flow rate (vph)	871	1	0	1042	0	0
Pedestrians	2			8		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	463			128		
pX, platoon unblocked			0.85		0.85	0.85
vC, conflicting volume			872		1394	444
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			503		341	1
tC, single (s)			4.1		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			901		534	914

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	580	291	347	695
Volume Left	0	0	0	0
Volume Right	0	1	0	0
cSH	1700	1700	901	1700
Volume to Capacity	0.34	0.17	0.00	0.41
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		37.2%	ICU Level of Service
Analysis Period (min)		15	A

HCM Signalized Intersection Capacity Analysis

14: Mt. Auburn Street & Common Street

1/28/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑	↑↑		↙	↗
Volume (vph)	224	638	695	241	360	253
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	10	10
Total Lost time (s)	5.5	5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1862	1675	3582		1756	1552
Flt Permitted	0.13	1.00	1.00		0.95	1.00
Satd. Flow (perm)	261	1675	3582		1756	1552
Peak-hour factor, PHF	0.99	0.99	0.91	0.91	0.93	0.93
Adj. Flow (vph)	226	644	764	265	387	272
RTOR Reduction (vph)	0	0	19	0	0	0
Lane Group Flow (vph)	226	644	1010	0	387	272
Confl. Peds. (#/hr)	28				2	8
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Bus Blockages (#/hr)	0	6	0	6	0	0
Parking (#/hr)		5				
Turn Type	pm+pt				pm+ov	
Protected Phases	1 4	6	2		3	1 4
Permitted Phases	6					3
Actuated Green, G (s)	89.3	82.5	64.8		37.2	56.2
Effective Green, g (s)	89.3	82.5	64.8		37.2	56.2
Actuated g/C Ratio	0.60	0.55	0.43		0.25	0.37
Clearance Time (s)		5.5	5.5		5.5	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)	358	921	1547		435	638
v/s Ratio Prot	c0.08	c0.38	0.28		c0.22	0.05
v/s Ratio Perm	0.30					0.12
v/c Ratio	0.63	0.70	0.65		0.89	0.43
Uniform Delay, d1	21.6	24.7	33.7		54.4	34.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.6	4.4	2.2		19.4	0.5
Delay (s)	25.2	29.1	35.9		73.8	35.4
Level of Service	C	C	D		E	D
Approach Delay (s)		28.1	35.9		57.9	
Approach LOS		C	D		E	

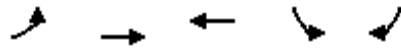
Intersection Summary			
HCM Average Control Delay	38.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

14: Mt. Auburn Street & Common Street

1/28/2011

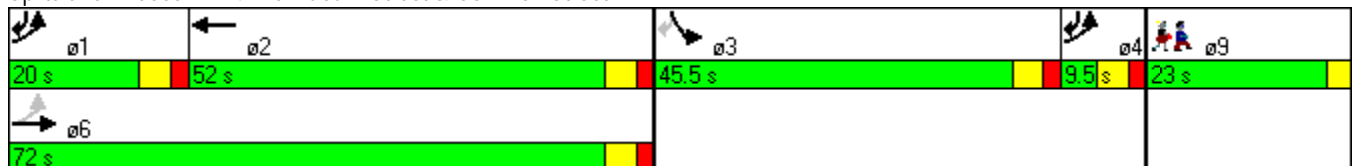


Lane Group	EBL	EBT	WBT	SBL	SBR	ø1	ø4	ø9
Lane Configurations								
Volume (vph)	224	638	695	360	253			
Lane Group Flow (vph)	226	644	1029	387	272			
Turn Type	pm+pt				pm+ov			
Protected Phases	1 4	6	2	3	1 4	1	4	9
Permitted Phases	6				3			
Detector Phase	1 4	6	2	3	3			
Switch Phase								
Minimum Initial (s)		4.0	4.0	4.0		4.0	4.0	7.0
Minimum Split (s)		9.5	9.5	9.5		20.0	9.5	23.0
Total Split (s)	29.5	72.0	52.0	45.5	29.5	20.0	9.5	23.0
Total Split (%)	19.7%	48.0%	34.7%	30.3%	19.7%	13%	6%	15%
Yellow Time (s)		3.5	3.5	3.5		3.5	3.5	3.0
All-Red Time (s)		2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5			
Lead/Lag			Lag	Lead		Lead	Lag	
Lead-Lag Optimize?			Yes	Yes		Yes	Yes	
Recall Mode		C-Max	C-Max	Min		None	Max	None
v/c Ratio	0.54	0.68	0.63	0.89	0.43			
Control Delay	19.8	29.2	34.8	76.9	27.0			
Queue Delay	0.0	7.3	0.0	0.0	0.0			
Total Delay	19.8	36.6	34.8	76.9	27.0			
Queue Length 50th (ft)	80	396	381	358	170			
Queue Length 95th (ft)	140	#797	#620	#521	170			
Internal Link Dist (ft)		48	1077	686				
Turn Bay Length (ft)								
Base Capacity (vph)	449	948	1622	468	647			
Starvation Cap Reductn	0	258	0	0	0			
Spillback Cap Reductn	0	0	0	0	0			
Storage Cap Reductn	0	0	0	0	0			
Reduced v/c Ratio	0.50	0.93	0.63	0.83	0.42			

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 14: Mt. Auburn Street & Common Street



HCM Signalized Intersection Capacity Analysis
 21: Mt. Auburn Street & Bates Road East

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	747	194	19	839	10	327	6	28	4	3	15
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.5	5.5	4.0	5.5	5.5			5.5			5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00			0.97	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99			1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.99			0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1881	1980	1430	1881	1974			1862			1736	
Flt Permitted	0.09	1.00	1.00	0.19	1.00			0.70			0.90	
Satd. Flow (perm)	177	1980	1430	377	1974			1355			1570	
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.87	0.87	0.87	0.70	0.70	0.70
Adj. Flow (vph)	1	770	200	21	912	11	376	7	32	6	4	21
RTOR Reduction (vph)	0	0	20	0	0	0	0	2	0	0	18	0
Lane Group Flow (vph)	1	770	180	21	923	0	0	413	0	0	13	0
Confl. Peds. (#/hr)	32		33	33		32	9		3	3		9
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			0									0
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		6	7		2		7	4			8	
Permitted Phases	6		6	2			4			8		
Actuated Green, G (s)	67.5	67.5	87.1	67.5	67.5			40.7			17.1	
Effective Green, g (s)	67.5	67.5	87.1	67.5	67.5			40.7			17.1	
Actuated g/C Ratio	0.57	0.57	0.73	0.57	0.57			0.34			0.14	
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5			5.5			5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	100	1121	1045	213	1118			546			225	
v/s Ratio Prot		0.39	0.03		c0.47			c0.12				
v/s Ratio Perm	0.01		0.10	0.06				c0.13			0.01	
v/c Ratio	0.01	0.69	0.17	0.10	0.83			0.76			0.06	
Uniform Delay, d1	11.3	18.3	4.9	11.9	21.0			34.8			44.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	3.4	0.1	0.9	7.0			5.9			0.1	
Delay (s)	11.5	21.8	5.0	12.8	28.0			40.8			44.2	
Level of Service	B	C	A	B	C			D			D	
Approach Delay (s)		18.3			27.7			40.8			44.2	
Approach LOS		B			C			D			D	

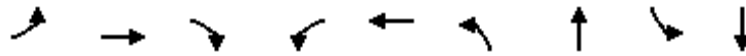
Intersection Summary

HCM Average Control Delay	26.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	119.2	Sum of lost time (s)	11.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Queues

21: Mt. Auburn Street & Bates Road East

1/28/2011



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	1	747	194	19	839	327	6	4	3	
Lane Group Flow (vph)	1	770	200	21	923	0	415	0	31	
Turn Type	Perm		pm+ov	Perm		pm+pt		Perm		
Protected Phases		6	7		2	7	4		8	9
Permitted Phases	6		6	2		4		8		
Detector Phase	6	6	7	2	2	7	4	8	8	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	7.0
Minimum Split (s)	25.5	25.5	8.0	25.5	25.5	8.0	25.5	9.5	9.5	23.0
Total Split (s)	73.0	73.0	11.0	73.0	73.0	11.0	44.0	33.0	33.0	23.0
Total Split (%)	52.1%	52.1%	7.9%	52.1%	52.1%	7.9%	31.4%	23.6%	23.6%	16%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	4.0	5.5	5.5	5.5	
Lead/Lag			Lead			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes			Yes		Yes	Yes	
Recall Mode	Max	Max	None	Max	Max	None	Max	None	None	None
v/c Ratio	0.01	0.67	0.18	0.10	0.81		0.79		0.11	
Control Delay	11.0	20.9	4.2	12.6	26.8		48.0		18.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	11.0	20.9	4.2	12.6	26.8		48.0		18.8	
Queue Length 50th (ft)	0	381	31	7	524		266		6	
Queue Length 95th (ft)	3	521	58	20	721		#426		21	
Internal Link Dist (ft)		1077			987		295		217	
Turn Bay Length (ft)	75		100	75						
Base Capacity (vph)	102	1142	1100	217	1139		528		396	
Starvation Cap Reductn	0	0	0	0	0		0		0	
Spillback Cap Reductn	0	0	0	0	0		0		0	
Storage Cap Reductn	0	0	0	0	0		0		0	
Reduced v/c Ratio	0.01	0.67	0.18	0.10	0.81		0.79		0.08	

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 117

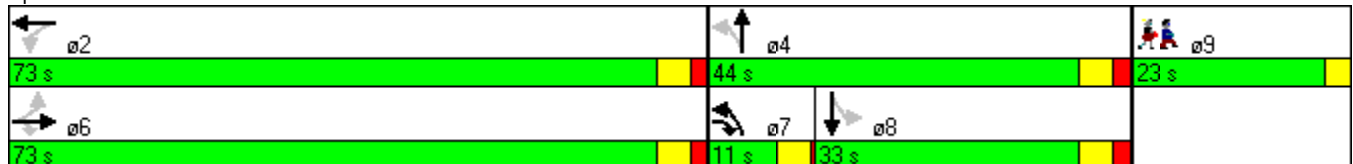
Natural Cycle: 140

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Mt. Auburn Street & Bates Road East



HCM Signalized Intersection Capacity Analysis
 24: Mt. Auburn Street & Boylston Street

1/28/2011

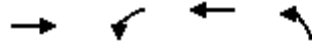


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	776	49	15	886	30	15
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.96	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	1940		1891	1952	1831	
Flt Permitted	1.00		0.26	1.00	0.97	
Satd. Flow (perm)	1940		521	1952	1831	
Peak-hour factor, PHF	0.97	0.97	0.93	0.93	0.77	0.77
Adj. Flow (vph)	800	51	16	953	39	19
RTOR Reduction (vph)	1	0	0	0	18	0
Lane Group Flow (vph)	850	0	16	953	40	0
Confl. Peds. (#/hr)		27	27		1	
Heavy Vehicles (%)	2%	2%	0%	0%	1%	1%
Bus Blockages (#/hr)	0	6	0	6	0	0
Parking (#/hr)		0				
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	52.2		52.2	52.2	4.3	
Effective Green, g (s)	52.2		52.2	52.2	4.3	
Actuated g/C Ratio	0.74		0.74	0.74	0.06	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1428		384	1437	111	
v/s Ratio Prot	0.44			c0.49	c0.02	
v/s Ratio Perm			0.03			
v/c Ratio	0.60		0.04	0.66	0.36	
Uniform Delay, d1	4.4		2.5	4.8	32.0	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.7		0.0	1.2	2.0	
Delay (s)	5.1		2.6	6.0	34.0	
Level of Service	A		A	A	C	
Approach Delay (s)	5.1			5.9	34.0	
Approach LOS	A			A	C	
Intersection Summary						
HCM Average Control Delay			6.4		HCM Level of Service	A
HCM Volume to Capacity ratio			0.64			
Actuated Cycle Length (s)			70.9		Sum of lost time (s)	14.4
Intersection Capacity Utilization			54.3%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues

24: Mt. Auburn Street & Boylston Street

1/28/2011



Lane Group	EBT	WBL	WBT	NBL	ø9
Lane Configurations	↻	↻	↻	↻	
Volume (vph)	776	15	886	30	
Lane Group Flow (vph)	851	16	953	58	
Turn Type	Perm				
Protected Phases	4		8	2	9
Permitted Phases		8			
Detector Phase	4	8	8	2	
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	22.0
Total Split (s)	48.0	48.0	48.0	20.0	22.0
Total Split (%)	53.3%	53.3%	53.3%	22.2%	24%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Min	Min	Min	None	None
v/c Ratio	0.53	0.04	0.59	0.26	
Control Delay	7.7	5.8	9.0	27.6	
Queue Delay	0.0	0.0	0.0	0.0	
Total Delay	7.7	5.8	9.0	27.6	
Queue Length 50th (ft)	94	1	117	15	
Queue Length 95th (ft)	526	13	#664	49	
Internal Link Dist (ft)	987		740	495	
Turn Bay Length (ft)		75			
Base Capacity (vph)	1573	422	1582	490	
Starvation Cap Reductn	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	
Storage Cap Reductn	0	0	0	0	
Reduced v/c Ratio	0.54	0.04	0.60	0.12	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 65.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 24: Mt. Auburn Street & Boylston Street



HCM Unsignalized Intersection Capacity Analysis
 31: Mt. Auburn Street & Winthrop Street

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻		↻	↻	↻	
Volume (veh/h)	763	15	10	905	25	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.91	0.91	0.84	0.84
Hourly flow rate (vph)	779	15	11	995	30	8
Pedestrians				4	18	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	820			738		
pX, platoon unblocked			0.75		0.67	0.75
vC, conflicting volume			812		1821	808
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			588		1152	583
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		79	98
cM capacity (veh/h)			734		143	382

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	794	11	995	38
Volume Left	0	11	0	30
Volume Right	15	0	0	8
cSH	1700	734	1700	165
Volume to Capacity	0.47	0.01	0.59	0.23
Queue Length 95th (ft)	0	1	0	21
Control Delay (s)	0.0	10.0	0.0	33.2
Lane LOS		A		D
Approach Delay (s)	0.0	0.1		33.2
Approach LOS				D

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		56.5%	ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

26: Mt. Auburn Street & Chauncey Street

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	
Volume (veh/h)	761	9	11	902	13	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.89	0.89	0.73	0.73
Hourly flow rate (vph)	777	9	12	1013	18	16
Pedestrians	3				24	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				2	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	1119			439		
pX, platoon unblocked			0.79		0.66	0.79
vC, conflicting volume			810		1846	805
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			622		1297	616
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		84	96
cM capacity (veh/h)			739		115	381

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	786	12	1013	34
Volume Left	0	12	0	18
Volume Right	9	0	0	16
cSH	1700	739	1700	173
Volume to Capacity	0.46	0.02	0.60	0.20
Queue Length 95th (ft)	0	1	0	18
Control Delay (s)	0.0	10.0	0.0	31.0
Lane LOS		A		D
Approach Delay (s)	0.0	0.1		31.0
Approach LOS				D

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		55.1%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

28: Mt. Auburn Street & School Street

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↖	↗		↖	↗	
Volume (vph)	86	654	33	32	769	75	44	387	77	71	200	100
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1859	1942		1843	1961	1573	1874	1916		1740	1741	
Flt Permitted	0.06	1.00		0.18	1.00	1.00	0.43	1.00		0.21	1.00	
Satd. Flow (perm)	118	1942		352	1961	1573	855	1916		385	1741	
Peak-hour factor, PHF	0.99	0.99	0.99	0.88	0.88	0.88	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	87	661	33	36	874	85	49	430	86	75	211	105
RTOR Reduction (vph)	0	1	0	0	0	9	0	0	0	0	0	0
Lane Group Flow (vph)	87	693	0	36	874	76	49	516	0	75	316	0
Confl. Peds. (#/hr)	13		37	37		13	5		19	19		5
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		6			2			3			8	
Permitted Phases	6			2		2	3			8		
Actuated Green, G (s)	66.2	66.2		66.2	66.2	66.2	49.8	49.8		49.8	49.8	
Effective Green, g (s)	66.2	66.2		66.2	66.2	66.2	49.8	49.8		49.8	49.8	
Actuated g/C Ratio	0.50	0.50		0.50	0.50	0.50	0.37	0.37		0.37	0.37	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	58	962		174	972	779	319	714		144	649	
v/s Ratio Prot		0.36			0.45			c0.27			0.18	
v/s Ratio Perm	c0.74			0.10		0.05	0.06			0.19		
v/c Ratio	1.50	0.72		0.21	0.90	0.10	0.15	0.72		0.52	0.49	
Uniform Delay, d1	33.7	26.4		18.9	30.7	17.9	27.9	36.0		32.6	32.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	295.8	4.6		2.7	12.9	0.2	1.0	6.3		12.8	2.6	
Delay (s)	329.5	31.1		21.6	43.5	18.1	28.9	42.2		45.4	34.7	
Level of Service	F	C		C	D	B	C	D		D	C	
Approach Delay (s)		64.3			40.6			41.1			36.8	
Approach LOS		E			D			D			D	

Intersection Summary

HCM Average Control Delay	46.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	133.6	Sum of lost time (s)	17.6
Intersection Capacity Utilization	133.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

28: Mt. Auburn Street & School Street

1/28/2011



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	86	654	32	769	75	44	387	71	200	
Lane Group Flow (vph)	87	694	36	874	85	49	516	75	316	
Turn Type	Perm		Perm		Perm	Perm		Perm		
Protected Phases		6		2			3		8	9
Permitted Phases	6		2		2	3		8		
Detector Phase	6	6	2	2	2	3	3	8	8	
Switch Phase										
Minimum Initial (s)	44.0	44.0	44.0	44.0	44.0	39.0	39.0	39.0	39.0	7.0
Minimum Split (s)	50.0	50.0	50.0	50.0	50.0	45.0	45.0	45.0	45.0	17.3
Total Split (s)	72.0	72.0	72.0	72.0	72.0	55.7	55.7	55.7	55.7	17.3
Total Split (%)	49.7%	49.7%	49.7%	49.7%	49.7%	38.4%	38.4%	38.4%	38.4%	12%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	Max	None
v/c Ratio	1.47	0.71	0.20	0.88	0.11	0.15	0.71	0.51	0.48	
Control Delay	318.0	30.9	23.7	41.6	14.9	30.2	41.9	48.2	34.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	318.0	30.9	23.7	41.6	14.9	30.2	41.9	48.2	34.8	
Queue Length 50th (ft)	~98	417	16	610	27	26	353	47	193	
Queue Length 95th (ft)	#188	716	48	#1049	68	66	585	123	339	
Internal Link Dist (ft)		359		1191			1065		1130	
Turn Bay Length (ft)	100		100		75	75		75		
Base Capacity (vph)	59	981	177	990	802	324	728	146	661	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.47	0.71	0.20	0.88	0.11	0.15	0.71	0.51	0.48	

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 131.2

Natural Cycle: 145

Control Type: Semi Act-Uncoord

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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






Queue shown is maximum after two cycles.

Queues

28: Mt. Auburn Street & School Street

1/28/2011




















Splits and Phases: 28: Mt. Auburn Street & School Street

 ø2	 ø3	 ø9
72 s	55.7 s	17.3 s
 ø6	 ø8	
72 s	55.7 s	

HCM Unsignalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

1/28/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	709	17	40	768	12	25	7	67	7	2	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.94	0.94	0.94	0.90	0.90	0.90	0.58	0.58	0.58
Hourly flow rate (vph)	13	762	18	43	817	13	28	8	74	12	3	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (ft)	1271					856						
pX, platoon unblocked	0.69			0.70			0.84	0.84	0.70	0.84	0.84	0.69
vC, conflicting volume	830			781			1706	1712	772	1775	1715	823
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	529			476			947	954	463	1029	958	520
tC, single (s)	4.1			4.1			7.1	6.7	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.2	3.3	3.5	4.0	3.3
p0 queue free %	98			94			85	96	82	91	98	99
cM capacity (veh/h)	724			770			188	190	416	135	202	387
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	13	781	43	830	110	21						
Volume Left	13	0	43	0	28	12						
Volume Right	0	18	0	13	74	5						
cSH	724	1700	770	1700	299	173						
Volume to Capacity	0.02	0.46	0.06	0.49	0.37	0.12						
Queue Length 95th (ft)	1	0	4	0	41	10						
Control Delay (s)	10.1	0.0	9.9	0.0	23.9	28.7						
Lane LOS	B		A		C	D						
Approach Delay (s)	0.2		0.5		23.9	28.7						
Approach LOS					C	D						
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			51.5%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
 1: Mt. Auburn Street & Upland Road

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	709	17	40	768	12	25	7	67	7	2	3
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.91			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1900	1955		1900	1957			1717			1876	
Flt Permitted	0.32	1.00		0.34	1.00			0.95			0.91	
Satd. Flow (perm)	644	1955		688	1957			1658			1766	
Peak-hour factor, PHF	0.93	0.93	0.93	0.94	0.94	0.94	0.90	0.90	0.90	0.58	0.58	0.58
Adj. Flow (vph)	13	762	18	43	817	13	28	8	74	12	3	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	12	0	0	1	0
Lane Group Flow (vph)	13	780	0	43	830	0	0	98	0	0	19	0
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	17%	5%	0%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									5
Turn Type	custom			custom			custom			custom		
Protected Phases												
Permitted Phases	2!	2!		2!	2!		6!	6!		6!	6!	
Actuated Green, G (s)	51.0	51.0		51.0	51.0			51.0			51.0	
Effective Green, g (s)	51.0	51.0		51.0	51.0			51.0			51.0	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.84			0.84	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	538	1635		575	1636			1386			1476	
v/s Ratio Prot												
v/s Ratio Perm	0.02	0.40		0.06	c0.42			0.06			0.01	
v/c Ratio	0.02	0.48		0.07	0.51			0.07			0.01	
Uniform Delay, d1	0.8	1.4		0.9	1.4			0.9			0.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	1.0		0.3	1.1			0.0			0.0	
Delay (s)	0.9	2.4		1.1	2.5			0.9			0.8	
Level of Service	A	A		A	A			A			A	
Approach Delay (s)		2.3			2.5			0.9			0.8	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	2.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

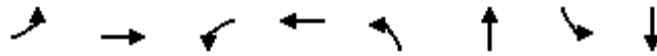
! Phase conflict between lane groups.

c Critical Lane Group

Queues

1: Mt. Auburn Street & Upland Road

1/28/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations									
Volume (vph)	12	709	40	768	25	7	7	2	
Lane Group Flow (vph)	13	780	43	830	0	110	0	20	
Turn Type	custom		custom		custom		custom		
Protected Phases									9
Permitted Phases	2!	2!	2!	2!	6!	6!	6!	6!	
Detector Phase	2	2	2	2	6	6	6	6	
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	7.0
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	23.0
Total Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	23.0
Total Split (%)	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	37%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Max	Max	Max	Max	None	None	None	None	None
v/c Ratio	0.02	0.43	0.07	0.46		0.07		0.01	
Control Delay	2.8	3.4	2.6	3.6		1.3		2.2	
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	2.8	3.4	2.6	3.6		1.3		2.2	
Queue Length 50th (ft)	0	0	0	0		0		0	
Queue Length 95th (ft)	8	289	18	323		21		5	
Internal Link Dist (ft)		1191		274		506		50	
Turn Bay Length (ft)	75		75						
Base Capacity (vph)	599	1819	640	1820		1547		1643	
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	0.02	0.43	0.07	0.46		0.07		0.01	

Intersection Summary

Cycle Length: 62

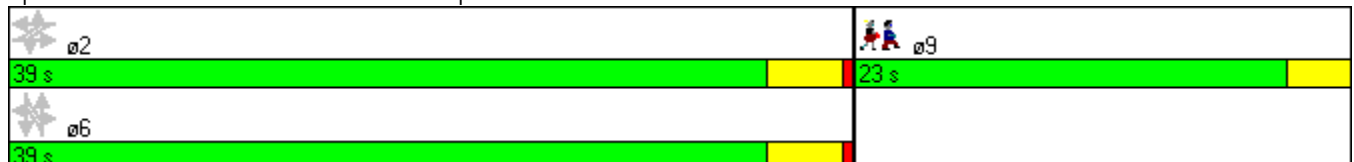
Actuated Cycle Length: 58.6

Natural Cycle: 65

Control Type: Semi Act-Uncoord

! Phase conflict between lane groups.

Splits and Phases: 1: Mt. Auburn Street & Upland Road



HCM Unsignalized Intersection Capacity Analysis

2: Mt. Auburn Street & Melendy Avenue

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↗
Volume (veh/h)	726	57	18	803	17	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	789	62	20	873	18	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	354			502		
pX, platoon unblocked			0.86		0.72	0.86
vC, conflicting volume			851		1732	820
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			745		1385	709
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		83	92
cM capacity (veh/h)			742		111	373

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	851	892	49
Volume Left	0	20	18
Volume Right	62	0	30
cSH	1700	742	198
Volume to Capacity	0.50	0.03	0.25
Queue Length 95th (ft)	0	2	23
Control Delay (s)	0.0	0.7	29.1
Lane LOS		A	D
Approach Delay (s)	0.0	0.7	29.1
Approach LOS			D

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

3: Mt. Auburn Street & Lloyd Road

1/28/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	27	727	809	18	4	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.50	0.50
Hourly flow rate (vph)	29	773	852	19	8	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		415	441			
pX, platoon unblocked	0.65				0.70	0.65
vC, conflicting volume	871				1692	861
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	529				1422	514
tC, single (s)	4.6				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.7				4.0	3.3
p0 queue free %	95				90	93
cM capacity (veh/h)	541				78	366

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	802	871	32
Volume Left	29	0	8
Volume Right	0	19	24
cSH	541	1700	191
Volume to Capacity	0.05	0.51	0.17
Queue Length 95th (ft)	4	0	15
Control Delay (s)	1.6	0.0	27.6
Lane LOS	A		D
Approach Delay (s)	1.6	0.0	27.6
Approach LOS			D

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		67.1%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

4: Mt. Auburn Street & Elton Avenue

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	689	42	35	827	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.93	0.93	0.25	0.25
Hourly flow rate (vph)	703	43	38	889	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	465			391		
pX, platoon unblocked			0.92	0.68	0.92	
vC, conflicting volume			746	1689	724	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			681	1517	658	
tC, single (s)			4.1	6.4	6.2	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			96	100	100	
cM capacity (veh/h)			848	86	431	

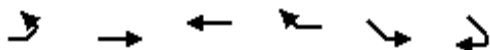
Direction, Lane #	EB 1	WB 1
Volume Total	746	927
Volume Left	0	38
Volume Right	43	0
cSH	1700	848
Volume to Capacity	0.44	0.04
Queue Length 95th (ft)	0	3
Control Delay (s)	0.0	1.2
Lane LOS		A
Approach Delay (s)	0.0	1.2
Approach LOS		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

5: Mt. Auburn Street & Irma Avenue

1/28/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↔	↔		↔	
Volume (veh/h)	26	663	851	18	6	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.90	0.90	0.72	0.72
Hourly flow rate (vph)	28	705	946	20	8	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		628	228			
pX, platoon unblocked	0.63				0.64	0.63
vC, conflicting volume	966				1716	956
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	656				1763	640
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				86	95
cM capacity (veh/h)	596				57	303

Direction, Lane #	EB 1	WB 1	SE 1
Volume Total	733	966	24
Volume Left	28	0	8
Volume Right	0	20	15
cSH	596	1700	121
Volume to Capacity	0.05	0.57	0.20
Queue Length 95th (ft)	4	0	17
Control Delay (s)	1.3	0.0	41.9
Lane LOS	A		E
Approach Delay (s)	1.3	0.0	41.9
Approach LOS			E

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		63.2%	ICU Level of Service
Analysis Period (min)		15	B

HCM Signalized Intersection Capacity Analysis

6: Mt. Auburn Street & Kimball Road

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Volume (vph)	15	595	59	25	772	39	81	105	103	11	12	16
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	3.0	3.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.95			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1710	3079		1710	1737			1658			1630	
Flt Permitted	0.19	1.00		0.34	1.00			0.89			0.86	
Satd. Flow (perm)	349	3079		613	1737			1489			1414	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.78	0.78	0.78	0.69	0.69	0.69
Adj. Flow (vph)	16	647	64	26	813	41	104	135	132	16	17	23
RTOR Reduction (vph)	0	4	0	0	1	0	0	15	0	0	17	0
Lane Group Flow (vph)	16	707	0	26	853	0	0	356	0	0	39	0
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	3%	2%	1%	10%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)		5							5			
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.0	85.0		82.0	82.0			36.0			36.0	
Effective Green, g (s)	85.0	85.0		82.0	82.0			36.0			36.0	
Actuated g/C Ratio	0.65	0.65		0.63	0.63			0.28			0.28	
Clearance Time (s)	3.0	3.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	228	2013		387	1096			412			392	
v/s Ratio Prot		0.23			c0.49							
v/s Ratio Perm	0.05			0.04				c0.24			0.03	
v/c Ratio	0.07	0.35		0.07	0.78			0.86			0.10	
Uniform Delay, d1	8.2	10.1		9.3	17.4			44.7			35.0	
Progression Factor	1.00	1.00		0.57	0.65			1.00			1.00	
Incremental Delay, d2	0.6	0.5		0.2	3.7			20.7			0.5	
Delay (s)	8.8	10.6		5.5	14.9			65.4			35.5	
Level of Service	A	B		A	B			E			D	
Approach Delay (s)		10.6			14.6			65.4			35.5	
Approach LOS		B			B			E			D	

Intersection Summary

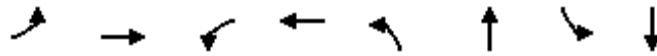
HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

6: Mt. Auburn Street & Kimball Road

1/28/2011

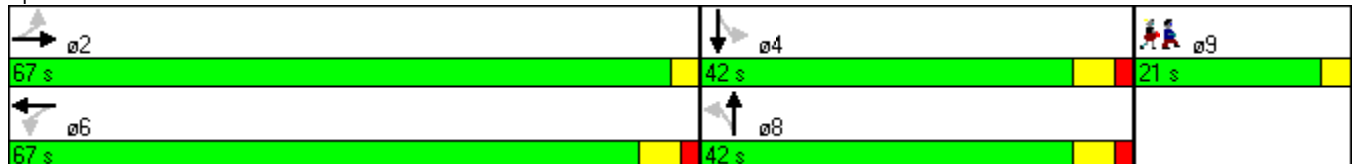


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations	↖	↗	↖	↗		↕		↕	
Volume (vph)	15	595	25	772	81	105	11	12	
Lane Group Flow (vph)	16	711	26	854	0	371	0	56	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		2		6		8		4	9
Permitted Phases	2		6		8		4		
Detector Phase	2	2	6	6	8	8	4	4	
Switch Phase									
Minimum Initial (s)	7.0	7.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0
Minimum Split (s)	35.0	35.0	35.0	35.0	17.0	17.0	17.0	17.0	21.0
Total Split (s)	67.0	67.0	67.0	67.0	42.0	42.0	42.0	42.0	21.0
Total Split (%)	51.5%	51.5%	51.5%	51.5%	32.3%	32.3%	32.3%	32.3%	16%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	None
v/c Ratio	0.07	0.35	0.07	0.78		0.87		0.14	
Control Delay	9.1	10.5	5.6	15.4		63.2		23.8	
Queue Delay	0.0	0.0	0.0	2.0		0.0		0.0	
Total Delay	9.1	10.5	5.6	17.5		63.2		23.8	
Queue Length 50th (ft)	5	129	4	483		284		21	
Queue Length 95th (ft)	14	164	m6	m156		339		38	
Internal Link Dist (ft)		148		118		676		475	
Turn Bay Length (ft)	75		75						
Base Capacity (vph)	228	2016	386	1097		428		408	
Starvation Cap Reductn	0	0	0	124		0		0	
Spillback Cap Reductn	0	84	0	0		0		0	
Storage Cap Reductn	0	0	0	0		0		0	
Reduced v/c Ratio	0.07	0.37	0.07	0.88		0.87		0.14	

Intersection Summary

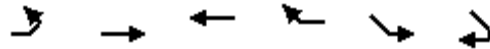
Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 29 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Mt. Auburn Street & Kimball Road



HCM Unsignalized Intersection Capacity Analysis
 7: Mt. Auburn Street & Templeton Parkway

1/28/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↔↔	↔		↔↔	
Volume (veh/h)	18	691	821	23	2	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.93	0.93	0.90	0.90
Hourly flow rate (vph)	19	735	883	25	2	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		198	170			
pX, platoon unblocked	0.63				0.67	0.63
vC, conflicting volume	908				1301	895
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	559				711	540
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				99	95
cM capacity (veh/h)	630				243	310

Direction, Lane #	EB 1	EB 2	WB 1	SE 1
Volume Total	264	490	908	19
Volume Left	19	0	0	2
Volume Right	0	0	25	17
cSH	630	1700	1700	300
Volume to Capacity	0.03	0.29	0.53	0.06
Queue Length 95th (ft)	2	0	0	5
Control Delay (s)	1.1	0.0	0.0	17.8
Lane LOS	A			C
Approach Delay (s)	0.4		0.0	17.8
Approach LOS				C

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		52.4%	ICU Level of Service
Analysis Period (min)		15	A

HCM Signalized Intersection Capacity Analysis
 8: Mt. Auburn Street & Arlington Street

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	507	93	213	504	39	291	708	220	17	433	49
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00	1.00		0.95	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1863	3593		1776	1908		1900	2000	1604		3624	
Flt Permitted	0.34	1.00		0.22	1.00		0.22	1.00	1.00		0.65	
Satd. Flow (perm)	671	3593		411	1908		439	2000	1604		2358	
Peak-hour factor, PHF	0.96	0.96	0.96	0.88	0.88	0.88	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	97	528	97	242	573	44	323	787	244	19	481	54
RTOR Reduction (vph)	0	12	0	0	2	0	0	0	88	0	0	0
Lane Group Flow (vph)	97	613	0	242	615	0	323	787	156	0	554	0
Heavy Vehicles (%)	2%	3%	5%	7%	4%	0%	0%	0%	6%	7%	3%	3%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			pm+pt			pm+pt		pm+ov	Perm		
Protected Phases		2		1	6		3	8	1		4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	39.2	39.2		62.4	62.4		53.0	53.0	72.2		33.0	
Effective Green, g (s)	39.2	39.2		62.4	62.4		53.0	53.0	72.2		33.0	
Actuated g/C Ratio	0.30	0.30		0.48	0.48		0.41	0.41	0.56		0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	202	1083		399	916		359	815	891		599	
v/s Ratio Prot		0.17		0.09	c0.32		0.11	c0.39	0.03			
v/s Ratio Perm	0.14			0.20			0.26		0.07		0.23	
v/c Ratio	0.48	0.57		0.61	0.67		0.90	0.97	0.17		0.92	
Uniform Delay, d1	37.1	38.2		22.7	25.9		29.6	37.6	14.2		47.3	
Progression Factor	0.79	0.79		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	7.3	2.0		2.6	3.9		27.8	24.2	0.1		20.2	
Delay (s)	36.6	32.3		25.3	29.9		57.4	61.8	14.3		67.5	
Level of Service	D	C		C	C		E	E	B		E	
Approach Delay (s)		32.8			28.6			52.2			67.5	
Approach LOS		C			C			D			E	

Intersection Summary

HCM Average Control Delay	44.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues

8: Mt. Auburn Street & Arlington Street

1/28/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	93	507	213	504	291	708	220	17	433	
Lane Group Flow (vph)	97	625	242	617	323	787	244	0	554	
Turn Type	Perm		pm+pt		pm+pt		pm+ov	Perm		
Protected Phases		2	1	6	3	8	1		4	9
Permitted Phases	2		6		8		8	4		
Detector Phase	2	2	1	6	3	8	1	4	4	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	7.0
Minimum Split (s)	40.0	40.0	8.0	40.0	19.0	25.0	8.0	25.0	25.0	21.0
Total Split (s)	44.0	44.0	8.0	52.0	20.0	57.0	8.0	37.0	37.0	21.0
Total Split (%)	33.8%	33.8%	6.2%	40.0%	15.4%	43.8%	6.2%	28.5%	28.5%	16%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lag	Lag	Lead		Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max	None	Min	Min	None
v/c Ratio	0.45	0.54	0.59	0.65	0.90	0.97	0.24		0.93	
Control Delay	35.0	29.7	31.4	29.7	57.7	62.2	3.3		70.2	
Queue Delay	0.0	1.2	0.0	1.4	0.0	148.0	0.0		0.0	
Total Delay	35.0	30.9	31.4	31.0	57.7	210.2	3.3		70.2	
Queue Length 50th (ft)	56	227	107	347	192	640	15		241	
Queue Length 95th (ft)	m122	m297	#358	#663	#327	#909	45		#353	
Internal Link Dist (ft)		90		1748		393			435	
Turn Bay Length (ft)	100						300			
Base Capacity (vph)	214	1162	407	952	359	815	1014		598	
Starvation Cap Reductn	0	314	0	0	0	230	0		0	
Spillback Cap Reductn	0	0	0	165	0	0	0		0	
Storage Cap Reductn	0	0	0	0	0	0	0		0	
Reduced v/c Ratio	0.45	0.74	0.59	0.78	0.90	1.35	0.24		0.93	

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 135

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.








m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Mt. Auburn Street & Arlington Street

1/28/2011

Splits and Phases: 8: Mt. Auburn Street & Arlington Street

 ø1 8 s	 ø2 44 s	 ø3 20 s	 ø4 37 s	 ø9 21 s
 ø6 52 s	 ø8 57 s			

HCM Signalized Intersection Capacity Analysis

10: Arlington Street & Tufts Medical Center

1/28/2011



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕	↕	↕	↕		↕	↕		↕	↕	
Volume (vph)	26	291	422	48	515	8	357	6	4	125	34	347
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		0.95	0.95		1.00	1.00	
Frt		1.00	0.85	1.00	1.00		1.00	1.00		1.00	0.86	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.95		0.95	1.00	
Satd. Flow (prot)		1891	1667	1863	1953		1770	1773		1743	1686	
Flt Permitted		0.88	1.00	0.43	1.00		0.95	0.95		0.95	1.00	
Satd. Flow (perm)		1663	1667	838	1953		1770	1773		1743	1686	
Peak-hour factor, PHF	0.87	0.87	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.66	0.92	0.66
Adj. Flow (vph)	30	334	459	52	542	8	388	7	4	189	37	526
RTOR Reduction (vph)	0	0	200	0	1	0	0	1	0	0	318	0
Lane Group Flow (vph)	0	364	259	52	549	0	198	200	0	189	245	0
Heavy Vehicles (%)	9%	5%	2%	2%	2%	14%	2%	2%	2%	9%	2%	2%
Turn Type	Perm	pm+ov		Perm	Split			Split				
Protected Phases		6	4		2		4	4		8	8	
Permitted Phases	6	6		2								
Actuated Green, G (s)		28.3	38.4	28.3	28.3		10.1	10.1		12.1	12.1	
Effective Green, g (s)		28.3	38.4	28.3	28.3		10.1	10.1		12.1	12.1	
Actuated g/C Ratio		0.42	0.56	0.42	0.42		0.15	0.15		0.18	0.18	
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		692	1039	349	813		263	263		310	300	
v/s Ratio Prot			0.04		c0.28		0.11	c0.11		0.11	c0.15	
v/s Ratio Perm		0.22	0.12	0.06								
v/c Ratio		0.53	0.25	0.15	0.68		0.75	0.76		0.61	0.82	
Uniform Delay, d1		14.8	7.5	12.4	16.1		27.8	27.8		25.8	26.9	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.8	0.6	0.2	2.2		18.0	18.6		3.4	15.6	
Delay (s)		17.7	8.1	12.6	18.4		45.7	46.4		29.2	42.5	
Level of Service		B	A	B	B		D	D		C	D	
Approach Delay (s)		12.3			17.9			46.0		39.1		
Approach LOS		B			B			D		D		

Intersection Summary

HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

10: Arlington Street & Tufts Medical Center

1/28/2011



Lane Group	SEL	SET	SER	NWL	NWT	NEL	NET	SWL	SWT	ø9
Lane Configurations		↕	↕	↕	↕	↕	↕	↕	↕	
Volume (vph)	26	291	422	48	515	357	6	125	34	
Lane Group Flow (vph)	0	364	459	52	550	198	201	189	563	
Turn Type	Perm		pm+ov	Perm		Split		Split		
Protected Phases		6	4		2	4	4	8	8	9
Permitted Phases	6		6	2						
Detector Phase	6	6	4	2	2	4	4	8	8	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	18.0
Total Split (s)	32.0	32.0	14.0	32.0	32.0	14.0	14.0	16.0	16.0	18.0
Total Split (%)	40.0%	40.0%	17.5%	40.0%	40.0%	17.5%	17.5%	20.0%	20.0%	23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Min	Min	Max	Max	None	None	None
v/c Ratio		0.51	0.37	0.14	0.65	0.73	0.73	0.59	0.90	
Control Delay		18.2	1.8	14.9	21.1	46.1	46.3	35.3	29.3	
Queue Delay		0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		18.2	2.0	14.9	21.1	46.1	46.3	35.3	29.3	
Queue Length 50th (ft)		91	0	11	149	74	75	65	60	
Queue Length 95th (ft)		228	41	44	#408	#230	#235	111	#299	
Internal Link Dist (ft)		393			505		52		96	
Turn Bay Length (ft)								150		
Base Capacity (vph)		717	1240	362	843	272	274	322	627	
Starvation Cap Reductn		0	165	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.51	0.43	0.14	0.65	0.73	0.73	0.59	0.90	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 65.6

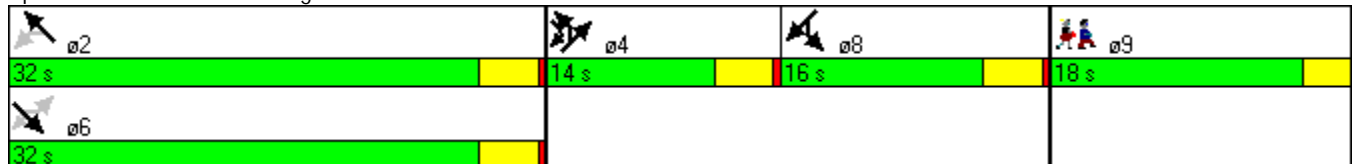
Natural Cycle: 80

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 10: Arlington Street & Tufts Medical Center



5.0 APPENDIX

5.8 Level-of-Service Analyses - Alternative 2

HCM Signalized Intersection Capacity Analysis

36: Mt. Auburn Street & Palfrey Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕				
Volume (vph)	110	741	149	55	848	85	73	169	65	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	16	16	16	12	12	12
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		0.95			0.95			1.00				
Frbp, ped/bikes		1.00			1.00			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		0.98			0.99			0.97				
Flt Protected		0.99			1.00			0.99				
Satd. Flow (prot)		3608			3622			2127				
Flt Permitted		0.64			0.80			0.99				
Satd. Flow (perm)		2334			2888			2127				
Peak-hour factor, PHF	0.92	0.89	0.89	0.94	0.94	0.92	0.67	0.92	0.67	0.92	0.92	0.92
Adj. Flow (vph)	120	833	167	59	902	92	109	184	97	0	0	0
RTOR Reduction (vph)	0	10	0	0	5	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1110	0	0	1048	0	0	390	0	0	0	0
Confl. Peds. (#/hr)			10	10			10		10			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	6	0	6	0	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Split					
Protected Phases		1			1		8	8				
Permitted Phases	1			1								
Actuated Green, G (s)		69.8			69.8			25.2				
Effective Green, g (s)		69.8			69.8			25.2				
Actuated g/C Ratio		0.63			0.63			0.23				
Clearance Time (s)		4.0			4.0			4.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1481			1833			487				
v/s Ratio Prot								c0.18				
v/s Ratio Perm		c0.48			0.36							
v/c Ratio		0.75			0.57			0.80				
Uniform Delay, d1		14.0			11.5			40.0				
Progression Factor		0.69			0.79			1.00				
Incremental Delay, d2		2.5			1.1			9.2				
Delay (s)		12.2			10.2			49.2				
Level of Service		B			B			D				
Approach Delay (s)		12.2			10.2			49.2			0.0	
Approach LOS		B			B			D			A	
Intersection Summary												
HCM Average Control Delay			17.0		HCM Level of Service			B				
HCM Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			110.0		Sum of lost time (s)			15.0				
Intersection Capacity Utilization			79.8%		ICU Level of Service			D				
Analysis Period (min)			15									

c Critical Lane Group

Queues

36: Mt. Auburn Street & Palfrey Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBT	ø2
Lane Configurations		↕↕		↕↕	↕	
Volume (vph)	110	741	55	848	169	
Lane Group Flow (vph)	0	1120	0	1053	390	
Turn Type	Perm		Perm			
Protected Phases		1		1	8	2
Permitted Phases	1		1			
Detector Phase	1	1	1	1	8	
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	4.0	7.0
Minimum Split (s)	17.0	17.0	17.0	17.0	20.0	23.0
Total Split (s)	62.0	62.0	62.0	62.0	25.0	23.0
Total Split (%)	56.4%	56.4%	56.4%	56.4%	22.7%	21%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	None
v/c Ratio		0.73		0.55	0.80	
Control Delay		12.5		10.2	53.8	
Queue Delay		0.0		0.0	0.0	
Total Delay		12.5		10.2	53.8	
Queue Length 50th (ft)		124		133	253	
Queue Length 95th (ft)		m#295		237	#464	
Internal Link Dist (ft)		491		164	368	
Turn Bay Length (ft)						
Base Capacity (vph)		1542		1899	487	
Starvation Cap Reductn		3		42	0	
Spillback Cap Reductn		1		0	0	
Storage Cap Reductn		0		0	0	
Reduced v/c Ratio		0.73		0.57	0.80	

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 108 (98%), Referenced to phase 1:EBWB, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 36: Mt. Auburn Street & Palfrey Street



HCM Unsignalized Intersection Capacity Analysis
 15: Mt. Auburn Street & Phillips Street

1/27/2011



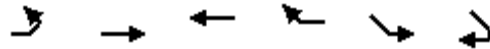
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	799	7	45	981	7	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.94	0.94	0.67	0.67
Hourly flow rate (vph)	898	8	48	1044	10	27
Pedestrians	25			18		
Lane Width (ft)	11.0			13.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	2			2		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	244			343		
pX, platoon unblocked				0.86	0.88	0.86
vC, conflicting volume				906	1544	471
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				556	612	49
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				94	97	97
cM capacity (veh/h)				866	350	856

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	599	307	396	696	37
Volume Left	0	0	48	0	10
Volume Right	0	8	0	0	27
cSH	1700	1700	866	1700	609
Volume to Capacity	0.35	0.18	0.06	0.41	0.06
Queue Length 95th (ft)	0	0	4	0	5
Control Delay (s)	0.0	0.0	1.7	0.0	11.3
Lane LOS	A			B	
Approach Delay (s)	0.0		0.6	11.3	
Approach LOS				B	

Intersection Summary					
Average Delay			0.5		
Intersection Capacity Utilization			66.0%	ICU Level of Service	C
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
 17: Mt. Auburn Street & Marshall Street

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↕↕	↕↕			
Volume (veh/h)	29	788	1026	37	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.94	0.94	0.67	0.67
Hourly flow rate (vph)	33	885	1091	39	0	0
Pedestrians		25	18		12	
Lane Width (ft)		12.0	12.0		0.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		2	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		347	240			
pX, platoon unblocked	0.80				0.86	0.80
vC, conflicting volume	1143				1649	602
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	674				745	0
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	100
cM capacity (veh/h)	713				288	853

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	328	590	728	403
Volume Left	33	0	0	0
Volume Right	0	0	0	39
cSH	713	1700	1700	1700
Volume to Capacity	0.05	0.35	0.43	0.24
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	1.5	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.5		0.0	
Approach LOS				

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		56.4%	ICU Level of Service
Analysis Period (min)		15	B

HCM Unsignalized Intersection Capacity Analysis
 19: Mt. Auburn Street & Parker Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Volume (veh/h)	781	7	9	1063	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.92	0.92	0.70	0.70
Hourly flow rate (vph)	964	9	10	1155	0	0
Pedestrians	14			10	19	
Lane Width (ft)	12.0			12.0	0.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	485			102		
pX, platoon unblocked				0.89	0.85	0.89
vC, conflicting volume				992	1599	515
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				732	738	194
tC, single (s)				4.2	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				99	100	100
cM capacity (veh/h)				757	292	716

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	643	330	395	770
Volume Left	0	0	10	0
Volume Right	0	9	0	0
cSH	1700	1700	757	1700
Volume to Capacity	0.38	0.19	0.01	0.45
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.0	0.0	0.4	0.0
Lane LOS	A			
Approach Delay (s)	0.0		0.1	
Approach LOS				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis

14: Mt. Auburn Street & Common Street

1/27/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	163	618	719	149	484	353
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1792	1592	3537		1863	1648
Flt Permitted	0.15	1.00	1.00		0.95	1.00
Satd. Flow (perm)	280	1592	3537		1863	1648
Peak-hour factor, PHF	0.81	0.81	0.92	0.92	0.97	0.97
Adj. Flow (vph)	201	763	782	162	499	364
RTOR Reduction (vph)	0	0	14	0	0	0
Lane Group Flow (vph)	201	763	930	0	499	364
Confl. Peds. (#/hr)	14			14	14	10
Heavy Vehicles (%)	6%	6%	4%	4%	2%	2%
Bus Blockages (#/hr)	0	9	0	9	0	0
Parking (#/hr)		5				
Turn Type	pm+pt				pm+ov	
Protected Phases	1	6	2		3	1
Permitted Phases	6					3
Actuated Green, G (s)	69.3	69.3	44.8		32.7	53.2
Effective Green, g (s)	69.3	69.3	44.8		32.7	53.2
Actuated g/C Ratio	0.63	0.63	0.41		0.30	0.48
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	458	1003	1441		554	857
v/s Ratio Prot	0.08	c0.48	0.26		c0.27	0.08
v/s Ratio Perm	0.19					0.14
v/c Ratio	0.44	0.76	0.65		0.90	0.42
Uniform Delay, d1	12.8	14.5	26.2		37.1	18.5
Progression Factor	1.45	0.47	1.00		1.00	1.00
Incremental Delay, d2	0.5	4.2	2.2		17.7	0.3
Delay (s)	19.1	11.0	28.5		54.8	18.8
Level of Service	B	B	C		D	B
Approach Delay (s)		12.7	28.5		39.6	
Approach LOS		B	C		D	

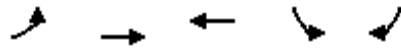
Intersection Summary

HCM Average Control Delay	26.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

14: Mt. Auburn Street & Common Street

1/27/2011



Lane Group	EBL	EBT	WBT	SBL	SBR	ø9
Lane Configurations						
Volume (vph)	163	618	719	484	353	
Lane Group Flow (vph)	201	763	944	499	364	
Turn Type	pm+pt				pm+ov	
Protected Phases	1	6	2	3	1	9
Permitted Phases	6				3	
Detector Phase	1	6	2	3	1	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	7.0
Minimum Split (s)	8.0	20.0	20.0	8.0	8.0	23.0
Total Split (s)	10.0	48.0	38.0	39.0	10.0	23.0
Total Split (%)	9.1%	43.6%	34.5%	35.5%	9.1%	21%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead		Lag		Lead	
Lead-Lag Optimize?	Yes		Yes		Yes	
Recall Mode	None	C-Max	C-Max	Min	None	None
v/c Ratio	0.44	0.76	0.65	0.90	0.46	
Control Delay	16.7	11.8	28.7	57.6	18.1	
Queue Delay	0.0	0.5	0.0	0.0	0.0	
Total Delay	16.7	12.2	28.7	57.6	18.1	
Queue Length 50th (ft)	37	192	273	327	150	
Queue Length 95th (ft)	m94	176	366	#503	205	
Internal Link Dist (ft)		22	1076	686		
Turn Bay Length (ft)						
Base Capacity (vph)	458	1003	1452	593	797	
Starvation Cap Reductn	0	44	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.44	0.80	0.65	0.84	0.46	

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.






m Volume for 95th percentile queue is metered by upstream signal.

Queues

14: Mt. Auburn Street & Common Street

1/27/2011

Splits and Phases: 14: Mt. Auburn Street & Common Street

 ø1	 ø2	 ø3	 ø9
10 s	38 s	39 s	23 s
 ø6			
48 s			

HCM Signalized Intersection Capacity Analysis

21: Mt. Auburn Street & Bates Road East

2/24/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	842	341	19	886	8	173	1	17	14	10	6
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99			1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.99			0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96			0.98	
Satd. Flow (prot)	1857	1961	1392	1857	1958			1861			1888	
Flt Permitted	0.11	1.00	1.00	0.09	1.00			0.72			0.85	
Satd. Flow (perm)	211	1961	1392	179	1958			1402			1646	
Peak-hour factor, PHF	0.90	0.90	0.90	0.98	0.98	0.98	0.74	0.74	0.74	0.85	0.85	0.85
Adj. Flow (vph)	1	936	379	19	904	8	234	1	23	16	12	7
RTOR Reduction (vph)	0	0	65	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1	936	314	19	912	0	0	258	0	0	35	0
Confl. Peds. (#/hr)	17		20	20		17	7		1	1		7
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			0									0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		3			3			1				1
Permitted Phases	3		3	3			1			1		
Actuated Green, G (s)	46.4	46.4	46.4	46.4	46.4			18.4			18.4	
Effective Green, g (s)	46.4	46.4	46.4	46.4	46.4			18.4			18.4	
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56			0.22			0.22	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	119	1103	783	101	1101			313			367	
v/s Ratio Prot		c0.48			0.47							
v/s Ratio Perm	0.00		0.23	0.11				c0.18			0.02	
v/c Ratio	0.01	0.85	0.40	0.19	0.83			0.82			0.10	
Uniform Delay, d1	7.9	15.1	10.2	8.8	14.8			30.5			25.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	8.2	1.5	4.1	7.2			16.0			0.1	
Delay (s)	8.1	23.3	11.7	12.9	22.0			46.5			25.6	
Level of Service	A	C	B	B	C			D			C	
Approach Delay (s)		19.9			21.8			46.5			25.6	
Approach LOS		B			C			D			C	

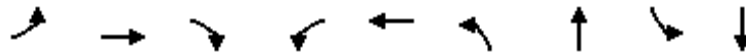
Intersection Summary

HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	82.5	Sum of lost time (s)	17.7
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

21: Mt. Auburn Street & Bates Road East

2/24/2011



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations										
Volume (vph)	1	842	341	19	886	173	1	14	10	
Lane Group Flow (vph)	1	936	379	19	912	0	258	0	35	
Turn Type	Perm		Perm	Perm		Perm		Perm		
Protected Phases		3			3		1		1	2
Permitted Phases	3		3	3		1		1		
Detector Phase	3	3	3	3	3	1	1	1	1	
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	1.0
Minimum Split (s)	17.0	17.0	17.0	17.0	17.0	16.0	16.0	16.0	16.0	19.0
Total Split (s)	52.0	52.0	52.0	52.0	52.0	24.4	24.4	24.4	24.4	19.0
Total Split (%)	54.5%	54.5%	54.5%	54.5%	54.5%	25.6%	25.6%	25.6%	25.6%	20%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag						Lead	Lead	Lead	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	Min	Min	Min	Min	None
v/c Ratio	0.01	0.82	0.44	0.18	0.80		0.80		0.09	
Control Delay	11.0	23.2	8.4	16.3	22.1		51.1		27.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	11.0	23.2	8.4	16.3	22.1		51.1		27.5	
Queue Length 50th (ft)	0	304	47	4	289		114		13	
Queue Length 95th (ft)	3	#823	169	25	#795		#224		42	
Internal Link Dist (ft)		1076			987		295		217	
Turn Bay Length (ft)	75		100	75						
Base Capacity (vph)	122	1136	867	104	1135		324		381	
Starvation Cap Reductn	0	0	0	0	0		0		0	
Spillback Cap Reductn	0	0	0	0	0		0		0	
Storage Cap Reductn	0	0	0	0	0		0		0	
Reduced v/c Ratio	0.01	0.82	0.44	0.18	0.80		0.80		0.09	

Intersection Summary

Cycle Length: 95.4

Actuated Cycle Length: 80

Natural Cycle: 90

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Mt. Auburn Street & Bates Road East



HCM Signalized Intersection Capacity Analysis

24: Mt. Auburn Street & Boylston Street

1/27/2011

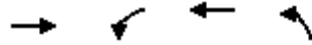


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩		↩	↩	↩	
Volume (vph)	793	103	22	716	95	72
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.94	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	1904		1859	1890	1832	
Flt Permitted	1.00		0.09	1.00	0.97	
Satd. Flow (perm)	1904		178	1890	1832	
Peak-hour factor, PHF	0.92	0.92	0.94	0.94	0.43	0.43
Adj. Flow (vph)	862	112	23	762	221	167
RTOR Reduction (vph)	4	0	0	0	29	0
Lane Group Flow (vph)	970	0	23	762	359	0
Confl. Peds. (#/hr)		16	16		1	
Heavy Vehicles (%)	3%	3%	2%	2%	0%	0%
Bus Blockages (#/hr)	0	9	0	9	0	0
Parking (#/hr)		0				
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	44.0		44.0	44.0	17.2	
Effective Green, g (s)	44.0		44.0	44.0	17.2	
Actuated g/C Ratio	0.58		0.58	0.58	0.23	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1101		103	1093	414	
v/s Ratio Prot	c0.51			0.40	c0.20	
v/s Ratio Perm			0.13			
v/c Ratio	0.88		0.22	0.70	0.87	
Uniform Delay, d1	13.8		7.8	11.3	28.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	8.4		1.1	2.0	17.2	
Delay (s)	22.2		8.9	13.3	45.6	
Level of Service	C		A	B	D	
Approach Delay (s)	22.2			13.2	45.6	
Approach LOS	C			B	D	
Intersection Summary						
HCM Average Control Delay			23.1		HCM Level of Service	C
HCM Volume to Capacity ratio			0.88			
Actuated Cycle Length (s)			76.1		Sum of lost time (s)	14.9
Intersection Capacity Utilization			61.6%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Queues

24: Mt. Auburn Street & Boylston Street

1/27/2011



Lane Group	EBT	WBL	WBT	NBL	ø9
Lane Configurations	→	↵	→	↵	
Volume (vph)	793	22	716	95	
Lane Group Flow (vph)	974	23	762	388	
Turn Type	Perm				
Protected Phases	4		8	2	9
Permitted Phases		8			
Detector Phase	4	8	8	2	
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	22.0
Total Split (s)	47.0	47.0	47.0	21.0	22.0
Total Split (%)	52.2%	52.2%	52.2%	23.3%	24%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Min	Min	Min	None	None
v/c Ratio	0.84	0.21	0.67	0.84	
Control Delay	22.6	16.4	15.6	43.8	
Queue Delay	0.0	0.0	0.0	0.0	
Total Delay	22.6	16.4	15.6	43.8	
Queue Length 50th (ft)	260	4	169	137	
Queue Length 95th (ft)	#854	30	#589	116	
Internal Link Dist (ft)	987		740	495	
Turn Bay Length (ft)		25			
Base Capacity (vph)	1153	108	1141	461	
Starvation Cap Reductn	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	
Storage Cap Reductn	0	0	0	0	
Reduced v/c Ratio	0.84	0.21	0.67	0.84	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 72.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 24: Mt. Auburn Street & Boylston Street



HCM Unsignalized Intersection Capacity Analysis

31: Mt. Auburn Street & Winthrop Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→		↙	↑	↘	
Volume (veh/h)	826	39	20	698	18	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.93	0.93	0.59	0.59
Hourly flow rate (vph)	879	41	22	751	31	22
Pedestrians				23	14	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				2	1	
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)	820		738			
pX, platoon unblocked			0.55		0.72	0.55
vC, conflicting volume			934		1707	936
vC1, stage 1 conf vol					913	
vC2, stage 2 conf vol					794	
vCu, unblocked vol			476		766	480
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			96		91	93
cM capacity (veh/h)			587		329	316

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	920	22	751	53
Volume Left	0	22	0	31
Volume Right	41	0	0	22
cSH	1700	587	1700	324
Volume to Capacity	0.54	0.04	0.44	0.16
Queue Length 95th (ft)	0	3	0	14
Control Delay (s)	0.0	11.4	0.0	18.3
Lane LOS		B		C
Approach Delay (s)	0.0	0.3		18.3
Approach LOS				C

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		59.0%	ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

26: Mt. Auburn Street & Chauncey Street

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩		↩	↩	↩	
Volume (veh/h)	795	44	55	698	20	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.97	0.97	0.59	0.59
Hourly flow rate (vph)	883	49	57	720	34	46
Pedestrians	6				31	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	1				3	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh	2			2		
Upstream signal (ft)	1119			439		
pX, platoon unblocked			0.58		0.75	0.58
vC, conflicting volume			963		1778	939
vC1, stage 1 conf vol					939	
vC2, stage 2 conf vol					839	
vCu, unblocked vol			577		880	535
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			90		88	85
cM capacity (veh/h)			559		288	306

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	932	57	720	80
Volume Left	0	57	0	34
Volume Right	49	0	0	46
cSH	1700	559	1700	298
Volume to Capacity	0.55	0.10	0.42	0.27
Queue Length 95th (ft)	0	8	0	26
Control Delay (s)	0.0	12.2	0.0	21.4
Lane LOS		B		C
Approach Delay (s)	0.0	0.9		21.4
Approach LOS				C

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		53.4%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

28: Mt. Auburn Street & School Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	726	20	45	642	34	19	138	44	88	417	92
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)	4.0	6.0		6.0	6.0	4.0	6.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	0.97	1.00		0.99	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1809	1895		1798	1905	1504	1743	1791		1729	1759	
Flt Permitted	0.11	1.00		0.08	1.00	1.00	0.24	1.00		0.37	1.00	
Satd. Flow (perm)	212	1895		154	1905	1504	433	1791		666	1759	
Peak-hour factor, PHF	0.86	0.86	0.86	0.92	0.92	0.92	0.78	0.78	0.78	0.93	0.93	0.93
Adj. Flow (vph)	88	844	23	49	698	37	24	177	56	95	448	99
RTOR Reduction (vph)	0	0	0	0	0	6	0	0	0	0	0	0
Lane Group Flow (vph)	88	867	0	49	698	31	24	233	0	95	547	0
Confl. Peds. (#/hr)	26		29	29		26	33		19	19		33
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	6%	6%	6%	2%	2%	2%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	pm+pt			Perm		pm+ov	Perm			pm+pt		
Protected Phases	1	6			2	4		3		4	8	
Permitted Phases	6			2		2	3			8		
Actuated Green, G (s)	57.2	57.2		49.2	49.2	60.0	23.9	23.9		38.7	38.7	
Effective Green, g (s)	57.2	57.2		49.2	49.2	60.0	23.9	23.9		38.7	38.7	
Actuated g/C Ratio	0.51	0.51		0.44	0.44	0.53	0.21	0.21		0.34	0.34	
Clearance Time (s)	4.0	6.0		6.0	6.0	4.0	6.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	164	959		67	829	799	92	379		330	602	
v/s Ratio Prot	0.02	c0.46			0.37	0.00		0.13		0.03	c0.31	
v/s Ratio Perm	0.25			0.32		0.02	0.06			0.07		
v/c Ratio	0.54	0.90		0.73	0.84	0.04	0.26	0.61		0.29	0.91	
Uniform Delay, d1	21.9	25.4		26.4	28.4	12.7	37.2	40.4		26.5	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.4	13.4		51.3	10.1	0.0	1.5	3.0		0.5	17.5	
Delay (s)	25.2	38.8		77.8	38.6	12.7	38.7	43.3		26.9	53.0	
Level of Service	C	D		E	D	B	D	D		C	D	
Approach Delay (s)		37.6			39.8			42.9			49.1	
Approach LOS		D			D			D			D	

Intersection Summary

HCM Average Control Delay	41.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	109.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

28: Mt. Auburn Street & School Street

1/27/2011

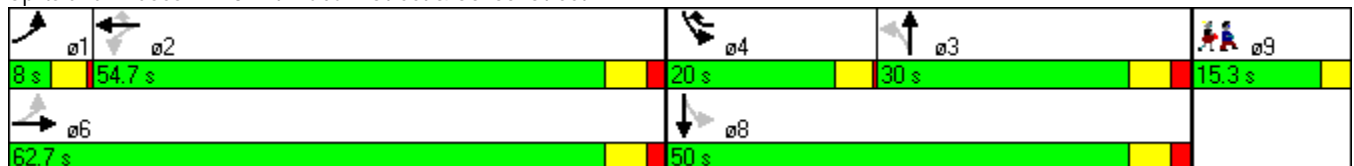


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	76	726	45	642	34	19	138	88	417	
Lane Group Flow (vph)	88	867	49	698	37	24	233	95	547	
Turn Type	pm+pt		Perm		pm+ov	Perm		pm+pt		
Protected Phases	1	6		2	4		3	4	8	9
Permitted Phases	6		2		2	3		8		
Detector Phase	1	6	2	2	4	3	3	4	8	
Switch Phase										
Minimum Initial (s)	4.0	20.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	1.0
Minimum Split (s)	8.0	40.0	30.0	30.0	20.0	30.0	30.0	20.0	20.0	15.3
Total Split (s)	8.0	62.7	54.7	54.7	20.0	30.0	30.0	20.0	50.0	15.3
Total Split (%)	6.3%	49.0%	42.7%	42.7%	15.6%	23.4%	23.4%	15.6%	39.1%	12%
Yellow Time (s)	3.5	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	3.0
All-Red Time (s)	0.5	2.0	2.0	2.0	0.5	2.0	2.0	0.5	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	Max	Max	Max	None	Min	Min	None	Min	None
v/c Ratio	0.51	0.88	0.72	0.83	0.04	0.26	0.61	0.27	0.89	
Control Delay	28.1	37.9	85.3	38.5	9.1	45.9	47.2	26.1	52.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	28.1	37.9	85.3	38.5	9.1	45.9	47.2	26.1	52.2	
Queue Length 50th (ft)	29	524	28	423	7	14	143	42	346	
Queue Length 95th (ft)	70	#946	#120	#814	27	39	226	94	#644	
Internal Link Dist (ft)		359		1191			1065		1130	
Turn Bay Length (ft)	100		100		75	75		75		
Base Capacity (vph)	171	980	68	846	921	103	426	400	706	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.51	0.88	0.72	0.83	0.04	0.23	0.55	0.24	0.77	

Intersection Summary

Cycle Length: 128
 Actuated Cycle Length: 110.6
 Natural Cycle: 130
 Control Type: Semi Act-Uncoord
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 28: Mt. Auburn Street & School Street



HCM Unsignalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	865	22	40	578	3	28	2	42	6	6	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.74	0.74	0.74	0.75	0.75	0.75
Hourly flow rate (vph)	11	930	24	42	608	3	38	3	57	8	8	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL					None						
Median storage (veh)	2											
Upstream signal (ft)	1271					856						
pX, platoon unblocked	0.84			0.55			0.63	0.63	0.55	0.63	0.63	0.84
vC, conflicting volume	612			954			1676	1659	942	1704	1669	610
vC1, stage 1 conf vol							963	963		694	694	
vC2, stage 2 conf vol							713	696		1010	975	
vCu, unblocked vol	437			508			1194	1167	486	1238	1183	435
tC, single (s)	4.1			4.1			7.1	6.7	6.2	7.3	6.5	6.4
tC, 2 stage (s)							6.1	5.7		6.3	5.5	
tF (s)	2.2			2.2			3.5	4.2	3.3	3.7	4.0	3.5
p0 queue free %	99			93			84	99	82	95	96	97
cM capacity (veh/h)	947			588			237	236	317	149	221	492

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	954	42	612	97	32
Volume Left	11	0	42	0	38	8
Volume Right	0	24	0	3	57	16
cSH	947	1700	588	1700	278	261
Volume to Capacity	0.01	0.56	0.07	0.36	0.35	0.12
Queue Length 95th (ft)	1	0	6	0	38	10
Control Delay (s)	8.8	0.0	11.6	0.0	24.8	20.7
Lane LOS	A		B		C	C
Approach Delay (s)	0.1		0.7		24.8	20.7
Approach LOS					C	C

Intersection Summary

Average Delay	2.1
Intersection Capacity Utilization	57.7%
ICU Level of Service	B
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

2/24/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	865	22	40	578	3	28	2	42	6	6	12
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.92			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1900	1900		1900	1941			1722			1616	
Flt Permitted	0.42	1.00		0.27	1.00			0.92			0.97	
Satd. Flow (perm)	847	1900		539	1941			1618			1580	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.74	0.74	0.74	0.75	0.75	0.75
Adj. Flow (vph)	11	930	24	42	608	3	38	3	57	8	8	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	9	0	0	3	0
Lane Group Flow (vph)	11	954	0	42	611	0	0	89	0	0	29	0
Heavy Vehicles (%)	0%	5%	0%	0%	3%	0%	4%	17%	5%	20%	0%	18%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5									5
Turn Type	custom			custom			custom			custom		
Protected Phases												
Permitted Phases	2!	2!		2!	2!		6!	6!		6!	6!	
Actuated Green, G (s)	51.0	51.0		51.0	51.0			51.0			51.0	
Effective Green, g (s)	51.0	51.0		51.0	51.0			51.0			51.0	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.84			0.84	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	708	1589		451	1623			1353			1321	
v/s Ratio Prot												
v/s Ratio Perm	0.01	c0.50		0.08	0.31			0.05			0.02	
v/c Ratio	0.02	0.60		0.09	0.38			0.07			0.02	
Uniform Delay, d1	0.8	1.6		0.9	1.2			0.9			0.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	1.7		0.4	0.7			0.1			0.0	
Delay (s)	0.9	3.3		1.3	1.9			1.0			0.9	
Level of Service	A	A		A	A			A			A	
Approach Delay (s)		3.3			1.8			1.0			0.9	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	2.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

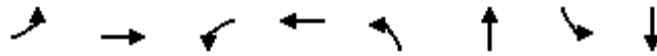
! Phase conflict between lane groups.

c Critical Lane Group

Queues

1: Mt. Auburn Street & Upland Road

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations									
Volume (vph)	10	865	40	578	28	2	6	6	
Lane Group Flow (vph)	11	954	42	611	0	98	0	32	
Turn Type	custom		custom		custom		custom		
Protected Phases									9
Permitted Phases	2!	2!	2!	2!	6!	6!	6!	6!	
Detector Phase	2	2	2	2	6	6	6	6	
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	23.0
Total Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	23.0
Total Split (%)	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	37%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	None
v/c Ratio	0.01	0.54	0.08	0.34		0.07		0.02	
Control Delay	2.6	4.6	2.9	2.8		1.5		1.8	
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	2.6	4.6	2.9	2.8		1.5		1.8	
Queue Length 50th (ft)	0	0	0	0		0		0	
Queue Length 95th (ft)	7	445	19	199		15		8	
Internal Link Dist (ft)		1191		274		506		50	
Turn Bay Length (ft)	50		50						
Base Capacity (vph)	789	1766	502	1804		1507		1469	
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	0.01	0.54	0.08	0.34		0.07		0.02	

Intersection Summary

Cycle Length: 62

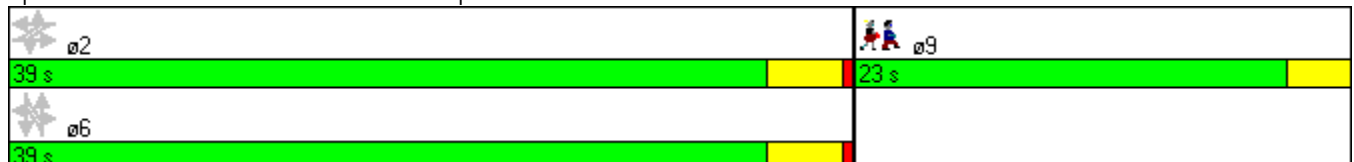
Actuated Cycle Length: 58.6

Natural Cycle: 65

Control Type: Semi Act-Uncoord

! Phase conflict between lane groups.

Splits and Phases: 1: Mt. Auburn Street & Upland Road



HCM Unsignalized Intersection Capacity Analysis

2: Mt. Auburn Street & Melendy Avenue

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	900	13	14	611	10	43
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	957	14	15	643	11	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	354			502		
pX, platoon unblocked			0.76		0.86	0.76
vC, conflicting volume			971		1637	964
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			804		1127	795
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		94	84
cM capacity (veh/h)			623		190	294

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	971	658	58
Volume Left	0	15	11
Volume Right	14	0	47
cSH	1700	623	267
Volume to Capacity	0.57	0.02	0.22
Queue Length 95th (ft)	0	2	20
Control Delay (s)	0.0	0.7	22.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.7	22.2
Approach LOS			C

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		55.7%	ICU Level of Service
Analysis Period (min)		15	B

HCM Unsignalized Intersection Capacity Analysis

3: Mt. Auburn Street & Lloyd Road

1/27/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	935	619	1	2	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.50	0.50
Hourly flow rate (vph)	9	995	652	1	4	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		415	441			
pX, platoon unblocked	0.79				0.87	0.79
vC, conflicting volume	653				1664	652
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	428				1146	427
tC, single (s)	4.6				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.7				4.0	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	725				153	496

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1003	653	16
Volume Left	9	0	4
Volume Right	0	1	12
cSH	725	1700	318
Volume to Capacity	0.01	0.38	0.05
Queue Length 95th (ft)	1	0	4
Control Delay (s)	0.4	0.0	16.9
Lane LOS	A		C
Approach Delay (s)	0.4	0.0	16.9
Approach LOS			C

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		62.8%	ICU Level of Service
Analysis Period (min)		15	B

HCM Unsignalized Intersection Capacity Analysis

4: Mt. Auburn Street & Elton Avenue

1/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔			
Volume (veh/h)	838	99	54	620	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.96	0.96	0.25	0.25
Hourly flow rate (vph)	911	108	56	646	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	465			391		
pX, platoon unblocked				0.76	0.88	0.76
vC, conflicting volume	1018			1723	965	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	871			1178	800	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	91			100	100	
cM capacity (veh/h)	599			168	294	

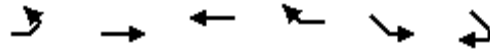
Direction, Lane #	EB 1	WB 1
Volume Total	1018	702
Volume Left	0	56
Volume Right	108	0
cSH	1700	599
Volume to Capacity	0.60	0.09
Queue Length 95th (ft)	0	8
Control Delay (s)	0.0	2.6
Lane LOS		A
Approach Delay (s)	0.0	2.6
Approach LOS		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

5: Mt. Auburn Street & Irma Avenue

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↔	↔		↔	
Volume (veh/h)	8	830	619	8	24	55
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.68	0.68
Hourly flow rate (vph)	9	892	703	9	35	81
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		628	228			
pX, platoon unblocked	0.76				0.84	0.76
vC, conflicting volume	712				1618	708
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	463				1228	457
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				79	82
cM capacity (veh/h)	842				164	458

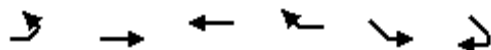
Direction, Lane #	EB 1	WB 1	SE 1
Volume Total	901	712	116
Volume Left	9	0	35
Volume Right	0	9	81
cSH	842	1700	297
Volume to Capacity	0.01	0.42	0.39
Queue Length 95th (ft)	1	0	45
Control Delay (s)	0.3	0.0	24.7
Lane LOS	A		C
Approach Delay (s)	0.3	0.0	24.7
Approach LOS			C

Intersection Summary			
Average Delay		1.8	
Intersection Capacity Utilization	58.7%		ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

7: Mt. Auburn Street & Templeton Parkway

1/27/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↕↕	↔		↕↕	
Volume (veh/h)	2	907	626	1	3	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.95	0.95	0.79	0.79
Hourly flow rate (vph)	2	1008	659	1	4	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		198	170			
pX, platoon unblocked	0.77				0.85	0.77
vC, conflicting volume	660				1168	659
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	411				381	410
tC, single (s)	4.1				7.5	7.3
tC, 2 stage (s)						
tF (s)	2.2				3.8	3.5
p0 queue free %	100				99	94
cM capacity (veh/h)	894				443	421

Direction, Lane #	EB 1	EB 2	WB 1	SE 1
Volume Total	338	672	660	29
Volume Left	2	0	0	4
Volume Right	0	0	1	25
cSH	894	1700	1700	423
Volume to Capacity	0.00	0.40	0.39	0.07
Queue Length 95th (ft)	0	0	0	6
Control Delay (s)	0.1	0.0	0.0	14.1
Lane LOS	A			B
Approach Delay (s)	0.0		0.0	14.1
Approach LOS				B

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		41.4%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

6: Mt. Auburn Street & Kimball Road

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Volume (vph)	11	769	74	46	581	19	34	29	99	41	56	12
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1555	2995		1676	1709			1559			1722	
Flt Permitted	0.30	1.00		0.24	1.00			0.91			0.72	
Satd. Flow (perm)	486	2995		418	1709			1428			1271	
Peak-hour factor, PHF	0.85	0.85	0.85	0.91	0.91	0.91	0.68	0.68	0.68	0.77	0.77	0.77
Adj. Flow (vph)	13	905	87	51	638	21	50	43	146	53	73	16
RTOR Reduction (vph)	0	5	0	0	1	0	0	0	0	0	4	0
Lane Group Flow (vph)	13	987	0	51	658	0	0	239	0	0	138	0
Heavy Vehicles (%)	10%	6%	2%	2%	5%	0%	7%	12%	2%	0%	2%	0%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)		5							5			
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	71.4	71.4		71.4	71.4			27.0			27.0	
Effective Green, g (s)	71.4	71.4		71.4	71.4			27.0			27.0	
Actuated g/C Ratio	0.62	0.62		0.62	0.62			0.23			0.23	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	302	1860		260	1061			335			298	
v/s Ratio Prot		0.33			c0.39							
v/s Ratio Perm	0.03			0.12				c0.17			0.11	
v/c Ratio	0.04	0.53		0.20	0.62			0.71			0.46	
Uniform Delay, d1	8.5	12.3		9.4	13.4			40.4			37.8	
Progression Factor	1.00	1.00		0.47	0.41			1.00			1.00	
Incremental Delay, d2	0.3	1.1		1.4	2.3			7.0			5.1	
Delay (s)	8.8	13.4		5.9	7.9			47.5			42.9	
Level of Service	A	B		A	A			D			D	
Approach Delay (s)		13.4			7.7			47.5			42.9	
Approach LOS		B			A			D			D	

Intersection Summary

HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

6: Mt. Auburn Street & Kimball Road

1/27/2011

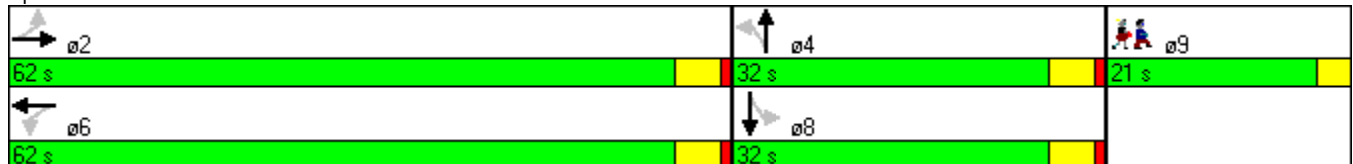


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations									
Volume (vph)	11	769	46	581	34	29	41	56	
Lane Group Flow (vph)	13	992	51	659	0	239	0	142	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		2		6		4		8	9
Permitted Phases	2		6		4		8		
Detector Phase	2	2	6	6	4	4	8	8	
Switch Phase									
Minimum Initial (s)	7.0	7.0	8.0	8.0	8.0	8.0	8.0	8.0	1.0
Minimum Split (s)	23.0	23.0	20.0	20.0	13.0	13.0	13.0	13.0	21.0
Total Split (s)	62.0	62.0	62.0	62.0	32.0	32.0	32.0	32.0	21.0
Total Split (%)	53.9%	53.9%	53.9%	53.9%	27.8%	27.8%	27.8%	27.8%	18%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Max	Max	None
v/c Ratio	0.04	0.52	0.19	0.60		0.71		0.47	
Control Delay	11.3	13.4	7.0	8.0		53.5		42.5	
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	11.3	13.5	7.0	8.0		53.5		42.5	
Queue Length 50th (ft)	3	166	7	94		163		88	
Queue Length 95th (ft)	15	322	m15	m135		180		127	
Internal Link Dist (ft)		148		118		676		475	
Turn Bay Length (ft)	75		75						
Base Capacity (vph)	312	1926	269	1097		336		302	
Starvation Cap Reductn	0	0	0	9		0		0	
Spillback Cap Reductn	0	34	0	0		0		0	
Storage Cap Reductn	0	0	0	0		0		0	
Reduced v/c Ratio	0.04	0.52	0.19	0.61		0.71		0.47	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 9 (8%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Mt. Auburn Street & Kimball Road



HCM Signalized Intersection Capacity Analysis

8: Mt. Auburn Street & Arlington Street

2/24/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	73	457	380	270	513	9	72	247	87	10	997	42
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		3.0	4.0		3.0	4.0	3.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00	1.00		0.95	
Frt	1.00	0.93		1.00	1.00		1.00	1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1776	3349		1845	1902		1712	1905	1667		3698	
Flt Permitted	0.46	1.00		0.13	1.00		0.10	1.00	1.00		0.95	
Satd. Flow (perm)	858	3349		259	1902		183	1905	1667		3520	
Peak-hour factor, PHF	0.96	0.96	0.96	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	76	476	396	284	540	9	78	268	95	11	1096	46
RTOR Reduction (vph)	0	135	0	0	0	0	0	0	37	0	0	0
Lane Group Flow (vph)	76	737	0	284	549	0	78	268	58	0	1153	0
Heavy Vehicles (%)	7%	8%	3%	3%	5%	0%	11%	5%	2%	0%	2%	5%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Turn Type	Perm			pm+pt			pm+pt		pm+ov		Perm	
Protected Phases		2		1	6		3	8	1			4
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	27.0	27.0		57.8	57.8		42.6	42.6	70.4		36.4	
Effective Green, g (s)	27.0	27.0		57.8	57.8		42.6	42.6	70.4		36.4	
Actuated g/C Ratio	0.23	0.23		0.50	0.50		0.37	0.37	0.61		0.32	
Clearance Time (s)	4.0	4.0		3.0	4.0		3.0	4.0	3.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	201	786		514	956		110	706	1020		1114	
v/s Ratio Prot		c0.22		0.13	c0.29		c0.02	0.14	0.01			
v/s Ratio Perm	0.09			0.14			0.24		0.02		c0.33	
v/c Ratio	0.38	0.94		0.55	0.57		0.71	0.38	0.06		1.04	
Uniform Delay, d1	36.9	43.2		21.8	20.0		31.3	26.5	9.0		39.3	
Progression Factor	0.80	0.83		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	4.6	17.9		4.2	2.5		18.8	0.3	0.0		36.4	
Delay (s)	34.0	53.5		26.1	22.5		50.1	26.9	9.0		75.7	
Level of Service	C	D		C	C		D	C	A		E	
Approach Delay (s)		52.0			23.7			27.1			75.7	
Approach LOS		D			C			C			E	

Intersection Summary

HCM Average Control Delay	49.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

8: Mt. Auburn Street & Arlington Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	73	457	270	513	72	247	87	10	997	
Lane Group Flow (vph)	76	872	284	549	78	268	95	0	1153	
Turn Type	Perm		pm+pt		pm+pt		pm+ov	Perm		
Protected Phases		2	1	6	3	8	1		4	9
Permitted Phases	2		6		8		8	4		
Detector Phase	2	2	1	6	3	8	1	4	4	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	10.0	3.0	10.0	4.0	4.0	4.0	7.0
Minimum Split (s)	34.0	34.0	7.0	18.0	7.0	18.0	7.0	20.0	20.0	21.0
Total Split (s)	34.0	34.0	14.0	48.0	7.0	46.0	14.0	39.0	39.0	21.0
Total Split (%)	29.6%	29.6%	12.2%	41.7%	6.1%	40.0%	12.2%	33.9%	33.9%	18%
Yellow Time (s)	3.5	3.5	3.0	3.5	3.0	3.5	3.0	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.0	0.5	0.0	0.5	0.0	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	4.0	
Lead/Lag	Lag	Lag	Lead		Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	Max	C-Max	None	Min	Max	Max	Max	None
v/c Ratio	0.34	0.87	0.54	0.55	0.64	0.39	0.09		1.04	
Control Delay	31.8	35.8	25.2	22.4	49.7	29.0	1.8		75.7	
Queue Delay	0.0	5.4	0.0	0.0	0.0	1.2	0.0		0.0	
Total Delay	31.8	41.3	25.2	22.4	49.7	30.2	1.8		75.7	
Queue Length 50th (ft)	48	276	107	235	38	145	0		~501	
Queue Length 95th (ft)	m60	#307	#357	487	#88	219	16		#636	
Internal Link Dist (ft)		90		521		344			1269	
Turn Bay Length (ft)	100		400		360					
Base Capacity (vph)	224	1005	523	1006	122	696	1095		1114	
Starvation Cap Reductn	0	92	0	0	0	241	0		0	
Spillback Cap Reductn	0	0	0	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0	0	0	0		0	
Reduced v/c Ratio	0.34	0.96	0.54	0.55	0.64	0.59	0.09		1.04	

Intersection Summary

Cycle Length: 115

Actuated Cycle Length: 115

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 120

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.








m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Mt. Auburn Street & Arlington Street

1/27/2011

Splits and Phases: 8: Mt. Auburn Street & Arlington Street

 ø1	 ø2	 ø3	 ø4	 ø9
14 s	34 s	7 s	39 s	21 s
 ø6		 ø8		
48 s		46 s		

HCM Signalized Intersection Capacity Analysis

10: Arlington Street & Tufts Medical Center

1/27/2011



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕	↕	↕	↕		↕	↕		↕	↕	
Volume (vph)	22	1034	591	21	158	69	217	6	107	7	1	31
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		0.95	0.95		1.00	1.00	
Frt		1.00	0.85	1.00	0.95		1.00	0.90		1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (prot)		1960	1589	1638	1746		1367	1452		1900	1180	
Flt Permitted		0.99	1.00	0.08	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (perm)		1945	1589	136	1746		1367	1452		1900	1180	
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.73	0.73	0.73	0.86	0.86	0.86
Adj. Flow (vph)	24	1112	635	23	174	76	297	8	147	8	1	36
RTOR Reduction (vph)	0	0	149	0	13	0	0	75	0	0	35	0
Lane Group Flow (vph)	0	1136	486	23	237	0	235	142	0	8	2	0
Heavy Vehicles (%)	45%	1%	7%	16%	6%	17%	32%	0%	10%	0%	0%	46%
Turn Type	Perm		pm+ov	Perm			Split			Split		
Protected Phases		6	4		2		4	4		8	8	
Permitted Phases	6		6	2								
Actuated Green, G (s)		50.6	64.8	50.6	50.6		14.2	14.2		2.3	2.3	
Effective Green, g (s)		50.6	64.8	50.6	50.6		14.2	14.2		2.3	2.3	
Actuated g/C Ratio		0.60	0.77	0.60	0.60		0.17	0.17		0.03	0.03	
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1163	1292	81	1044		229	244		52	32	
v/s Ratio Prot			0.06		0.14		c0.17	0.10		c0.00	0.00	
v/s Ratio Perm		c0.58	0.24	0.17								
v/c Ratio		0.98	0.38	0.28	0.23		1.03	0.58		0.15	0.06	
Uniform Delay, d1		16.4	3.3	8.2	7.9		35.2	32.5		40.2	40.1	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		21.4	0.8	1.9	0.1		66.4	9.8		1.4	0.8	
Delay (s)		37.8	4.1	10.2	8.0		101.6	42.2		41.6	40.9	
Level of Service		D	A	B	A		F	D		D	D	
Approach Delay (s)		25.7			8.2			73.1			41.0	
Approach LOS		C			A			E			D	

Intersection Summary

HCM Average Control Delay	32.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	84.6	Sum of lost time (s)	17.5
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

10: Arlington Street & Tufts Medical Center

1/27/2011



Lane Group	SEL	SET	SER	NWL	NWT	NEL	NET	SWL	SWT	ø9
Lane Configurations										
Volume (vph)	22	1034	591	21	158	217	6	7	1	
Lane Group Flow (vph)	0	1136	635	23	250	235	217	8	37	
Turn Type	Perm		pm+ov	Perm		Split		Split		
Protected Phases		6	4		2	4	4	8	8	9
Permitted Phases	6		6	2						
Detector Phase	6	6	4	2	2	4	4	8	8	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	18.0
Total Split (s)	54.0	54.0	18.0	54.0	54.0	18.0	18.0	8.0	8.0	18.0
Total Split (%)	55.1%	55.1%	18.4%	55.1%	55.1%	18.4%	18.4%	8.2%	8.2%	18%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Min	Min	Max	Max	None	None	None
v/c Ratio		0.93	0.43	0.27	0.23	0.98	0.66	0.08	0.39	
Control Delay		30.4	1.3	21.3	7.8	89.7	30.7	43.1	28.1	
Queue Delay		59.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		90.0	1.8	21.3	7.8	89.7	30.7	43.1	28.1	
Queue Length 50th (ft)		456	0	5	41	124	61	4	1	
Queue Length 95th (ft)		#1083	30	35	122	#254	117	19	#32	
Internal Link Dist (ft)		344			505		69		101	
Turn Bay Length (ft)				125				150		
Base Capacity (vph)		1224	1473	85	1111	241	330	96	94	
Starvation Cap Reductn		222	405	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		1.13	0.59	0.27	0.23	0.98	0.66	0.08	0.39	

Intersection Summary

Cycle Length: 98

Actuated Cycle Length: 80.4

Natural Cycle: 140

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 10: Arlington Street & Tufts Medical Center

ø2	ø4	ø8	ø9
54 s	18 s	8 s	18 s
ø6			
54 s			

HCM Signalized Intersection Capacity Analysis

36: Mt. Auburn Street & Palfrey Street

1/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕				
Volume (vph)	137	862	137	33	825	34	154	169	34	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	16	16	16	12	12	12
Total Lost time (s)		5.5			5.5			5.5				
Lane Util. Factor		0.95			0.95			1.00				
Frbp, ped/bikes		0.99			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		0.98			0.99			0.99				
Flt Protected		0.99			1.00			0.98				
Satd. Flow (prot)		3613			3653			2163				
Flt Permitted		0.61			0.85			0.98				
Satd. Flow (perm)		2204			3102			2163				
Peak-hour factor, PHF	0.92	0.97	0.97	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.92	0.92
Adj. Flow (vph)	149	889	141	36	897	37	171	184	38	0	0	0
RTOR Reduction (vph)	0	8	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1171	0	0	968	0	0	393	0	0	0	0
Confl. Peds. (#/hr)			10	10			10		10			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	6	0	6	0	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Split					
Protected Phases		4			8		2	2				
Permitted Phases	4			8								
Actuated Green, G (s)		78.7			78.7			33.3				
Effective Green, g (s)		78.7			78.7			33.3				
Actuated g/C Ratio		0.61			0.61			0.26				
Clearance Time (s)		5.5			5.5			5.5				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1334			1878			554				
v/s Ratio Prot								c0.18				
v/s Ratio Perm		c0.53			0.31							
v/c Ratio		0.88			0.52			0.71				
Uniform Delay, d1		21.6			14.7			44.0				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		8.4			1.0			4.2				
Delay (s)		30.0			15.7			48.1				
Level of Service		C			B			D				
Approach Delay (s)		30.0			15.7			48.1			0.0	
Approach LOS		C			B			D			A	
Intersection Summary												
HCM Average Control Delay			27.4		HCM Level of Service			C				
HCM Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			130.0		Sum of lost time (s)			18.0				
Intersection Capacity Utilization			86.6%		ICU Level of Service			E				
Analysis Period (min)			15									

c Critical Lane Group

Queues

36: Mt. Auburn Street & Palfrey Street

1/27/2011



Lane Group	EBL	EBT	WBL	WBT	NBT	ø9
Lane Configurations		↕↕		↕↕	↕↕	
Volume (vph)	137	862	33	825	169	
Lane Group Flow (vph)	0	1179	0	970	393	
Turn Type	Perm		Perm			
Protected Phases		4		8	2	9
Permitted Phases	4		8			
Detector Phase	4	4	8	8	2	
Switch Phase						
Minimum Initial (s)	7.0	7.0	4.0	4.0	7.0	7.0
Minimum Split (s)	25.5	25.5	20.0	20.0	25.5	23.0
Total Split (s)	81.5	81.5	81.5	81.5	25.5	23.0
Total Split (%)	62.7%	62.7%	62.7%	62.7%	19.6%	18%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	None
v/c Ratio		0.85		0.50	0.71	
Control Delay		27.0		14.5	53.0	
Queue Delay		4.8		0.7	0.0	
Total Delay		31.8		15.2	53.0	
Queue Length 50th (ft)		355		200	300	
Queue Length 95th (ft)		#623		304	#600	
Internal Link Dist (ft)		491		175	368	
Turn Bay Length (ft)						
Base Capacity (vph)		1382		1938	554	
Starvation Cap Reductn		148		568	0	
Spillback Cap Reductn		0		0	0	
Storage Cap Reductn		0		0	0	
Reduced v/c Ratio		0.96		0.71	0.71	

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 36 (28%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 36: Mt. Auburn Street & Palfrey Street



HCM Unsignalized Intersection Capacity Analysis
 15: Mt. Auburn Street & Phillips Street

1/27/2011



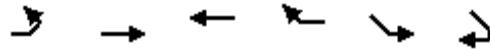
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	884	12	42	876	16	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.92	0.92	0.42	0.42
Hourly flow rate (vph)	911	12	46	952	38	48
Pedestrians	11			11		
Lane Width (ft)	11.0			13.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	1			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	255			336		
pX, platoon unblocked				0.82	0.88	0.82
vC, conflicting volume				924	1496	473
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				482	400	0
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				95	92	95
cM capacity (veh/h)				888	484	890

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	608	316	363	635	86
Volume Left	0	0	46	0	38
Volume Right	0	12	0	0	48
cSH	1700	1700	888	1700	648
Volume to Capacity	0.36	0.19	0.05	0.37	0.13
Queue Length 95th (ft)	0	0	4	0	11
Control Delay (s)	0.0	0.0	1.7	0.0	11.4
Lane LOS	A			B	
Approach Delay (s)	0.0		0.6	11.4	
Approach LOS				B	

Intersection Summary					
Average Delay			0.8		
Intersection Capacity Utilization			64.1%	ICU Level of Service	C
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
 17: Mt. Auburn Street & Marshall Street

1/28/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑			
Volume (veh/h)	41	863	918	30	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	890	998	33	0	0
Pedestrians		11	11		20	
Lane Width (ft)		12.0	12.0		0.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		1	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		347	244			
pX, platoon unblocked	0.79				0.87	0.79
vC, conflicting volume	1050				1575	546
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	521				501	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	100
cM capacity (veh/h)	819				412	850

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	339	593	665	365
Volume Left	42	0	0	0
Volume Right	0	0	0	33
cSH	819	1700	1700	1700
Volume to Capacity	0.05	0.35	0.39	0.21
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	1.7	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.6		0.0	
Approach LOS				

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		64.5%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 19: Mt. Auburn Street & Parker Street

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Volume (veh/h)	862	1	0	948	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.99	0.99	0.91	0.91	0.83	0.83
Hourly flow rate (vph)	871	1	0	1042	0	0
Pedestrians	2			8		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	463			128		
pX, platoon unblocked				0.85	0.85	0.85
vC, conflicting volume				872	1394	444
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				503	341	1
tC, single (s)				4.1	6.9	7.0
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	100	100
cM capacity (veh/h)				901	534	914

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	580	291	347	695
Volume Left	0	0	0	0
Volume Right	0	1	0	0
cSH	1700	1700	901	1700
Volume to Capacity	0.34	0.17	0.00	0.41
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis

14: Mt. Auburn Street & Common Street

1/28/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↑↑		↖	↗
Volume (vph)	224	638	695	241	360	253
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	10	10
Total Lost time (s)	5.5	5.5	5.5		5.5	5.5
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1862	1675	3582		1756	1552
Flt Permitted	0.13	1.00	1.00		0.95	1.00
Satd. Flow (perm)	261	1675	3582		1756	1552
Peak-hour factor, PHF	0.99	0.99	0.91	0.91	0.93	0.93
Adj. Flow (vph)	226	644	764	265	387	272
RTOR Reduction (vph)	0	0	19	0	0	0
Lane Group Flow (vph)	226	644	1010	0	387	272
Confl. Peds. (#/hr)	28				2	8
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Bus Blockages (#/hr)	0	6	0	6	0	0
Parking (#/hr)		5				
Turn Type	pm+pt				pm+ov	
Protected Phases	1 4	6	2		3	1 4
Permitted Phases	6					3
Actuated Green, G (s)	89.3	82.5	64.8		37.2	56.2
Effective Green, g (s)	89.3	82.5	64.8		37.2	56.2
Actuated g/C Ratio	0.60	0.55	0.43		0.25	0.37
Clearance Time (s)		5.5	5.5		5.5	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)	358	921	1547		435	638
v/s Ratio Prot	c0.08	c0.38	0.28		c0.22	0.05
v/s Ratio Perm	0.30					0.12
v/c Ratio	0.63	0.70	0.65		0.89	0.43
Uniform Delay, d1	21.6	24.7	33.7		54.4	34.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.6	4.4	2.2		19.4	0.5
Delay (s)	25.2	29.1	35.9		73.8	35.4
Level of Service	C	C	D		E	D
Approach Delay (s)		28.1	35.9		57.9	
Approach LOS		C	D		E	

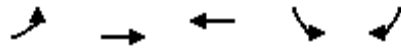
Intersection Summary				
HCM Average Control Delay		38.9	HCM Level of Service	D
HCM Volume to Capacity ratio		0.75		
Actuated Cycle Length (s)		150.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization		70.1%	ICU Level of Service	C
Analysis Period (min)		15		

c Critical Lane Group

Queues

14: Mt. Auburn Street & Common Street

1/28/2011

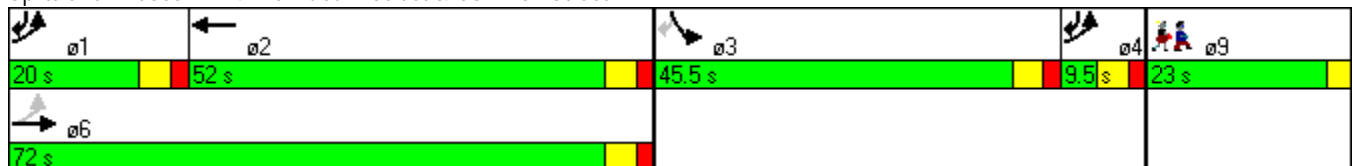


Lane Group	EBL	EBT	WBT	SBL	SBR	ø1	ø4	ø9
Lane Configurations								
Volume (vph)	224	638	695	360	253			
Lane Group Flow (vph)	226	644	1029	387	272			
Turn Type	pm+pt				pm+ov			
Protected Phases	1 4	6	2	3	1 4	1	4	9
Permitted Phases	6				3			
Detector Phase	1 4	6	2	3	3			
Switch Phase								
Minimum Initial (s)		4.0	4.0	4.0		4.0	4.0	7.0
Minimum Split (s)		9.5	9.5	9.5		20.0	9.5	23.0
Total Split (s)	29.5	72.0	52.0	45.5	29.5	20.0	9.5	23.0
Total Split (%)	19.7%	48.0%	34.7%	30.3%	19.7%	13%	6%	15%
Yellow Time (s)		3.5	3.5	3.5		3.5	3.5	3.0
All-Red Time (s)		2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5			
Lead/Lag			Lag	Lead		Lead	Lag	
Lead-Lag Optimize?			Yes	Yes		Yes	Yes	
Recall Mode		C-Max	C-Max	Min		None	Max	None
v/c Ratio	0.54	0.68	0.63	0.89	0.43			
Control Delay	19.8	29.2	34.8	76.9	27.0			
Queue Delay	0.0	7.3	0.0	0.0	0.0			
Total Delay	19.8	36.6	34.8	76.9	27.0			
Queue Length 50th (ft)	80	396	381	358	170			
Queue Length 95th (ft)	140	#797	#620	#521	170			
Internal Link Dist (ft)		48	1077	686				
Turn Bay Length (ft)								
Base Capacity (vph)	449	948	1622	468	647			
Starvation Cap Reductn	0	258	0	0	0			
Spillback Cap Reductn	0	0	0	0	0			
Storage Cap Reductn	0	0	0	0	0			
Reduced v/c Ratio	0.50	0.93	0.63	0.83	0.42			

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 14: Mt. Auburn Street & Common Street



HCM Signalized Intersection Capacity Analysis

21: Mt. Auburn Street & Bates Road East

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	747	194	19	839	10	327	6	28	4	3	15
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.5	5.5	4.0	5.5	5.5			5.5			5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00			0.97	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99			1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.99			0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1881	1980	1430	1881	1974			1862			1736	
Flt Permitted	0.09	1.00	1.00	0.19	1.00			0.70			0.90	
Satd. Flow (perm)	177	1980	1430	377	1974			1355			1570	
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.87	0.87	0.87	0.70	0.70	0.70
Adj. Flow (vph)	1	770	200	21	912	11	376	7	32	6	4	21
RTOR Reduction (vph)	0	0	20	0	0	0	0	2	0	0	18	0
Lane Group Flow (vph)	1	770	180	21	923	0	0	413	0	0	13	0
Confl. Peds. (#/hr)	32		33	33		32	9		3	3		9
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			0									0
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		6	7		2		7	4			8	
Permitted Phases	6		6	2			4			8		
Actuated Green, G (s)	67.5	67.5	87.1	67.5	67.5			40.7			17.1	
Effective Green, g (s)	67.5	67.5	87.1	67.5	67.5			40.7			17.1	
Actuated g/C Ratio	0.57	0.57	0.73	0.57	0.57			0.34			0.14	
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5			5.5			5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	100	1121	1045	213	1118			546			225	
v/s Ratio Prot		0.39	0.03		c0.47			c0.12				
v/s Ratio Perm	0.01		0.10	0.06				c0.13			0.01	
v/c Ratio	0.01	0.69	0.17	0.10	0.83			0.76			0.06	
Uniform Delay, d1	11.3	18.3	4.9	11.9	21.0			34.8			44.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	3.4	0.1	0.9	7.0			5.9			0.1	
Delay (s)	11.5	21.8	5.0	12.8	28.0			40.8			44.2	
Level of Service	B	C	A	B	C			D			D	
Approach Delay (s)		18.3			27.7			40.8			44.2	
Approach LOS		B			C			D			D	

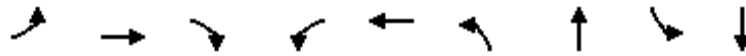
Intersection Summary

HCM Average Control Delay	26.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	119.2	Sum of lost time (s)	11.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Queues

21: Mt. Auburn Street & Bates Road East

1/28/2011



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	1	747	194	19	839	327	6	4	3	
Lane Group Flow (vph)	1	770	200	21	923	0	415	0	31	
Turn Type	Perm		pm+ov	Perm		pm+pt		Perm		
Protected Phases		6	7		2	7	4		8	9
Permitted Phases	6		6	2		4		8		
Detector Phase	6	6	7	2	2	7	4	8	8	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	7.0
Minimum Split (s)	25.5	25.5	8.0	25.5	25.5	8.0	25.5	9.5	9.5	23.0
Total Split (s)	73.0	73.0	11.0	73.0	73.0	11.0	44.0	33.0	33.0	23.0
Total Split (%)	52.1%	52.1%	7.9%	52.1%	52.1%	7.9%	31.4%	23.6%	23.6%	16%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	4.0	5.5	5.5	5.5	
Lead/Lag			Lead			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes			Yes		Yes	Yes	
Recall Mode	Max	Max	None	Max	Max	None	Max	None	None	None
v/c Ratio	0.01	0.67	0.18	0.10	0.81		0.79		0.11	
Control Delay	11.0	20.9	4.2	12.6	26.8		48.0		18.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	11.0	20.9	4.2	12.6	26.8		48.0		18.8	
Queue Length 50th (ft)	0	381	31	7	524		266		6	
Queue Length 95th (ft)	3	521	58	20	721		#426		21	
Internal Link Dist (ft)		1077			987		295		217	
Turn Bay Length (ft)	75		100	75						
Base Capacity (vph)	102	1142	1100	217	1139		528		396	
Starvation Cap Reductn	0	0	0	0	0		0		0	
Spillback Cap Reductn	0	0	0	0	0		0		0	
Storage Cap Reductn	0	0	0	0	0		0		0	
Reduced v/c Ratio	0.01	0.67	0.18	0.10	0.81		0.79		0.08	

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 117

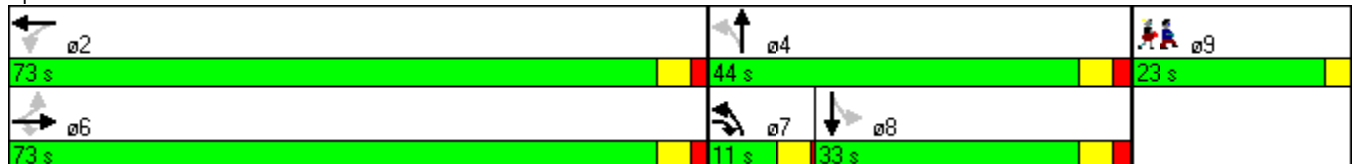
Natural Cycle: 140

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Mt. Auburn Street & Bates Road East



HCM Signalized Intersection Capacity Analysis
 24: Mt. Auburn Street & Boylston Street

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩		↩	↩	↩	
Volume (vph)	776	49	15	886	30	15
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.96	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	1940		1891	1952	1831	
Flt Permitted	1.00		0.26	1.00	0.97	
Satd. Flow (perm)	1940		521	1952	1831	
Peak-hour factor, PHF	0.97	0.97	0.93	0.93	0.77	0.77
Adj. Flow (vph)	800	51	16	953	39	19
RTOR Reduction (vph)	1	0	0	0	18	0
Lane Group Flow (vph)	850	0	16	953	40	0
Confl. Peds. (#/hr)		27	27		1	
Heavy Vehicles (%)	2%	2%	0%	0%	1%	1%
Bus Blockages (#/hr)	0	6	0	6	0	0
Parking (#/hr)		0				
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	52.2		52.2	52.2	4.3	
Effective Green, g (s)	52.2		52.2	52.2	4.3	
Actuated g/C Ratio	0.74		0.74	0.74	0.06	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1428		384	1437	111	
v/s Ratio Prot	0.44			c0.49	c0.02	
v/s Ratio Perm			0.03			
v/c Ratio	0.60		0.04	0.66	0.36	
Uniform Delay, d1	4.4		2.5	4.8	32.0	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.7		0.0	1.2	2.0	
Delay (s)	5.1		2.6	6.0	34.0	
Level of Service	A		A	A	C	
Approach Delay (s)	5.1			5.9	34.0	
Approach LOS	A			A	C	

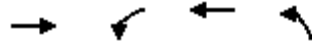
Intersection Summary

HCM Average Control Delay	6.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	70.9	Sum of lost time (s)	14.4
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Queues

24: Mt. Auburn Street & Boylston Street

1/28/2011



Lane Group	EBT	WBL	WBT	NBL	ø9
Lane Configurations	→	↵	→	↵	
Volume (vph)	776	15	886	30	
Lane Group Flow (vph)	851	16	953	58	
Turn Type	Perm				
Protected Phases	4		8	2	9
Permitted Phases		8			
Detector Phase	4	8	8	2	
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	22.0
Total Split (s)	48.0	48.0	48.0	20.0	22.0
Total Split (%)	53.3%	53.3%	53.3%	22.2%	24%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Min	Min	Min	None	None
v/c Ratio	0.53	0.04	0.59	0.26	
Control Delay	7.7	5.8	9.0	27.6	
Queue Delay	0.0	0.0	0.0	0.0	
Total Delay	7.7	5.8	9.0	27.6	
Queue Length 50th (ft)	94	1	117	15	
Queue Length 95th (ft)	526	13	#664	49	
Internal Link Dist (ft)	987		740	495	
Turn Bay Length (ft)		25			
Base Capacity (vph)	1573	422	1582	490	
Starvation Cap Reductn	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	
Storage Cap Reductn	0	0	0	0	
Reduced v/c Ratio	0.54	0.04	0.60	0.12	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 65.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 24: Mt. Auburn Street & Boylston Street



HCM Unsignalized Intersection Capacity Analysis
 31: Mt. Auburn Street & Winthrop Street

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻		↻	↻	↻	
Volume (veh/h)	763	15	10	905	25	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.91	0.91	0.84	0.84
Hourly flow rate (vph)	779	15	11	995	30	8
Pedestrians				4	18	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage (veh)	2			2		
Upstream signal (ft)	820			738		
pX, platoon unblocked			0.75		0.68	0.75
vC, conflicting volume			812		1821	808
vC1, stage 1 conf vol					804	
vC2, stage 2 conf vol					1016	
vCu, unblocked vol			586		1153	581
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		89	98
cM capacity (veh/h)			733		263	382

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	794	11	995	38
Volume Left	0	11	0	30
Volume Right	15	0	0	8
cSH	1700	733	1700	282
Volume to Capacity	0.47	0.01	0.59	0.14
Queue Length 95th (ft)	0	1	0	12
Control Delay (s)	0.0	10.0	0.0	19.7
Lane LOS		A		C
Approach Delay (s)	0.0	0.1		19.7
Approach LOS				C

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		56.5%	ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

26: Mt. Auburn Street & Chauncey Street

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩		↩	↩	↩	↩
Volume (veh/h)	761	9	11	902	13	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.89	0.89	0.73	0.73
Hourly flow rate (vph)	777	9	12	1013	18	16
Pedestrians	3				24	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				2	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh	2			2		
Upstream signal (ft)	1119			439		
pX, platoon unblocked			0.77		0.68	0.77
vC, conflicting volume			810		1846	805
vC1, stage 1 conf vol					805	
vC2, stage 2 conf vol					1041	
vCu, unblocked vol			603		1246	597
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		93	96
cM capacity (veh/h)			735		249	382

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	786	12	1013	34
Volume Left	0	12	0	18
Volume Right	9	0	0	16
cSH	1700	735	1700	299
Volume to Capacity	0.46	0.02	0.60	0.11
Queue Length 95th (ft)	0	1	0	10
Control Delay (s)	0.0	10.0	0.0	18.6
Lane LOS		A		C
Approach Delay (s)	0.0	0.1		18.6
Approach LOS				C

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		55.1%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

28: Mt. Auburn Street & School Street

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	86	654	33	32	769	75	44	387	77	71	200	100
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1859	1942		1843	1961	1573	1874	1916		1740	1741	
Flt Permitted	0.06	1.00		0.18	1.00	1.00	0.43	1.00		0.21	1.00	
Satd. Flow (perm)	118	1942		352	1961	1573	855	1916		385	1741	
Peak-hour factor, PHF	0.99	0.99	0.99	0.88	0.88	0.88	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	87	661	33	36	874	85	49	430	86	75	211	105
RTOR Reduction (vph)	0	1	0	0	0	9	0	0	0	0	0	0
Lane Group Flow (vph)	87	693	0	36	874	76	49	516	0	75	316	0
Confl. Peds. (#/hr)	13		37	37		13	5		19	19		5
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		6			2			3				8
Permitted Phases	6			2		2	3			8		
Actuated Green, G (s)	66.2	66.2		66.2	66.2	66.2	49.8	49.8		49.8	49.8	
Effective Green, g (s)	66.2	66.2		66.2	66.2	66.2	49.8	49.8		49.8	49.8	
Actuated g/C Ratio	0.50	0.50		0.50	0.50	0.50	0.37	0.37		0.37	0.37	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	58	962		174	972	779	319	714		144	649	
v/s Ratio Prot		0.36			0.45			c0.27			0.18	
v/s Ratio Perm	c0.74			0.10		0.05	0.06			0.19		
v/c Ratio	1.50	0.72		0.21	0.90	0.10	0.15	0.72		0.52	0.49	
Uniform Delay, d1	33.7	26.4		18.9	30.7	17.9	27.9	36.0		32.6	32.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	295.8	4.6		2.7	12.9	0.2	1.0	6.3		12.8	2.6	
Delay (s)	329.5	31.1		21.6	43.5	18.1	28.9	42.2		45.4	34.7	
Level of Service	F	C		C	D	B	C	D		D	C	
Approach Delay (s)		64.3			40.6			41.1			36.8	
Approach LOS		E			D			D			D	

Intersection Summary

HCM Average Control Delay	46.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	133.6	Sum of lost time (s)	17.6
Intersection Capacity Utilization	133.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

28: Mt. Auburn Street & School Street

1/28/2011



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	86	654	32	769	75	44	387	71	200	
Lane Group Flow (vph)	87	694	36	874	85	49	516	75	316	
Turn Type	Perm		Perm		Perm	Perm		Perm		
Protected Phases		6		2			3		8	9
Permitted Phases	6		2		2	3		8		
Detector Phase	6	6	2	2	2	3	3	8	8	
Switch Phase										
Minimum Initial (s)	44.0	44.0	44.0	44.0	44.0	39.0	39.0	39.0	39.0	7.0
Minimum Split (s)	50.0	50.0	50.0	50.0	50.0	45.0	45.0	45.0	45.0	17.3
Total Split (s)	72.0	72.0	72.0	72.0	72.0	55.7	55.7	55.7	55.7	17.3
Total Split (%)	49.7%	49.7%	49.7%	49.7%	49.7%	38.4%	38.4%	38.4%	38.4%	12%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	Max	None
v/c Ratio	1.47	0.71	0.20	0.88	0.11	0.15	0.71	0.51	0.48	
Control Delay	318.0	30.9	23.7	41.6	14.9	30.2	41.9	48.2	34.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	318.0	30.9	23.7	41.6	14.9	30.2	41.9	48.2	34.8	
Queue Length 50th (ft)	~98	417	16	610	27	26	353	47	193	
Queue Length 95th (ft)	#188	716	48	#1049	68	66	585	123	339	
Internal Link Dist (ft)		359		1191			1065		1130	
Turn Bay Length (ft)	100		100		75	75		75		
Base Capacity (vph)	59	981	177	990	802	324	728	146	661	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.47	0.71	0.20	0.88	0.11	0.15	0.71	0.51	0.48	

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 131.2

Natural Cycle: 145

Control Type: Semi Act-Uncoord

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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






Queue shown is maximum after two cycles.

Queues

28: Mt. Auburn Street & School Street

1/28/2011




















Splits and Phases: 28: Mt. Auburn Street & School Street

 ø2	 ø3	 ø9
72 s	55.7 s	17.3 s
 ø6	 ø8	
72 s	55.7 s	

HCM Unsignalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

1/28/2011

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (veh/h)	12	709	17	40	768	12	25	7	67	7	2	3	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.93	0.93	0.93	0.94	0.94	0.94	0.90	0.90	0.90	0.58	0.58	0.58	
Hourly flow rate (vph)	13	762	18	43	817	13	28	8	74	12	3	5	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	TWLTL					None							
Median storage (veh)	2												
Upstream signal (ft)	1271					856							
pX, platoon unblocked	0.68			0.70			0.83	0.83	0.70	0.83	0.83	0.68	
vC, conflicting volume	830			781			1706	1712	772	1775	1715	823	
vC1, stage 1 conf vol							797	797		909	909		
vC2, stage 2 conf vol							909	915		867	806		
vCu, unblocked vol	517			478			945	952	465	1028	955	507	
tC, single (s)	4.1			4.1			7.1	6.7	6.2	7.1	6.5	6.2	
tC, 2 stage (s)							6.1	5.7		6.1	5.5		
tF (s)	2.2			2.2			3.5	4.2	3.3	3.5	4.0	3.3	
p0 queue free %	98			94			89	97	82	94	99	99	
cM capacity (veh/h)	722			771			263	256	416	209	271	388	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1							
Volume Total	13	781	43	830	110	21							
Volume Left	13	0	43	0	28	12							
Volume Right	0	18	0	13	74	5							
cSH	722	1700	771	1700	350	247							
Volume to Capacity	0.02	0.46	0.06	0.49	0.31	0.08							
Queue Length 95th (ft)	1	0	4	0	33	7							
Control Delay (s)	10.1	0.0	9.9	0.0	20.0	20.9							
Lane LOS	B		A		C	C							
Approach Delay (s)	0.2		0.5		20.0	20.9							
Approach LOS					C	C							
Intersection Summary													
Average Delay			1.8										
Intersection Capacity Utilization			51.5%		ICU Level of Service			A					
Analysis Period (min)			15										

HCM Signalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	709	17	40	768	12	25	7	67	7	2	3
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.91			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1900	1955		1900	1957			1717			1876	
Flt Permitted	0.32	1.00		0.34	1.00			0.95			0.91	
Satd. Flow (perm)	644	1955		688	1957			1658			1766	
Peak-hour factor, PHF	0.93	0.93	0.93	0.94	0.94	0.94	0.90	0.90	0.90	0.58	0.58	0.58
Adj. Flow (vph)	13	762	18	43	817	13	28	8	74	12	3	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	12	0	0	1	0
Lane Group Flow (vph)	13	780	0	43	830	0	0	98	0	0	19	0
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	17%	5%	0%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									5
Turn Type	custom			custom			custom			custom		
Protected Phases												
Permitted Phases	2!	2!		2!	2!		6!	6!		6!	6!	
Actuated Green, G (s)	51.0	51.0		51.0	51.0			51.0			51.0	
Effective Green, g (s)	51.0	51.0		51.0	51.0			51.0			51.0	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.84			0.84	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	538	1635		575	1636			1386			1476	
v/s Ratio Prot												
v/s Ratio Perm	0.02	0.40		0.06	c0.42			0.06			0.01	
v/c Ratio	0.02	0.48		0.07	0.51			0.07			0.01	
Uniform Delay, d1	0.8	1.4		0.9	1.4			0.9			0.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	1.0		0.3	1.1			0.0			0.0	
Delay (s)	0.9	2.4		1.1	2.5			0.9			0.8	
Level of Service	A	A		A	A			A			A	
Approach Delay (s)		2.3			2.5			0.9			0.8	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	2.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

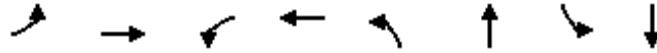
! Phase conflict between lane groups.

c Critical Lane Group

Queues

1: Mt. Auburn Street & Upland Road

1/28/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations									
Volume (vph)	12	709	40	768	25	7	7	2	
Lane Group Flow (vph)	13	780	43	830	0	110	0	20	
Turn Type	custom		custom		custom		custom		
Protected Phases									9
Permitted Phases	2!	2!	2!	2!	6!	6!	6!	6!	
Detector Phase	2	2	2	2	6	6	6	6	
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	7.0
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	23.0
Total Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	23.0
Total Split (%)	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	37%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Max	Max	Max	Max	None	None	None	None	None
v/c Ratio	0.02	0.43	0.07	0.46		0.07		0.01	
Control Delay	2.8	3.4	2.6	3.6		1.3		2.2	
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	2.8	3.4	2.6	3.6		1.3		2.2	
Queue Length 50th (ft)	0	0	0	0		0		0	
Queue Length 95th (ft)	8	289	18	323		21		5	
Internal Link Dist (ft)		1191		274		506		50	
Turn Bay Length (ft)	75		75						
Base Capacity (vph)	599	1819	640	1820		1547		1643	
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	0.02	0.43	0.07	0.46		0.07		0.01	

Intersection Summary

Cycle Length: 62

Actuated Cycle Length: 58.6

Natural Cycle: 65

Control Type: Semi Act-Uncoord

! Phase conflict between lane groups.

Splits and Phases: 1: Mt. Auburn Street & Upland Road



HCM Unsignalized Intersection Capacity Analysis

2: Mt. Auburn Street & Melendy Avenue

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Volume (veh/h)	726	57	18	803	17	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	789	62	20	873	18	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	354			502		
pX, platoon unblocked			0.86		0.72	0.86
vC, conflicting volume			851		1732	820
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			745		1385	709
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		83	92
cM capacity (veh/h)			742		111	373

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	851	892	49
Volume Left	0	20	18
Volume Right	62	0	30
cSH	1700	742	198
Volume to Capacity	0.50	0.03	0.25
Queue Length 95th (ft)	0	2	23
Control Delay (s)	0.0	0.7	29.1
Lane LOS		A	D
Approach Delay (s)	0.0	0.7	29.1
Approach LOS			D

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

3: Mt. Auburn Street & Lloyd Road

1/28/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↕	
Volume (veh/h)	27	727	809	18	4	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.50	0.50
Hourly flow rate (vph)	29	773	852	19	8	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		415	441			
pX, platoon unblocked	0.65				0.70	0.65
vC, conflicting volume	871				1692	861
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	529				1422	514
tC, single (s)	4.6				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.7				4.0	3.3
p0 queue free %	95				90	93
cM capacity (veh/h)	541				78	366

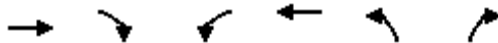
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	802	871	32
Volume Left	29	0	8
Volume Right	0	19	24
cSH	541	1700	191
Volume to Capacity	0.05	0.51	0.17
Queue Length 95th (ft)	4	0	15
Control Delay (s)	1.6	0.0	27.6
Lane LOS	A		D
Approach Delay (s)	1.6	0.0	27.6
Approach LOS			D

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		67.1%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

4: Mt. Auburn Street & Elton Avenue

1/28/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔			
Volume (veh/h)	689	42	35	827	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.93	0.93	0.25	0.25
Hourly flow rate (vph)	703	43	38	889	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	465			391		
pX, platoon unblocked				0.92	0.68	0.92
vC, conflicting volume				746	1689	724
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				681	1517	658
tC, single (s)				4.1	6.4	6.2
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				96	100	100
cM capacity (veh/h)				848	86	431

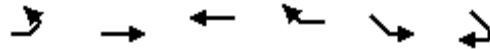
Direction, Lane #	EB 1	WB 1
Volume Total	746	927
Volume Left	0	38
Volume Right	43	0
cSH	1700	848
Volume to Capacity	0.44	0.04
Queue Length 95th (ft)	0	3
Control Delay (s)	0.0	1.2
Lane LOS		A
Approach Delay (s)	0.0	1.2
Approach LOS		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

5: Mt. Auburn Street & Irma Avenue

1/28/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↔	↔		↔	
Volume (veh/h)	26	663	851	18	6	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.90	0.90	0.72	0.72
Hourly flow rate (vph)	28	705	946	20	8	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		628	228			
pX, platoon unblocked	0.63				0.64	0.63
vC, conflicting volume	966				1716	956
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	656				1763	640
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				86	95
cM capacity (veh/h)	596				57	303

Direction, Lane #	EB 1	WB 1	SE 1
Volume Total	733	966	24
Volume Left	28	0	8
Volume Right	0	20	15
cSH	596	1700	121
Volume to Capacity	0.05	0.57	0.20
Queue Length 95th (ft)	4	0	17
Control Delay (s)	1.3	0.0	41.9
Lane LOS	A		E
Approach Delay (s)	1.3	0.0	41.9
Approach LOS			E

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		63.2%	ICU Level of Service
Analysis Period (min)		15	B

HCM Signalized Intersection Capacity Analysis

6: Mt. Auburn Street & Kimball Road

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	595	59	25	772	39	81	105	103	11	12	16
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	3.0	3.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.95			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1710	3079		1710	1737			1658			1630	
Flt Permitted	0.19	1.00		0.34	1.00			0.89			0.86	
Satd. Flow (perm)	349	3079		613	1737			1489			1414	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.78	0.78	0.78	0.69	0.69	0.69
Adj. Flow (vph)	16	647	64	26	813	41	104	135	132	16	17	23
RTOR Reduction (vph)	0	4	0	0	1	0	0	15	0	0	17	0
Lane Group Flow (vph)	16	707	0	26	853	0	0	356	0	0	39	0
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	3%	2%	1%	10%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)		5							5			
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.0	85.0		82.0	82.0			36.0			36.0	
Effective Green, g (s)	85.0	85.0		82.0	82.0			36.0			36.0	
Actuated g/C Ratio	0.65	0.65		0.63	0.63			0.28			0.28	
Clearance Time (s)	3.0	3.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	228	2013		387	1096			412			392	
v/s Ratio Prot		0.23			c0.49							
v/s Ratio Perm	0.05			0.04				c0.24			0.03	
v/c Ratio	0.07	0.35		0.07	0.78			0.86			0.10	
Uniform Delay, d1	8.2	10.1		9.3	17.4			44.7			35.0	
Progression Factor	1.00	1.00		0.57	0.65			1.00			1.00	
Incremental Delay, d2	0.6	0.5		0.2	3.7			20.7			0.5	
Delay (s)	8.8	10.6		5.5	14.9			65.4			35.5	
Level of Service	A	B		A	B			E			D	
Approach Delay (s)		10.6			14.6			65.4			35.5	
Approach LOS		B			B			E			D	

Intersection Summary

HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

6: Mt. Auburn Street & Kimball Road

1/28/2011

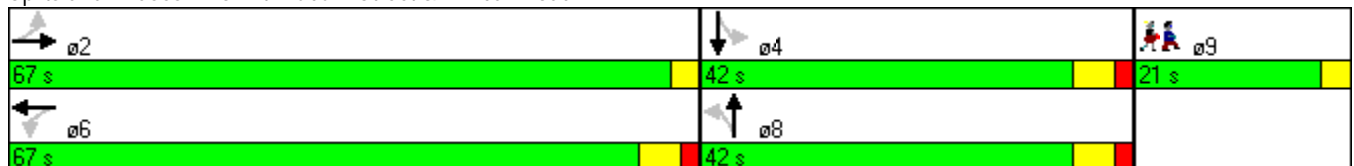


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations									
Volume (vph)	15	595	25	772	81	105	11	12	
Lane Group Flow (vph)	16	711	26	854	0	371	0	56	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		2		6		8		4	9
Permitted Phases	2		6		8		4		
Detector Phase	2	2	6	6	8	8	4	4	
Switch Phase									
Minimum Initial (s)	7.0	7.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0
Minimum Split (s)	35.0	35.0	35.0	35.0	17.0	17.0	17.0	17.0	21.0
Total Split (s)	67.0	67.0	67.0	67.0	42.0	42.0	42.0	42.0	21.0
Total Split (%)	51.5%	51.5%	51.5%	51.5%	32.3%	32.3%	32.3%	32.3%	16%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	None
v/c Ratio	0.07	0.35	0.07	0.78		0.87		0.14	
Control Delay	9.1	10.5	5.6	15.4		63.2		23.8	
Queue Delay	0.0	0.0	0.0	2.0		0.0		0.0	
Total Delay	9.1	10.5	5.6	17.5		63.2		23.8	
Queue Length 50th (ft)	5	129	4	483		284		21	
Queue Length 95th (ft)	14	164	m6	m156		339		38	
Internal Link Dist (ft)		148		118		676		475	
Turn Bay Length (ft)	75		75						
Base Capacity (vph)	228	2016	386	1097		428		408	
Starvation Cap Reductn	0	0	0	124		0		0	
Spillback Cap Reductn	0	84	0	0		0		0	
Storage Cap Reductn	0	0	0	0		0		0	
Reduced v/c Ratio	0.07	0.37	0.07	0.88		0.87		0.14	

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 29 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

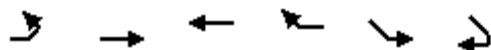
Splits and Phases: 6: Mt. Auburn Street & Kimball Road



HCM Unsignalized Intersection Capacity Analysis

7: Mt. Auburn Street & Templeton Parkway

1/28/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↕↕	↔		↕↕	
Volume (veh/h)	18	691	821	23	2	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.93	0.93	0.90	0.90
Hourly flow rate (vph)	19	735	883	25	2	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		198	170			
pX, platoon unblocked	0.63				0.67	0.63
vC, conflicting volume	908				1301	895
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	559				711	540
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				99	95
cM capacity (veh/h)	630				243	310

Direction, Lane #	EB 1	EB 2	WB 1	SE 1
Volume Total	264	490	908	19
Volume Left	19	0	0	2
Volume Right	0	0	25	17
cSH	630	1700	1700	300
Volume to Capacity	0.03	0.29	0.53	0.06
Queue Length 95th (ft)	2	0	0	5
Control Delay (s)	1.1	0.0	0.0	17.8
Lane LOS	A			C
Approach Delay (s)	0.4		0.0	17.8
Approach LOS				C

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		52.4%	ICU Level of Service
Analysis Period (min)		15	A

HCM Signalized Intersection Capacity Analysis

8: Mt. Auburn Street & Arlington Street

1/28/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↗		↗	
Volume (vph)	93	507	93	213	504	39	291	708	220	17	433	49
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00	1.00		0.95	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1863	3593		1776	1908		1900	2000	1604		3624	
Flt Permitted	0.34	1.00		0.22	1.00		0.22	1.00	1.00		0.65	
Satd. Flow (perm)	671	3593		411	1908		439	2000	1604		2358	
Peak-hour factor, PHF	0.96	0.96	0.96	0.88	0.88	0.88	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	97	528	97	242	573	44	323	787	244	19	481	54
RTOR Reduction (vph)	0	12	0	0	2	0	0	0	88	0	0	0
Lane Group Flow (vph)	97	613	0	242	615	0	323	787	156	0	554	0
Heavy Vehicles (%)	2%	3%	5%	7%	4%	0%	0%	0%	6%	7%	3%	3%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			pm+pt			pm+pt		pm+ov	Perm		
Protected Phases		2		1	6		3	8	1		4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	39.2	39.2		62.4	62.4		53.0	53.0	72.2		33.0	
Effective Green, g (s)	39.2	39.2		62.4	62.4		53.0	53.0	72.2		33.0	
Actuated g/C Ratio	0.30	0.30		0.48	0.48		0.41	0.41	0.56		0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	202	1083		399	916		359	815	891		599	
v/s Ratio Prot		0.17		0.09	c0.32		0.11	c0.39	0.03			
v/s Ratio Perm	0.14			0.20			0.26		0.07		0.23	
v/c Ratio	0.48	0.57		0.61	0.67		0.90	0.97	0.17		0.92	
Uniform Delay, d1	37.1	38.2		22.7	25.9		29.6	37.6	14.2		47.3	
Progression Factor	0.79	0.79		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	7.3	2.0		2.6	3.9		27.8	24.2	0.1		20.2	
Delay (s)	36.6	32.3		25.3	29.9		57.4	61.8	14.3		67.5	
Level of Service	D	C		C	C		E	E	B		E	
Approach Delay (s)		32.8			28.6			52.2			67.5	
Approach LOS		C			C			D			E	

Intersection Summary

HCM Average Control Delay	44.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues

8: Mt. Auburn Street & Arlington Street

1/28/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	93	507	213	504	291	708	220	17	433	
Lane Group Flow (vph)	97	625	242	617	323	787	244	0	554	
Turn Type	Perm		pm+pt		pm+pt		pm+ov	Perm		
Protected Phases		2	1	6	3	8	1		4	9
Permitted Phases	2		6		8		8	4		
Detector Phase	2	2	1	6	3	8	1	4	4	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	7.0
Minimum Split (s)	40.0	40.0	8.0	40.0	19.0	25.0	8.0	25.0	25.0	21.0
Total Split (s)	44.0	44.0	8.0	52.0	20.0	57.0	8.0	37.0	37.0	21.0
Total Split (%)	33.8%	33.8%	6.2%	40.0%	15.4%	43.8%	6.2%	28.5%	28.5%	16%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lag	Lag	Lead		Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max	None	Min	Min	None
v/c Ratio	0.45	0.54	0.59	0.65	0.90	0.97	0.24		0.93	
Control Delay	35.0	29.7	31.4	29.7	57.7	62.2	3.3		70.2	
Queue Delay	0.0	1.2	0.0	1.4	0.0	148.0	0.0		0.0	
Total Delay	35.0	30.9	31.4	31.0	57.7	210.2	3.3		70.2	
Queue Length 50th (ft)	56	227	107	347	192	640	15		241	
Queue Length 95th (ft)	m122	m297	#358	#663	#327	#909	45		#353	
Internal Link Dist (ft)		90		1748		393			435	
Turn Bay Length (ft)	100						300			
Base Capacity (vph)	214	1162	407	952	359	815	1014		598	
Starvation Cap Reductn	0	314	0	0	0	230	0		0	
Spillback Cap Reductn	0	0	0	165	0	0	0		0	
Storage Cap Reductn	0	0	0	0	0	0	0		0	
Reduced v/c Ratio	0.45	0.74	0.59	0.78	0.90	1.35	0.24		0.93	

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 135

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.








m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Mt. Auburn Street & Arlington Street

1/28/2011

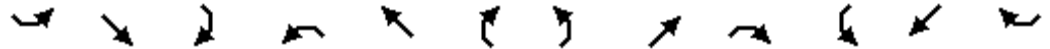
Splits and Phases: 8: Mt. Auburn Street & Arlington Street

 ø1 8 s	 ø2 44 s	 ø3 20 s	 ø4 37 s	 ø9 21 s
 ø6 52 s	 ø8 57 s			

HCM Signalized Intersection Capacity Analysis

10: Arlington Street & Tufts Medical Center

1/28/2011



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕	↕	↕	↕		↕	↕		↕	↕	
Volume (vph)	26	291	422	48	515	8	357	6	4	125	34	347
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		0.95	0.95		1.00	1.00	
Frt		1.00	0.85	1.00	1.00		1.00	1.00		1.00	0.86	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.95		0.95	1.00	
Satd. Flow (prot)		1891	1667	1863	1953		1770	1773		1743	1686	
Flt Permitted		0.88	1.00	0.43	1.00		0.95	0.95		0.95	1.00	
Satd. Flow (perm)		1663	1667	838	1953		1770	1773		1743	1686	
Peak-hour factor, PHF	0.87	0.87	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.66	0.92	0.66
Adj. Flow (vph)	30	334	459	52	542	8	388	7	4	189	37	526
RTOR Reduction (vph)	0	0	200	0	1	0	0	1	0	0	318	0
Lane Group Flow (vph)	0	364	259	52	549	0	198	200	0	189	245	0
Heavy Vehicles (%)	9%	5%	2%	2%	2%	14%	2%	2%	2%	9%	2%	2%
Turn Type	Perm	pm+ov		Perm				Split			Split	
Protected Phases		6	4		2		4	4		8	8	
Permitted Phases	6	6		2								
Actuated Green, G (s)		28.3	38.4	28.3	28.3		10.1	10.1		12.1	12.1	
Effective Green, g (s)		28.3	38.4	28.3	28.3		10.1	10.1		12.1	12.1	
Actuated g/C Ratio		0.42	0.56	0.42	0.42		0.15	0.15		0.18	0.18	
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		692	1039	349	813		263	263		310	300	
v/s Ratio Prot			0.04		c0.28		0.11	c0.11		0.11	c0.15	
v/s Ratio Perm		0.22	0.12	0.06								
v/c Ratio		0.53	0.25	0.15	0.68		0.75	0.76		0.61	0.82	
Uniform Delay, d1		14.8	7.5	12.4	16.1		27.8	27.8		25.8	26.9	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.8	0.6	0.2	2.2		18.0	18.6		3.4	15.6	
Delay (s)		17.7	8.1	12.6	18.4		45.7	46.4		29.2	42.5	
Level of Service		B	A	B	B		D	D		C	D	
Approach Delay (s)		12.3			17.9		46.0			39.1		
Approach LOS		B			B		D			D		

Intersection Summary

HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

10: Arlington Street & Tufts Medical Center

1/28/2011



Lane Group	SEL	SET	SER	NWL	NWT	NEL	NET	SWL	SWT	ø9
Lane Configurations										
Volume (vph)	26	291	422	48	515	357	6	125	34	
Lane Group Flow (vph)	0	364	459	52	550	198	201	189	563	
Turn Type	Perm		pm+ov	Perm		Split		Split		
Protected Phases		6	4		2	4	4	8	8	9
Permitted Phases	6		6	2						
Detector Phase	6	6	4	2	2	4	4	8	8	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	18.0
Total Split (s)	32.0	32.0	14.0	32.0	32.0	14.0	14.0	16.0	16.0	18.0
Total Split (%)	40.0%	40.0%	17.5%	40.0%	40.0%	17.5%	17.5%	20.0%	20.0%	23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Min	Min	Max	Max	None	None	None
v/c Ratio		0.51	0.37	0.14	0.65	0.73	0.73	0.59	0.90	
Control Delay		18.2	1.8	14.9	21.1	46.1	46.3	35.3	29.3	
Queue Delay		0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		18.2	2.0	14.9	21.1	46.1	46.3	35.3	29.3	
Queue Length 50th (ft)		91	0	11	149	74	75	65	60	
Queue Length 95th (ft)		228	41	44	#408	#230	#235	111	#299	
Internal Link Dist (ft)		393			505		52		96	
Turn Bay Length (ft)								150		
Base Capacity (vph)		717	1240	362	843	272	274	322	627	
Starvation Cap Reductn		0	165	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.51	0.43	0.14	0.65	0.73	0.73	0.59	0.90	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 65.6

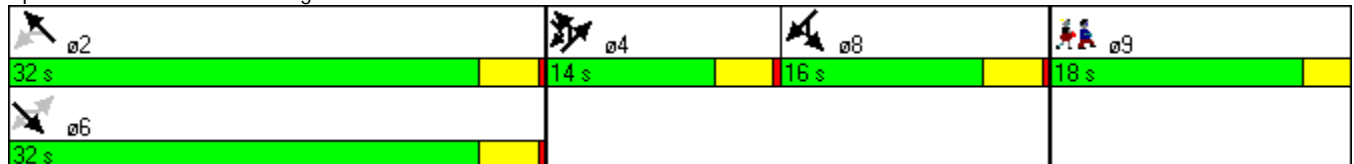
Natural Cycle: 80

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 10: Arlington Street & Tufts Medical Center



5.0 APPENDIX

5.9 Level-of-Service Analyses- Alternative 3

HCM Signalized Intersection Capacity Analysis

36: Mt. Auburn Street & Palfrey Street

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕				
Volume (vph)	110	741	149	55	848	85	73	169	65	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	16	16	16	12	12	12
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		0.95			0.95			1.00				
Frbp, ped/bikes		1.00			1.00			0.99				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		0.98			0.99			0.97				
Flt Protected		0.99			1.00			0.99				
Satd. Flow (prot)		3607			3622			2129				
Flt Permitted		0.60			0.74			0.99				
Satd. Flow (perm)		2185			2683			2129				
Peak-hour factor, PHF	0.92	0.89	0.89	0.94	0.94	0.92	0.67	0.92	0.67	0.92	0.92	0.92
Adj. Flow (vph)	120	833	167	59	902	92	109	184	97	0	0	0
RTOR Reduction (vph)	0	13	0	0	7	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1107	0	0	1046	0	0	390	0	0	0	0
Confl. Peds. (#/hr)			10	10			10		10			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	6	0	6	0	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Prot					
Protected Phases		1			1		3	8				
Permitted Phases	1			1								
Actuated Green, G (s)		57.6			57.6			37.4				
Effective Green, g (s)		57.6			57.6			37.4				
Actuated g/C Ratio		0.52			0.52			0.34				
Clearance Time (s)		4.0			4.0			4.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1144			1405			724				
v/s Ratio Prot								c0.18				
v/s Ratio Perm		c0.51			0.39							
v/c Ratio		0.97			0.74			0.54				
Uniform Delay, d1		25.3			20.5			29.3				
Progression Factor		1.00			0.91			1.00				
Incremental Delay, d2		19.8			2.9			0.8				
Delay (s)		45.1			21.4			30.1				
Level of Service		D			C			C				
Approach Delay (s)		45.1			21.4			30.1			0.0	
Approach LOS		D			C			C			A	

Intersection Summary

HCM Average Control Delay	33.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

36: Mt. Auburn Street & Palfrey Street

1/26/2011



Lane Group	EBL	EBT	WBL	WBT	NBT	ø2	ø3
Lane Configurations							
Volume (vph)	110	741	55	848	169		
Lane Group Flow (vph)	0	1120	0	1053	390		
Turn Type	Perm		Perm				
Protected Phases		1		1	8	2	3
Permitted Phases	1		1				
Detector Phase	1	1	1	1	8		
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	4.0	7.0	8.0
Minimum Split (s)	17.0	17.0	17.0	17.0	20.0	23.0	18.5
Total Split (s)	64.0	64.0	64.0	64.0	23.0	23.0	23.0
Total Split (%)	58.2%	58.2%	58.2%	58.2%	20.9%	21%	21%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.0	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		
Lead/Lag	Lead	Lead	Lead	Lead		Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None
v/c Ratio		0.93		0.72	0.54		
Control Delay		37.0		19.4	35.1		
Queue Delay		0.1		0.0	0.0		
Total Delay		37.2		19.5	35.1		
Queue Length 50th (ft)		358		177	206		
Queue Length 95th (ft)		#518		302	#493		
Internal Link Dist (ft)		491		164	368		
Turn Bay Length (ft)							
Base Capacity (vph)		1206		1470	722		
Starvation Cap Reductn		0		16	0		
Spillback Cap Reductn		3		0	0		
Storage Cap Reductn		0		0	0		
Reduced v/c Ratio		0.93		0.72	0.54		

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 27 (25%), Referenced to phase 1:EBWB, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 36: Mt. Auburn Street & Palfrey Street

HCM Unsignalized Intersection Capacity Analysis
 15: Mt. Auburn Street & Phillips Street

1/26/2011



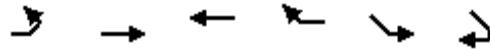
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	799	7	45	981	7	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.94	0.94	0.67	0.67
Hourly flow rate (vph)	898	8	48	1044	10	27
Pedestrians	25			18		
Lane Width (ft)	11.0			13.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	2			2		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	244			343		
pX, platoon unblocked				0.81	0.90	0.81
vC, conflicting volume				906	1544	471
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				405	417	0
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				95	98	97
cM capacity (veh/h)				928	476	866

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	599	307	396	696	37
Volume Left	0	0	48	0	10
Volume Right	0	8	0	0	27
cSH	1700	1700	928	1700	705
Volume to Capacity	0.35	0.18	0.05	0.41	0.05
Queue Length 95th (ft)	0	0	4	0	4
Control Delay (s)	0.0	0.0	1.6	0.0	10.4
Lane LOS	A			B	
Approach Delay (s)	0.0		0.6	10.4	
Approach LOS				B	

Intersection Summary					
Average Delay			0.5		
Intersection Capacity Utilization			66.0%	ICU Level of Service	C
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
 17: Mt. Auburn Street & Marshall Street

1/26/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑			
Volume (veh/h)	29	788	1026	37	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.94	0.94	0.67	0.67
Hourly flow rate (vph)	33	885	1091	39	0	0
Pedestrians		25	18		12	
Lane Width (ft)		12.0	12.0		0.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		2	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		347	240			
pX, platoon unblocked	0.79				0.88	0.79
vC, conflicting volume	1143				1649	602
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	659				542	0
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	100
cM capacity (veh/h)	718				396	847

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	328	590	728	403
Volume Left	33	0	0	0
Volume Right	0	0	0	39
cSH	718	1700	1700	1700
Volume to Capacity	0.05	0.35	0.43	0.24
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	1.5	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.5		0.0	
Approach LOS				

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		56.4%	ICU Level of Service
Analysis Period (min)		15	B

HCM Unsignalized Intersection Capacity Analysis
 19: Mt. Auburn Street & Parker Street

1/26/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Volume (veh/h)	781	7	9	1063	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.92	0.92	0.70	0.70
Hourly flow rate (vph)	964	9	10	1155	0	0
Pedestrians	14			10	19	
Lane Width (ft)	12.0			12.0	0.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	485			102		
pX, platoon unblocked			0.83		0.87	0.83
vC, conflicting volume			992		1599	515
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			595		527	24
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			805		407	866

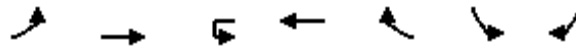
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	643	330	395	770
Volume Left	0	0	10	0
Volume Right	0	9	0	0
cSH	1700	1700	805	1700
Volume to Capacity	0.38	0.19	0.01	0.45
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.0	0.0	0.4	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.1	
Approach LOS				

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization	46.7%		ICU Level of Service A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis

14: Mt. Auburn Street & Common Street

1/26/2011



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	163	618	20	719	149	484	353
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0		4.0	4.0
Lane Util. Factor	1.00	1.00		0.95		1.00	1.00
Frbp, ped/bikes	1.00	1.00		0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00		1.00	1.00
Frt	1.00	1.00		0.97		1.00	0.85
Flt Protected	0.95	1.00		1.00		0.95	1.00
Satd. Flow (prot)	1792	1592		3537		1863	1648
Flt Permitted	0.14	1.00		0.93		0.95	1.00
Satd. Flow (perm)	265	1592		3283		1863	1648
Peak-hour factor, PHF	0.81	0.81	0.92	0.92	0.92	0.97	0.97
Adj. Flow (vph)	201	763	22	782	162	499	364
RTOR Reduction (vph)	0	0	0	13	0	0	0
Lane Group Flow (vph)	201	763	0	953	0	499	364
Confl. Peds. (#/hr)	14				14	14	10
Heavy Vehicles (%)	6%	6%	2%	4%	4%	2%	2%
Bus Blockages (#/hr)	0	9	0	0	9	0	0
Parking (#/hr)		5					
Turn Type	pm+pt		Perm			pm+ov	
Protected Phases	1	6		2		3	1
Permitted Phases	6		2				3
Actuated Green, G (s)	69.3	69.3		44.8		32.7	53.2
Effective Green, g (s)	69.3	69.3		44.8		32.7	53.2
Actuated g/C Ratio	0.63	0.63		0.41		0.30	0.48
Clearance Time (s)	4.0	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	452	1003		1337		554	857
v/s Ratio Prot	0.08	c0.48				c0.27	0.08
v/s Ratio Perm	0.20			0.29			0.14
v/c Ratio	0.44	0.76		0.71		0.90	0.42
Uniform Delay, d1	13.2	14.5		27.2		37.1	18.5
Progression Factor	1.63	0.38		1.00		1.00	1.00
Incremental Delay, d2	0.4	3.3		3.3		17.7	0.3
Delay (s)	21.8	8.8		30.5		54.8	18.8
Level of Service	C	A		C		D	B
Approach Delay (s)		11.5		30.5		39.6	
Approach LOS		B		C		D	

Intersection Summary

HCM Average Control Delay	26.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Queues

14: Mt. Auburn Street & Common Street

1/26/2011



Lane Group	EBL	EBT	WBU	WBT	SBL	SBR	ø9
Lane Configurations							
Volume (vph)	163	618	20	719	484	353	
Lane Group Flow (vph)	201	763	0	966	499	364	
Turn Type	pm+pt		Perm			pm+ov	
Protected Phases	1	6		2	3	1	9
Permitted Phases	6		2			3	
Detector Phase	1	6	2	2	3	1	
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	7.0
Minimum Split (s)	8.0	20.0	20.0	20.0	8.0	8.0	23.0
Total Split (s)	10.0	48.0	38.0	38.0	39.0	10.0	23.0
Total Split (%)	9.1%	43.6%	34.5%	34.5%	35.5%	9.1%	21%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead		Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	Yes		Yes	
Recall Mode	None	C-Max	C-Max	C-Max	Min	None	None
v/c Ratio	0.44	0.76		0.72	0.90	0.46	
Control Delay	18.7	9.5		30.8	57.6	18.2	
Queue Delay	0.0	0.7		0.0	0.0	0.0	
Total Delay	18.7	10.1		30.8	57.6	18.2	
Queue Length 50th (ft)	48	110		290	327	150	
Queue Length 95th (ft)	m57	m138		392	#503	205	
Internal Link Dist (ft)		22		1076	686		
Turn Bay Length (ft)							
Base Capacity (vph)	452	1003		1349	593	796	
Starvation Cap Reductn	0	60		0	0	0	
Spillback Cap Reductn	0	0		0	0	0	
Storage Cap Reductn	0	0		0	0	0	
Reduced v/c Ratio	0.44	0.81		0.72	0.84	0.46	

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green, Master Intersection

Natural Cycle: 110

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.






m Volume for 95th percentile queue is metered by upstream signal.

Queues

14: Mt. Auburn Street & Common Street

1/26/2011

Splits and Phases: 14: Mt. Auburn Street & Common Street

 ø1	 ø2	 ø3	 ø9
10 s	38 s	39 s	23 s
 ø6			
48 s			

HCM Signalized Intersection Capacity Analysis

21: Mt. Auburn Street & Bates Road East

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	842	341	29	886	8	173	1	17	28	10	6
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99			1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.99			0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96			0.97	
Satd. Flow (prot)	1857	1961	1392	1857	1958			1862			1893	
Flt Permitted	0.11	1.00	1.00	0.09	1.00			0.71			0.80	
Satd. Flow (perm)	210	1961	1392	178	1958			1379			1566	
Peak-hour factor, PHF	0.90	0.90	0.90	0.98	0.98	0.98	0.74	0.74	0.74	0.85	0.85	0.85
Adj. Flow (vph)	11	936	379	30	904	8	234	1	23	33	12	7
RTOR Reduction (vph)	0	0	65	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	11	936	314	30	912	0	0	258	0	0	52	0
Confl. Peds. (#/hr)	17		20	20		17	7		1	1		7
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			0									0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		3			3			1				1
Permitted Phases	3		3	3			1			1		
Actuated Green, G (s)	46.4	46.4	46.4	46.4	46.4			18.5			18.5	
Effective Green, g (s)	46.4	46.4	46.4	46.4	46.4			18.5			18.5	
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56			0.22			0.22	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	118	1102	782	100	1100			309			351	
v/s Ratio Prot		c0.48			0.47							
v/s Ratio Perm	0.05		0.23	0.17				c0.19			0.03	
v/c Ratio	0.09	0.85	0.40	0.30	0.83			0.83			0.15	
Uniform Delay, d1	8.4	15.2	10.2	9.5	14.8			30.6			25.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.6	8.2	1.5	7.5	7.2			17.4			0.2	
Delay (s)	9.9	23.4	11.8	17.1	22.1			48.0			25.9	
Level of Service	A	C	B	B	C			D			C	
Approach Delay (s)		20.0			21.9			48.0			25.9	
Approach LOS		B			C			D			C	

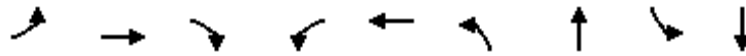
Intersection Summary

HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	82.6	Sum of lost time (s)	17.7
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

21: Mt. Auburn Street & Bates Road East

1/26/2011



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	ø2
Lane Configurations										
Volume (vph)	10	842	341	29	886	173	1	28	10	
Lane Group Flow (vph)	11	936	379	30	912	0	258	0	52	
Turn Type	Perm		Perm	Perm		Perm		Perm		
Protected Phases		3			3		1		1	2
Permitted Phases	3		3	3		1		1		
Detector Phase	3	3	3	3	3	1	1	1	1	
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	1.0
Minimum Split (s)	17.0	17.0	17.0	17.0	17.0	16.0	16.0	16.0	16.0	19.0
Total Split (s)	52.0	52.0	52.0	52.0	52.0	24.4	24.4	24.4	24.4	19.0
Total Split (%)	54.5%	54.5%	54.5%	54.5%	54.5%	25.6%	25.6%	25.6%	25.6%	20%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag						Lead	Lead	Lead	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	Min	Min	Min	Min	None
v/c Ratio	0.09	0.83	0.44	0.29	0.81		0.81		0.14	
Control Delay	12.8	23.3	8.4	21.1	22.2		52.2		28.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	12.8	23.3	8.4	21.1	22.2		52.2		28.0	
Queue Length 50th (ft)	2	304	47	6	289		115		19	
Queue Length 95th (ft)	15	#823	169	41	#795		#227		56	
Internal Link Dist (ft)		1076			987		295		217	
Turn Bay Length (ft)	75		100	75						
Base Capacity (vph)	121	1134	865	103	1132		318		362	
Starvation Cap Reductn	0	0	0	0	0		0		0	
Spillback Cap Reductn	0	0	0	0	0		0		0	
Storage Cap Reductn	0	0	0	0	0		0		0	
Reduced v/c Ratio	0.09	0.83	0.44	0.29	0.81		0.81		0.14	

Intersection Summary

Cycle Length: 95.4

Actuated Cycle Length: 80.2

Natural Cycle: 90

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Mt. Auburn Street & Bates Road East



HCM Signalized Intersection Capacity Analysis
 24: Mt. Auburn Street & Boylston Street

1/26/2011



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations		↕		↕	↕	↕	
Volume (vph)	10	793	103	32	716	95	72
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0		4.0	4.0	4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	
Frbp, ped/bikes		1.00		1.00	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00	
Frt		0.98		1.00	1.00	0.94	
Flt Protected		1.00		0.95	1.00	0.97	
Satd. Flow (prot)		1904		1858	1890	1832	
Flt Permitted		0.99		0.27	1.00	0.97	
Satd. Flow (perm)		1890		527	1890	1832	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.43	0.43
Adj. Flow (vph)	11	862	112	34	762	221	167
RTOR Reduction (vph)	0	4	0	0	0	28	0
Lane Group Flow (vph)	0	981	0	34	762	360	0
Confl. Peds. (#/hr)			16	16		1	
Heavy Vehicles (%)	2%	3%	3%	2%	2%	0%	0%
Bus Blockages (#/hr)	0	0	9	0	9	0	0
Parking (#/hr)			0				
Turn Type	Perm			Perm			
Protected Phases		4			8	2	
Permitted Phases	4			8			
Actuated Green, G (s)		43.5		43.5	43.5	17.0	
Effective Green, g (s)		43.5		43.5	43.5	17.0	
Actuated g/C Ratio		0.64		0.64	0.64	0.25	
Clearance Time (s)		4.0		4.0	4.0	4.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		1200		335	1200	455	
v/s Ratio Prot					0.40	c0.20	
v/s Ratio Perm		c0.52		0.06			
v/c Ratio		0.82		0.10	0.64	0.79	
Uniform Delay, d1		9.5		4.9	7.6	24.1	
Progression Factor		1.00		1.01	1.02	1.00	
Incremental Delay, d2		4.4		0.1	1.1	9.1	
Delay (s)		13.9		5.1	8.9	33.2	
Level of Service		B		A	A	C	
Approach Delay (s)		13.9			8.7	33.2	
Approach LOS		B			A	C	

Intersection Summary

HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	68.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

24: Mt. Auburn Street & Boylston Street

1/26/2011



Lane Group	EBU	EBT	WBL	WBT	NBL	ø9
Lane Configurations		↕	↖	↗	↘	
Volume (vph)	10	793	32	716	95	
Lane Group Flow (vph)	0	985	34	762	388	
Turn Type	Perm		Perm			
Protected Phases		4		8	2	9
Permitted Phases	4		8			
Detector Phase	4	4	8	8	2	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	22.0
Total Split (s)	47.0	47.0	47.0	47.0	21.0	22.0
Total Split (%)	52.2%	52.2%	52.2%	52.2%	23.3%	24%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	Min	None	None
v/c Ratio		0.82	0.10	0.64	0.80	
Control Delay		17.0	5.9	10.9	36.7	
Queue Delay		0.0	0.0	0.0	0.0	
Total Delay		17.0	5.9	10.9	36.7	
Queue Length 50th (ft)		268	5	172	137	
Queue Length 95th (ft)		#491	m15	m275	83	
Internal Link Dist (ft)		987		740	495	
Turn Bay Length (ft)			25			
Base Capacity (vph)		1203	335	1200	483	
Starvation Cap Reductn		0	0	0	0	
Spillback Cap Reductn		0	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.82	0.10	0.64	0.80	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 68.5

Natural Cycle: 100

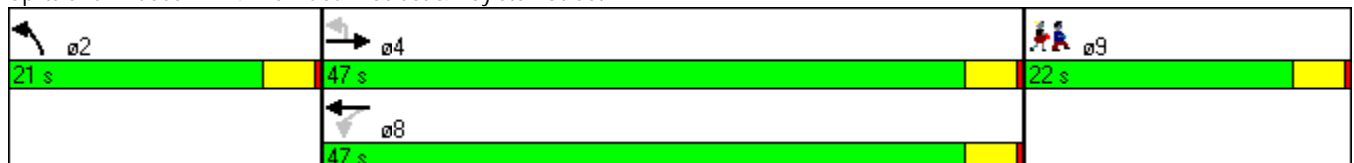
Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: Mt. Auburn Street & Boylston Street



HCM Unsignalized Intersection Capacity Analysis

31: Mt. Auburn Street & Winthrop Street

1/26/2011



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations		↕		↕	↑	↕	
Volume (veh/h)	10	826	39	30	698	18	13
Sign Control		Free			Free	Stop	
Grade		0%			0%	0%	
Peak Hour Factor	0.92	0.94	0.94	0.93	0.93	0.59	0.59
Hourly flow rate (vph)	0	879	41	32	751	31	22
Pedestrians					23	14	
Lane Width (ft)					12.0	12.0	
Walking Speed (ft/s)					4.0	4.0	
Percent Blockage					2	1	
Right turn flare (veh)							
Median type		Raised			Raised		
Median storage (veh)		1			1		
Upstream signal (ft)		820			738		
pX, platoon unblocked	0.00			0.60		0.76	0.60
vC, conflicting volume	0			934		1729	936
vC1, stage 1 conf vol						913	
vC2, stage 2 conf vol						815	
vCu, unblocked vol	0			559		849	563
tC, single (s)	0.0			4.1		6.4	6.2
tC, 2 stage (s)						5.4	
tF (s)	0.0			2.2		3.5	3.3
p0 queue free %	0			95		89	93
cM capacity (veh/h)	0			595		279	309

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	920	32	751	53
Volume Left	0	32	0	31
Volume Right	41	0	0	22
cSH	1700	595	1700	291
Volume to Capacity	0.54	0.05	0.44	0.18
Queue Length 95th (ft)	0	4	0	16
Control Delay (s)	0.0	11.4	0.0	20.1
Lane LOS		B		C
Approach Delay (s)	0.0	0.5		20.1
Approach LOS				C

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		66.6%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

26: Mt. Auburn Street & Chauncey Street

1/26/2011



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations		↕		↕	↑	↕	
Volume (veh/h)	10	795	44	55	698	20	27
Sign Control		Free			Free	Stop	
Grade		0%			0%	0%	
Peak Hour Factor	0.92	0.90	0.90	0.97	0.97	0.59	0.59
Hourly flow rate (vph)	0	883	49	57	720	34	46
Pedestrians		6				31	
Lane Width (ft)		12.0				12.0	
Walking Speed (ft/s)		4.0				4.0	
Percent Blockage		1				3	
Right turn flare (veh)							
Median type		None			None		
Median storage (veh)							
Upstream signal (ft)		1119			439		
pX, platoon unblocked	0.00			0.66		0.83	0.66
vC, conflicting volume	0			963		1778	939
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	0			690		939	653
tC, single (s)	0.0			4.1		6.4	6.2
tC, 2 stage (s)							
tF (s)	0.0			2.2		3.5	3.3
p0 queue free %	0			90		84	85
cM capacity (veh/h)	0			578		209	298

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	932	57	720	80
Volume Left	0	57	0	34
Volume Right	49	0	0	46
cSH	1700	578	1700	253
Volume to Capacity	0.55	0.10	0.42	0.32
Queue Length 95th (ft)	0	8	0	33
Control Delay (s)	0.0	11.9	0.0	25.7
Lane LOS		B		D
Approach Delay (s)	0.0	0.9		25.7
Approach LOS				D

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization	60.1%		ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

28: Mt. Auburn Street & School Street

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↖	↗		↖	↗	
Volume (vph)	81	726	20	55	642	34	19	138	44	88	417	92
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)	4.0	6.0		6.0	6.0	4.0	6.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	0.97	1.00		0.99	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1809	1895		1798	1905	1504	1743	1791		1729	1759	
Flt Permitted	0.11	1.00		0.08	1.00	1.00	0.24	1.00		0.37	1.00	
Satd. Flow (perm)	212	1895		154	1905	1504	433	1791		666	1759	
Peak-hour factor, PHF	0.86	0.86	0.86	0.92	0.92	0.92	0.78	0.78	0.78	0.93	0.93	0.93
Adj. Flow (vph)	94	844	23	60	698	37	24	177	56	95	448	99
RTOR Reduction (vph)	0	0	0	0	0	6	0	0	0	0	0	0
Lane Group Flow (vph)	94	867	0	60	698	31	24	233	0	95	547	0
Confl. Peds. (#/hr)	26		29	29		26	33		19	19		33
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	6%	6%	6%	2%	2%	2%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	pm+pt			Perm		pm+ov	Perm			pm+pt		
Protected Phases	1	6			2	4		3		4	8	
Permitted Phases	6			2		2	3			8		
Actuated Green, G (s)	57.2	57.2		49.2	49.2	60.0	23.9	23.9		38.7	38.7	
Effective Green, g (s)	57.2	57.2		49.2	49.2	60.0	23.9	23.9		38.7	38.7	
Actuated g/C Ratio	0.51	0.51		0.44	0.44	0.53	0.21	0.21		0.34	0.34	
Clearance Time (s)	4.0	6.0		6.0	6.0	4.0	6.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	164	959		67	829	799	92	379		330	602	
v/s Ratio Prot	0.02	c0.46			0.37	0.00		0.13		0.03	c0.31	
v/s Ratio Perm	0.27			0.39		0.02	0.06			0.07		
v/c Ratio	0.57	0.90		0.90	0.84	0.04	0.26	0.61		0.29	0.91	
Uniform Delay, d1	22.0	25.4		29.5	28.4	12.7	37.2	40.4		26.5	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.8	13.4		83.2	10.1	0.0	1.5	3.0		0.5	17.5	
Delay (s)	26.8	38.8		112.7	38.6	12.7	38.7	43.3		26.9	53.0	
Level of Service	C	D		F	D	B	D	D		C	D	
Approach Delay (s)		37.6			43.0			42.9			49.1	
Approach LOS		D			D			D			D	

Intersection Summary

HCM Average Control Delay	42.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	109.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

28: Mt. Auburn Street & School Street

1/26/2011



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	81	726	55	642	34	19	138	88	417	
Lane Group Flow (vph)	94	867	60	698	37	24	233	95	547	
Turn Type	pm+pt		Perm		pm+ov	Perm		pm+pt		
Protected Phases	1	6		2	4		3	4	8	9
Permitted Phases	6		2		2	3		8		
Detector Phase	1	6	2	2	4	3	3	4	8	
Switch Phase										
Minimum Initial (s)	4.0	20.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	1.0
Minimum Split (s)	8.0	40.0	30.0	30.0	20.0	30.0	30.0	20.0	20.0	15.3
Total Split (s)	8.0	62.7	54.7	54.7	20.0	30.0	30.0	20.0	50.0	15.3
Total Split (%)	6.3%	49.0%	42.7%	42.7%	15.6%	23.4%	23.4%	15.6%	39.1%	12%
Yellow Time (s)	3.5	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	3.0
All-Red Time (s)	0.5	2.0	2.0	2.0	0.5	2.0	2.0	0.5	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lead/Lag	Lead		Lag	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	Max	Max	Max	None	Min	Min	None	Min	None
v/c Ratio	0.55	0.88	0.88	0.83	0.04	0.26	0.61	0.27	0.89	
Control Delay	30.1	37.9	118.2	38.5	9.1	45.9	47.2	26.1	52.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	30.1	37.9	118.2	38.5	9.1	45.9	47.2	26.1	52.2	
Queue Length 50th (ft)	31	524	38	423	7	14	143	42	346	
Queue Length 95th (ft)	#81	#946	#148	#814	27	39	226	94	#644	
Internal Link Dist (ft)		359		1191			1065		1130	
Turn Bay Length (ft)	100		100		75	75		75		
Base Capacity (vph)	171	980	68	846	921	103	426	400	706	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.55	0.88	0.88	0.83	0.04	0.23	0.55	0.24	0.77	

Intersection Summary

Cycle Length: 128

Actuated Cycle Length: 110.6

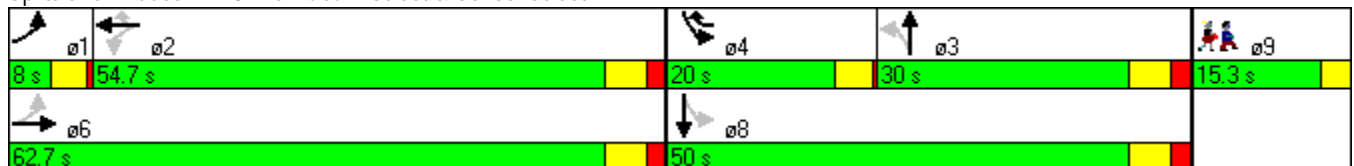
Natural Cycle: 140

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 28: Mt. Auburn Street & School Street



HCM Unsignalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	865	22	40	578	3	28	2	42	6	6	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.74	0.74	0.74	0.75	0.75	0.75
Hourly flow rate (vph)	11	930	24	42	608	3	38	3	57	8	8	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised					Raised					
Median storage veh		1					1					
Upstream signal (ft)		1271					856					
pX, platoon unblocked	0.84			0.55			0.63	0.63	0.55	0.63	0.63	0.84
vC, conflicting volume	612			954			1676	1659	942	1704	1669	610
vC1, stage 1 conf vol							963	963		694	694	
vC2, stage 2 conf vol							713	696		1010	975	
vCu, unblocked vol	445			512			1216	1189	491	1260	1205	443
tC, single (s)	4.1			4.1			7.1	6.7	6.2	7.3	6.5	6.4
tC, 2 stage (s)							6.1	5.7		6.3	5.5	
tF (s)	2.2			2.2			3.5	4.2	3.3	3.7	4.0	3.5
p0 queue free %	99			93			80	99	82	94	96	97
cM capacity (veh/h)	948			588			186	190	316	125	183	490

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	954	42	612	97	32
Volume Left	11	0	42	0	38	8
Volume Right	0	24	0	3	57	16
cSH	948	1700	588	1700	245	228
Volume to Capacity	0.01	0.56	0.07	0.36	0.40	0.14
Queue Length 95th (ft)	1	0	6	0	45	12
Control Delay (s)	8.8	0.0	11.6	0.0	29.1	23.4
Lane LOS	A		B		D	C
Approach Delay (s)	0.1		0.7		29.1	23.4
Approach LOS					D	C

Intersection Summary

Average Delay	2.4
Intersection Capacity Utilization	57.7%
ICU Level of Service	B
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Volume (vph)	10	865	22	40	578	3	28	2	42	6	6	12
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.92			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1900	1900		1900	1941			1722			1616	
Flt Permitted	0.42	1.00		0.27	1.00			0.92			0.97	
Satd. Flow (perm)	847	1900		539	1941			1618			1580	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.74	0.74	0.74	0.75	0.75	0.75
Adj. Flow (vph)	11	930	24	42	608	3	38	3	57	8	8	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	9	0	0	3	0
Lane Group Flow (vph)	11	954	0	42	611	0	0	89	0	0	29	0
Heavy Vehicles (%)	0%	5%	0%	0%	3%	0%	4%	17%	5%	20%	0%	18%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)			5									5
Turn Type	custom			custom			custom			custom		
Protected Phases												
Permitted Phases	2!	2!		2!	2!		6!	6!		6!	6!	
Actuated Green, G (s)	51.0	51.0		51.0	51.0			51.0			51.0	
Effective Green, g (s)	51.0	51.0		51.0	51.0			51.0			51.0	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.84			0.84	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	708	1589		451	1623			1353			1321	
v/s Ratio Prot												
v/s Ratio Perm	0.01	c0.50		0.08	0.31			0.05			0.02	
v/c Ratio	0.02	0.60		0.09	0.38			0.07			0.02	
Uniform Delay, d1	0.8	1.6		0.9	1.2			0.9			0.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	1.7		0.4	0.7			0.0			0.0	
Delay (s)	0.9	3.3		1.3	1.9			0.9			0.8	
Level of Service	A	A		A	A			A			A	
Approach Delay (s)		3.3			1.8			0.9			0.8	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	2.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Queues

1: Mt. Auburn Street & Upland Road

1/26/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations									
Volume (vph)	10	865	40	578	28	2	6	6	
Lane Group Flow (vph)	11	954	42	611	0	98	0	32	
Turn Type	custom		custom		custom		custom		
Protected Phases									9
Permitted Phases	2!	2!	2!	2!	6!	6!	6!	6!	
Detector Phase	2	2	2	2	6	6	6	6	
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	23.0
Total Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	23.0
Total Split (%)	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	37%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Max	Max	Max	Max	None	None	None	None	None
v/c Ratio	0.01	0.54	0.08	0.34		0.07		0.02	
Control Delay	2.6	4.6	2.9	2.8		1.5		1.8	
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	2.6	4.6	2.9	2.8		1.5		1.8	
Queue Length 50th (ft)	0	0	0	0		0		0	
Queue Length 95th (ft)	7	445	19	199		15		8	
Internal Link Dist (ft)		1191		274		506		50	
Turn Bay Length (ft)	50		50						
Base Capacity (vph)	789	1766	502	1804		1507		1469	
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	0.01	0.54	0.08	0.34		0.07		0.02	

Intersection Summary

Cycle Length: 62

Actuated Cycle Length: 58.6

Natural Cycle: 65

Control Type: Semi Act-Uncoord

! Phase conflict between lane groups.

Splits and Phases: 1: Mt. Auburn Street & Upland Road



HCM Unsignalized Intersection Capacity Analysis

2: Mt. Auburn Street & Melendy Avenue

1/26/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩		↩	↩	↩	↩
Volume (veh/h)	900	13	0	611	10	43
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.92	0.92
Hourly flow rate (vph)	957	14	0	643	11	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			None		
Median storage veh	1					
Upstream signal (ft)	354			502		
pX, platoon unblocked			0.77		0.87	0.77
vC, conflicting volume			971		1608	964
vC1, stage 1 conf vol					964	
vC2, stage 2 conf vol					643	
vCu, unblocked vol			810		1097	801
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	84
cM capacity (veh/h)			625		273	295

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	971	0	643	58
Volume Left	0	0	0	11
Volume Right	14	0	0	47
cSH	1700	1700	1700	290
Volume to Capacity	0.57	0.00	0.38	0.20
Queue Length 95th (ft)	0	0	0	18
Control Delay (s)	0.0	0.0	0.0	20.4
Lane LOS				C
Approach Delay (s)	0.0	0.0		20.4
Approach LOS				C

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		55.7%	ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

3: Mt. Auburn Street & Lloyd Road

1/26/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↷		↶	↷
Volume (veh/h)	0	935	619	1	2	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.50	0.50
Hourly flow rate (vph)	0	995	652	1	4	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		415	441			
pX, platoon unblocked	0.79				0.87	0.79
vC, conflicting volume	653				1647	652
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	428				1128	427
tC, single (s)	4.6				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.7				4.0	3.3
p0 queue free %	100				97	98
cM capacity (veh/h)	725				160	496

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	0	995	653	16
Volume Left	0	0	0	4
Volume Right	0	0	1	12
cSH	1700	1700	1700	325
Volume to Capacity	0.00	0.59	0.38	0.05
Queue Length 95th (ft)	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	16.7
Lane LOS				C
Approach Delay (s)	0.0		0.0	16.7
Approach LOS				C

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		56.8%	ICU Level of Service
Analysis Period (min)		15	B

HCM Unsignalized Intersection Capacity Analysis

4: Mt. Auburn Street & Elton Avenue

1/26/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→		↵	↑		
Volume (veh/h)	838	99	54	620	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.96	0.96	0.25	0.25
Hourly flow rate (vph)	911	108	56	646	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	465			391		
pX, platoon unblocked				0.76	0.87	0.76
vC, conflicting volume				1018	1723	965
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				871	1208	800
tC, single (s)				4.1	6.4	6.2
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				91	100	100
cM capacity (veh/h)				599	160	294

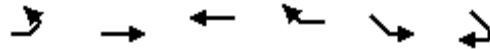
Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	1018	56	646
Volume Left	0	56	0
Volume Right	108	0	0
cSH	1700	599	1700
Volume to Capacity	0.60	0.09	0.38
Queue Length 95th (ft)	0	8	0
Control Delay (s)	0.0	11.6	0.0
Lane LOS	B		
Approach Delay (s)	0.0	0.9	
Approach LOS			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

5: Mt. Auburn Street & Irma Avenue

1/26/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	8	830	619	8	24	55
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.68	0.68
Hourly flow rate (vph)	9	892	703	9	35	81
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		628	228			
pX, platoon unblocked	0.76				0.83	0.76
vC, conflicting volume	712				1618	708
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	463				1243	457
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				78	82
cM capacity (veh/h)	842				160	458

Direction, Lane #	EB 1	EB 2	WB 1	SE 1
Volume Total	9	892	712	116
Volume Left	9	0	0	35
Volume Right	0	0	9	81
cSH	842	1700	1700	293
Volume to Capacity	0.01	0.52	0.42	0.40
Queue Length 95th (ft)	1	0	0	46
Control Delay (s)	9.3	0.0	0.0	25.1
Lane LOS	A			D
Approach Delay (s)	0.1		0.0	25.1
Approach LOS				D

Intersection Summary			
Average Delay		1.7	
Intersection Capacity Utilization		52.6%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

6: Mt. Auburn Street & Kimball Road

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	769	74	46	581	19	34	29	99	41	56	12
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1555	2995		1676	1709			1559			1722	
Flt Permitted	0.30	1.00		0.24	1.00			0.91			0.72	
Satd. Flow (perm)	486	2995		418	1709			1428			1271	
Peak-hour factor, PHF	0.85	0.85	0.85	0.91	0.91	0.91	0.68	0.68	0.68	0.77	0.77	0.77
Adj. Flow (vph)	13	905	87	51	638	21	50	43	146	53	73	16
RTOR Reduction (vph)	0	5	0	0	1	0	0	0	0	0	4	0
Lane Group Flow (vph)	13	987	0	51	658	0	0	239	0	0	138	0
Heavy Vehicles (%)	10%	6%	2%	2%	5%	0%	7%	12%	2%	0%	2%	0%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Parking (#/hr)		5							5			
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	71.4	71.4		71.4	71.4			27.0			27.0	
Effective Green, g (s)	71.4	71.4		71.4	71.4			27.0			27.0	
Actuated g/C Ratio	0.62	0.62		0.62	0.62			0.23			0.23	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	302	1860		260	1061			335			298	
v/s Ratio Prot		0.33			c0.39							
v/s Ratio Perm	0.03			0.12				c0.17			0.11	
v/c Ratio	0.04	0.53		0.20	0.62			0.71			0.46	
Uniform Delay, d1	8.5	12.3		9.4	13.4			40.4			37.8	
Progression Factor	1.00	1.00		0.41	0.37			1.00			1.00	
Incremental Delay, d2	0.3	1.1		1.3	2.2			7.0			5.1	
Delay (s)	8.8	13.4		5.2	7.1			47.5			42.9	
Level of Service	A	B		A	A			D			D	
Approach Delay (s)		13.4			7.0			47.5			42.9	
Approach LOS		B			A			D			D	

Intersection Summary

HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	16.6
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

6: Mt. Auburn Street & Kimball Road

1/26/2011

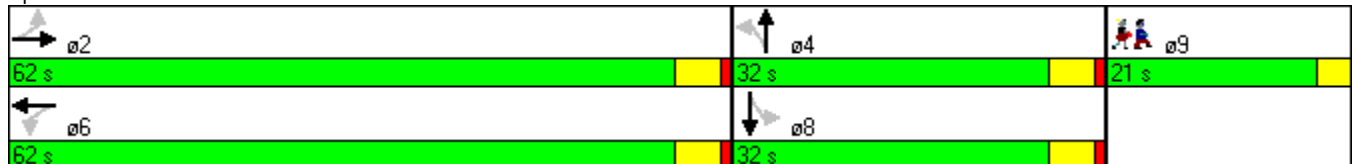


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations									
Volume (vph)	11	769	46	581	34	29	41	56	
Lane Group Flow (vph)	13	992	51	659	0	239	0	142	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		2		6		4		8	9
Permitted Phases	2		6		4		8		
Detector Phase	2	2	6	6	4	4	8	8	
Switch Phase									
Minimum Initial (s)	7.0	7.0	8.0	8.0	8.0	8.0	8.0	8.0	1.0
Minimum Split (s)	23.0	23.0	20.0	20.0	13.0	13.0	13.0	13.0	21.0
Total Split (s)	62.0	62.0	62.0	62.0	32.0	32.0	32.0	32.0	21.0
Total Split (%)	53.9%	53.9%	53.9%	53.9%	27.8%	27.8%	27.8%	27.8%	18%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Max	Max	None
v/c Ratio	0.04	0.52	0.19	0.60		0.71		0.47	
Control Delay	11.3	13.4	6.1	7.2		53.5		42.5	
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	11.3	13.5	6.1	7.2		53.5		42.5	
Queue Length 50th (ft)	3	166	6	93		163		88	
Queue Length 95th (ft)	15	322	m14	m130		180		127	
Internal Link Dist (ft)		148		118		676		475	
Turn Bay Length (ft)	75		75						
Base Capacity (vph)	312	1926	269	1097		336		302	
Starvation Cap Reductn	0	0	0	9		0		0	
Spillback Cap Reductn	0	34	0	0		0		0	
Storage Cap Reductn	0	0	0	0		0		0	
Reduced v/c Ratio	0.04	0.52	0.19	0.61		0.71		0.47	

Intersection Summary

Cycle Length: 115
 Actuated Cycle Length: 115
 Offset: 9 (8%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

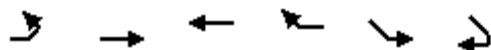
Splits and Phases: 6: Mt. Auburn Street & Kimball Road



HCM Unsignalized Intersection Capacity Analysis

7: Mt. Auburn Street & Templeton Parkway

1/26/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↔↑	↔		↔	
Volume (veh/h)	2	907	626	1	3	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.95	0.95	0.79	0.79
Hourly flow rate (vph)	2	1008	659	1	4	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		198	170			
pX, platoon unblocked	0.77				0.86	0.77
vC, conflicting volume	660				1168	659
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	413				383	413
tC, single (s)	4.1				7.5	7.3
tC, 2 stage (s)						
tF (s)	2.2				3.8	3.5
p0 queue free %	100				99	94
cM capacity (veh/h)	894				442	420

Direction, Lane #	EB 1	EB 2	WB 1	SE 1
Volume Total	338	672	660	29
Volume Left	2	0	0	4
Volume Right	0	0	1	25
cSH	894	1700	1700	423
Volume to Capacity	0.00	0.40	0.39	0.07
Queue Length 95th (ft)	0	0	0	6
Control Delay (s)	0.1	0.0	0.0	14.1
Lane LOS	A			B
Approach Delay (s)	0.0		0.0	14.1
Approach LOS				B

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		41.4%	ICU Level of Service
Analysis Period (min)		15	A

HCM Signalized Intersection Capacity Analysis
 8: Mt. Auburn Street & Arlington Street

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↗		↗	↗
Volume (vph)	73	457	380	270	513	9	72	247	87	10	997	42
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		3.0	4.0		4.0	4.0	3.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00	1.00		0.95	
Frt	1.00	0.93		1.00	1.00		1.00	1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1776	3349		1845	1902		1712	1905	1667		3698	
Flt Permitted	0.46	1.00		0.13	1.00		0.10	1.00	1.00		0.95	
Satd. Flow (perm)	858	3349		254	1902		172	1905	1667		3520	
Peak-hour factor, PHF	0.96	0.96	0.96	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	76	476	396	284	540	9	78	268	95	11	1096	46
RTOR Reduction (vph)	0	135	0	0	0	0	0	0	37	0	0	0
Lane Group Flow (vph)	76	737	0	284	549	0	78	268	58	0	1153	0
Heavy Vehicles (%)	7%	8%	3%	3%	5%	0%	11%	5%	2%	0%	2%	5%
Bus Blockages (#/hr)	0	0	9	0	0	9	0	0	0	0	0	0
Turn Type	Perm		pm+pt			Perm		pm+ov		Perm		
Protected Phases	2		1			6		8		1		
Permitted Phases	2		6			8		8		4		
Actuated Green, G (s)	27.6	27.6	58.4		58.4	42.0	42.0	69.8	42.0			
Effective Green, g (s)	27.6	27.6	58.4		58.4	42.0	42.0	69.8	42.0			
Actuated g/C Ratio	0.24	0.24	0.51		0.51	0.37	0.37	0.61	0.37			
Clearance Time (s)	4.0	4.0	3.0		4.0	4.0	4.0	3.0	4.0			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	206	804	514		966	63	696	1012	1286			
v/s Ratio Prot	c0.22		0.13		c0.29	0.14		0.01				
v/s Ratio Perm	0.09		0.15			c0.45		0.02	0.33			
v/c Ratio	0.37	0.92	0.55		0.57	1.24	0.39	0.06	0.90			
Uniform Delay, d1	36.4	42.6	22.0		19.6	36.5	27.0	9.2	34.5			
Progression Factor	0.80	0.83	1.00		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	4.3	15.1	4.2		2.4	190.6	0.4	0.0	10.0			
Delay (s)	33.3	50.3	26.2		22.0	227.1	27.3	9.2	44.4			
Level of Service	C	D	C		C	F	C	A	D			
Approach Delay (s)	48.9		23.4			58.8		44.4				
Approach LOS	D		C			E		D				

Intersection Summary			
HCM Average Control Delay	42.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

8: Mt. Auburn Street & Arlington Street

1/26/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	73	457	270	513	72	247	87	10	997	
Lane Group Flow (vph)	76	872	284	549	78	268	95	0	1153	
Turn Type	Perm		pm+pt		Perm		pm+ov	Perm		
Protected Phases		2	1	6		8	1		4	9
Permitted Phases	2		6		8		8	4		
Detector Phase	2	2	1	6	8	8	1	4	4	
Switch Phase										
Minimum Initial (s)	15.0	15.0	4.0	10.0	15.0	15.0	4.0	15.0	15.0	7.0
Minimum Split (s)	34.0	34.0	7.0	18.0	20.0	20.0	7.0	46.0	46.0	21.0
Total Split (s)	34.0	34.0	14.0	48.0	46.0	46.0	14.0	46.0	46.0	21.0
Total Split (%)	29.6%	29.6%	12.2%	41.7%	40.0%	40.0%	12.2%	40.0%	40.0%	18%
Yellow Time (s)	3.5	3.5	3.0	3.5	3.5	3.5	3.0	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.0	0.5	0.5	0.5	0.0	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0	
Lead/Lag	Lag	Lag	Lead				Lead			
Lead-Lag Optimize?	Yes	Yes	Yes				Yes			
Recall Mode	C-Max	C-Max	Max	C-Max	Min	Min	Max	Max	Max	None
v/c Ratio	0.34	0.87	0.55	0.55	1.26	0.39	0.09		0.90	
Control Delay	31.8	35.8	25.4	22.4	233.6	29.0	1.8		45.0	
Queue Delay	0.0	5.4	0.0	0.0	0.0	1.2	0.0		0.0	
Total Delay	31.8	41.3	25.4	22.4	233.6	30.2	1.8		45.0	
Queue Length 50th (ft)	48	276	109	235	-72	145	0		420	
Queue Length 95th (ft)	m60	#307	#359	487	#172	219	16		#549	
Internal Link Dist (ft)		90		1917		344			1269	
Turn Bay Length (ft)	100				360					
Base Capacity (vph)	224	1005	521	1006	62	696	1095		1285	
Starvation Cap Reductn	0	92	0	0	0	241	0		0	
Spillback Cap Reductn	0	0	0	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0	0	0	0		0	
Reduced v/c Ratio	0.34	0.96	0.55	0.55	1.26	0.59	0.09		0.90	

Intersection Summary

Cycle Length: 115

Actuated Cycle Length: 115

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 120

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.







m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Mt. Auburn Street & Arlington Street

1/26/2011

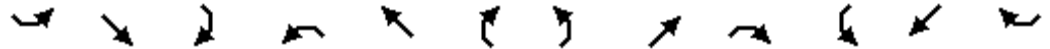
Splits and Phases: 8: Mt. Auburn Street & Arlington Street

 ø1	 ø2	 ø4	 ø9
<div style="background-color: #00FF00; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;">14 s</div>	<div style="background-color: #00FF00; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;">34 s</div>	<div style="background-color: #00FF00; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;">46 s</div>	<div style="background-color: #00FF00; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;">21 s</div>
 ø6	 ø8		
<div style="background-color: #00FF00; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;">48 s</div>	<div style="background-color: #00FF00; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;">46 s</div>		

HCM Signalized Intersection Capacity Analysis

10: Arlington Street & Tufts Medical Center

1/26/2011



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕	↕	↕	↕		↕	↕		↕	↕	
Volume (vph)	22	1034	591	21	158	69	217	6	107	7	1	31
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		0.95	0.95		1.00	1.00	
Frt		1.00	0.85	1.00	0.95		1.00	0.90		1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (prot)		1960	1589	1638	1746		1367	1452		1900	1180	
Flt Permitted		0.99	1.00	0.08	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (perm)		1945	1589	136	1746		1367	1452		1900	1180	
Peak-hour factor, PHF	0.93	0.93	0.93	0.91	0.91	0.91	0.73	0.73	0.73	0.86	0.86	0.86
Adj. Flow (vph)	24	1112	635	23	174	76	297	8	147	8	1	36
RTOR Reduction (vph)	0	0	149	0	13	0	0	75	0	0	35	0
Lane Group Flow (vph)	0	1136	486	23	237	0	235	142	0	8	2	0
Heavy Vehicles (%)	45%	1%	7%	16%	6%	17%	32%	0%	10%	0%	0%	46%
Turn Type	Perm	pm+ov		Perm	Split			Split				
Protected Phases		6	4		2		4	4		8	8	
Permitted Phases	6	6		2								
Actuated Green, G (s)		50.6	64.8	50.6	50.6		14.2	14.2		2.3	2.3	
Effective Green, g (s)		50.6	64.8	50.6	50.6		14.2	14.2		2.3	2.3	
Actuated g/C Ratio		0.60	0.77	0.60	0.60		0.17	0.17		0.03	0.03	
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1163	1292	81	1044		229	244		52	32	
v/s Ratio Prot			0.06		0.14		c0.17	0.10		c0.00	0.00	
v/s Ratio Perm		c0.58	0.24	0.17								
v/c Ratio		0.98	0.38	0.28	0.23		1.03	0.58		0.15	0.06	
Uniform Delay, d1		16.4	3.3	8.2	7.9		35.2	32.5		40.2	40.1	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		21.4	0.8	1.9	0.1		66.4	9.8		1.4	0.8	
Delay (s)		37.8	4.1	10.2	8.0		101.6	42.2		41.6	40.9	
Level of Service		D	A	B	A		F	D		D	D	
Approach Delay (s)		25.7		8.2		73.1			41.0			
Approach LOS		C		A		E			D			

Intersection Summary

HCM Average Control Delay	32.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	84.6	Sum of lost time (s)	17.5
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

10: Arlington Street & Tufts Medical Center

1/26/2011



Lane Group	SEL	SET	SER	NWL	NWT	NEL	NET	SWL	SWT	ø9
Lane Configurations		↕	↗	↖	↘	↙	↕	↖	↗	
Volume (vph)	22	1034	591	21	158	217	6	7	1	
Lane Group Flow (vph)	0	1136	635	23	250	235	217	8	37	
Turn Type	Perm		pm+ov	Perm		Split		Split		
Protected Phases		6	4		2	4	4	8	8	9
Permitted Phases	6		6	2						
Detector Phase	6	6	4	2	2	4	4	8	8	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	18.0
Total Split (s)	54.0	54.0	18.0	54.0	54.0	18.0	18.0	8.0	8.0	18.0
Total Split (%)	55.1%	55.1%	18.4%	55.1%	55.1%	18.4%	18.4%	8.2%	8.2%	18%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Min	Min	Max	Max	None	None	None
v/c Ratio		0.93	0.43	0.27	0.23	0.98	0.66	0.08	0.39	
Control Delay		30.4	1.3	21.3	7.8	89.7	30.7	43.1	28.1	
Queue Delay		59.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		90.0	1.8	21.3	7.8	89.7	30.7	43.1	28.1	
Queue Length 50th (ft)		456	0	5	41	124	61	4	1	
Queue Length 95th (ft)		#1083	30	35	122	#254	117	19	#32	
Internal Link Dist (ft)		344			505		69		101	
Turn Bay Length (ft)				125				150		
Base Capacity (vph)		1224	1473	85	1111	241	330	96	94	
Starvation Cap Reductn		222	405	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		1.13	0.59	0.27	0.23	0.98	0.66	0.08	0.39	

Intersection Summary

Cycle Length: 98

Actuated Cycle Length: 80.4

Natural Cycle: 140

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 10: Arlington Street & Tufts Medical Center

ø2	ø4	ø8	ø9
54 s	18 s	8 s	18 s
ø6			
54 s			

HCM Signalized Intersection Capacity Analysis

36: Mt. Auburn Street & Palfrey Street

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕				
Volume (vph)	137	862	137	33	825	34	154	169	34	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	16	16	16	12	12	12
Total Lost time (s)		5.5			5.5			5.5				
Lane Util. Factor		0.95			0.95			1.00				
Frbp, ped/bikes		0.99			1.00			1.00				
Flpb, ped/bikes		1.00			1.00			1.00				
Frt		0.98			0.99			0.99				
Flt Protected		0.99			1.00			0.98				
Satd. Flow (prot)		3613			3653			2163				
Flt Permitted		0.61			0.85			0.98				
Satd. Flow (perm)		2204			3102			2163				
Peak-hour factor, PHF	0.92	0.97	0.97	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.92	0.92
Adj. Flow (vph)	149	889	141	36	897	37	171	184	38	0	0	0
RTOR Reduction (vph)	0	8	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1171	0	0	968	0	0	393	0	0	0	0
Confl. Peds. (#/hr)			10	10			10		10			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	6	0	6	0	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm			Split					
Protected Phases		4			8		2	2				
Permitted Phases	4			8								
Actuated Green, G (s)		78.7			78.7			33.3				
Effective Green, g (s)		78.7			78.7			33.3				
Actuated g/C Ratio		0.61			0.61			0.26				
Clearance Time (s)		5.5			5.5			5.5				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1334			1878			554				
v/s Ratio Prot								c0.18				
v/s Ratio Perm		c0.53			0.31							
v/c Ratio		0.88			0.52			0.71				
Uniform Delay, d1		21.6			14.7			44.0				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		8.4			1.0			4.2				
Delay (s)		30.0			15.7			48.1				
Level of Service		C			B			D				
Approach Delay (s)		30.0			15.7			48.1			0.0	
Approach LOS		C			B			D			A	

Intersection Summary

HCM Average Control Delay	27.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

36: Mt. Auburn Street & Palfrey Street

1/26/2011



Lane Group	EBL	EBT	WBL	WBT	NBT	ø9
Lane Configurations		↕↕		↕↕	↕↕	
Volume (vph)	137	862	33	825	169	
Lane Group Flow (vph)	0	1179	0	970	393	
Turn Type	Perm		Perm			
Protected Phases		4		8	2	9
Permitted Phases	4		8			
Detector Phase	4	4	8	8	2	
Switch Phase						
Minimum Initial (s)	7.0	7.0	4.0	4.0	7.0	7.0
Minimum Split (s)	25.5	25.5	20.0	20.0	25.5	23.0
Total Split (s)	81.5	81.5	81.5	81.5	25.5	23.0
Total Split (%)	62.7%	62.7%	62.7%	62.7%	19.6%	18%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	None
v/c Ratio		0.85		0.50	0.71	
Control Delay		27.0		14.5	53.0	
Queue Delay		4.8		0.7	0.0	
Total Delay		31.8		15.2	53.0	
Queue Length 50th (ft)		355		200	300	
Queue Length 95th (ft)		#623		304	#600	
Internal Link Dist (ft)		491		175	368	
Turn Bay Length (ft)						
Base Capacity (vph)		1382		1938	554	
Starvation Cap Reductn		148		568	0	
Spillback Cap Reductn		0		0	0	
Storage Cap Reductn		0		0	0	
Reduced v/c Ratio		0.96		0.71	0.71	

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 36 (28%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 36: Mt. Auburn Street & Palfrey Street



HCM Unsignalized Intersection Capacity Analysis
 15: Mt. Auburn Street & Phillips Street

1/26/2011



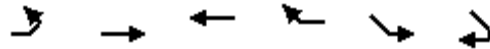
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	884	12	42	876	16	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.92	0.92	0.42	0.42
Hourly flow rate (vph)	911	12	46	952	38	48
Pedestrians	11			11		
Lane Width (ft)	11.0			13.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	1			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	255			336		
pX, platoon unblocked				0.82	0.88	0.82
vC, conflicting volume				924	1496	473
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				482	386	0
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				95	92	95
cM capacity (veh/h)				888	491	890

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	608	316	363	635	86
Volume Left	0	0	46	0	38
Volume Right	0	12	0	0	48
cSH	1700	1700	888	1700	654
Volume to Capacity	0.36	0.19	0.05	0.37	0.13
Queue Length 95th (ft)	0	0	4	0	11
Control Delay (s)	0.0	0.0	1.7	0.0	11.3
Lane LOS	A			B	
Approach Delay (s)	0.0		0.6	11.3	
Approach LOS				B	

Intersection Summary					
Average Delay			0.8		
Intersection Capacity Utilization			64.1%	ICU Level of Service	C
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis
 17: Mt. Auburn Street & Marshall Street

1/26/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑↑	↑↑			
Volume (veh/h)	41	863	918	30	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	890	998	33	0	0
Pedestrians		11	11		20	
Lane Width (ft)		12.0	12.0		0.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		1	1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		347	244			
pX, platoon unblocked	0.78				0.86	0.78
vC, conflicting volume	1050				1575	546
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	504				485	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	100
cM capacity (veh/h)	825				419	844

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	339	593	665	365
Volume Left	42	0	0	0
Volume Right	0	0	0	33
cSH	825	1700	1700	1700
Volume to Capacity	0.05	0.35	0.39	0.21
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	1.7	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.6		0.0	
Approach LOS				

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		64.5%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 19: Mt. Auburn Street & Parker Street

1/26/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Volume (veh/h)	862	1	0	948	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.99	0.99	0.91	0.91	0.83	0.83
Hourly flow rate (vph)	871	1	0	1042	0	0
Pedestrians	2			8		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	463			128		
pX, platoon unblocked				0.85	0.85	0.85
vC, conflicting volume				872	1394	444
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				503	322	1
tC, single (s)				4.1	6.9	7.0
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	100	100
cM capacity (veh/h)				901	545	914

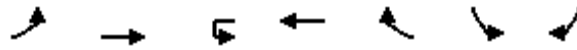
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	580	291	347	695
Volume Left	0	0	0	0
Volume Right	0	1	0	0
cSH	1700	1700	901	1700
Volume to Capacity	0.34	0.17	0.00	0.41
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis

14: Mt. Auburn Street & Common Street

1/26/2011



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	224	638	20	695	241	360	253
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	10	10
Total Lost time (s)	5.5	5.5		5.5		5.5	5.5
Lane Util. Factor	1.00	1.00		0.95		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00		1.00	1.00
Frt	1.00	1.00		0.96		1.00	0.85
Flt Protected	0.95	1.00		1.00		0.95	1.00
Satd. Flow (prot)	1862	1675		3581		1756	1552
Flt Permitted	0.13	1.00		0.93		0.95	1.00
Satd. Flow (perm)	247	1675		3331		1756	1552
Peak-hour factor, PHF	0.99	0.99	0.92	0.91	0.91	0.93	0.93
Adj. Flow (vph)	226	644	22	764	265	387	272
RTOR Reduction (vph)	0	0	0	18	0	0	0
Lane Group Flow (vph)	226	644	0	1033	0	387	272
Confl. Peds. (#/hr)	28					2	8
Heavy Vehicles (%)	2%	2%	2%	2%	2%	1%	1%
Bus Blockages (#/hr)	0	6	0	0	6	0	0
Parking (#/hr)		5					
Turn Type	pm+pt		Perm			pm+ov	
Protected Phases	1 4	6		2		3	1 4
Permitted Phases	6		2				3
Actuated Green, G (s)	89.3	82.5		64.8		37.2	56.2
Effective Green, g (s)	89.3	82.5		64.8		37.2	56.2
Actuated g/C Ratio	0.60	0.55		0.43		0.25	0.37
Clearance Time (s)		5.5		5.5		5.5	
Vehicle Extension (s)		3.0		3.0		3.0	
Lane Grp Cap (vph)	352	921		1439		435	638
v/s Ratio Prot	c0.08	c0.38				c0.22	0.05
v/s Ratio Perm	0.30			0.31			0.12
v/c Ratio	0.64	0.70		0.72		0.89	0.43
Uniform Delay, d1	22.2	24.7		35.1		54.4	34.9
Progression Factor	1.00	1.00		1.00		1.00	1.00
Incremental Delay, d2	4.0	4.4		3.1		19.4	0.5
Delay (s)	26.2	29.1		38.2		73.8	35.4
Level of Service	C	C		D		E	D
Approach Delay (s)		28.3		38.2		57.9	
Approach LOS		C		D		E	

Intersection Summary			
HCM Average Control Delay		39.9	HCM Level of Service D
HCM Volume to Capacity ratio		0.75	
Actuated Cycle Length (s)		150.0	Sum of lost time (s) 23.5
Intersection Capacity Utilization		90.7%	ICU Level of Service E
Analysis Period (min)		15	

c Critical Lane Group

Queues

14: Mt. Auburn Street & Common Street

1/26/2011

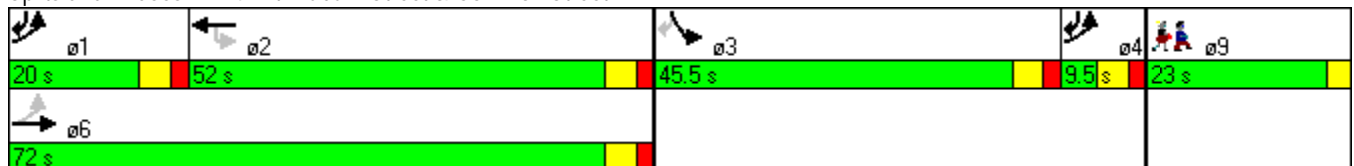


Lane Group	EBL	EBT	WBU	WBT	SBL	SBR	ø1	ø4	ø9
Lane Configurations									
Volume (vph)	224	638	20	695	360	253			
Lane Group Flow (vph)	226	644	0	1051	387	272			
Turn Type	pm+pt		Perm			pm+ov			
Protected Phases	14	6		2	3	14	1	4	9
Permitted Phases	6		2			3			
Detector Phase	14	6	2	2	3	3			
Switch Phase									
Minimum Initial (s)		4.0	4.0	4.0	4.0		4.0	4.0	7.0
Minimum Split (s)		9.5	9.5	9.5	9.5		20.0	9.5	23.0
Total Split (s)	29.5	72.0	52.0	52.0	45.5	29.5	20.0	9.5	23.0
Total Split (%)	19.7%	48.0%	34.7%	34.7%	30.3%	19.7%	13%	6%	15%
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5	3.5	3.0
All-Red Time (s)		2.0	2.0	2.0	2.0		2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5			
Lead/Lag			Lag	Lag	Lead		Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	Yes		Yes	Yes	
Recall Mode		C-Max	C-Max	C-Max	Min		None	Max	None
v/c Ratio	0.55	0.68		0.70	0.89	0.43			
Control Delay	21.1	29.2		36.6	76.9	27.0			
Queue Delay	0.0	7.3		0.0	0.0	0.0			
Total Delay	21.1	36.6		36.6	76.9	27.0			
Queue Length 50th (ft)	80	396		405	358	170			
Queue Length 95th (ft)	146	#797		#687	#521	170			
Internal Link Dist (ft)		48		1077	686				
Turn Bay Length (ft)									
Base Capacity (vph)	442	948		1508	468	647			
Starvation Cap Reductn	0	258		0	0	0			
Spillback Cap Reductn	0	0		0	0	0			
Storage Cap Reductn	0	0		0	0	0			
Reduced v/c Ratio	0.51	0.93		0.70	0.83	0.42			

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:WBTU and 6:EBTL, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 14: Mt. Auburn Street & Common Street



HCM Signalized Intersection Capacity Analysis

21: Mt. Auburn Street & Bates Road East

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	747	194	29	839	10	327	6	28	8	3	15
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	5.5	5.5	4.0	5.5	5.5			5.5			5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00			0.97	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99			1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.99			0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96			0.98	
Satd. Flow (prot)	1881	1980	1430	1881	1974			1862			1758	
Flt Permitted	0.09	1.00	1.00	0.19	1.00			0.70			0.83	
Satd. Flow (perm)	177	1980	1430	377	1974			1362			1474	
Peak-hour factor, PHF	0.97	0.97	0.97	0.92	0.92	0.92	0.87	0.87	0.87	0.70	0.70	0.70
Adj. Flow (vph)	5	770	200	32	912	11	376	7	32	11	4	21
RTOR Reduction (vph)	0	0	20	0	0	0	0	2	0	0	18	0
Lane Group Flow (vph)	5	770	180	32	923	0	0	413	0	0	18	0
Confl. Peds. (#/hr)	32		33	33		32	9		3	3		9
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			0									0
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		6	7		2		7	4			8	
Permitted Phases	6		6	2		4			8			
Actuated Green, G (s)	67.5	67.5	87.1	67.5	67.5			40.7			17.1	
Effective Green, g (s)	67.5	67.5	87.1	67.5	67.5			40.7			17.1	
Actuated g/C Ratio	0.57	0.57	0.73	0.57	0.57			0.34			0.14	
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5			5.5			5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	100	1121	1045	213	1118			547			211	
v/s Ratio Prot		0.39	0.03		c0.47			c0.12				
v/s Ratio Perm	0.03		0.10	0.08				c0.13			0.01	
v/c Ratio	0.05	0.69	0.17	0.15	0.83			0.76			0.09	
Uniform Delay, d1	11.5	18.3	4.9	12.3	21.0			34.8			44.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.9	3.4	0.1	1.5	7.0			5.9			0.2	
Delay (s)	12.5	21.8	5.0	13.7	28.0			40.7			44.4	
Level of Service	B	C	A	B	C			D			D	
Approach Delay (s)		18.3			27.5			40.7			44.4	
Approach LOS		B			C			D			D	

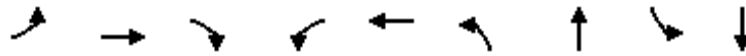
Intersection Summary

HCM Average Control Delay	26.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	119.2	Sum of lost time (s)	11.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Queues

21: Mt. Auburn Street & Bates Road East

1/26/2011



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	5	747	194	29	839	327	6	8	3	
Lane Group Flow (vph)	5	770	200	32	923	0	415	0	36	
Turn Type	Perm		pm+ov	Perm		pm+pt		Perm		
Protected Phases		6	7		2	7	4		8	9
Permitted Phases	6		6	2		4		8		
Detector Phase	6	6	7	2	2	7	4	8	8	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	7.0
Minimum Split (s)	25.5	25.5	8.0	25.5	25.5	8.0	25.5	9.5	9.5	23.0
Total Split (s)	73.0	73.0	11.0	73.0	73.0	11.0	44.0	33.0	33.0	23.0
Total Split (%)	52.1%	52.1%	7.9%	52.1%	52.1%	7.9%	31.4%	23.6%	23.6%	16%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5	4.0	5.5	5.5	4.0	5.5	5.5	5.5	
Lead/Lag			Lead			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes			Yes		Yes	Yes	
Recall Mode	Max	Max	None	Max	Max	None	Max	None	None	None
v/c Ratio	0.05	0.67	0.18	0.15	0.81		0.78		0.14	
Control Delay	12.4	20.9	4.2	13.6	26.8		47.8		20.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	12.4	20.9	4.2	13.6	26.8		47.8		20.5	
Queue Length 50th (ft)	2	381	31	11	524		266		9	
Queue Length 95th (ft)	8	521	58	29	721		#424		25	
Internal Link Dist (ft)		1077			987		295		217	
Turn Bay Length (ft)	75		100	75						
Base Capacity (vph)	102	1142	1100	217	1139		530		372	
Starvation Cap Reductn	0	0	0	0	0		0		0	
Spillback Cap Reductn	0	0	0	0	0		0		0	
Storage Cap Reductn	0	0	0	0	0		0		0	
Reduced v/c Ratio	0.05	0.67	0.18	0.15	0.81		0.78		0.10	

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 117

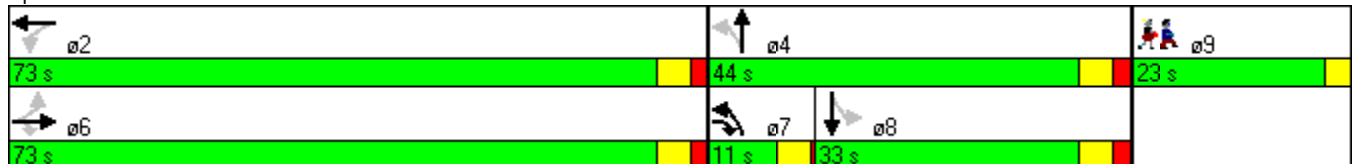
Natural Cycle: 140

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 21: Mt. Auburn Street & Bates Road East



HCM Signalized Intersection Capacity Analysis

24: Mt. Auburn Street & Boylston Street

1/26/2011



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations		↕		↕	↕	↕	
Volume (vph)	10	776	49	25	886	30	15
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0		4.0	4.0	4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	
Frbp, ped/bikes		1.00		1.00	1.00	1.00	
Flpb, ped/bikes		1.00		0.99	1.00	1.00	
Frt		0.99		1.00	1.00	0.96	
Flt Protected		1.00		0.95	1.00	0.97	
Satd. Flow (prot)		1940		1890	1952	1831	
Flt Permitted		0.99		0.34	1.00	0.97	
Satd. Flow (perm)		1918		676	1952	1831	
Peak-hour factor, PHF	0.92	0.97	0.97	0.93	0.93	0.77	0.77
Adj. Flow (vph)	11	800	51	27	953	39	19
RTOR Reduction (vph)	0	1	0	0	0	18	0
Lane Group Flow (vph)	0	861	0	27	953	40	0
Confl. Peds. (#/hr)			27	27		1	
Heavy Vehicles (%)	2%	2%	2%	0%	0%	1%	1%
Bus Blockages (#/hr)	0	0	6	0	6	0	0
Parking (#/hr)			0				
Turn Type	Perm			Perm			
Protected Phases		4			8	2	
Permitted Phases	4			8			
Actuated Green, G (s)		60.1		60.1	60.1	4.6	
Effective Green, g (s)		60.1		60.1	60.1	4.6	
Actuated g/C Ratio		0.76		0.76	0.76	0.06	
Clearance Time (s)		4.0		4.0	4.0	4.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		1450		511	1476	106	
v/s Ratio Prot					c0.49	c0.02	
v/s Ratio Perm		0.45		0.04			
v/c Ratio		0.59		0.05	0.65	0.38	
Uniform Delay, d1		4.3		2.5	4.6	36.1	
Progression Factor		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.7		0.0	1.0	2.3	
Delay (s)		5.0		2.5	5.6	38.3	
Level of Service		A		A	A	D	
Approach Delay (s)		5.0			5.5	38.3	
Approach LOS		A			A	D	

Intersection Summary

HCM Average Control Delay	6.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	14.8
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Queues

24: Mt. Auburn Street & Boylston Street

1/26/2011



Lane Group	EBU	EBT	WBL	WBT	NBL	ø9
Lane Configurations		↕	↖	↗	↘	
Volume (vph)	10	776	25	886	30	
Lane Group Flow (vph)	0	862	27	953	58	
Turn Type	Perm		Perm			
Protected Phases		4		8	2	9
Permitted Phases	4		8			
Detector Phase	4	4	8	8	2	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	22.0
Total Split (s)	48.0	48.0	48.0	48.0	20.0	22.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%	22.2%	24%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Min	Min	Min	Min	None	None
v/c Ratio		0.54	0.05	0.59	0.29	
Control Delay		7.7	5.4	8.7	29.7	
Queue Delay		0.0	0.0	0.0	0.0	
Total Delay		7.7	5.4	8.7	29.7	
Queue Length 50th (ft)		97	2	117	17	
Queue Length 95th (ft)		546	m19	#663	49	
Internal Link Dist (ft)		987		740	495	
Turn Bay Length (ft)			75			
Base Capacity (vph)		1596	563	1626	419	
Starvation Cap Reductn		0	0	0	0	
Spillback Cap Reductn		0	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.54	0.05	0.59	0.14	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 74.4

Natural Cycle: 100

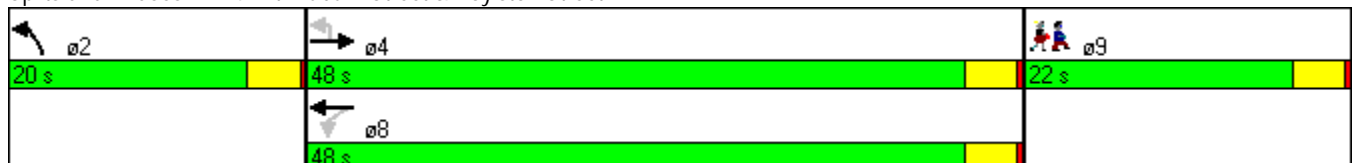
Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: Mt. Auburn Street & Boylston Street



HCM Unsignalized Intersection Capacity Analysis

31: Mt. Auburn Street & Winthrop Street

1/26/2011



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations		↕		↕	↑	↕	
Volume (veh/h)	10	763	15	20	905	25	7
Sign Control		Free			Free	Stop	
Grade		0%			0%	0%	
Peak Hour Factor	0.92	0.98	0.98	0.91	0.91	0.84	0.84
Hourly flow rate (vph)	0	779	15	22	995	30	8
Pedestrians					4	18	
Lane Width (ft)					12.0	12.0	
Walking Speed (ft/s)					4.0	4.0	
Percent Blockage					0	1	
Right turn flare (veh)							
Median type		Raised			Raised		
Median storage (veh)		1			1		
Upstream signal (ft)		820			738		
pX, platoon unblocked	0.00			0.76		0.67	0.76
vC, conflicting volume	0			812		1843	808
vC1, stage 1 conf vol						804	
vC2, stage 2 conf vol						1038	
vCu, unblocked vol	0			598		1217	593
tC, single (s)	0.0			4.1		6.4	6.2
tC, 2 stage (s)						5.4	
tF (s)	0.0			2.2		3.5	3.3
p0 queue free %	0			97		86	98
cM capacity (veh/h)	0			735		207	381

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	794	22	995	38
Volume Left	0	22	0	30
Volume Right	15	0	0	8
cSH	1700	735	1700	230
Volume to Capacity	0.47	0.03	0.59	0.17
Queue Length 95th (ft)	0	2	0	15
Control Delay (s)	0.0	10.0	0.0	23.7
Lane LOS		B		C
Approach Delay (s)	0.0	0.2		23.7
Approach LOS				C

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		57.9%	ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

26: Mt. Auburn Street & Chauncey Street

1/26/2011



Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations		↔		↔	↑	↔	
Volume (veh/h)	10	761	9	21	902	13	12
Sign Control		Free			Free	Stop	
Grade		0%			0%	0%	
Peak Hour Factor	0.92	0.98	0.98	0.89	0.89	0.73	0.73
Hourly flow rate (vph)	0	777	9	24	1013	18	16
Pedestrians		3				24	
Lane Width (ft)		12.0				12.0	
Walking Speed (ft/s)		4.0				4.0	
Percent Blockage		0				2	
Right turn flare (veh)							
Median type		Raised			Raised		
Median storage (veh)		1			1		
Upstream signal (ft)		1119			439		
pX, platoon unblocked	0.00			0.79		0.67	0.79
vC, conflicting volume	0			810		1869	805
vC1, stage 1 conf vol						805	
vC2, stage 2 conf vol						1064	
vCu, unblocked vol	0			622		1333	616
tC, single (s)	0.0			4.1		6.4	6.2
tC, 2 stage (s)						5.4	
tF (s)	0.0			2.2		3.5	3.3
p0 queue free %	0			97		91	96
cM capacity (veh/h)	0			739		193	381

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	786	24	1013	34
Volume Left	0	24	0	18
Volume Right	9	0	0	16
cSH	1700	739	1700	253
Volume to Capacity	0.46	0.03	0.60	0.14
Queue Length 95th (ft)	0	2	0	12
Control Delay (s)	0.0	10.0	0.0	21.5
Lane LOS		B		C
Approach Delay (s)	0.0	0.2		21.5
Approach LOS				C

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		56.2%	ICU Level of Service
Analysis Period (min)		15	B

HCM Signalized Intersection Capacity Analysis
 28: Mt. Auburn Street & School Street

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	654	33	42	769	75	44	387	77	71	200	100
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	12	12	12	10	10	10
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1859	1942		1843	1961	1573	1874	1916		1740	1741	
Flt Permitted	0.06	1.00		0.18	1.00	1.00	0.43	1.00		0.21	1.00	
Satd. Flow (perm)	118	1942		352	1961	1573	855	1916		385	1741	
Peak-hour factor, PHF	0.99	0.99	0.99	0.88	0.88	0.88	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	92	661	33	48	874	85	49	430	86	75	211	105
RTOR Reduction (vph)	0	1	0	0	0	9	0	0	0	0	0	0
Lane Group Flow (vph)	92	693	0	48	874	76	49	516	0	75	316	0
Confl. Peds. (#/hr)	13		37	37		13	5		19	19		5
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		6			2			3			8	
Permitted Phases	6			2		2	3			8		
Actuated Green, G (s)	66.2	66.2		66.2	66.2	66.2	49.8	49.8		49.8	49.8	
Effective Green, g (s)	66.2	66.2		66.2	66.2	66.2	49.8	49.8		49.8	49.8	
Actuated g/C Ratio	0.50	0.50		0.50	0.50	0.50	0.37	0.37		0.37	0.37	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	58	962		174	972	779	319	714		144	649	
v/s Ratio Prot		0.36			0.45			c0.27			0.18	
v/s Ratio Perm	c0.78			0.14		0.05	0.06			0.19		
v/c Ratio	1.59	0.72		0.28	0.90	0.10	0.15	0.72		0.52	0.49	
Uniform Delay, d1	33.7	26.4		19.7	30.7	17.9	27.9	36.0		32.6	32.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	330.8	4.6		3.9	12.9	0.2	1.0	6.3		12.8	2.6	
Delay (s)	364.5	31.1		23.6	43.5	18.1	28.9	42.2		45.4	34.7	
Level of Service	F	C		C	D	B	C	D		D	C	
Approach Delay (s)		70.1			40.4			41.1			36.8	
Approach LOS		E			D			D			D	

Intersection Summary		
HCM Average Control Delay	48.5	HCM Level of Service D
HCM Volume to Capacity ratio	1.21	
Actuated Cycle Length (s)	133.6	Sum of lost time (s) 17.6
Intersection Capacity Utilization	137.9%	ICU Level of Service H
Analysis Period (min)	15	

c Critical Lane Group

Queues

28: Mt. Auburn Street & School Street

1/26/2011



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	91	654	42	769	75	44	387	71	200	
Lane Group Flow (vph)	92	694	48	874	85	49	516	75	316	
Turn Type	Perm		Perm		Perm	Perm		Perm		
Protected Phases		6		2			3		8	9
Permitted Phases	6		2		2	3		8		
Detector Phase	6	6	2	2	2	3	3	8	8	
Switch Phase										
Minimum Initial (s)	44.0	44.0	44.0	44.0	44.0	39.0	39.0	39.0	39.0	7.0
Minimum Split (s)	50.0	50.0	50.0	50.0	50.0	45.0	45.0	45.0	45.0	17.3
Total Split (s)	72.0	72.0	72.0	72.0	72.0	55.7	55.7	55.7	55.7	17.3
Total Split (%)	49.7%	49.7%	49.7%	49.7%	49.7%	38.4%	38.4%	38.4%	38.4%	12%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	Max	None
v/c Ratio	1.56	0.71	0.27	0.88	0.11	0.15	0.71	0.51	0.48	
Control Delay	351.3	30.9	25.8	41.6	14.9	30.2	41.9	48.2	34.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	351.3	30.9	25.8	41.6	14.9	30.2	41.9	48.2	34.8	
Queue Length 50th (ft)	~106	417	22	610	27	26	353	47	193	
Queue Length 95th (ft)	#202	716	63	#1049	68	66	585	123	339	
Internal Link Dist (ft)		359		1191			1065		1130	
Turn Bay Length (ft)	100		100		75	75		75		
Base Capacity (vph)	59	981	177	990	802	324	728	146	661	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.56	0.71	0.27	0.88	0.11	0.15	0.71	0.51	0.48	

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 131.2

Natural Cycle: 145

Control Type: Semi Act-Uncoord

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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






Queue shown is maximum after two cycles.

Queues

28: Mt. Auburn Street & School Street

1/26/2011

Splits and Phases: 28: Mt. Auburn Street & School Street

 ø2	 ø3	 ø9
72 s	55.7 s	17.3 s
 ø6	 ø8	
72 s	55.7 s	

HCM Unsignalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	709	17	40	768	12	25	7	67	7	2	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.94	0.94	0.94	0.90	0.90	0.90	0.58	0.58	0.58
Hourly flow rate (vph)	13	762	18	43	817	13	28	8	74	12	3	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh		1			1							
Upstream signal (ft)		1271			856							
pX, platoon unblocked	0.68			0.70			0.83	0.83	0.70	0.83	0.83	0.68
vC, conflicting volume	830			781			1706	1712	772	1775	1715	823
vC1, stage 1 conf vol							797	797		909	909	
vC2, stage 2 conf vol							909	915		867	806	
vCu, unblocked vol	521			477			945	952	464	1028	956	512
tC, single (s)	4.1			4.1			7.1	6.7	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.7		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.2	3.3	3.5	4.0	3.3
p0 queue free %	98			94			88	97	82	93	99	99
cM capacity (veh/h)	723			770			230	225	416	179	237	388

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	13	781	43	830	110	21
Volume Left	13	0	43	0	28	12
Volume Right	0	18	0	13	74	5
cSH	723	1700	770	1700	329	217
Volume to Capacity	0.02	0.46	0.06	0.49	0.33	0.10
Queue Length 95th (ft)	1	0	4	0	36	8
Control Delay (s)	10.1	0.0	9.9	0.0	21.3	23.4
Lane LOS	B		A		C	C
Approach Delay (s)	0.2		0.5		21.3	23.4
Approach LOS					C	C

Intersection Summary

Average Delay	1.9
Intersection Capacity Utilization	51.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis

1: Mt. Auburn Street & Upland Road

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	709	17	40	768	12	25	7	67	7	2	3
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.91			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1900	1955		1900	1957			1717			1876	
Flt Permitted	0.32	1.00		0.34	1.00			0.95			0.91	
Satd. Flow (perm)	644	1955		688	1957			1658			1766	
Peak-hour factor, PHF	0.93	0.93	0.93	0.94	0.94	0.94	0.90	0.90	0.90	0.58	0.58	0.58
Adj. Flow (vph)	13	762	18	43	817	13	28	8	74	12	3	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	12	0	0	1	0
Lane Group Flow (vph)	13	780	0	43	830	0	0	98	0	0	19	0
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	17%	5%	0%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									5
Turn Type	custom			custom			custom			custom		
Protected Phases												
Permitted Phases	2!	2!		2!	2!		6!	6!		6!	6!	
Actuated Green, G (s)	51.0	51.0		51.0	51.0			51.0			51.0	
Effective Green, g (s)	51.0	51.0		51.0	51.0			51.0			51.0	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.84			0.84	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	538	1635		575	1636			1386			1476	
v/s Ratio Prot												
v/s Ratio Perm	0.02	0.40		0.06	c0.42			0.06			0.01	
v/c Ratio	0.02	0.48		0.07	0.51			0.07			0.01	
Uniform Delay, d1	0.8	1.4		0.9	1.4			0.9			0.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	1.0		0.3	1.1			0.0			0.0	
Delay (s)	0.9	2.4		1.1	2.5			0.9			0.8	
Level of Service	A	A		A	A			A			A	
Approach Delay (s)		2.3			2.5			0.9			0.8	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	2.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

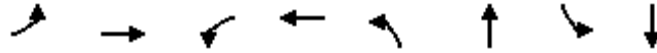
! Phase conflict between lane groups.

c Critical Lane Group

Queues

1: Mt. Auburn Street & Upland Road

1/26/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations									
Volume (vph)	12	709	40	768	25	7	7	2	
Lane Group Flow (vph)	13	780	43	830	0	110	0	20	
Turn Type	custom		custom		custom		custom		
Protected Phases									9
Permitted Phases	2!	2!	2!	2!	6!	6!	6!	6!	
Detector Phase	2	2	2	2	6	6	6	6	
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	7.0
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	23.0
Total Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	23.0
Total Split (%)	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	62.9%	37%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	Max	Max	Max	Max	None	None	None	None	None
v/c Ratio	0.02	0.43	0.07	0.46		0.07		0.01	
Control Delay	2.8	3.4	2.6	3.6		1.3		2.2	
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0	
Total Delay	2.8	3.4	2.6	3.6		1.3		2.2	
Queue Length 50th (ft)	0	0	0	0		0		0	
Queue Length 95th (ft)	8	289	18	323		21		5	
Internal Link Dist (ft)		1191		274		506		50	
Turn Bay Length (ft)	75		75						
Base Capacity (vph)	599	1819	640	1820		1547		1643	
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	0.02	0.43	0.07	0.46		0.07		0.01	

Intersection Summary

Cycle Length: 62

Actuated Cycle Length: 58.6

Natural Cycle: 65

Control Type: Semi Act-Uncoord

! Phase conflict between lane groups.

Splits and Phases: 1: Mt. Auburn Street & Upland Road



HCM Unsignalized Intersection Capacity Analysis

2: Mt. Auburn Street & Melendy Avenue

1/26/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	726	57	18	803	17	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	789	62	20	873	18	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	354			502		
pX, platoon unblocked				0.86	0.72	0.86
vC, conflicting volume				851	1732	820
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				745	1385	709
tC, single (s)				4.1	6.4	6.2
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				97	83	92
cM capacity (veh/h)				742	111	373

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	851	892	49
Volume Left	0	20	18
Volume Right	62	0	30
cSH	1700	742	198
Volume to Capacity	0.50	0.03	0.25
Queue Length 95th (ft)	0	2	23
Control Delay (s)	0.0	0.7	29.1
Lane LOS		A	D
Approach Delay (s)	0.0	0.7	29.1
Approach LOS			D

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

3: Mt. Auburn Street & Lloyd Road

1/26/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	27	727	809	18	4	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.95	0.95	0.50	0.50
Hourly flow rate (vph)	29	773	852	19	8	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		415	441			
pX, platoon unblocked	0.65				0.70	0.65
vC, conflicting volume	871				1692	861
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	529				1422	514
tC, single (s)	4.6				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.7				4.0	3.3
p0 queue free %	95				90	93
cM capacity (veh/h)	541				78	366
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	802	871	32			
Volume Left	29	0	8			
Volume Right	0	19	24			
cSH	541	1700	191			
Volume to Capacity	0.05	0.51	0.17			
Queue Length 95th (ft)	4	0	15			
Control Delay (s)	1.6	0.0	27.6			
Lane LOS	A		D			
Approach Delay (s)	1.6	0.0	27.6			
Approach LOS			D			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			67.1%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Mt. Auburn Street & Elton Avenue

1/26/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔			
Volume (veh/h)	689	42	35	827	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.93	0.93	0.25	0.25
Hourly flow rate (vph)	703	43	38	889	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	465			391		
pX, platoon unblocked				0.92	0.68	0.92
vC, conflicting volume				746	1689	724
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				681	1517	658
tC, single (s)				4.1	6.4	6.2
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				96	100	100
cM capacity (veh/h)				848	86	431

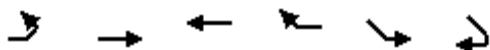
Direction, Lane #	EB 1	WB 1
Volume Total	746	927
Volume Left	0	38
Volume Right	43	0
cSH	1700	848
Volume to Capacity	0.44	0.04
Queue Length 95th (ft)	0	3
Control Delay (s)	0.0	1.2
Lane LOS		A
Approach Delay (s)	0.0	1.2
Approach LOS		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

5: Mt. Auburn Street & Irma Avenue

1/26/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↔	↔		↔	
Volume (veh/h)	26	663	851	18	6	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.90	0.90	0.72	0.72
Hourly flow rate (vph)	28	705	946	20	8	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		628	228			
pX, platoon unblocked	0.63				0.64	0.63
vC, conflicting volume	966				1716	956
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	656				1763	640
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				86	95
cM capacity (veh/h)	596				57	303

Direction, Lane #	EB 1	WB 1	SE 1
Volume Total	733	966	24
Volume Left	28	0	8
Volume Right	0	20	15
cSH	596	1700	121
Volume to Capacity	0.05	0.57	0.20
Queue Length 95th (ft)	4	0	17
Control Delay (s)	1.3	0.0	41.9
Lane LOS	A		E
Approach Delay (s)	1.3	0.0	41.9
Approach LOS			E

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		63.2%	ICU Level of Service
Analysis Period (min)		15	B

HCM Signalized Intersection Capacity Analysis

6: Mt. Auburn Street & Kimball Road

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	595	59	25	772	39	81	105	103	11	12	16
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	3.0	3.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.95			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1710	3079		1710	1737			1658			1630	
Flt Permitted	0.19	1.00		0.34	1.00			0.89			0.86	
Satd. Flow (perm)	349	3079		613	1737			1489			1414	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.78	0.78	0.78	0.69	0.69	0.69
Adj. Flow (vph)	16	647	64	26	813	41	104	135	132	16	17	23
RTOR Reduction (vph)	0	4	0	0	1	0	0	15	0	0	17	0
Lane Group Flow (vph)	16	707	0	26	853	0	0	356	0	0	39	0
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	3%	2%	1%	10%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)		5							5			
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.0	85.0		82.0	82.0			36.0			36.0	
Effective Green, g (s)	85.0	85.0		82.0	82.0			36.0			36.0	
Actuated g/C Ratio	0.65	0.65		0.63	0.63			0.28			0.28	
Clearance Time (s)	3.0	3.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	228	2013		387	1096			412			392	
v/s Ratio Prot		0.23			c0.49							
v/s Ratio Perm	0.05			0.04				c0.24			0.03	
v/c Ratio	0.07	0.35		0.07	0.78			0.86			0.10	
Uniform Delay, d1	8.2	10.1		9.3	17.4			44.7			35.0	
Progression Factor	1.00	1.00		0.57	0.65			1.00			1.00	
Incremental Delay, d2	0.6	0.5		0.2	3.7			20.7			0.5	
Delay (s)	8.8	10.6		5.5	14.9			65.4			35.5	
Level of Service	A	B		A	B			E			D	
Approach Delay (s)		10.6			14.6			65.4			35.5	
Approach LOS		B			B			E			D	

Intersection Summary

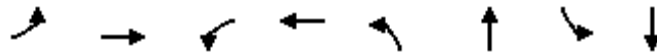
HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

6: Mt. Auburn Street & Kimball Road

1/26/2011

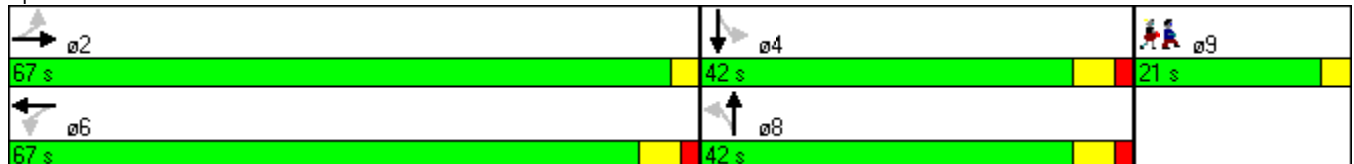


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø9
Lane Configurations									
Volume (vph)	15	595	25	772	81	105	11	12	
Lane Group Flow (vph)	16	711	26	854	0	371	0	56	
Turn Type	Perm		Perm		Perm		Perm		
Protected Phases		2		6		8		4	9
Permitted Phases	2		6		8		4		
Detector Phase	2	2	6	6	8	8	4	4	
Switch Phase									
Minimum Initial (s)	7.0	7.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0
Minimum Split (s)	35.0	35.0	35.0	35.0	17.0	17.0	17.0	17.0	21.0
Total Split (s)	67.0	67.0	67.0	67.0	42.0	42.0	42.0	42.0	21.0
Total Split (%)	51.5%	51.5%	51.5%	51.5%	32.3%	32.3%	32.3%	32.3%	16%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	3.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	None
v/c Ratio	0.07	0.35	0.07	0.78		0.87		0.14	
Control Delay	9.1	10.5	5.6	15.4		63.2		23.8	
Queue Delay	0.0	0.0	0.0	2.0		0.0		0.0	
Total Delay	9.1	10.5	5.6	17.5		63.2		23.8	
Queue Length 50th (ft)	5	129	4	483		284		21	
Queue Length 95th (ft)	14	164	m6	m156		339		38	
Internal Link Dist (ft)		148		118		676		475	
Turn Bay Length (ft)	75		75						
Base Capacity (vph)	228	2016	386	1097		428		408	
Starvation Cap Reductn	0	0	0	124		0		0	
Spillback Cap Reductn	0	84	0	0		0		0	
Storage Cap Reductn	0	0	0	0		0		0	
Reduced v/c Ratio	0.07	0.37	0.07	0.88		0.87		0.14	

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 29 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.

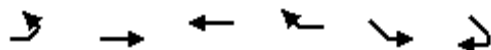
Splits and Phases: 6: Mt. Auburn Street & Kimball Road



HCM Unsignalized Intersection Capacity Analysis

7: Mt. Auburn Street & Templeton Parkway

1/26/2011



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↕↕	↔		↕↕	
Volume (veh/h)	18	691	821	23	2	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.93	0.93	0.90	0.90
Hourly flow rate (vph)	19	735	883	25	2	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		198	170			
pX, platoon unblocked	0.63				0.67	0.63
vC, conflicting volume	908				1301	895
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	559				711	540
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				99	95
cM capacity (veh/h)	630				243	310

Direction, Lane #	EB 1	EB 2	WB 1	SE 1
Volume Total	264	490	908	19
Volume Left	19	0	0	2
Volume Right	0	0	25	17
cSH	630	1700	1700	300
Volume to Capacity	0.03	0.29	0.53	0.06
Queue Length 95th (ft)	2	0	0	5
Control Delay (s)	1.1	0.0	0.0	17.8
Lane LOS	A			C
Approach Delay (s)	0.4		0.0	17.8
Approach LOS				C

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		52.4%	ICU Level of Service
Analysis Period (min)		15	A

HCM Signalized Intersection Capacity Analysis

8: Mt. Auburn Street & Arlington Street

1/26/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↗		↗	
Volume (vph)	93	507	93	213	504	39	291	708	220	17	433	49
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00	1.00		0.95	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1863	3593		1776	1908		1900	2000	1604		3624	
Flt Permitted	0.34	1.00		0.22	1.00		0.22	1.00	1.00		0.65	
Satd. Flow (perm)	671	3593		411	1908		439	2000	1604		2358	
Peak-hour factor, PHF	0.96	0.96	0.96	0.88	0.88	0.88	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	97	528	97	242	573	44	323	787	244	19	481	54
RTOR Reduction (vph)	0	12	0	0	2	0	0	0	88	0	0	0
Lane Group Flow (vph)	97	613	0	242	615	0	323	787	156	0	554	0
Heavy Vehicles (%)	2%	3%	5%	7%	4%	0%	0%	0%	6%	7%	3%	3%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	0	0	0	0
Parking (#/hr)			5									
Turn Type	Perm			pm+pt			pm+pt		pm+ov		Perm	
Protected Phases		2		1	6		3	8	1			4
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	39.2	39.2		62.4	62.4		53.0	53.0	72.2			33.0
Effective Green, g (s)	39.2	39.2		62.4	62.4		53.0	53.0	72.2			33.0
Actuated g/C Ratio	0.30	0.30		0.48	0.48		0.41	0.41	0.56			0.25
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	202	1083		399	916		359	815	891			599
v/s Ratio Prot		0.17		0.09	c0.32		0.11	c0.39	0.03			
v/s Ratio Perm	0.14			0.20			0.26		0.07			0.23
v/c Ratio	0.48	0.57		0.61	0.67		0.90	0.97	0.17			0.92
Uniform Delay, d1	37.1	38.2		22.7	25.9		29.6	37.6	14.2			47.3
Progression Factor	0.79	0.79		1.00	1.00		1.00	1.00	1.00			1.00
Incremental Delay, d2	7.3	2.0		2.6	3.9		27.8	24.2	0.1			20.2
Delay (s)	36.6	32.3		25.3	29.9		57.4	61.8	14.3			67.5
Level of Service	D	C		C	C		E	E	B			E
Approach Delay (s)		32.8			28.6			52.2				67.5
Approach LOS		C			C			D				E

Intersection Summary

HCM Average Control Delay	44.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues

8: Mt. Auburn Street & Arlington Street

1/26/2011



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø9
Lane Configurations										
Volume (vph)	93	507	213	504	291	708	220	17	433	
Lane Group Flow (vph)	97	625	242	617	323	787	244	0	554	
Turn Type	Perm		pm+pt		pm+pt		pm+ov	Perm		
Protected Phases		2	1	6	3	8	1		4	9
Permitted Phases	2		6		8		8	4		
Detector Phase	2	2	1	6	3	8	1	4	4	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	7.0
Minimum Split (s)	40.0	40.0	8.0	40.0	19.0	25.0	8.0	25.0	25.0	21.0
Total Split (s)	44.0	44.0	8.0	52.0	20.0	57.0	8.0	37.0	37.0	21.0
Total Split (%)	33.8%	33.8%	6.2%	40.0%	15.4%	43.8%	6.2%	28.5%	28.5%	16%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lag	Lag	Lead		Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max	None	Min	Min	None
v/c Ratio	0.45	0.54	0.59	0.65	0.90	0.97	0.24		0.93	
Control Delay	35.0	29.7	31.4	29.7	57.7	62.2	3.3		70.2	
Queue Delay	0.0	1.2	0.0	1.4	0.0	148.0	0.0		0.0	
Total Delay	35.0	30.9	31.4	31.0	57.7	210.2	3.3		70.2	
Queue Length 50th (ft)	56	227	107	347	192	640	15		241	
Queue Length 95th (ft)	m122	m297	#358	#663	#327	#909	45		#353	
Internal Link Dist (ft)		90		1748		393			435	
Turn Bay Length (ft)	100						300			
Base Capacity (vph)	214	1162	407	952	359	815	1014		598	
Starvation Cap Reductn	0	314	0	0	0	230	0		0	
Spillback Cap Reductn	0	0	0	165	0	0	0		0	
Storage Cap Reductn	0	0	0	0	0	0	0		0	
Reduced v/c Ratio	0.45	0.74	0.59	0.78	0.90	1.35	0.24		0.93	

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 135

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.








m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Mt. Auburn Street & Arlington Street

1/26/2011

Splits and Phases: 8: Mt. Auburn Street & Arlington Street

 ø1 8 s	 ø2 44 s	 ø3 20 s	 ø4 37 s	 ø9 21 s
 ø6 52 s	 ø8 57 s			

HCM Signalized Intersection Capacity Analysis

10: Arlington Street & Tufts Medical Center

1/26/2011



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕	↕	↕	↕		↕	↕		↕	↕	
Volume (vph)	26	291	422	48	515	8	357	6	4	125	34	347
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		0.95	0.95		1.00	1.00	
Frt		1.00	0.85	1.00	1.00		1.00	1.00		1.00	0.86	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.95		0.95	1.00	
Satd. Flow (prot)		1891	1667	1863	1953		1770	1773		1743	1686	
Flt Permitted		0.88	1.00	0.43	1.00		0.95	0.95		0.95	1.00	
Satd. Flow (perm)		1663	1667	838	1953		1770	1773		1743	1686	
Peak-hour factor, PHF	0.87	0.87	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.66	0.92	0.66
Adj. Flow (vph)	30	334	459	52	542	8	388	7	4	189	37	526
RTOR Reduction (vph)	0	0	200	0	1	0	0	1	0	0	318	0
Lane Group Flow (vph)	0	364	259	52	549	0	198	200	0	189	245	0
Heavy Vehicles (%)	9%	5%	2%	2%	2%	14%	2%	2%	2%	9%	2%	2%
Turn Type	Perm	pm+ov		Perm	Split			Split				
Protected Phases		6	4		2		4	4		8	8	
Permitted Phases	6	6		2								
Actuated Green, G (s)		28.3	38.4	28.3	28.3		10.1	10.1		12.1	12.1	
Effective Green, g (s)		28.3	38.4	28.3	28.3		10.1	10.1		12.1	12.1	
Actuated g/C Ratio		0.42	0.56	0.42	0.42		0.15	0.15		0.18	0.18	
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		692	1039	349	813		263	263		310	300	
v/s Ratio Prot			0.04		c0.28		0.11	c0.11		0.11	c0.15	
v/s Ratio Perm		0.22	0.12	0.06								
v/c Ratio		0.53	0.25	0.15	0.68		0.75	0.76		0.61	0.82	
Uniform Delay, d1		14.8	7.5	12.4	16.1		27.8	27.8		25.8	26.9	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.8	0.6	0.2	2.2		18.0	18.6		3.4	15.6	
Delay (s)		17.7	8.1	12.6	18.4		45.7	46.4		29.2	42.5	
Level of Service		B	A	B	B		D	D		C	D	
Approach Delay (s)		12.3		17.9			46.0		39.1			
Approach LOS		B		B			D		D			

Intersection Summary

HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

10: Arlington Street & Tufts Medical Center

1/26/2011



Lane Group	SEL	SET	SER	NWL	NWT	NEL	NET	SWL	SWT	ø9
Lane Configurations										
Volume (vph)	26	291	422	48	515	357	6	125	34	
Lane Group Flow (vph)	0	364	459	52	550	198	201	189	563	
Turn Type	Perm		pm+ov	Perm		Split		Split		
Protected Phases		6	4		2	4	4	8	8	9
Permitted Phases	6		6	2						
Detector Phase	6	6	4	2	2	4	4	8	8	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	18.0
Total Split (s)	32.0	32.0	14.0	32.0	32.0	14.0	14.0	16.0	16.0	18.0
Total Split (%)	40.0%	40.0%	17.5%	40.0%	40.0%	17.5%	17.5%	20.0%	20.0%	23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Min	Min	Max	Max	None	None	None
v/c Ratio		0.51	0.37	0.14	0.65	0.73	0.73	0.59	0.90	
Control Delay		18.2	1.8	14.9	21.1	46.1	46.3	35.3	29.3	
Queue Delay		0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		18.2	2.0	14.9	21.1	46.1	46.3	35.3	29.3	
Queue Length 50th (ft)		91	0	11	149	74	75	65	60	
Queue Length 95th (ft)		228	41	44	#408	#230	#235	111	#299	
Internal Link Dist (ft)		393			505		52		96	
Turn Bay Length (ft)								150		
Base Capacity (vph)		717	1240	362	843	272	274	322	627	
Starvation Cap Reductn		0	165	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.51	0.43	0.14	0.65	0.73	0.73	0.59	0.90	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 65.6

Natural Cycle: 80

Control Type: Semi Act-Uncoord

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

Queue shown is maximum after two cycles.

Splits and Phases: 10: Arlington Street & Tufts Medical Center

