



**508-510 Somerville Avenue
Somerville, Massachusetts**

Traffic Impact & Access Study



**Prepared For:
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CIVIL ENGINEERS and LAND SURVEYORS

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Design Consultants, Inc.**

June 2014

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INTRODUCTION

This traffic impact and access study was prepared for the proposed 508-510 Somerville Avenue development in Somerville, Massachusetts. This development will consist of twelve (12) apartment units and 1,201 square feet of ground floor supporting retail. This project is to be accessed (ingress/egress) by a right-in/right-out driveway on the south side of Somerville Avenue between Park Street and Laurel Street.

This traffic impact and access study contains the following sections:

- A. Existing Conditions
- B. Traffic Volumes
- C. Capacity Analysis
- D. Conclusions

A. EXISTING CONDITIONS

A1. STUDY AREA

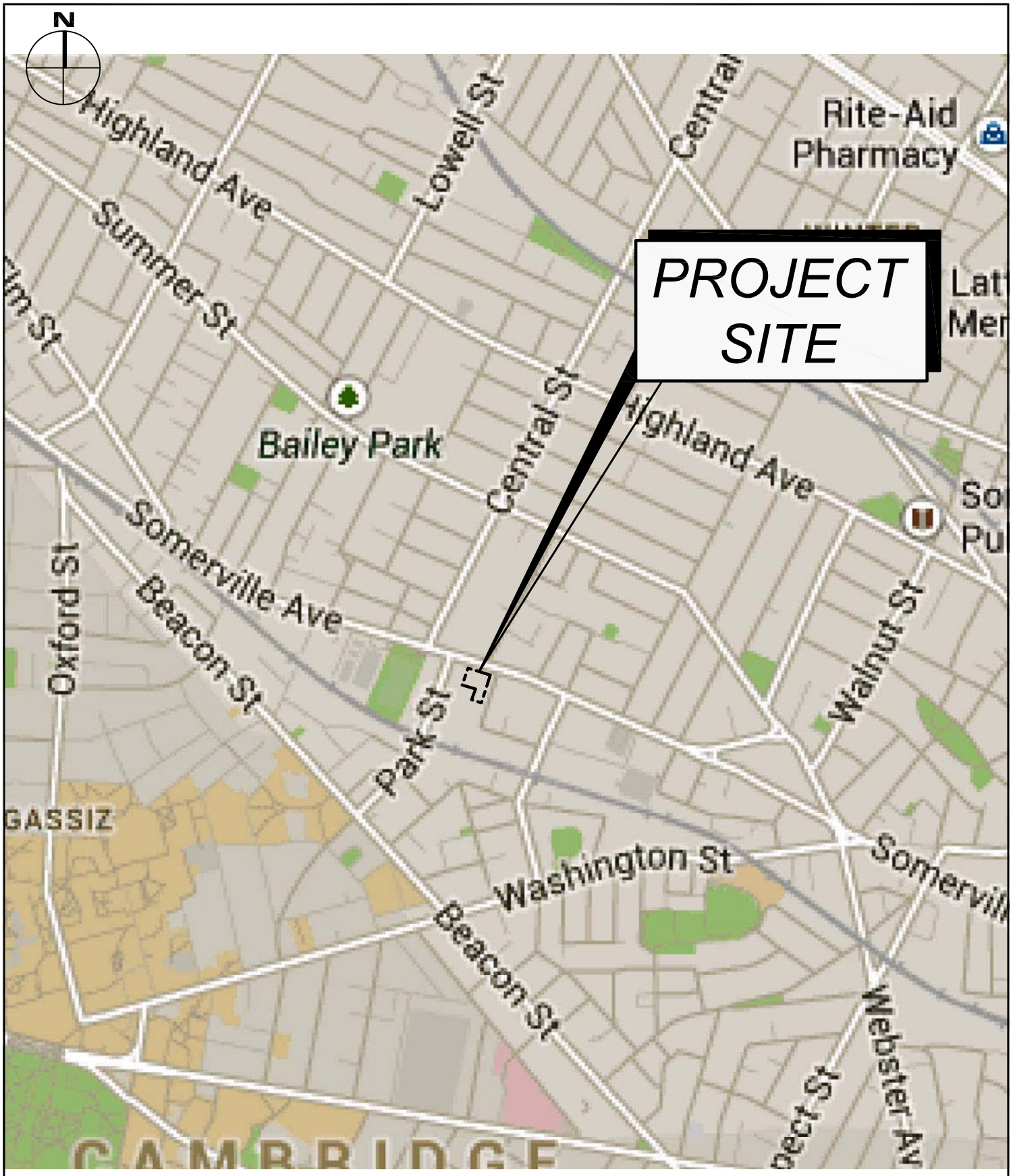
The Site is located on the south side of Somerville Avenue between Park Street and Laurel Street. The following local intersection was examined in this traffic study:

- Somerville Avenue at Park Street / Dunkin Donuts

Somerville Avenue is an Urban Principal Arterial roadway orientated in the east-west direction between Porter Square and McGrath Highway. Somerville Avenue provides one travel lane and one painted bicycle lane in each direction with on-street parking in the vicinity of the project. The posted speed limit is 30 mph. MBTA bus routes #83 and #87 operate along Somerville Avenue. Somerville Avenue at its signalized intersection with Park Street provides for one through lane and one right turn lane for eastbound traffic. Westbound, Somerville Avenue provides one through lane and one left turn lane. The intersection of Somerville Avenue/Park Street has new traffic signal equipment and signal timing - less than 10 years old. In the vicinity, Somerville Avenue is surrounded by low-density commercial and low- to medium-density residential homes. Conway Park and Veteran's Memorial Rink are located 400 feet west.

Park Street is two-lane an Urban Collector roadway orientated in the north-south direction between Beacon Street and Somerville Avenue. On the south side of Beacon Street, Park Street becomes Scott Street. Park Street at its intersection with Somerville Avenue is 32 feet wide and provides for a one lane approach to the intersection. An active rail crossing (Fitchburg/South Acton Commuter Rail Line) is located approximately 550 feet south from Somerville Avenue along Park Street, and approximately 650 feet from Beacon Street and north. Park Street is surrounded by low-density commercial and low- to medium-density residential homes. Painted bike sharrows are found on Park Street.

A project locus map of the Site is shown on Figure A1. The existing study intersections are shown in Figure A2.



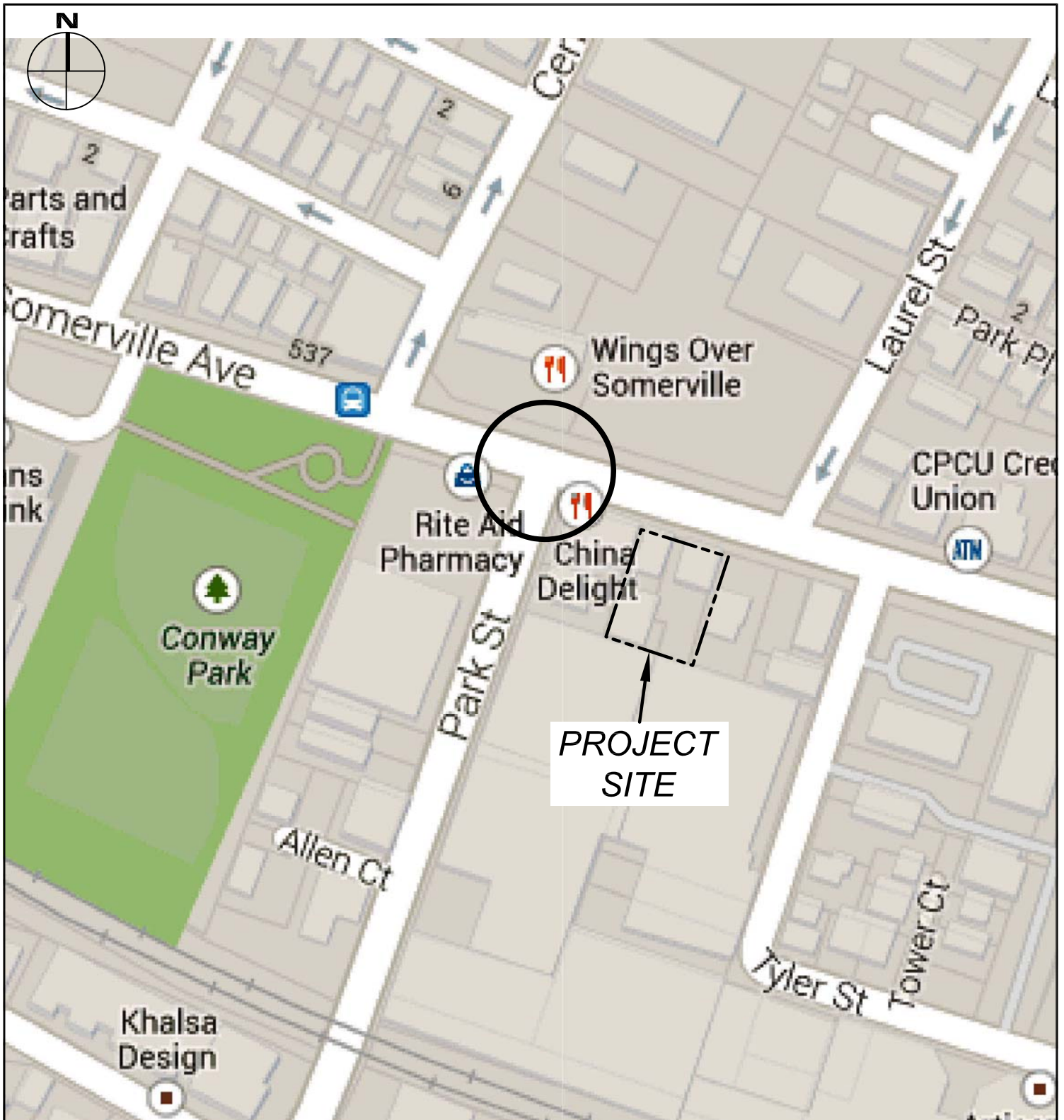
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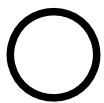
508-510 Somerville Ave
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Locus Map

Figure A1



Legend



Study Intersection

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508-510 Somerville Ave
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Study
Intersections

Figure A2

A2. TRANSIT SUPPLY

The Site is conveniently situated close to public transportation. The Site is approximately 1-mile away from the Porter Square Transit Station and approximately 1-mile from the Harvard Square Transit Station. Moreover, the Site is served by the following MBTA bus routes #83 and #87 on Somerville Avenue.

The Green Line Extension (GLX) project will have a proposed transit stations at Gilman Square and Union Square Station – both less than 1-mile away. The anticipated completion date for the Union Square Station is 2016. Gilman Square Station is expected to be complete by 2019. This project will extend the existing MBTA Green Line service from a relocated Lechmere Station in East Cambridge to Union Square in Somerville and College Avenue in Medford. This project is a major transportation priority of the Commonwealth and will offer a “one-seat” ride along the project corridor to downtown Boston, (eliminating the need for transfers at Lechmere Station and at Orange and Red Line stations) improving travel times within the project corridor. The new transit station will meet or exceed the Americans with Disabilities Act (ADA) standards. Once completed, trains will operate every five to six minutes in the peak periods, providing fast and efficient service to downtown Boston.

A3. MODE SPLIT

This development is located in an area where non-vehicular modes of transportation dominate. Non-vehicular modes of transportation includes bicycling, walking, transit, and telecommuting. US Census Tract Data (Tract 3512.04) from 2008 to 2012 indicates that 33.5% of Somerville residents do not own a vehicle. According to the same US Census Tract Data, 57.8% of Somerville workers in the area travel to work without the use of an automobile.

B. TRAFFIC VOLUMES

B1. EXISTING TRAFFIC COUNTS

In September 2013, intersection counts were collected for the weekday AM peak period, weekday PM peak period, and Saturday midday period. The following location was collected:

- Somerville Avenue at Park Street / Dunkin Donuts

Also conducted in September 2013 was a 48-hour ATR count on Somerville Avenue, between Park Street and Laurel Street. All traffic counts collected are included in **Appendix A**.

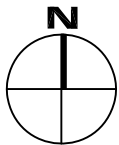
B2. SEASONAL ADJUSTMENT

Seasonal variations in traffic volumes were examined for the study area. Based on MassDOT count station 8098 located within Somerville city limits, traffic volumes in the area for the month of September historically have been higher than average for year. Therefore, the existing traffic counts collected in September 2013 were unadjusted for seasonality.

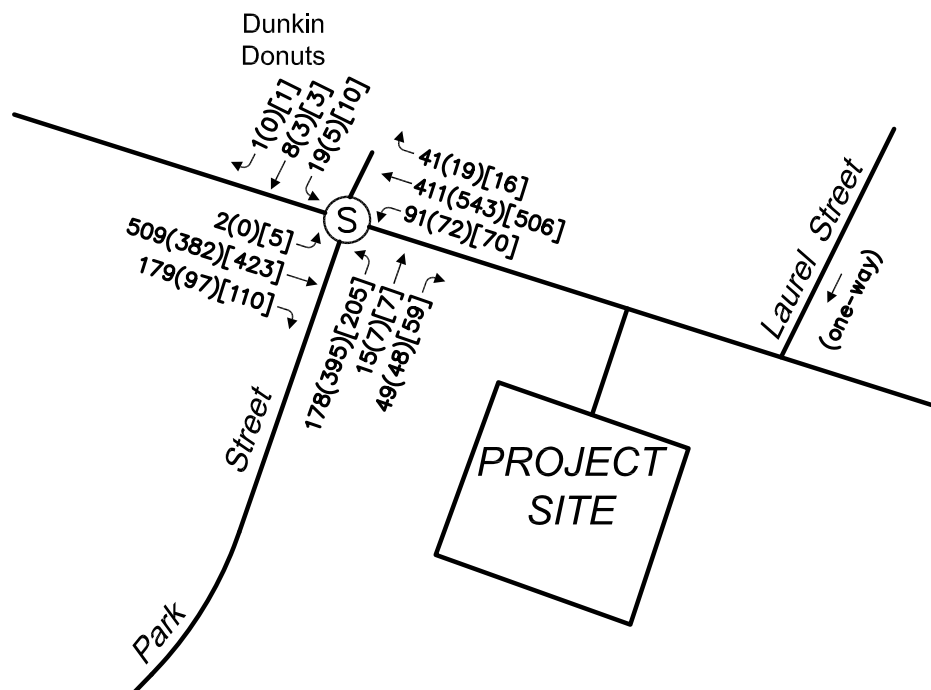
The existing AM, PM, and Saturday midday peak hour turning movement volumes at these intersections are shown in Figure B1. It should be noted that some of the traffic volumes between intersections do not balance due to driveway traffic generation.

B3. 2018 NO-BUILD TRAFFIC VOLUMES

To estimate traffic levels in Year 2018, MassDOT historical traffic counts in the area were examined. Based on historic traffic data from a nearby count station on Somerville Avenue (Station 8443), a 0.7% annual traffic growth rate was identified by projecting the historical volumes to Year 2018. To be conservative, a 1.0% annual traffic growth rate was assumed and applied to the existing volumes to help generate 2018 No-Build traffic volumes. *Also included in the No-Build volumes is traffic expected from 515 Somerville Avenue across the street. This project proposes thirty (30) residential homes.* The 2018 No-Build volumes were created by summing the 1% annual growth traffic and the 515 Somerville Avenue project traffic volumes. The 508-510 Somerville Avenue Project volumes are included in **Appendix A**. The total No-Build volumes for this subject site are shown in Figure B2.



Not To Scale



Legend



Existing Traffic Signal

xx(yy)[zz] AM(PM)[Saturday] Peak Hour Volumes

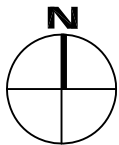
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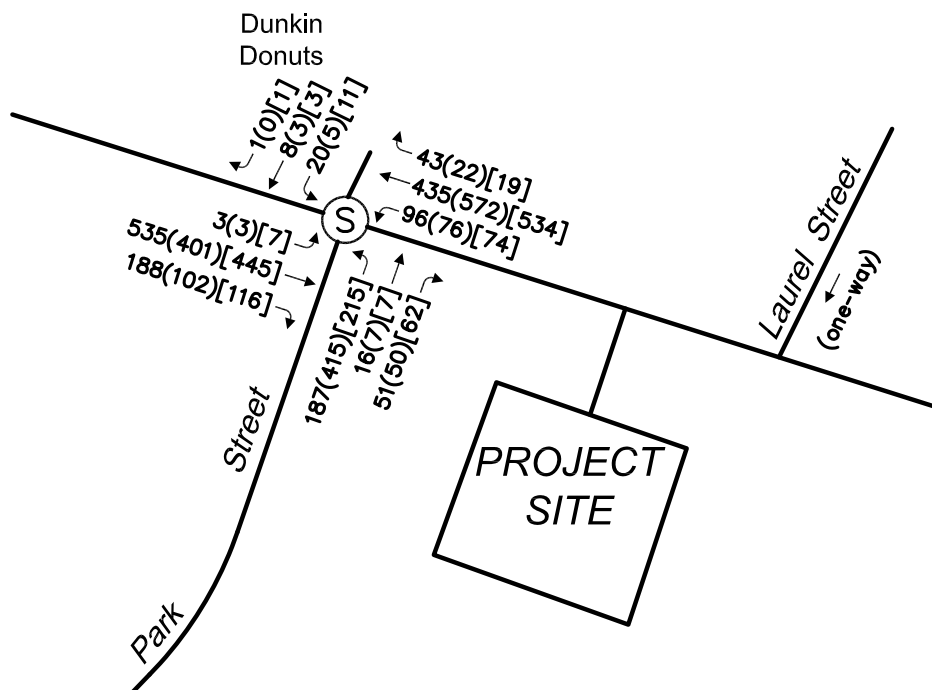
508-510 Somerville Ave
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2013 Existing
Traffic Volumes

Figure B1



Not To Scale



Legend



Existing Traffic Signal

xx(yy)[zz] AM(PM)[Saturday] Peak Hour Volumes

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2018 No-Build
Traffic Volumes

Figure B2

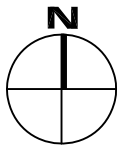
B4. SITE TRAFFIC

This development will consist of twelve (12) apartment units and 1,201 square feet of ground floor supporting retail. This project is to be accessed (ingress/egress) by a right-in/right-out driveway on the south side of Somerville Avenue between Park Street and Laurel Street. The *Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition*, was used to estimate trips associated with the Site. The results of the analysis is shown in Table B1.

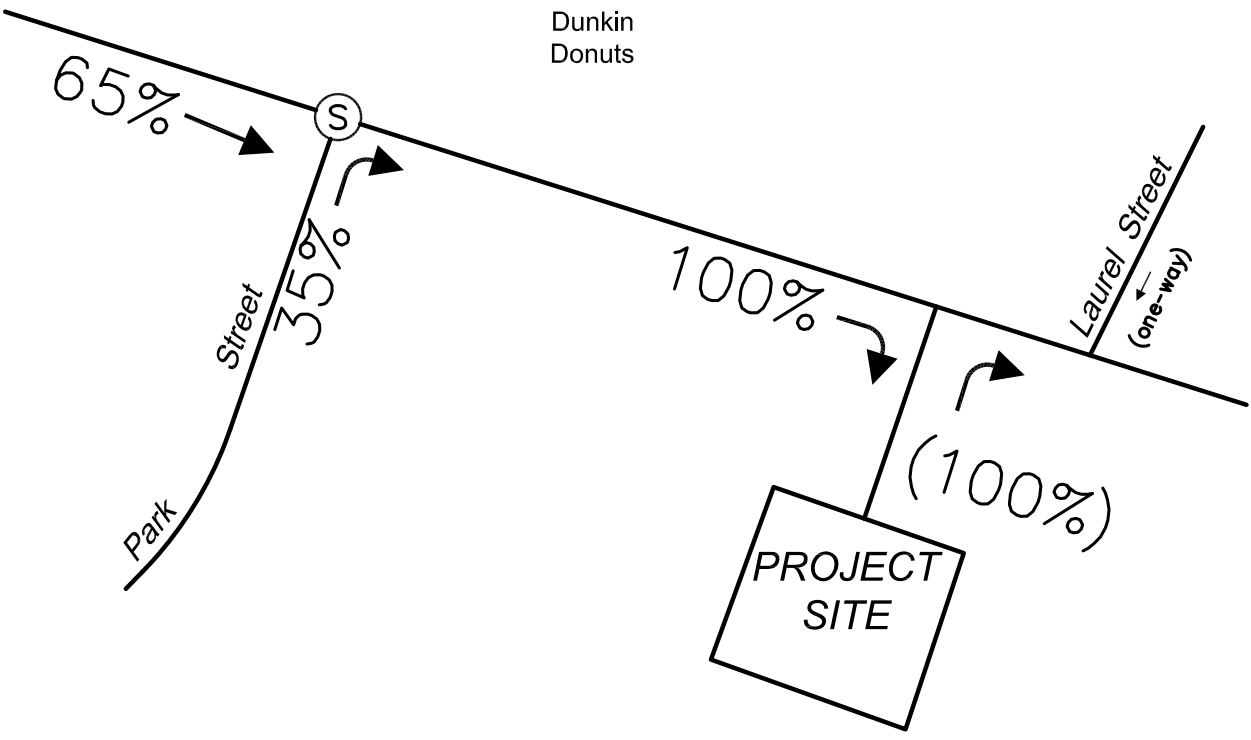
Table B1: Trip Generation

508-510 Somerville Ave Project	AM Peak	PM Peak	Weekday Daily	Sat. Midday Peak	Sat. Daily
<i>Residential Apartments</i>					
Gross Entering Trips	1	5	40	3	39
Gross Exiting Trips	5	2	40	3	38
Gross Total Trips	6	7	80	6	77
<i>Transit / Bike / Walk / Telecommute (57.8%) --US Census Tract 3512.04--</i>					
Entering Trips	1	3	23	2	23
Exiting Trips	3	1	23	2	22
Auto Enter Trips	0	2	17	1	16
Auto Exit Trips	2	1	17	1	16
Auto Trips	2	3	34	2	32
<i>Ground floor supporting Retail</i>					
Entering Trips	4	1	27	1	25
Exiting Trips	4	2	26	2	25
Total Auto Enter Trips	4	3	44	2	41
Total Auto Exit Trips	6	3	43	3	41
Total Auto Trips (retail+residential)	10	6	87	5	82

The Site is expected to generate 87 daily weekday and 82 daily weekend trips. During the weekday AM and PM peak hour, the development is expected to generate 10 trips and 6 trips, respectively. During the Saturday midday peak hour, the Site is expected to generate 5 trips. Detailed trip generation calculations are provided in **Appendix B**. The existing travel patterns in the area were used to estimate the trip distribution of the Site trips onto the local transportation network. The trip distribution percentages are shown in Figure B3. The resulting Site trips on the network are shown in Figure B4.



Not To Scale



Legend



Existing Traffic Signal

XX%

Trip Distribution Inbound

(XX%)

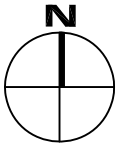
Trip Distribution Outbound

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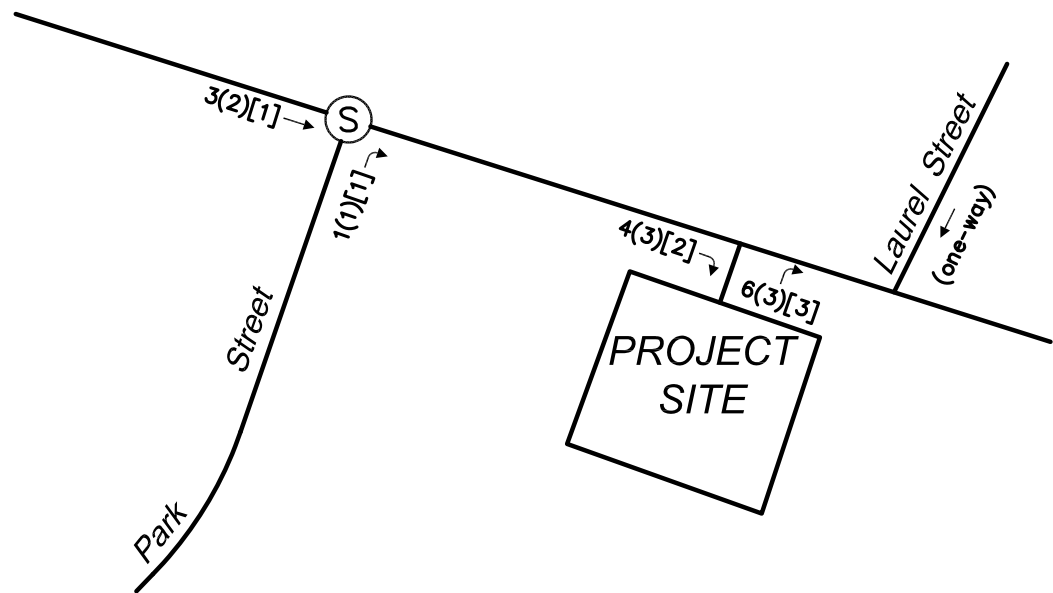
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Trip Distribution

Figure B3



Not To Scale



Legend



Existing Traffic Signal

xx(yy)[zz] AM(PM)[Saturday] Peak Hour Volumes

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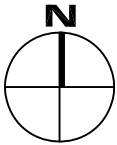
508-510 Somerville Ave
Somerville, MA

Site Trips

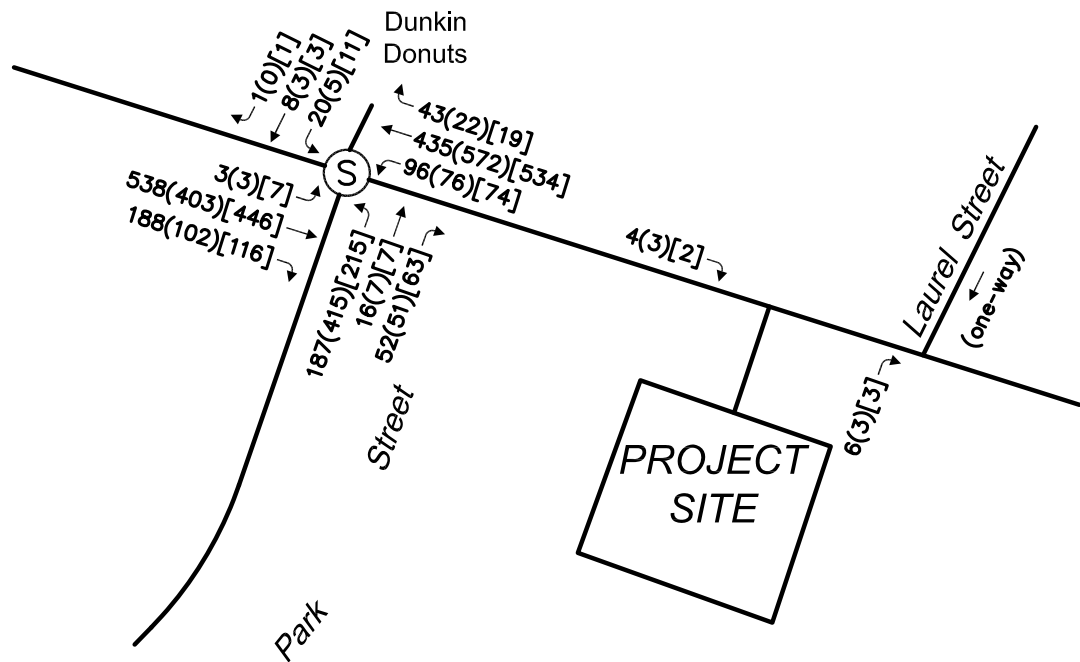
Figure B4

B5. 2018 BUILD TRAFFIC VOLUMES

Under Build conditions, this development will consist of twelve (12) apartment units and 1,201 square feet of ground floor supporting retail. This project is to be accessed (ingress/egress) by a right-in/right-out driveway on the south side of Somerville Avenue between Park Street and Laurel Street. To develop 2018 Build traffic volumes, the 2018 No-Build traffic volumes were summed with the Site trips to arrive at 2018 Build traffic volumes. The resulting Build volumes are shown in Figure B5.



Not To Scale



Legend



Existing Traffic Signal

xx(yy)[zz] AM(PM)[Saturday] Peak Hour Volumes

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2018 Build
Traffic Volumes

Figure B5

C. CAPACITY ANALYSIS

C1. Traffic Analysis Criteria

The Highway Capacity Manual (HCM) from the Federal Highway Administration (FHWA) provides guidance and analysis methodologies that are used to calculate measure performance levels for freeway sections, ramp junctions, weave sections and intersections (signalized and unsignalized).

Level of Service (LOS) is a term used to denote different operating conditions that occur under various traffic volume loads. It is a qualitative measure of the effect of a number of factors including geometrics, speed, travel delay, freedom to maneuver, and safety. The LOS is divided into a range of six letter grades, ranging from A to F, with A being the best and F the worst. LOS E or F is generally considered inadequate traffic operations in suburban and urban areas.

The MassDOT Highway Design Manual indicates a minimum overall LOS D. MassDOT strives for the best LOS possible wherever possible, and indicates overall LOS D can be acceptable for urban areas, in accordance with AASHTO guidelines. The minimum LOS for the area is supported by the guidance found in the National Highway Institute (NHI) Fundamentals of Planning, Design and Approval of Interchange Improvements to the Interstate System, Publication No. FHWA-NHI-10-038.

Intersection performance measures can be calculated in the form of volume to capacity (v/c) ratio, average vehicular delay, average and 95th percentile queue lengths, and level-of-service (LOS). *Synchro 8.0 was the software used to execute the intersection analysis. Synchro 8.0*, a software program from Trafficware, uses the methodologies and thresholds contained within the HCM. This is the preferred/recommended software of MassDOT. Traffic volume represents the travel demand observed and capacity represents the amount of traffic the intersection can accommodate under prevailing conditions. Volume to capacity ratio that approaches or exceeds 1.0 indicates traffic congestion or poor operating conditions.

LOS designation is reported differently for signalized and unsignalized intersections. For signalized intersections, it is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, LOS criteria are quantified in terms of average control delay per vehicle for the peak hour, which is reported for the entire intersection and by lane or lane group approach.

For unsignalized intersections, the analysis assumes that the traffic on the mainline is not affected by traffic on the side street. The LOS for each movement is calculated by determining the length of gaps that are available in the conflicting traffic stream. Based upon the length of the gaps between vehicles, the capacity of the movement can be calculated.

The demand of the movement is then compared to the capacity and utilized to determine the average control delay for the movement. For unsignalized intersections, an overall intersection LOS is not determined. It is generally reported in terms of delay for left-turns on the mainline and all side street movements.

The delay ranges differ slightly between unsignalized and signalized intersections due to driver expectations and behavior for each LOS. Table C1 summarizes the LOS criteria.

Table C1: Intersection LOS Thresholds

LOS	Signalized	Unsignalized
	Control Delay (sec/veh)	Control Delay (sec/veh)
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

Source: 2000 Highway Capacity Manual

C2. Existing Conditions Intersection Analysis

The study intersection was analyzed for existing peak hour traffic conditions during the weekday AM and PM peak hour, and Saturday midday peak hour. Existing intersection lane configurations and traffic control were assumed in the analysis. The results of the existing conditions analysis is shown in Table C2. The detailed analysis worksheets are included in **Appendix C**.

Table C2: Existing Conditions LOS

North-South Road	East-West Road	Lane	AM Peak Hour				PM Peak Hour				Sat Midday				Lane Storage (ft)
			v/c	s/veh	LOS	Q (ft)	v/c	s/veh	LOS	Q (ft)	v/c	s/veh	LOS	Q (ft)	
Park St/Dunkin Donuts Dwy	Somerville Ave	NB LTR	0.68	25.8	C	#166	0.80	25.6	C	#302	0.47	14.7	B	127	400
		SB LTR	0.09	14.5	B	22	0.02	9.8	A	7	0.03	9.9	A	11	50
		EB T	0.86	27.1	C	#326	0.81	29.1	C	#284	0.92	43.0	D	#337	400
		EB R	0.13	11.7	B	30	0.07	15.7	B	25	0.08	15.7	B	31	80
		WB L	0.46	11.5	B	34	0.36	13.6	B	37	0.37	14.2	B	37	150
		WB TR	0.54	9.8	A	167	0.77	19.9	B	#286	0.73	18.6	B	262	180
		Overall	0.79	18.9	B		0.87	23.3	C		0.69	24.9	C		

Volume-to-capacity (v/c), delay (seconds/veh), and Level of Service (LOS) obtained from HCM 2000 outputs in Synchro 8.

All Queues (Q) are 95th percentile queue measured in feet per Synchro 8 methodology

= vol for the 95th perc. cycle exceeds capacity. If the v/c for this movement is less than 1.0, the 95th perc. queue will rarely be exceeded.

No queue lengths provided for all-way stop controlled intersections

This signalized intersection operates with adequate LOS and under capacity for all studied peak hours. It should be noted that the estimated 95th percentile queue for Park Street and the eastbound and westbound through movements on Somerville Avenue is approximately 300 feet during the weekday PM peak hour. During the weekday AM peak hour, the 95th percentile queue for the eastbound through movement and northbound approach is approximately 330 feet and 170 feet, respectively. During the Saturday midday peak hour, the 95th percentile queue for the eastbound Somerville through movement is approximately 340 feet.

C3. 2018 No-Build Conditions Intersection Analysis

The study intersection was analyzed for 2018 No-Build peak hour traffic conditions during the weekday AM and PM peak hour, and Saturday midday peak hour. Existing intersection lane configurations and traffic control were assumed in the analysis. The results of the analysis is shown in Table C3. The detailed analysis worksheets are included in **Appendix C**.

Table C3: 2018 No-Build Conditions LOS

North-South Road	East-West Road	Lane	AM Peak Hour				PM Peak Hour				Sat Midday				Lane Storage (ft)
			v/c	s/veh	LOS	Q (ft)	v/c	s/veh	LOS	Q (ft)	v/c	s/veh	LOS	Q (ft)	
Park St/Dunkin Donuts Dwy	Somerville Ave	NB LTR	0.75	31.0	C	#190	0.82	27.4	C	#335	0.60	20.3	C	#187	400
		SB LTR	0.10	15.3	B	24	0.02	10.1	B	8	0.04	12.1	B	14	50
		EB T	0.87	26.7	C	#340	0.88	38.4	D	#324	0.80	23.4	C	#288	400
		EB R	0.14	11.1	B	30	0.07	17.1	B	31	0.08	12.4	B	28	80
		WB L	0.49	11.6	B	34	0.39	15.1	B	41	0.35	11.1	B	31	150
		WB TR	0.55	9.4	A	171	0.81	23.3	C	#363	0.67	13.3	B	225	180
		Overall	0.83	19.5	B		0.89	27.5	C		0.73	17.5	B		
Volume-to-capacity (v/c), delay (seconds/veh), and Level of Service (LOS) obtained fom HCM 2000 outputs in Synchro 8.															
All Queues (Q) are 95th percentile queue measured in feet per Synchro 8 methodology															
# = vol for the 95th perc. cycle exceeds capacity. If the v/c for this movement is less than 1.0, the 95th perc. queue will rarely be exceeded.															

This signalized intersection operates with adequate LOS and under capacity for all studied peak hours. It should be noted that the estimated 95th percentile queue for Park Street and the eastbound and westbound through movements on Somerville Avenue is over 300 feet during the weekday PM peak hour. During the weekday AM peak hour, the 95th percentile queue for the eastbound through movement and northbound approach is approximately 340 feet and 190 feet, respectively. During the Saturday midday peak hour, the 95th percentile queue for the eastbound Somerville through movement is approximately 290 feet.

C4. 2018 Build Conditions Intersection Analysis

The study intersections were analyzed for 2018 Build peak hour traffic conditions during the weekday AM and PM peak hour, and Saturday midday peak hour. Existing intersection lane configurations and traffic control were assumed in the analysis. The results of the Build analysis is shown in Table C4. Somerville Avenue at Park Street and at the Site Driveway operates with adequate LOS and under capacity for all studied peak hours.

Table C4: 2018 Build Conditions LOS

North-South Road	East-West Road	Lane	AM Peak Hour				PM Peak Hour				Sat Midday				Lane Storage (ft)
			v/c	s/veh	LOS	Q (ft)	v/c	s/veh	LOS	Q (ft)	v/c	s/veh	LOS	Q (ft)	
Park St/Dunkin Donuts Dwy	Somerville Ave	NB LTR	0.76	31.1	C	#191	0.82	27.5	C	#336	0.60	20.3	C	#188	400
		SB LTR	0.10	15.3	B	24	0.02	10.1	B	8	0.04	12.1	B	14	50
		EB T	0.87	27.3	C	#343	0.87	36.5	D	#321	0.80	23.6	C	#291	400
		EB R	0.14	11.1	B	30	0.07	17.1	B	31	0.08	12.4	B	28	80
		WB L	0.49	11.7	B	34	0.39	15.1	B	41	0.35	11.1	B	31	150
		WB TR	0.55	9.4	A	171	0.81	23.3	C	#363	0.67	13.3	B	225	180
		Overall	0.84	19.7	B		0.90	27.0	C		0.74	17.6	B		
Site	Somerville Ave	NB R	0.01	11.9	B	1	0.01	10.6	B	1	0.01	11.1	B	0	50
		EB TR	0.39	0.0	A	0	0.29	0.0	A	0	0.33	0.0	A	0	150

Volume-to-capacity (v/c), delay (seconds/veh), and Level of Service (LOS) obtained from HCM 2000 outputs in Synchro 8.

All Queues (Q) are 95th percentile queue measured in feet per Synchro 8 methodology

= vol for the 95th perc. cycle exceeds capacity. If the v/c for this movement is less than 1.0, the 95th perc. queue will rarely be exceeded.

D. CONCLUSIONS

This traffic impact and access study has examined the impacts of the proposed 508-510 Somerville Avenue development in Somerville, Massachusetts. This development will consist of twelve (12) apartment units and 1,201 square feet of ground floor supporting retail. This project is to be accessed (ingress/egress) by a right-in/right-out driveway on the south side of Somerville Avenue between Park Street and Laurel Street.

This traffic study has determined that the proposed Site will not have negative Level-of-Service or intersection capacity impacts to the surrounding transportation system.

Trip Generation

The Site is expected to generate 87 daily weekday and 82 daily weekend trips. During the weekday AM and PM peak hour, the development is expected to generate 10 trips and 6 trips, respectively. During the Saturday midday peak hour, the Site is expected to generate 5 trips.

Multi-modal Impacts

The Site is located in an area where non-vehicular forms of traffic dominate the weekday peak hours of commuting. Non-vehicular modes of transportation includes bicycling, walking, transit, and telecommuting. US Census Tract Data (Tract 3512.04) from 2008 to 2012 indicates that *33.5% of Somerville residents in the area do not own a vehicle*. According to the same Census Tract Data (Tract 3512.04), *57.8% of existing Somerville workers in the area travel to work without use of an automobile*. The Site is conveniently situated close to public transportation and bicycle and pedestrian facilities. The Site is approximately 1-mile away from the Porter Square Transit Station and approximately 1-mile from the Harvard Square Transit Station. Moreover, the Site is served by the following MBTA bus routes #83 and #87 on Somerville Avenue. The transit share is expected to increase with the future stations as part of the Green Line Extension. Once completed, trains will operate every five to six minutes in the peak periods, providing fast and efficient service to downtown Boston.

Summary

The findings from this study indicate that the proposed development at 508-510 Somerville Avenue will not have any negative Level-of-Service or intersection capacity impacts to the surrounding transportation system and is expected to encourage the use of multi-modal transportation options in Somerville and the region beyond.

APPENDIX A – TRAFFIC COUNTS

N/S: Dunkin Donuts Driveway/ Park Street
 E/W: Somerville Avenue
 City, State: Somerville, MA
 Client: Design Consultants/ J. Sobel



File Name : 133530 B
 Site Code : 2013-099
 Start Date : 9/12/2013
 Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dunkin Donuts Driveway From North				Somerville Avenue From East				Park Street From South				Somerville Avenue From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	0	1	2	0	8	86	9	0	7	3	22	0	44	86	1	0	269
07:15 AM	0	3	3	0	11	84	6	0	6	3	36	0	38	102	1	0	293
07:30 AM	0	2	3	0	11	94	16	0	8	6	48	0	44	102	1	0	335
07:45 AM	0	3	6	0	10	108	22	0	9	3	39	0	44	128	1	0	373
Total	0	9	14	0	40	372	53	0	30	15	145	0	170	418	4	0	1270
08:00 AM	1	1	8	0	17	106	24	0	16	3	55	0	54	145	0	0	430
08:15 AM	0	3	2	0	4	104	19	0	13	4	38	0	43	110	1	0	341
08:30 AM	0	1	3	0	10	93	26	0	11	5	46	0	38	126	0	0	359
08:45 AM	0	0	2	0	3	90	22	0	17	3	51	0	17	102	0	0	307
Total	1	5	15	0	34	393	91	0	57	15	190	0	152	483	1	0	1437
Grand Total	1	14	29	0	74	765	144	0	87	30	335	0	322	901	5	0	2707
Apprch %	2.3	31.8	65.9	0	7.5	77.8	14.6	0	19.2	6.6	74.1	0	26.2	73.4	0.4	0	
Total %	0	0.5	1.1	0	2.7	28.3	5.3	0	3.2	1.1	12.4	0	11.9	33.3	0.2	0	
Cars	1	13	29	0	72	706	138	0	83	29	322	0	309	860	5	0	2567
% Cars	100	92.9	100	0	97.3	92.3	95.8	0	95.4	96.7	96.1	0	96	95.4	100	0	94.8
Heavy Vehicles	0	1	0	0	2	59	6	0	4	1	13	0	13	41	0	0	140
% Heavy Vehicles	0	7.1	0	0	2.7	7.7	4.2	0	4.6	3.3	3.9	0	4	4.6	0	0	5.2

	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					Int. Total
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	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	0	3	6	0	9	10	108	22	0	140	9	3	39	0	51	44	128	1	0	173	373
08:00 AM	1	1	8	0	10	17	106	24	0	147	16	3	55	0	74	54	145	0	0	199	430
08:15 AM	0	3	2	0	5	4	104	19	0	127	13	4	38	0	55	43	110	1	0	154	341
08:30 AM	0	1	3	0	4	10	93	26	0	129	11	5	46	0	62	38	126	0	0	164	359
Total Volume	1	8	19	0	28	41	411	91	0	543	49	15	178	0	242	179	509	2	0	690	1503
% App. Total	3.6	28.6	67.9	0		7.6	75.7	16.8	0		20.2	6.2	73.6	0		25.9	73.8	0.3	0		
PHF	.250	.667	.594	.000	.700	.603	.951	.875	.000	.923	.766	.750	.809	.000	.818	.829	.878	.500	.000	.867	.874
Cars	1	7	19	0	27	40	376	86	0	502	46	15	173	0	234	171	480	2	0	653	1416
% Cars	100	87.5	100	0	96.4	97.6	91.5	94.5	0	92.4	93.9	100	97.2	0	96.7	95.5	94.3	100	0	94.6	94.2
Heavy Vehicles	0	1	0	0	1	1	35	5	0	41	3	0	5	0	8	8	29	0	0	37	87
% Heavy Vehicles	0	12.5	0	0	3.6	2.4	8.5	5.5	0	7.6	6.1	0	2.8	0	3.3	4.5	5.7	0	0	5.4	5.8

N/S: Dunkin Donuts Driveway/ Park Street
 E/W: Somerville Avenue
 City, State: Somerville, MA
 Client: Design Consultants/ J. Sobel



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Groups Printed- Cars

	Dunkin Donuts Driveway From North				Somerville Avenue From East				Park Street From South				Somerville Avenue From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	0	1	2	0	8	77	9	0	7	3	18	0	43	86	1	0	255
07:15 AM	0	3	3	0	11	81	6	0	6	3	35	0	37	98	1	0	284
07:30 AM	0	2	3	0	10	87	15	0	8	6	45	0	43	100	1	0	320
07:45 AM	0	3	6	0	10	98	21	0	9	3	39	0	43	119	1	0	352
Total	0	9	14	0	39	343	51	0	30	15	137	0	166	403	4	0	1211
08:00 AM	1	1	8	0	17	97	23	0	16	3	53	0	51	129	0	0	399
08:15 AM	0	2	2	0	4	96	18	0	12	4	38	0	41	108	1	0	326
08:30 AM	0	1	3	0	9	85	24	0	9	5	43	0	36	124	0	0	339
08:45 AM	0	0	2	0	3	85	22	0	16	2	51	0	15	96	0	0	292
Total	1	4	15	0	33	363	87	0	53	14	185	0	143	457	1	0	1356
Grand Total	1	13	29	0	72	706	138	0	83	29	322	0	309	860	5	0	2567
Apprch %	2.3	30.2	67.4	0	7.9	77.1	15.1	0	19.1	6.7	74.2	0	26.3	73.3	0.4	0	
Total %	0	0.5	1.1	0	2.8	27.5	5.4	0	3.2	1.1	12.5	0	12	33.5	0.2	0	

	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	0	3	6	0	9	10	98	21	0	129	9	3	39	0	51	43	119	1	0	163	352
08:00 AM	1	1	8	0	10	17	97	23	0	137	16	3	53	0	72	51	129	0	0	180	399
08:15 AM	0	2	2	0	4	4	96	18	0	118	12	4	38	0	54	41	108	1	0	150	326
08:30 AM	0	1	3	0	4	9	85	24	0	118	9	5	43	0	57	36	124	0	0	160	339
Total Volume	1	7	19	0	27	40	376	86	0	502	46	15	173	0	234	171	480	2	0	653	1416
% App. Total	3.7	25.9	70.4	0		8	74.9	17.1	0		19.7	6.4	73.9	0		26.2	73.5	0.3	0		
PHF	.250	.583	.594	.000	.675	.588	.959	.896	.000	.916	.719	.750	.816	.000	.813	.838	.930	.500	.000	.907	.887

N/S: Dunkin Donuts Driveway/ Park Street
 E/W: Somerville Avenue
 City, State: Somerville, MA
 Client: Design Consultants/ J. Sobel



File Name : 133530 B
 Site Code : 2013-099
 Start Date : 9/12/2013
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Groups Printed- Heavy Vehicles

	Dunkin Donuts Driveway From North				Somerville Avenue From East				Park Street From South				Somerville Avenue From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	0	0	0	0	0	9	0	0	0	0	4	0	1	0	0	0	14
07:15 AM	0	0	0	0	0	3	0	0	0	0	1	0	1	4	0	0	9
07:30 AM	0	0	0	0	1	7	1	0	0	0	3	0	1	2	0	0	15
07:45 AM	0	0	0	0	0	10	1	0	0	0	0	0	1	9	0	0	21
Total	0	0	0	0	1	29	2	0	0	0	8	0	4	15	0	0	59
08:00 AM	0	0	0	0	0	9	1	0	0	0	2	0	3	16	0	0	31
08:15 AM	0	1	0	0	0	8	1	0	1	0	0	0	2	2	0	0	15
08:30 AM	0	0	0	0	1	8	2	0	2	0	3	0	2	2	0	0	20
08:45 AM	0	0	0	0	0	5	0	0	1	1	0	0	2	6	0	0	15
Total	0	1	0	0	1	30	4	0	4	1	5	0	9	26	0	0	81
Grand Total	0	1	0	0	2	59	6	0	4	1	13	0	13	41	0	0	140
Apprch %	0	100	0	0	3	88.1	9	0	22.2	5.6	72.2	0	24.1	75.9	0	0	
Total %	0	0.7	0	0	1.4	42.1	4.3	0	2.9	0.7	9.3	0	9.3	29.3	0	0	

	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	0	0	0	0	0	0	10	1	0	11	0	0	0	0	0	1	9	0	0	10	21
08:00 AM	0	0	0	0	0	0	9	1	0	10	0	0	2	0	2	3	16	0	0	19	31
08:15 AM	0	1	0	0	1	0	8	1	0	9	1	0	0	0	1	2	2	0	0	4	15
08:30 AM	0	0	0	0	0	1	8	2	0	11	2	0	3	0	5	2	2	0	0	4	20
Total Volume	0	1	0	0	1	1	35	5	0	41	3	0	5	0	8	8	29	0	0	37	87
% App. Total	0	100	0	0		2.4	85.4	12.2	0		37.5	0	62.5	0		21.6	78.4	0	0		
PHF	.000	.250	.000	.000	.250	.250	.875	.625	.000	.932	.375	.000	.417	.000	.400	.667	.453	.000	.000	.487	.702

N/S: Dunkin Donuts Driveway/ Park Street
 E/W: Somerville Avenue
 City, State: Somerville, MA
 Client: Design Consultants/ J. Sobel



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 Site Code : 2013-099
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Groups Printed- Peds and Bikes

	Dunkin Donuts Driveway From North				Somerville Avenue From East				Park Street From South				Somerville Avenue From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	0	11	0	4	1	4	0	0	2	3	3	5	0	0	33
07:15 AM	0	0	0	11	0	5	2	4	0	0	2	2	8	14	0	2	50
07:30 AM	0	0	0	15	0	4	7	8	0	0	2	8	8	14	0	2	68
07:45 AM	0	0	0	26	0	11	7	10	0	0	0	3	11	11	0	0	79
Total	0	0	0	63	0	24	17	26	0	0	6	16	30	44	0	4	230
08:00 AM	0	1	1	16	0	4	10	7	0	0	1	7	15	10	0	2	74
08:15 AM	0	0	0	24	0	6	6	11	0	0	1	3	17	9	0	5	82
08:30 AM	0	0	0	19	0	2	6	17	0	0	1	6	24	17	0	2	94
08:45 AM	0	0	0	24	0	8	10	10	0	0	7	9	22	12	0	0	102
Total	0	1	1	83	0	20	32	45	0	0	10	25	78	48	0	9	352
Grand Total	0	1	1	146	0	44	49	71	0	0	16	41	108	92	0	13	582
Apprch %	0	0.7	0.7	98.6	0	26.8	29.9	43.3	0	0	28.1	71.9	50.7	43.2	0	6.1	
Total %	0	0.2	0.2	25.1	0	7.6	8.4	12.2	0	0	2.7	7	18.6	15.8	0	2.2	

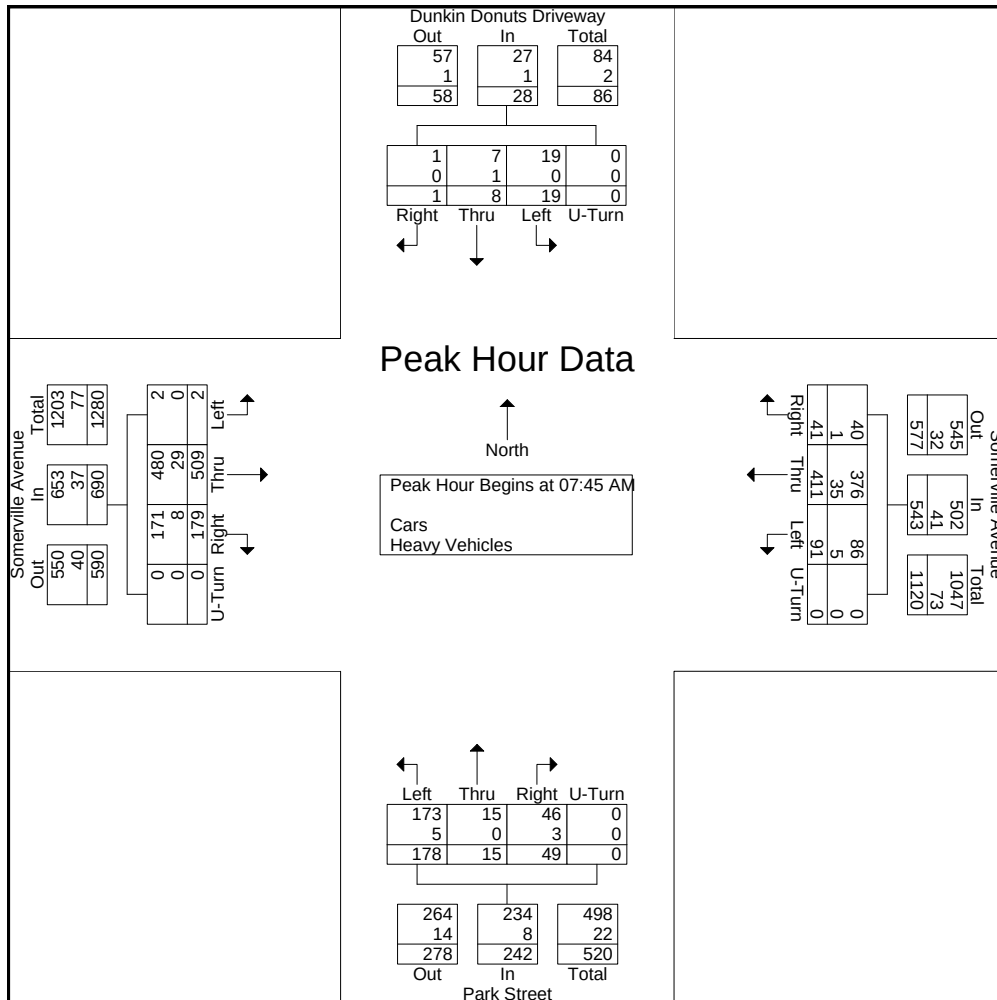
	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	1	1	16	18	0	4	10	7	21	0	0	1	7	8	15	10	0	2	27	74
08:15 AM	0	0	0	24	24	0	6	6	11	23	0	0	1	3	4	17	9	0	5	31	82
08:30 AM	0	0	0	19	19	0	2	6	17	25	0	0	1	6	7	24	17	0	2	43	94
08:45 AM	0	0	0	24	24	0	8	10	10	28	0	0	7	9	16	22	12	0	0	34	102
Total Volume	0	1	1	83	85	0	20	32	45	97	0	0	10	25	35	78	48	0	9	135	352
% App. Total	0	1.2	1.2	97.6		0	20.6	33	46.4		0	0	28.6	71.4		57.8	35.6	0	6.7		
PHF	.000	.250	.250	.865	.885	.000	.625	.800	.662	.866	.000	.000	.357	.694	.547	.813	.706	.000	.450	.785	.863

N/S: Dunkin Donuts Driveway/ Park Street
 E/W: Somerville Avenue
 City, State: Somerville, MA
 Client: Design Consultants/ J. Sobel



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	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	0	3	6	0	9	10	108	22	0	140	9	3	39	0	51	44	128	1	0	173	373
08:00 AM	1	1	8	0	10	17	106	24	0	147	16	3	55	0	74	54	145	0	0	199	430
08:15 AM	0	3	2	0	5	4	104	19	0	127	13	4	38	0	55	43	110	1	0	154	341
08:30 AM	0	1	3	0	4	10	93	26	0	129	11	5	46	0	62	38	126	0	0	164	359
Total Volume	1	8	19	0	28	41	411	91	0	543	49	15	178	0	242	179	509	2	0	690	1503
% App. Total	3.6	28.6	67.9	0		7.6	75.7	16.8	0		20.2	6.2	73.6	0		25.9	73.8	0.3	0		
PHF	.250	.667	.594	.000	.700	.603	.951	.875	.000	.923	.766	.750	.809	.000	.818	.829	.878	.500	.000	.867	.874
Cars	1	7	19	0	27	40	376	86	0	502	46	15	173	0	234	171	480	2	0	653	1416
% Cars	100	87.5	100	0	96.4	97.6	91.5	94.5	0	92.4	93.9	100	97.2	0	96.7	95.5	94.3	100	0	94.6	94.2
Heavy Vehicles	0	1	0	0	1	1	35	5	0	41	3	0	5	0	8	8	29	0	0	37	87
% Heavy Vehicles	0	12.5	0	0	3.6	2.4	8.5	5.5	0	7.6	6.1	0	2.8	0	3.3	4.5	5.7	0	0	5.4	5.8





PRECISION
D A T A
INDUSTRIES, LLC

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N/S: Dunkin Donuts Driveway/ Park Street
E/W: Somerville Avenue
City, State: Somerville, MA
Client: Design Consultants/ J. Sobel

File Name : 133530 BB
Site Code : 2013-099
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Groups Printed- Cars - Heavy Vehicles

	Dunkin Donuts Driveway From North				Somerville Avenue From East				Park Street From South				Somerville Avenue From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	0	1	4	0	6	112	21	0	13	0	106	0	15	98	0	0	376
04:15 PM	0	0	4	0	8	129	17	0	16	2	79	0	19	69	1	0	344
04:30 PM	0	1	2	0	4	126	18	0	18	3	93	0	18	97	0	0	380
04:45 PM	0	1	1	0	6	129	25	0	9	3	101	0	28	87	0	0	390
Total	0	3	11	0	24	496	81	0	56	8	379	0	80	351	1	0	1490
05:00 PM	0	0	3	0	3	142	11	0	18	4	97	0	15	96	0	0	389
05:15 PM	0	2	0	0	6	136	18	0	11	0	103	0	24	97	0	0	397
05:30 PM	0	0	1	0	4	136	18	0	10	0	94	0	30	102	0	0	395
05:45 PM	0	1	4	0	7	121	15	0	15	1	81	0	15	90	0	0	350
Total	0	3	8	0	20	535	62	0	54	5	375	0	84	385	0	0	1531
Grand Total	0	6	19	0	44	1031	143	0	110	13	754	0	164	736	1	0	3021
Apprch %	0	24	76	0	3.6	84.6	11.7	0	12.5	1.5	86	0	18.2	81.7	0.1	0	
Total %	0	0.2	0.6	0	1.5	34.1	4.7	0	3.6	0.4	25	0	5.4	24.4	0	0	
Cars	0	6	19	0	44	1001	139	0	108	12	739	0	157	717	1	0	2943
% Cars	0	100	100	0	100	97.1	97.2	0	98.2	92.3	98	0	95.7	97.4	100	0	97.4
Heavy Vehicles	0	0	0	0	0	30	4	0	2	1	15	0	7	19	0	0	78
% Heavy Vehicles	0	0	0	0	0	2.9	2.8	0	1.8	7.7	2	0	4.3	2.6	0	0	2.6

	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					Int. Total
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	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	1	1	0	2	6	129	25	0	160	9	3	101	0	113	28	87	0	0	115	390
05:00 PM	0	0	3	0	3	3	142	11	0	156	18	4	97	0	119	15	96	0	0	111	389
05:15 PM	0	2	0	0	2	6	136	18	0	160	11	0	103	0	114	24	97	0	0	121	397
05:30 PM	0	0	1	0	1	4	136	18	0	158	10	0	94	0	104	30	102	0	0	132	395
Total Volume	0	3	5	0	8	19	543	72	0	634	48	7	395	0	450	97	382	0	0	479	1571
% App. Total	0	37.5	62.5	0		3	85.6	11.4	0		10.7	1.6	87.8	0		20.3	79.7	0	0		
PHF	.000	.375	.417	.000	.667	.792	.956	.720	.000	.991	.667	.438	.959	.000	.945	.808	.936	.000	.000	.907	.989
Cars	0	3	5	0	8	19	525	71	0	615	47	7	388	0	442	94	374	0	0	468	1533
% Cars	0	100	100	0	100	100	96.7	98.6	0	97.0	97.9	100	98.2	0	98.2	96.9	97.9	0	0	97.7	97.6
Heavy Vehicles	0	0	0	0	0	0	18	1	0	19	1	0	7	0	8	3	8	0	0	11	38
% Heavy Vehicles	0	0	0	0	0	0	3.3	1.4	0	3.0	2.1	0	1.8	0	1.8	3.1	2.1	0	0	2.3	2.4

N/S: Dunkin Donuts Driveway/ Park Street
 E/W: Somerville Avenue
 City, State: Somerville, MA
 Client: Design Consultants/ J. Sobel



File Name : 133530 BB
 Site Code : 2013-099
 Start Date : 9/12/2013
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Groups Printed- Cars

	Dunkin Donuts Driveway From North				Somerville Avenue From East				Park Street From South				Somerville Avenue From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	0	1	4	0	6	111	20	0	13	0	103	0	14	93	0	0	365
04:15 PM	0	0	4	0	8	125	15	0	16	1	77	0	17	67	1	0	331
04:30 PM	0	1	2	0	4	119	18	0	17	3	91	0	17	96	0	0	368
04:45 PM	0	1	1	0	6	122	24	0	9	3	101	0	27	85	0	0	379
Total	0	3	11	0	24	477	77	0	55	7	372	0	75	341	1	0	1443
05:00 PM	0	0	3	0	3	135	11	0	18	4	94	0	14	94	0	0	376
05:15 PM	0	2	0	0	6	133	18	0	11	0	102	0	24	95	0	0	391
05:30 PM	0	0	1	0	4	135	18	0	9	0	91	0	29	100	0	0	387
05:45 PM	0	1	4	0	7	121	15	0	15	1	80	0	15	87	0	0	346
Total	0	3	8	0	20	524	62	0	53	5	367	0	82	376	0	0	1500
Grand Total	0	6	19	0	44	1001	139	0	108	12	739	0	157	717	1	0	2943
Apprch %	0	24	76	0	3.7	84.5	11.7	0	12.6	1.4	86	0	17.9	81.9	0.1	0	
Total %	0	0.2	0.6	0	1.5	34	4.7	0	3.7	0.4	25.1	0	5.3	24.4	0	0	

	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	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	1	1	0	2	6	122	24	0	152	9	3	101	0	113	27	85	0	0	112	379
05:00 PM	0	0	3	0	3	3	135	11	0	149	18	4	94	0	116	14	94	0	0	108	376
05:15 PM	0	2	0	0	2	6	133	18	0	157	11	0	102	0	113	24	95	0	0	119	391
05:30 PM	0	0	1	0	1	4	135	18	0	157	9	0	91	0	100	29	100	0	0	129	387
Total Volume	0	3	5	0	8	19	525	71	0	615	47	7	388	0	442	94	374	0	0	468	1533
% App. Total	0	37.5	62.5	0		3.1	85.4	11.5	0		10.6	1.6	87.8	0		20.1	79.9	0	0		
PHF	.000	.375	.417	.000	.667	.792	.972	.740	.000	.979	.653	.438	.951	.000	.953	.810	.935	.000	.000	.907	.980

N/S: Dunkin Donuts Driveway/ Park Street
 E/W: Somerville Avenue
 City, State: Somerville, MA
 Client: Design Consultants/ J. Sobel



File Name : 133530 BB
 Site Code : 2013-099
 Start Date : 9/12/2013
 Page No : 1

Groups Printed- Heavy Vehicles

	Dunkin Donuts Driveway From North				Somerville Avenue From East				Park Street From South				Somerville Avenue From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	0	0	0	0	0	1	1	0	0	0	3	0	1	5	0	0	11
04:15 PM	0	0	0	0	0	4	2	0	0	1	2	0	2	2	0	0	13
04:30 PM	0	0	0	0	0	7	0	0	1	0	2	0	1	1	0	0	12
04:45 PM	0	0	0	0	0	7	1	0	0	0	0	0	1	2	0	0	11
Total	0	0	0	0	0	19	4	0	1	1	7	0	5	10	0	0	47
05:00 PM	0	0	0	0	0	7	0	0	0	0	3	0	1	2	0	0	13
05:15 PM	0	0	0	0	0	3	0	0	0	0	1	0	0	2	0	0	6
05:30 PM	0	0	0	0	0	1	0	0	1	0	3	0	1	2	0	0	8
05:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	3	0	0	4
Total	0	0	0	0	0	11	0	0	1	0	8	0	2	9	0	0	31
Grand Total	0	0	0	0	0	30	4	0	2	1	15	0	7	19	0	0	78
Apprch %	0	0	0	0	0	88.2	11.8	0	11.1	5.6	83.3	0	26.9	73.1	0	0	
Total %	0	0	0	0	0	38.5	5.1	0	2.6	1.3	19.2	0	9	24.4	0	0	

	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	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 04:15 PM																					
04:15 PM	0	0	0	0	0	0	4	2	0	6	0	1	2	0	3	2	2	0	0	4	13
04:30 PM	0	0	0	0	0	0	7	0	0	7	1	0	2	0	3	1	1	0	0	2	12
04:45 PM	0	0	0	0	0	0	7	1	0	8	0	0	0	0	0	1	2	0	0	3	11
05:00 PM	0	0	0	0	0	0	7	0	0	7	0	0	3	0	3	1	2	0	0	3	13
Total Volume	0	0	0	0	0	0	25	3	0	28	1	1	7	0	9	5	7	0	0	12	49
% App. Total	0	0	0	0		0	89.3	10.7	0		11.1	11.1	77.8	0		41.7	58.3	0	0		
PHF	.000	.000	.000	.000	.000	.000	.893	.375	.000	.875	.250	.250	.583	.000	.750	.625	.875	.000	.000	.750	.942

N/S: Dunkin Donuts Driveway/ Park Street
 E/W: Somerville Avenue
 City, State: Somerville, MA
 Client: Design Consultants/ J. Sobel



File Name : 133530 BB
 Site Code : 2013-099
 Start Date : 9/12/2013
 Page No : 1

Groups Printed- Peds and Bikes

	Dunkin Donuts Driveway From North				Somerville Avenue From East				Park Street From South				Somerville Avenue From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
04:00 PM	0	0	0	8	0	8	2	4	2	0	0	8	0	4	0	2	38
04:15 PM	0	0	0	14	0	5	0	7	2	0	10	9	0	8	0	1	56
04:30 PM	0	0	0	18	0	3	0	13	0	0	7	7	1	7	0	1	57
04:45 PM	0	0	0	19	1	4	0	8	0	1	10	2	3	8	0	1	57
Total	0	0	0	59	1	20	2	32	4	1	27	26	4	27	0	5	208
05:00 PM	0	0	0	11	0	12	2	6	4	0	16	15	0	8	0	1	75
05:15 PM	0	0	0	24	0	11	0	14	4	0	21	26	5	11	0	5	121
05:30 PM	0	1	0	16	1	11	0	11	1	0	26	24	4	8	0	1	104
05:45 PM	0	0	0	24	0	18	1	11	6	0	27	38	10	10	0	1	146
Total	0	1	0	75	1	52	3	42	15	0	90	103	19	37	0	8	446
Grand Total	0	1	0	134	2	72	5	74	19	1	117	129	23	64	0	13	654
Apprch %	0	0.7	0	99.3	1.3	47.1	3.3	48.4	7.1	0.4	44	48.5	23	64	0	13	
Total %	0	0.2	0	20.5	0.3	11	0.8	11.3	2.9	0.2	17.9	19.7	3.5	9.8	0	2	

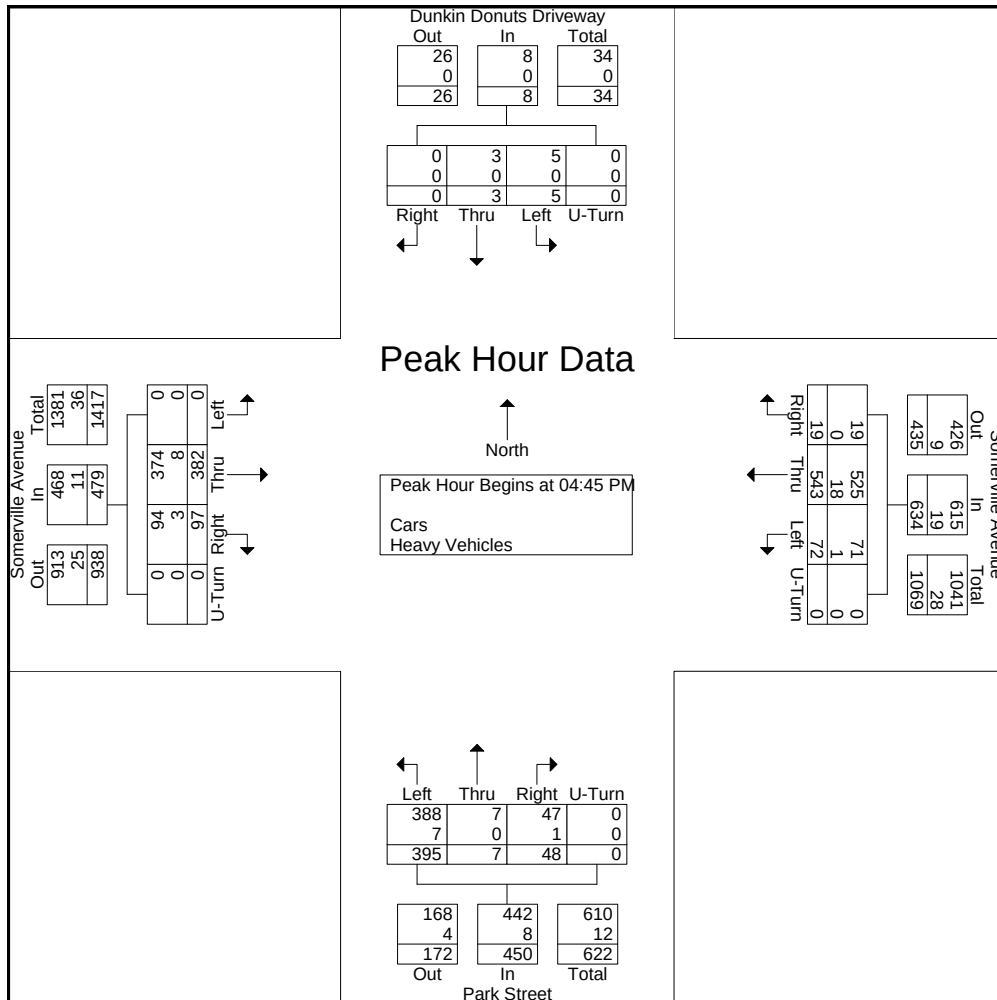
	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	11	11	0	12	2	6	20	4	0	16	15	35	0	8	0	1	9	75
05:15 PM	0	0	0	24	24	0	11	0	14	25	4	0	21	26	51	5	11	0	5	21	121
05:30 PM	0	1	0	16	17	1	11	0	11	23	1	0	26	24	51	4	8	0	1	13	104
05:45 PM	0	0	0	24	24	0	18	1	11	30	6	0	27	38	71	10	10	0	1	21	146
Total Volume	0	1	0	75	76	1	52	3	42	98	15	0	90	103	208	19	37	0	8	64	446
% App. Total	0	1.3	0	98.7		1	53.1	3.1	42.9		7.2	0	43.3	49.5		29.7	57.8	0	12.5		
PHF	.000	.250	.000	.781	.792	.250	.722	.375	.750	.817	.625	.000	.833	.678	.732	.475	.841	.000	.400	.762	.764

N/S: Dunkin Donuts Driveway/ Park Street
 E/W: Somerville Avenue
 City, State: Somerville, MA
 Client: Design Consultants/ J. Sobel



File Name : 133530 BB
 Site Code : 2013-099
 Start Date : 9/12/2013
 Page No : 1

	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	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	1	1	0	2	6	129	25	0	160	9	3	101	0	113	28	87	0	0	115	390
05:00 PM	0	0	3	0	3	3	142	11	0	156	18	4	97	0	119	15	96	0	0	111	389
05:15 PM	0	2	0	0	2	6	136	18	0	160	11	0	103	0	114	24	97	0	0	121	397
05:30 PM	0	0	1	0	1	4	136	18	0	158	10	0	94	0	104	30	102	0	0	132	395
Total Volume	0	3	5	0	8	19	543	72	0	634	48	7	395	0	450	97	382	0	0	479	1571
% App. Total	0	37.5	62.5	0		3	85.6	11.4	0		10.7	1.6	87.8	0		20.3	79.7	0	0		
PHF	.000	.375	.417	.000	.667	.792	.956	.720	.000	.991	.667	.438	.959	.000	.945	.808	.936	.000	.000	.907	.989
Cars	0	3	5	0	8	19	525	71	0	615	47	7	388	0	442	94	374	0	0	468	1533
% Cars	0	100	100	0	100	100	96.7	98.6	0	97.0	97.9	100	98.2	0	98.2	96.9	97.9	0	0	97.7	97.6
Heavy Vehicles	0	0	0	0	0	0	18	1	0	19	1	0	7	0	8	3	8	0	0	11	38
% Heavy Vehicles	0	0	0	0	0	0	3.3	1.4	0	3.0	2.1	0	1.8	0	1.8	3.1	2.1	0	0	2.3	2.4





PRECISION
D A T A
INDUSTRIES, LLC

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Email: datarequests@pdillc.com

N/S: Dunkin Donuts Driveway/ Park Street
E/W: Somerville Avenue
City, State: Somerville, MA
Client: Design Consultants/ J. Sobel

File Name : 133530 BBB
Site Code : 2013-099
Start Date : 9/14/2013
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dunkin Donuts Driveway From North				Somerville Avenue From East				Park Street From South				Somerville Avenue From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
11:00 AM	1	0	0	0	10	109	21	0	14	4	45	0	25	103	1	0	333
11:15 AM	0	0	0	0	9	122	15	0	14	0	56	0	18	98	0	0	332
11:30 AM	3	0	0	0	12	120	17	0	14	3	53	0	30	114	0	0	366
11:45 AM	0	1	3	0	4	121	18	0	12	2	48	0	17	101	2	0	329
Total	4	1	3	0	35	472	71	0	54	9	202	0	90	416	3	0	1360
12:00 PM	0	0	2	0	3	124	16	0	15	1	49	0	38	107	1	0	356
12:15 PM	0	2	3	0	4	134	20	0	12	4	57	0	26	91	1	0	354
12:30 PM	0	1	3	0	7	115	16	0	16	2	50	0	25	122	2	0	359
12:45 PM	1	0	2	0	2	133	18	0	16	0	49	0	21	103	1	0	346
Total	1	3	10	0	16	506	70	0	59	7	205	0	110	423	5	0	1415
Grand Total	5	4	13	0	51	978	141	0	113	16	407	0	200	839	8	0	2775
Apprch %	22.7	18.2	59.1	0	4.4	83.6	12.1	0	21.1	3	75.9	0	19.1	80.1	0.8	0	
Total %	0.2	0.1	0.5	0	1.8	35.2	5.1	0	4.1	0.6	14.7	0	7.2	30.2	0.3	0	
Cars	5	4	13	0	49	960	138	0	112	16	398	0	195	819	8	0	2717
% Cars	100	100	100	0	96.1	98.2	97.9	0	99.1	100	97.8	0	97.5	97.6	100	0	97.9
Heavy Vehicles	0	0	0	0	2	18	3	0	1	0	9	0	5	20	0	0	58
% Heavy Vehicles	0	0	0	0	3.9	1.8	2.1	0	0.9	0	2.2	0	2.5	2.4	0	0	2.1

	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					Int. Total
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	0	2	0	2	3	124	16	0	143	15	1	49	0	65	38	107	1	0	146	356
12:15 PM	0	2	3	0	5	4	134	20	0	158	12	4	57	0	73	26	91	1	0	118	354
12:30 PM	0	1	3	0	4	7	115	16	0	138	16	2	50	0	68	25	122	2	0	149	359
12:45 PM	1	0	2	0	3	2	133	18	0	153	16	0	49	0	65	21	103	1	0	125	346
Total Volume	1	3	10	0	14	16	506	70	0	592	59	7	205	0	271	110	423	5	0	538	1415
% App. Total	7.1	21.4	71.4	0		2.7	85.5	11.8	0		21.8	2.6	75.6	0		20.4	78.6	0.9	0		
PHF	.250	.375	.833	.000	.700	.571	.944	.875	.000	.937	.922	.438	.899	.000	.928	.724	.867	.625	.000	.903	.985
Cars	1	3	10	0	14	16	501	68	0	585	59	7	201	0	267	108	413	5	0	526	1392
% Cars	100	100	100	0	100	100	99.0	97.1	0	98.8	100	100	98.0	0	98.5	98.2	97.6	100	0	97.8	98.4
Heavy Vehicles	0	0	0	0	0	0	5	2	0	7	0	0	4	0	4	2	10	0	0	12	23
% Heavy Vehicles	0	0	0	0	0	0	1.0	2.9	0	1.2	0	0	2.0	0	1.5	1.8	2.4	0	0	2.2	1.6



PRECISION
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N/S: Dunkin Donuts Driveway/ Park Street
E/W: Somerville Avenue
City, State: Somerville, MA
Client: Design Consultants/ J. Sobel

File Name : 133530 BBB
Site Code : 2013-099
Start Date : 9/14/2013
Page No : 1

Groups Printed- Cars

	Dunkin Donuts Driveway From North				Somerville Avenue From East				Park Street From South				Somerville Avenue From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
11:00 AM	1	0	0	0	10	107	21	0	14	4	44	0	24	101	1	0	327
11:15 AM	0	0	0	0	8	119	14	0	13	0	56	0	17	96	0	0	323
11:30 AM	3	0	0	0	11	115	17	0	14	3	51	0	29	112	0	0	355
11:45 AM	0	1	3	0	4	118	18	0	12	2	46	0	17	97	2	0	320
Total	4	1	3	0	33	459	70	0	53	9	197	0	87	406	3	0	1325
12:00 PM	0	0	2	0	3	123	15	0	15	1	49	0	38	105	1	0	352
12:15 PM	0	2	3	0	4	133	20	0	12	4	55	0	25	88	1	0	347
12:30 PM	0	1	3	0	7	113	16	0	16	2	49	0	25	118	2	0	352
12:45 PM	1	0	2	0	2	132	17	0	16	0	48	0	20	102	1	0	341
Total	1	3	10	0	16	501	68	0	59	7	201	0	108	413	5	0	1392
Grand Total	5	4	13	0	49	960	138	0	112	16	398	0	195	819	8	0	2717
Apprch %	22.7	18.2	59.1	0	4.3	83.7	12	0	21.3	3	75.7	0	19.1	80.1	0.8	0	
Total %	0.2	0.1	0.5	0	1.8	35.3	5.1	0	4.1	0.6	14.6	0	7.2	30.1	0.3	0	

	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	0	2	0	2	3	123	15	0	141	15	1	49	0	65	38	105	1	0	144	352
12:15 PM	0	2	3	0	5	4	133	20	0	157	12	4	55	0	71	25	88	1	0	114	347
12:30 PM	0	1	3	0	4	7	113	16	0	136	16	2	49	0	67	25	118	2	0	145	352
12:45 PM	1	0	2	0	3	2	132	17	0	151	16	0	48	0	64	20	102	1	0	123	341
Total Volume	1	3	10	0	14	16	501	68	0	585	59	7	201	0	267	108	413	5	0	526	1392
% App. Total	7.1	21.4	71.4	0		2.7	85.6	11.6	0		22.1	2.6	75.3	0		20.5	78.5	1	0		
PHF	.250	.375	.833	.000	.700	.571	.942	.850	.000	.932	.922	.438	.914	.000	.940	.711	.875	.625	.000	.907	.989



PRECISION
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N/S: Dunkin Donuts Driveway/ Park Street
E/W: Somerville Avenue
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File Name : 133530 BBB
Site Code : 2013-099
Start Date : 9/14/2013
Page No : 1

Groups Printed- Heavy Vehicles

	Dunkin Donuts Driveway From North				Somerville Avenue From East				Park Street From South				Somerville Avenue From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
11:00 AM	0	0	0	0	0	2	0	0	0	0	1	0	1	2	0	0	6
11:15 AM	0	0	0	0	1	3	1	0	1	0	0	0	1	2	0	0	9
11:30 AM	0	0	0	0	1	5	0	0	0	0	2	0	1	2	0	0	11
11:45 AM	0	0	0	0	0	3	0	0	0	0	2	0	0	4	0	0	9
Total	0	0	0	0	2	13	1	0	1	0	5	0	3	10	0	0	35
12:00 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	2	0	0	4
12:15 PM	0	0	0	0	0	1	0	0	0	0	2	0	1	3	0	0	7
12:30 PM	0	0	0	0	0	2	0	0	0	0	1	0	0	4	0	0	7
12:45 PM	0	0	0	0	0	1	1	0	0	0	1	0	1	1	0	0	5
Total	0	0	0	0	0	5	2	0	0	0	4	0	2	10	0	0	23
Grand Total	0	0	0	0	2	18	3	0	1	0	9	0	5	20	0	0	58
Apprch %	0	0	0	0	8.7	78.3	13	0	10	0	90	0	20	80	0	0	
Total %	0	0	0	0	3.4	31	5.2	0	1.7	0	15.5	0	8.6	34.5	0	0	

	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	1	2	0	0	3	6
11:15 AM	0	0	0	0	0	1	3	1	0	5	1	0	0	0	1	1	2	0	0	3	9
11:30 AM	0	0	0	0	0	1	5	0	0	6	0	0	2	0	2	1	2	0	0	3	11
11:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	0	4	0	0	4	9
Total Volume	0	0	0	0	0	2	13	1	0	16	1	0	5	0	6	3	10	0	0	13	35
% App. Total	0	0	0	0		12.5	81.2	6.2	0		16.7	0	83.3	0		23.1	76.9	0	0		
PHF	.000	.000	.000	.000	.000	.500	.650	.250	.000	.667	.250	.000	.625	.000	.750	.750	.625	.000	.000	.813	.795

N/S: Dunkin Donuts Driveway/ Park Street
 E/W: Somerville Avenue
 City, State: Somerville, MA
 Client: Design Consultants/ J. Sobel



File Name : 133530 BBB
 Site Code : 2013-099
 Start Date : 9/14/2013
 Page No : 1

Groups Printed- Peds and Bikes

	Dunkin Donuts Driveway From North				Somerville Avenue From East				Park Street From South				Somerville Avenue From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
11:00 AM	0	0	0	22	0	11	5	8	3	0	2	14	4	10	0	5	84
11:15 AM	0	0	0	24	0	8	1	10	0	0	0	19	5	16	0	1	84
11:30 AM	0	0	0	33	0	13	1	12	1	0	1	21	5	14	0	3	104
11:45 AM	0	0	0	38	0	12	5	13	1	0	6	17	2	11	0	0	105
Total	0	0	0	117	0	44	12	43	5	0	9	71	16	51	0	9	377
12:00 PM	0	0	0	29	0	9	1	14	1	0	3	13	7	11	0	0	88
12:15 PM	0	3	0	29	0	7	1	15	0	0	0	14	4	19	0	0	92
12:30 PM	0	0	0	18	0	11	2	13	1	0	4	11	1	8	0	1	70
12:45 PM	0	0	0	25	1	12	0	10	0	0	2	17	0	3	0	0	70
Total	0	3	0	101	1	39	4	52	2	0	9	55	12	41	0	1	320
Grand Total	0	3	0	218	1	83	16	95	7	0	18	126	28	92	0	10	697
Apprch %	0	1.4	0	98.6	0.5	42.6	8.2	48.7	4.6	0	11.9	83.4	21.5	70.8	0	7.7	
Total %	0	0.4	0	31.3	0.1	11.9	2.3	13.6	1	0	2.6	18.1	4	13.2	0	1.4	

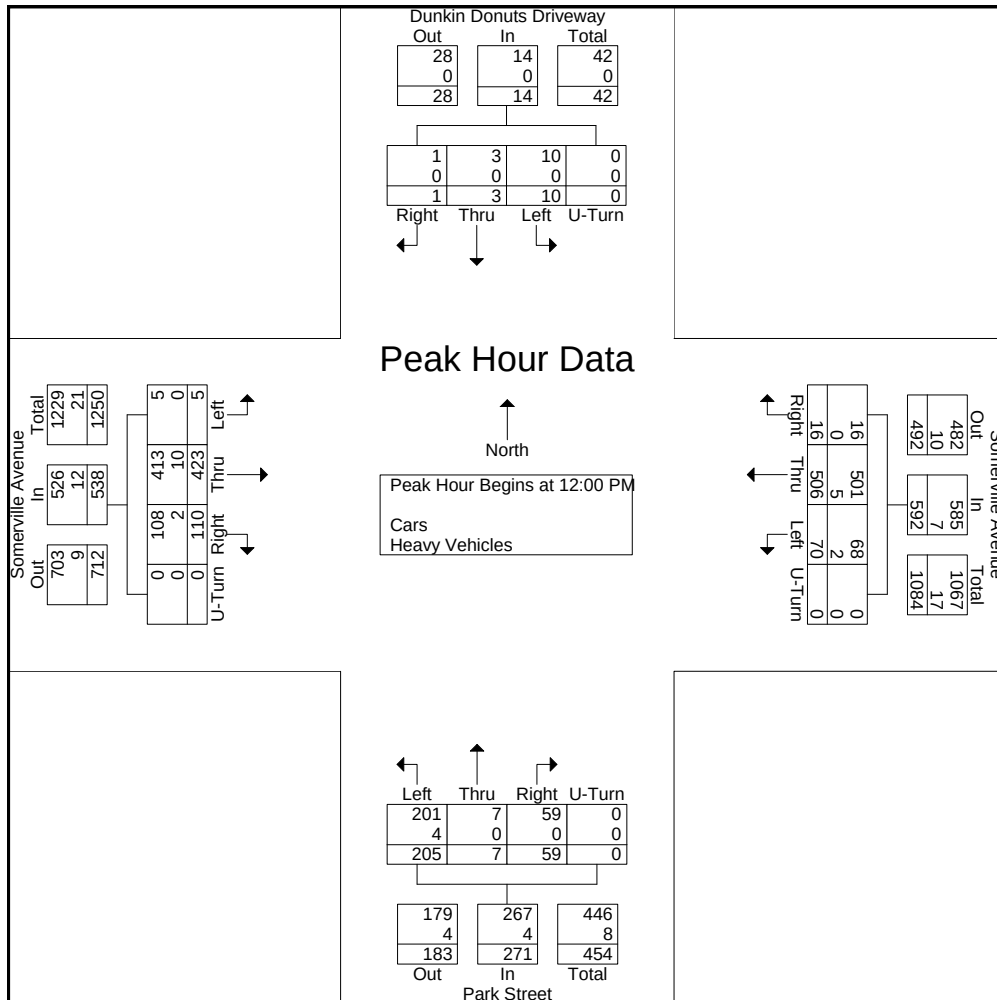
	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:30 AM																					
11:30 AM	0	0	0	33	33	0	13	1	12	26	1	0	1	21	23	5	14	0	3	22	104
11:45 AM	0	0	0	38	38	0	12	5	13	30	1	0	6	17	24	2	11	0	0	13	105
12:00 PM	0	0	0	29	29	0	9	1	14	24	1	0	3	13	17	7	11	0	0	18	88
12:15 PM	0	3	0	29	32	0	7	1	15	23	0	0	0	14	14	4	19	0	0	23	92
Total Volume	0	3	0	129	132	0	41	8	54	103	3	0	10	65	78	18	55	0	3	76	389
% App. Total	0	2.3	0	97.7		0	39.8	7.8	52.4		3.8	0	12.8	83.3		23.7	72.4	0	3.9		
PHF	.000	.250	.000	.849	.868	.000	.788	.400	.900	.858	.750	.000	.417	.774	.813	.643	.724	.000	.250	.826	.926

N/S: Dunkin Donuts Driveway/ Park Street
 E/W: Somerville Avenue
 City, State: Somerville, MA
 Client: Design Consultants/ J. Sobel



File Name : 133530 BBB
 Site Code : 2013-099
 Start Date : 9/14/2013
 Page No : 1

	Dunkin Donuts Driveway From North					Somerville Avenue From East					Park Street From South					Somerville Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	0	2	0	2	3	124	16	0	143	15	1	49	0	65	38	107	1	0	146	356
12:15 PM	0	2	3	0	5	4	134	20	0	158	12	4	57	0	73	26	91	1	0	118	354
12:30 PM	0	1	3	0	4	7	115	16	0	138	16	2	50	0	68	25	122	2	0	149	359
12:45 PM	1	0	2	0	3	2	133	18	0	153	16	0	49	0	65	21	103	1	0	125	346
Total Volume	1	3	10	0	14	16	506	70	0	592	59	7	205	0	271	110	423	5	0	538	1415
% App. Total	7.1	21.4	71.4	0		2.7	85.5	11.8	0		21.8	2.6	75.6	0		20.4	78.6	0.9	0		
PHF	.250	.375	.833	.000	.700	.571	.944	.875	.000	.937	.922	.438	.899	.000	.928	.724	.867	.625	.000	.903	.985
Cars	1	3	10	0	14	16	501	68	0	585	59	7	201	0	267	108	413	5	0	526	1392
% Cars	100	100	100	0	100	100	99.0	97.1	0	98.8	100	100	98.0	0	98.5	98.2	97.6	100	0	97.8	98.4
Heavy Vehicles	0	0	0	0	0	0	5	2	0	7	0	0	4	0	4	2	10	0	0	12	23
% Heavy Vehicles	0	0	0	0	0	0	1.0	2.9	0	1.2	0	0	2.0	0	1.5	1.8	2.4	0	0	2.2	1.6



Somerville Avenue
between Park Street and Laurel Street
City, State: Somerville, MA
Client: Design Consultants / J. Sobel



P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133530 A CLASS
Site Code: 2013-099
Date Start: 10-Sep-13

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/13	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	15	432	33	2	1	2	0	0	0	0	0	0	0	485
17:00	20	469	25	3	3	2	0	1	1	0	0	0	0	524
18:00	25	431	27	3	1	2	0	1	1	0	0	0	0	491
19:00	11	412	14	1	0	5	0	0	0	0	0	0	0	443
20:00	14	359	10	3	0	1	0	0	0	0	0	0	0	387
21:00	15	266	10	0	2	0	0	0	1	0	0	0	0	294
22:00	4	193	6	2	2	1	0	0	0	0	0	0	0	208
23:00	2	106	2	3	1	1	0	0	0	0	0	0	0	115
Total	106	2668	127	17	10	14	0	2	3	0	0	0	0	2947
Percent	3.6%	90.5%	4.3%	0.6%	0.3%	0.5%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.														
PM Peak Vol.	18:00	17:00	16:00	17:00	17:00	19:00		17:00	17:00					17:00
	25	469	33	3	3	5		1	1					524

Somerville Avenue
between Park Street and Laurel Street
City, State: Somerville, MA
Client: Design Consultants / J. Sobel



P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133530 A CLASS
Site Code: 2013-099
Date Start: 10-Sep-13

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/11/1														
3	4	60	1	1	1	0	0	0	0	0	0	0	0	67
01:00	1	43	3	1	0	0	0	0	0	0	0	0	0	48
02:00	3	17	1	1	0	1	0	0	0	0	0	0	0	23
03:00	0	30	1	1	1	0	0	0	0	0	0	0	0	33
04:00	0	32	3	2	0	1	0	0	1	0	0	0	0	39
05:00	4	74	12	9	4	1	0	0	0	0	0	0	0	104
06:00	3	220	41	11	3	2	0	0	1	0	0	0	0	281
07:00	7	375	40	7	3	1	0	0	0	0	0	0	0	433
08:00	16	368	36	2	7	4	1	0	1	0	0	0	0	435
09:00	19	367	36	4	3	4	0	0	1	0	0	0	0	434
10:00	11	360	53	1	13	2	0	0	0	0	0	0	0	440
11:00	14	364	42	4	6	4	0	0	1	0	0	0	0	435
12 PM	15	390	54	2	1	3	0	0	0	0	0	0	0	465
13:00	11	384	45	4	5	1	0	1	0	0	0	0	0	451
14:00	20	355	41	2	3	3	0	1	0	0	0	0	0	425
15:00	13	402	26	4	2	2	0	1	0	0	0	0	0	450
16:00	13	459	23	6	4	4	0	0	0	0	0	0	0	509
17:00	28	452	16	1	1	0	0	0	0	0	1	0	0	499
18:00	27	406	16	1	0	4	0	2	0	0	0	0	0	456
19:00	23	416	12	0	2	3	0	0	0	0	0	0	0	456
20:00	17	375	15	1	1	2	0	0	0	0	0	0	0	411
21:00	10	262	6	2	0	1	0	0	0	0	0	0	0	281
22:00	16	169	9	0	0	0	0	0	0	0	0	0	0	194
23:00	4	116	7	3	0	0	0	0	0	0	0	0	0	130
Total	279	6496	539	70	60	43	1	5	5	0	1	0	0	7499
Percent	3.7%	86.6%	7.2%	0.9%	0.8%	0.6%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	10:00	06:00	10:00	08:00	08:00		04:00					10:00
Vol.	19	375	53	11	13	4	1		1					440
PM Peak	17:00	16:00	12:00	16:00	13:00	16:00		18:00			17:00			16:00
Vol.	28	459	54	6	5	4		2			1			509
Total		9164	666	87	70	57	1	7	8	0	1	0	0	10446

Somerville Avenue
between Park Street and Laurel Street
City, State: Somerville, MA
Client: Design Consultants / J. Sobel



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Email: datarequests@pdillc.com

133530 A CLASS
Site Code: 2013-099
Date Start: 10-Sep-13

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/10/13	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	4	288	26	4	2	3	0	1	0	0	0	0	0	328
17:00	6	262	19	3	2	4	0	1	0	0	0	0	0	297
18:00	6	287	15	0	3	3	0	1	0	0	0	0	0	315
19:00	2	343	19	6	1	0	0	1	0	0	0	0	0	372
20:00	2	258	15	1	3	0	0	0	0	1	0	0	0	280
21:00	1	227	11	3	0	3	0	0	0	0	0	0	0	245
22:00	0	194	15	3	3	1	0	0	0	0	0	0	0	216
23:00	0	107	7	3	0	0	0	0	0	0	0	0	0	117
Total	21	1966	127	23	14	14	0	4	0	1	0	0	0	2170
Percent	1.0%	90.6%	5.9%	1.1%	0.6%	0.6%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.														
PM Peak Vol.	17:00	19:00	16:00	19:00	18:00	17:00		16:00		20:00				19:00
	6	343	26	6	3	4		1		1				372

Somerville Avenue
between Park Street and Laurel Street
City, State: Somerville, MA
Client: Design Consultants / J. Sobel



P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133530 A CLASS
Site Code: 2013-099
Date Start: 10-Sep-13

Office: 508.481.3999 Fax: 508.545.1234
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EB	Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
	09/11/1														
	3	0	54	4	2	1	0	0	0	0	0	0	0	0	61
	01:00	0	50	1	1	1	0	0	0	0	0	0	0	0	53
	02:00	0	33	3	1	0	0	0	0	0	0	0	0	0	37
	03:00	0	30	4	1	1	0	0	0	0	0	0	0	0	36
	04:00	0	40	1	1	2	1	0	0	0	0	0	0	0	45
	05:00	2	69	19	2	2	1	0	0	3	0	0	0	0	98
	06:00	3	184	37	3	2	2	0	0	2	0	0	0	0	233
	07:00	1	347	37	4	6	3	0	1	1	1	0	0	0	401
	08:00	7	359	21	4	4	1	1	0	0	0	0	0	0	397
	09:00	2	344	39	6	8	3	0	1	1	0	0	0	0	404
	10:00	3	301	51	4	10	1	0	1	1	0	0	0	0	372
	11:00	5	312	54	1	10	2	0	4	1	0	0	0	0	389
	12 PM	4	295	35	4	3	1	0	1	1	0	0	0	0	344
	13:00	3	322	33	2	11	3	1	2	0	0	0	0	0	377
	14:00	2	306	44	2	9	2	0	4	0	0	0	0	0	369
	15:00	4	343	39	3	4	5	0	1	0	0	0	0	0	399
	16:00	5	307	37	6	4	3	0	0	0	0	0	0	0	362
	17:00	8	329	25	2	1	0	0	0	0	0	0	0	0	365
	18:00	6	282	22	1	0	2	0	0	0	1	0	0	0	314
	19:00	2	374	22	3	1	2	0	1	0	0	0	0	0	405
	20:00	3	241	21	3	1	0	0	0	0	0	0	0	0	269
	21:00	1	284	14	2	3	0	0	1	0	0	0	0	0	305
	22:00	3	188	16	2	1	1	0	0	0	0	0	0	0	211
	23:00	3	104	11	3	0	0	0	1	0	0	0	0	0	122
	Total	67	5498	590	63	85	33	2	18	10	2	0	0	0	6368
	Percent	1.1%	86.3%	9.3%	1.0%	1.3%	0.5%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	
	AM Peak	08:00	08:00	11:00	09:00	10:00	07:00	08:00	11:00	05:00	07:00				09:00
	Vol.	7	359	54	6	10	3	1	4	3	1				404
	PM Peak	17:00	19:00	14:00	16:00	13:00	15:00	13:00	14:00	12:00	18:00				19:00
	Vol.	8	374	44	6	11	5	1	4	1	1				405
	Total		7464	717	86	99	47	2	22	10	3	0	0	0	8538

Somerville Avenue
between Park Street and Laurel Street
City, State: Somerville, MA
Client: Design Consultants / J. Sobel



PRECISION
D A T A
INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133530 A SPEED
Site Code: 2013-099
Date Start: 10-Sep-13

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/10/13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	82	118	235	46	4	0	0	0	0	0	0	0	0	485	23	17
17:00	131	124	244	23	2	0	0	0	0	0	0	0	0	524	22	16
18:00	143	105	231	10	2	0	0	0	0	0	0	0	0	491	22	15
19:00	91	117	206	27	2	0	0	0	0	0	0	0	0	443	22	16
20:00	60	82	186	48	10	1	0	0	0	0	0	0	0	387	24	18
21:00	47	74	116	47	9	1	0	0	0	0	0	0	0	294	24	18
22:00	10	36	89	61	12	0	0	0	0	0	0	0	0	208	27	21
23:00	3	15	32	44	18	3	0	0	0	0	0	0	0	115	29	24

%	19.2%	22.8%	45.4%	10.4%	2.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
AM Peak Vol.																
PM Peak Vol.	18:00	17:00	17:00	22:00	23:00	23:00									17:00	
	143	124	244	61	18	3									524	
Total	567	671	1339	306	59	5	0	0	0	0	0	0	0	2947	193	

Percent
t
15th Percentile : 7 MPH
50th Percentile : 17 MPH
85th Percentile : 23 MPH
95th Percentile : 27 MPH

Stats
10 MPH Pace Speed : 16-25 MPH
Number in Pace : 1517
Percent in Pace : 51.5%
Number of Vehicles > 25 MPH : 269
Percent of Vehicles > 25 MPH : 9.1%
Mean Speed(Average) : 17 MPH

Somerville Avenue
between Park Street and Laurel Street
City, State: Somerville, MA
Client: Design Consultants / J. Sobel



PRECISION
D A T A
INDUSTRIES, LLC

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133530 A SPEED
Site Code: 2013-099
Date Start: 10-Sep-13

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/11/																
13	3	3	7	27	19	8	0	0	0	0	0	0	0	67	33	27
01:00	0	3	11	11	19	2	1	1	0	0	0	0	0	48	33	28
02:00	1	0	1	11	7	1	2	0	0	0	0	0	0	23	34	29
03:00	0	1	7	11	10	2	2	0	0	0	0	0	0	33	33	28
04:00	0	1	3	13	14	8	0	0	0	0	0	0	0	39	35	30
05:00	0	9	21	33	36	5	0	0	0	0	0	0	0	104	32	27
06:00	13	58	87	82	34	6	1	0	0	0	0	0	0	281	28	22
07:00	57	84	183	92	15	2	0	0	0	0	0	0	0	433	25	19
08:00	71	112	216	33	2	1	0	0	0	0	0	0	0	435	23	17
09:00	80	97	209	40	8	0	0	0	0	0	0	0	0	434	23	17
10:00	71	105	200	62	2	0	0	0	0	0	0	0	0	440	23	18
11:00	80	96	208	47	4	0	0	0	0	0	0	0	0	435	23	17
12 PM	79	91	229	58	4	4	0	0	0	0	0	0	0	465	24	18
13:00	80	119	199	48	5	0	0	0	0	0	0	0	0	451	23	17
14:00	68	112	189	47	9	0	0	0	0	0	0	0	0	425	23	17
15:00	74	87	211	63	13	2	0	0	0	0	0	0	0	450	24	18
16:00	80	120	226	70	13	0	0	0	0	0	0	0	0	509	24	18
17:00	101	108	228	57	5	0	0	0	0	0	0	0	0	499	23	17
18:00	135	94	207	19	1	0	0	0	0	0	0	0	0	456	22	15
19:00	94	115	210	36	1	0	0	0	0	0	0	0	0	456	22	16
20:00	73	113	187	36	2	0	0	0	0	0	0	0	0	411	23	17
21:00	38	63	121	49	7	3	0	0	0	0	0	0	0	281	25	19
22:00	22	45	65	50	12	0	0	0	0	0	0	0	0	194	26	19
23:00	4	27	41	41	15	2	0	0	0	0	0	0	0	130	28	22

%	16.3%	22.2%	43.6%	13.8%	3.4%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
AM Peak	09:00	08:00	08:00	07:00	05:00	00:00	02:00	01:00							10:00	
Vol.	80	112	216	92	36	8	2	1							440	
PM Peak	18:00	16:00	12:00	16:00	23:00	12:00									16:00	
Vol.	135	120	229	70	15	4									509	
Total	1224	1663	3266	1036	257	46	6	1	0	0	0	0	0	7499	632	

Pecent
t
15th Percentile : 8 MPH
50th Percentile : 18 MPH
85th Percentile : 24 MPH
95th Percentile : 28 MPH

Stats
10 MPH Pace Speed : 16-25 MPH
Number in Pace : 3841
Percent in Pace : 51.2%
Number of Vehicles > 25 MPH : 983
Percent of Vehicles > 25 MPH : 13.1%
Mean Speed(Average) : 18 MPH



PRECISION
DATA
INDUSTRIES, LLC

133530 A SPEED
Site Code: 2013-099
Date Start: 10-Sep-13

[illegible]

Stats	10 MPH Pace Speed :	19-28 MPH
	Number in Pace :	1506
	Percent in Pace :	69.4%
	Number of Vehicles > 25 MPH :	506
	Percent of Vehicles > 25 MPH :	23.3%
	Mean Speed(Average) :	22 MPH

Somerville Avenue
between Park Street and Laurel Street
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133530 A SPEED
Site Code: 2013-099
Date Start: 10-Sep-13

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
09/11/																
13	0	0	5	21	27	7	1	0	0	0	0	0	0	61	34	30
01:00	0	1	5	25	15	6	0	1	0	0	0	0	0	53	34	29
02:00	0	0	3	7	14	10	3	0	0	0	0	0	0	37	37	32
03:00	2	0	3	4	16	10	1	0	0	0	0	0	0	36	36	30
04:00	0	1	4	8	18	9	4	1	0	0	0	0	0	45	38	32
05:00	1	1	8	39	36	11	1	1	0	0	0	0	0	98	34	29
06:00	1	3	47	86	82	13	1	0	0	0	0	0	0	233	32	28
07:00	4	26	180	150	39	2	0	0	0	0	0	0	0	401	28	24
08:00	22	53	208	93	20	1	0	0	0	0	0	0	0	397	26	21
09:00	11	59	204	117	12	1	0	0	0	0	0	0	0	404	26	22
10:00	4	33	199	121	14	1	0	0	0	0	0	0	0	372	27	23
11:00	6	36	232	103	12	0	0	0	0	0	0	0	0	389	26	22
12 PM	3	32	180	114	15	0	0	0	0	0	0	0	0	344	27	23
13:00	0	41	230	97	6	3	0	0	0	0	0	0	0	377	26	22
14:00	17	33	191	110	17	1	0	0	0	0	0	0	0	369	27	22
15:00	15	28	237	102	17	0	0	0	0	0	0	0	0	399	26	22
16:00	2	35	211	100	13	1	0	0	0	0	0	0	0	362	26	23
17:00	6	48	227	76	7	1	0	0	0	0	0	0	0	365	25	22
18:00	20	64	178	48	3	1	0	0	0	0	0	0	0	314	24	20
19:00	15	73	247	63	7	0	0	0	0	0	0	0	0	405	24	20
20:00	3	22	156	82	6	0	0	0	0	0	0	0	0	269	26	23
21:00	4	20	161	107	13	0	0	0	0	0	0	0	0	305	27	23
22:00	0	8	78	84	32	9	0	0	0	0	0	0	0	211	30	26
23:00	0	6	24	65	21	6	0	0	0	0	0	0	0	122	30	27

%	2.1%	9.8%	50.5%	28.6%	7.3%	1.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
AM Peak	08:00	09:00	11:00	07:00	06:00	06:00	04:00	01:00							09:00	
Vol.	22	59	232	150	82	13	4	1							404	
PM Peak	18:00	19:00	19:00	12:00	22:00	22:00									19:00	
Vol.	20	73	247	114	32	9									405	
Total	136	623	3218	1822	462	93	11	3	0	0	0	0	0	6368	696	

Pecent
t
15th Percentile : 17 MPH
50th Percentile : 22 MPH
85th Percentile : 27 MPH
95th Percentile : 31 MPH

Stats
10 MPH Pace Speed : 19-28 MPH
Number in Pace : 4363
Percent in Pace : 68.5%
Number of Vehicles > 25 MPH : 1838
Percent of Vehicles > 25 MPH : 28.9%
Mean Speed(Average) : 23 MPH

Somerville Avenue
between Park Street and Laurel Street
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Client: Design Consultants / J. Sobel



PRECISION
D A T A
INDUSTRIES, LLC

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133530 A VOLUME
Site Code: 2013-099
Date Start: 10-Sep-13

Start	WB			EB			Combin		10-Sep-13	
Time	A.M.	P.M.		A.M.	P.M.		A.M.	P.M.	Tue	
12:00	*	*		*	*		*	*		
12:15	*	*		*	*		*	*		
12:30	*	*		*	*		*	*		
12:45	*	*	0	*	*	0	*	*	0	
01:00	*	*		*	*		*	*		
01:15	*	*		*	*		*	*		
01:30	*	*		*	*		*	*		
01:45	*	*	0	*	*	0	*	*	0	
02:00	*	*		*	*		*	*		
02:15	*	*		*	*		*	*		
02:30	*	*		*	*		*	*		
02:45	*	*	0	*	*	0	*	*	0	
03:00	*	*		*	*		*	*		
03:15	*	*		*	*		*	*		
03:30	*	*		*	*		*	*		
03:45	*	*	0	*	*	0	*	*	0	
04:00	*	135		*	74		*	209		
04:15	*	111		*	87		*	198		
04:30	*	131		*	91		*	222		
04:45	*	108	485	*	76	328	*	184	813	
05:00	*	145		*	63		*	208		
05:15	*	139		*	91		*	230		
05:30	*	127		*	73		*	200		
05:45	*	113	524	*	70	297	*	183	821	
06:00	*	123		*	56		*	179		
06:15	*	122		*	84		*	206		
06:30	*	124		*	83		*	207		
06:45	*	122	491	*	92	315	*	214	806	
07:00	*	111		*	86		*	197		
07:15	*	122		*	98		*	220		
07:30	*	114		*	88		*	202		
07:45	*	96	443	*	100	372	*	196	815	
08:00	*	110		*	78		*	188		
08:15	*	97		*	65		*	162		
08:30	*	98		*	76		*	174		
08:45	*	82	387	*	61	280	*	143	667	
09:00	*	110		*	57		*	167		
09:15	*	67		*	52		*	119		
09:30	*	58		*	68		*	126		
09:45	*	59	294	*	68	245	*	127	539	
10:00	*	58		*	65		*	123		
10:15	*	57		*	44		*	101		
10:30	*	44		*	59		*	103		
10:45	*	49	208	*	48	216	*	97	424	
11:00	*	32		*	37		*	69		
11:15	*	31		*	26		*	57		
11:30	*	27		*	31		*	58		
11:45	*	25	115	*	23	117	*	48	232	
Total	0	2947		0	2170		0	5117		
Percent	0.0%	57.6%		0.0%	42.4%					
Day Total		2947			2170			5117		
Peak	-	-	05:00	-	-	-	07:00	-	-	-
Vol.	-	-	524	-	-	-	372	-	-	-
P.H.F.		0.903			0.930			0.917		

Somerville Avenue
between Park Street and Laurel Street
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Client: Design Consultants / J. Sobel

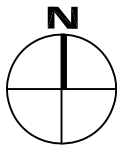


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INDUSTRIES, LLC

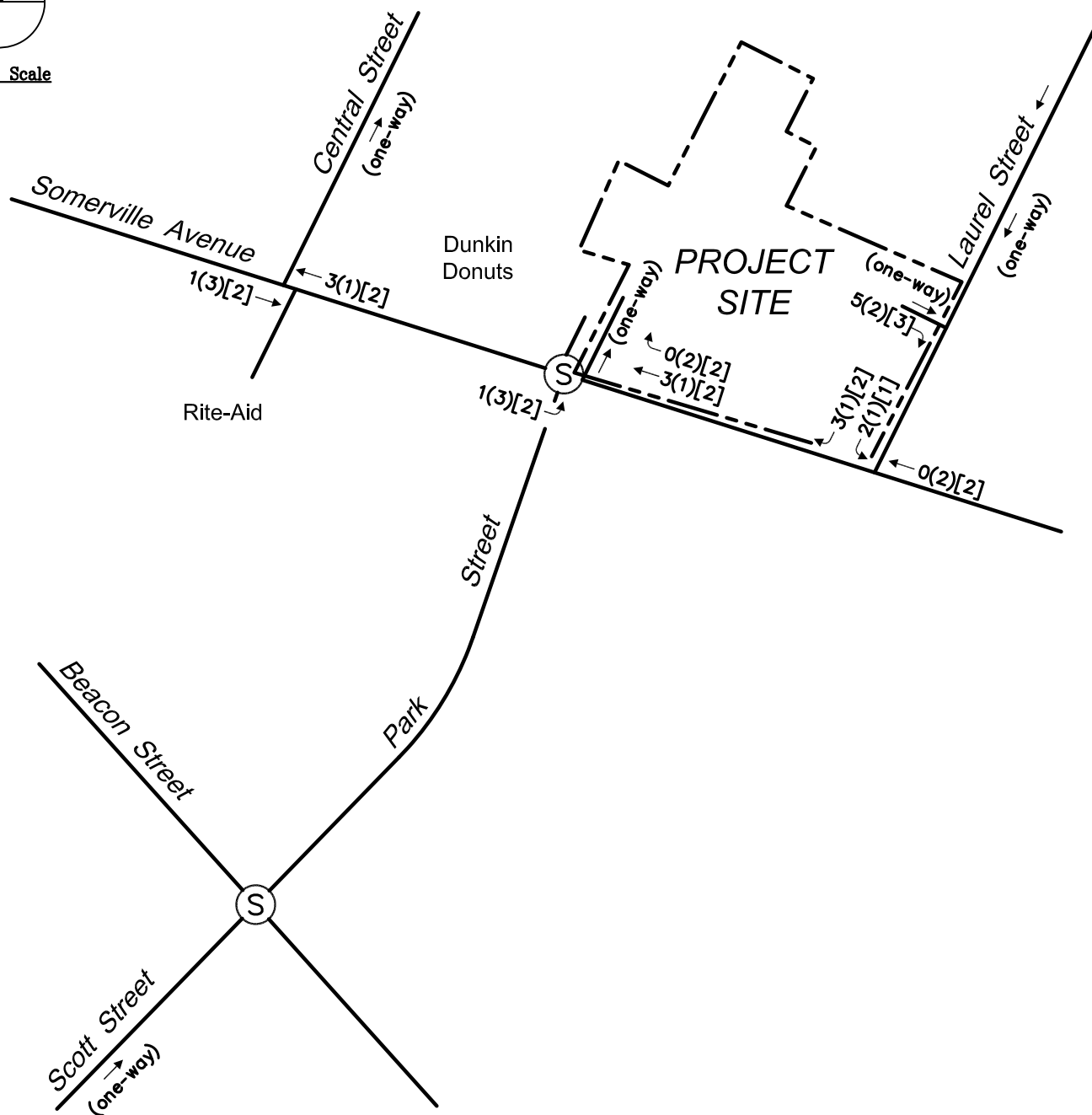
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133530 A VOLUME
Site Code: 2013-099
Date Start: 10-Sep-13

Start		WB		EB		Combin		11-Sep-13	
Time	A.M.	P.M.		A.M.	P.M.	A.M.	P.M.	Wed	
12:00	22	117		19	91	41	208		
12:15	16	110		14	92	30	202		
12:30	12	128		14	70	26	198		
12:45	17	110	465	14	91	31	201	809	
01:00	14	112		13	83	27	195		
01:15	12	113		17	85	29	198		
01:30	14	115		10	99	24	214		
01:45	8	111	451	13	110	21	221	828	
02:00	6	117		9	104	15	221		
02:15	3	103		13	81	16	184		
02:30	10	103		4	104	14	207		
02:45	4	102	425	11	80	15	182	794	
03:00	11	125		7	91	18	216		
03:15	5	106		11	97	16	203		
03:30	11	96		6	105	17	201		
03:45	6	123	450	12	106	18	229	849	
04:00	7	123		9	108	16	231		
04:15	8	123		9	100	17	223		
04:30	9	145		16	65	25	210		
04:45	15	118	509	11	89	26	207	871	
05:00	11	118		16	84	27	202		
05:15	19	132		18	92	37	224		
05:30	38	109		30	103	68	212		
05:45	36	140	499	34	86	70	226	864	
06:00	48	108		39	79	87	187		
06:15	61	126		54	81	115	207		
06:30	79	105		72	55	151	160		
06:45	93	117	456	68	99	161	216	770	
07:00	97	114		103	106	200	220		
07:15	105	116		83	113	188	229		
07:30	106	121		106	112	212	233		
07:45	125	105	456	109	74	234	179	861	
08:00	122	100		104	90	226	190		
08:15	118	99		105	68	223	167		
08:30	101	104		89	57	190	161		
08:45	94	108	411	99	54	193	162	680	
09:00	119	94		98	80	217	174		
09:15	104	69		116	83	220	152		
09:30	105	51		91	68	196	119		
09:45	106	67	281	99	74	205	141	586	
10:00	114	54		92	63	206	117		
10:15	100	61		86	52	186	113		
10:30	118	41		94	53	212	94		
10:45	108	38	194	100	43	208	81	405	
11:00	114	33		121	40	235	73		
11:15	110	36		101	37	211	73		
11:30	108	29		68	27	176	56		
11:45	103	32	130	99	18	202	50	252	
Total	2772	4727		2526	3842	5298	8569		
Percent	52.3%	55.2%		47.7%	44.8%				
Day Total		7499		6368		13867			
Peak	07:30	-	03:45	-	07:30	-	06:45	-	-
Vol.	471	-	514	-	424	-	895	-	898
P.H.F.	0.942		0.886		0.972		0.951		0.964



Not To Scale



Legend



Existing Traffic Signal

xx(yy)[zz] AM(PM)[Saturday] Peak Hour Volumes

Design Consultants, Inc.
Consulting Engineers and Surveyors

120 MIDDLESEX AVENUE, SUITE 20
SOMERVILLE, MA 02145
(617) 776-3350

515 Somerville Ave
Somerville, MA

Site Trips

Figure B4

APPENDIX B – TRIP GENERATION

Land Use: 220, Apartments

number of units: **12**

	AM Peak	PM Peak	Weekday Daily	Sat. Midday Peak	Sat. Daily
Average Rate (per num. of units)	0.51	0.62	6.65	0.52	6.39
Percent Entering	20%	65%	50%	50%	50%
Percent Exiting	80%	35%	50%	50%	50%
Total Trips	6	7	80	6	77
Entering Trips	1	5	40	3	39
Exiting Trips	5	2	40	3	38

Land Use: 826, Specialty Retail

SF **1,201**

	AM Peak ¹	PM Peak	Weekday Daily	Sat. Midday Peak ²	Sat. Daily
Average Rate (per KSF)	6.84	2.71	44.32	2.71	42.04
Percent Entering	48%	44%	50%	44%	50%
Percent Exiting	52%	56%	50%	56%	50%
Total Trips	8	3	53	3	50
Entering Trips	4	1	27	1	25
Exiting Trips	4	2	26	2	25

¹Peak hour of the generator due to unavailable peak hour of adjacent street data

²Assume weekday PM peak hour due to unavailable Saturday Data

Total Project Site

508-510 Somerville Ave Project	AM Peak	PM Peak	Weekday Daily	Sat. Midday Peak	Sat. Daily
Residential Apartments					
Gross Entering Trips	1	5	40	3	39
Gross Exiting Trips	5	2	40	3	38
Gross Total Trips	6	7	80	6	77
Transit / Bike / Walk / Telecommute (57.8%) --US Census Tract 3512.04--					
Entering Trips	1	3	23	2	23
Exiting Trips	3	1	23	2	22
Auto Enter Trips	0	2	17	1	16
Auto Exit Trips	2	1	17	1	16
Auto Trips	2	3	34	2	32
Ground floor supporting Retail					
Entering Trips	4	1	27	1	25
Exiting Trips	4	2	26	2	25
Total Auto Enter Trips	4	3	44	2	41
Total Auto Exit Trips	6	3	43	3	41
Total Auto Trips (retail+residential)	10	6	87	5	82

APPENDIX C – CAPACITY ANALYSIS

HCM Unsignalized Intersection Capacity Analysis

1: Rite Aid/Central St & Somerville Ave

12/2/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	65	671	6	1	424	209	1	2	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.91	0.91	0.91	0.33	0.33	0.33	0.92	0.92	0.92
Hourly flow rate (vph)	68	706	6	1	466	230	3	6	3	0	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)					191							
pX, platoon unblocked	0.82						0.82	0.82		0.82	0.82	0.82
vC, conflicting volume	696			713			1429	1544	709	1435	1432	581
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	519			713			1414	1554	709	1421	1418	379
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			97	93	99	100	100	100
cM capacity (veh/h)	854			869			90	86	437	82	103	548
Direction, Lane #	EB 1	WB 1	NB 1									
Volume Total	781	697	12									
Volume Left	68	1	3									
Volume Right	6	230	3									
cSH	854	869	109									
Volume to Capacity	0.08	0.00	0.11									
Queue Length 95th (ft)	7	0	9									
Control Delay (s)	2.0	0.0	42.1									
Lane LOS	A	A	E									
Approach Delay (s)	2.0	0.0	42.1									
Approach LOS			E									
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			87.7%	ICU Level of Service						E		
Analysis Period (min)			15									

Queues

2: Park St/Driveway & Somerville Ave

12/2/2013



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	587	206	99	492	295	39
v/c Ratio	0.84	0.29	0.41	0.56	0.67	0.09
Control Delay	29.8	3.4	11.8	11.5	27.9	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	3.4	11.8	11.5	27.9	16.3
Queue Length 50th (ft)	182	0	15	97	89	10
Queue Length 95th (ft)	#326	30	34	167	#166	22
Internal Link Dist (ft)	111			206	1198	16
Turn Bay Length (ft)			150			
Base Capacity (vph)	795	791	241	1055	438	438
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	0.74	0.26	0.41	0.47	0.67	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

2: Park St/Driveway & Somerville Ave

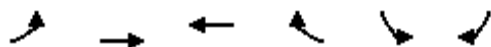
12/2/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	509	179	91	411	41	178	15	49	19	8	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Frt		1.00	0.85	1.00	0.99			0.97			1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.96			0.97	
Satd. Flow (prot)		1809	1538	1671	1735			1730			1760	
Flt Permitted		1.00	1.00	0.16	1.00			0.76			0.77	
Satd. Flow (perm)		1807	1538	276	1735			1360			1401	
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.82	0.82	0.82	0.70	0.70	0.70
Adj. Flow (vph)	2	585	206	99	447	45	217	18	60	27	11	1
RTOR Reduction (vph)	0	0	128	0	6	0	0	15	0	0	1	0
Lane Group Flow (vph)	0	587	78	99	486	0	0	280	0	0	38	0
Heavy Vehicles (%)	5%	5%	5%	8%	8%	8%	3%	3%	3%	4%	4%	4%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		21.5	21.5	29.5	29.5			17.4			17.4	
Effective Green, g (s)		21.5	21.5	29.5	29.5			17.4			17.4	
Actuated g/C Ratio		0.38	0.38	0.52	0.52			0.31			0.31	
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)		682	581	216	899			415			428	
v/s Ratio Prot				0.02	c0.28							
v/s Ratio Perm		c0.32	0.05	0.21				c0.21			0.03	
v/c Ratio		0.86	0.13	0.46	0.54			0.68			0.09	
Uniform Delay, d1		16.3	11.6	10.0	9.2			17.3			14.1	
Progression Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2		10.8	0.1	1.5	0.7			8.5			0.4	
Delay (s)		27.1	11.7	11.5	9.8			25.8			14.5	
Level of Service		C	B	B	A			C			B	
Approach Delay (s)		23.1			10.1			25.8			14.5	
Approach LOS		C			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			18.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			56.9			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			79.7%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Somerville Ave & Laurel St

12/2/2013

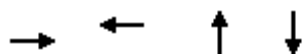


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↘
Volume (veh/h)	0	551	455	0	101	78
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.96	0.96	0.79	0.79
Hourly flow rate (vph)	0	586	474	0	128	99
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		286				
pX, platoon unblocked					0.71	
vC, conflicting volume	474				1060	474
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	474				883	474
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				43	83
cM capacity (veh/h)	1078				226	590
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	586	474	227			
Volume Left	0	0	128			
Volume Right	0	0	99			
cSH	1700	1700	309			
Volume to Capacity	0.34	0.28	0.73			
Queue Length 95th (ft)	0	0	136			
Control Delay (s)	0.0	0.0	43.1			
Lane LOS			E			
Approach Delay (s)	0.0	0.0	43.1			
Approach LOS			E			
Intersection Summary						
Average Delay			7.6			
Intersection Capacity Utilization			46.0%	ICU Level of Service		A
Analysis Period (min)			15			

Queues

4: Scott St/Park St & Beacon St

12/2/2013



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	416	371	140	212
v/c Ratio	0.57	0.49	0.25	0.47
Control Delay	13.6	10.7	11.0	12.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.6	10.7	11.0	12.7
Queue Length 50th (ft)	76	54	23	30
Queue Length 95th (ft)	142	110	47	71
Internal Link Dist (ft)	225	136	194	1198
Turn Bay Length (ft)				
Base Capacity (vph)	735	759	570	452
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	0.57	0.49	0.25	0.47
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

4: Scott St/Park St & Beacon St

12/2/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	361	0	0	261	99	32	75	8	156	0	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.96			0.99			0.98	
Flt Protected		1.00			1.00			0.99			0.96	
Satd. Flow (prot)		1820			1726			1784			1718	
Flt Permitted		0.95			1.00			0.88			0.66	
Satd. Flow (perm)		1741			1726			1588			1187	
Peak-hour factor, PHF	0.94	0.94	0.94	0.97	0.97	0.97	0.82	0.82	0.82	0.86	0.86	0.86
Adj. Flow (vph)	32	384	0	0	269	102	39	91	10	181	0	31
RTOR Reduction (vph)	0	0	0	0	31	0	0	6	0	0	31	0
Lane Group Flow (vph)	0	416	0	0	340	0	0	134	0	0	181	0
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	4%	4%	4%	4%	4%	4%
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		19.0			19.0			16.0			16.0	
Effective Green, g (s)		19.0			19.0			16.0			16.0	
Actuated g/C Ratio		0.42			0.42			0.36			0.36	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		735			728			564			422	
v/s Ratio Prot					0.20							
v/s Ratio Perm		c0.24						0.08			c0.15	
v/c Ratio		0.57			0.47			0.24			0.43	
Uniform Delay, d1		9.9			9.4			10.2			11.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.1			2.2			1.0			3.2	
Delay (s)		13.0			11.5			11.2			14.2	
Level of Service		B			B			B			B	
Approach Delay (s)		13.0			11.5			11.2			14.2	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			45.0			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			69.1%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: Rite Aid/Central St & Somerville Ave

12/2/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	96	473	17	4	573	389	2	13	7	0	0	0
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	0.69	0.69	0.69	0.92	0.92	0.92
Hourly flow rate (vph)	103	509	18	4	603	409	3	19	10	0	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)					191							
pX, platoon unblocked	0.73						0.73	0.73		0.73	0.73	0.73
vC, conflicting volume	1013			527			1541	1745	518	1560	1550	808
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	830			527			1556	1837	518	1583	1568	548
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	82			100			95	59	98	100	100	100
cM capacity (veh/h)	583			1040			58	46	562	37	66	390
Direction, Lane #	EB 1	WB 1	NB 1									
Volume Total	630	1017	32									
Volume Left	103	4	3									
Volume Right	18	409	10									
cSH	583	1040	66									
Volume to Capacity	0.18	0.00	0.48									
Queue Length 95th (ft)	16	0	48									
Control Delay (s)	4.7	0.1	101.9									
Lane LOS	A	A	F									
Approach Delay (s)	4.7	0.1	101.9									
Approach LOS			F									
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			98.7%		ICU Level of Service				F			
Analysis Period (min)			15									

Queues

2: Park St/Driveway & Somerville Ave

12/2/2013



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	420	107	73	567	474	11
v/c Ratio	0.78	0.20	0.30	0.81	0.78	0.02
Control Delay	32.9	4.2	14.3	26.3	26.0	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	4.2	14.3	26.3	26.0	10.4
Queue Length 50th (ft)	143	0	15	164	142	2
Queue Length 95th (ft)	#284	25	37	#286	#302	7
Internal Link Dist (ft)	111			206	1198	16
Turn Bay Length (ft)			150			
Base Capacity (vph)	553	560	240	815	611	695
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.19	0.30	0.70	0.78	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

2: Park St/Driveway & Somerville Ave

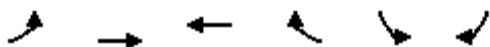
12/2/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑			↕			↕	
Volume (vph)	0	382	97	72	543	19	395	7	48	5	3	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Frt		1.00	0.85	1.00	0.99			0.99			1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.96			0.97	
Satd. Flow (prot)		1863	1583	1752	1835			1759			1841	
Flt Permitted		1.00	1.00	0.20	1.00			0.74			0.83	
Satd. Flow (perm)		1863	1583	377	1835			1366			1568	
Peak-hour factor, PHF	0.91	0.91	0.91	0.99	0.99	0.99	0.95	0.95	0.95	0.67	0.67	0.67
Adj. Flow (vph)	0	420	107	73	548	19	416	7	51	7	4	0
RTOR Reduction (vph)	0	0	77	0	2	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	420	30	73	565	0	0	467	0	0	11	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	0%	0%	0%
Turn Type		NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases			4	8			2			6		
Actuated Green, G (s)		16.4	16.4	23.7	23.7			25.2			25.2	
Effective Green, g (s)		16.4	16.4	23.7	23.7			25.2			25.2	
Actuated g/C Ratio		0.28	0.28	0.40	0.40			0.43			0.43	
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)		518	440	205	738			584			670	
v/s Ratio Prot		0.23		0.01	c0.31							
v/s Ratio Perm			0.02	0.13				c0.34			0.01	
v/c Ratio		0.81	0.07	0.36	0.77			0.80			0.02	
Uniform Delay, d1		19.8	15.6	12.5	15.2			14.7			9.7	
Progression Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2		9.3	0.1	1.1	4.7			11.0			0.0	
Delay (s)		29.1	15.7	13.6	19.9			25.6			9.8	
Level of Service		C	B	B	B			C			A	
Approach Delay (s)		26.4			19.2			25.6			9.8	
Approach LOS		C			B			C			A	
Intersection Summary												
HCM 2000 Control Delay			23.3			HCM 2000 Level of Service					C	
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			58.9			Sum of lost time (s)				15.0		
Intersection Capacity Utilization			69.9%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Somerville Ave & Laurel St

12/2/2013

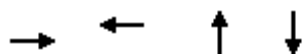


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↘
Volume (veh/h)	0	453	576	0	44	59
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.97	0.97	0.60	0.60
Hourly flow rate (vph)	0	503	594	0	73	98
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		286				
pX, platoon unblocked					0.78	
vC, conflicting volume	594				1097	594
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	594				986	594
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				66	80
cM capacity (veh/h)	982				214	501
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	503	594	172			
Volume Left	0	0	73			
Volume Right	0	0	98			
cSH	1700	1700	318			
Volume to Capacity	0.30	0.35	0.54			
Queue Length 95th (ft)	0	0	75			
Control Delay (s)	0.0	0.0	28.8			
Lane LOS			D			
Approach Delay (s)	0.0	0.0	28.8			
Approach LOS			D			
Intersection Summary						
Average Delay			3.9			
Intersection Capacity Utilization			43.0%	ICU Level of Service		A
Analysis Period (min)			15			

Queues

4: Scott St/Park St & Beacon St

12/2/2013



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	461	577	297	168
v/c Ratio	0.76	0.72	0.48	0.41
Control Delay	22.0	16.7	14.3	11.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	22.0	16.7	14.3	11.7
Queue Length 50th (ft)	94	102	56	22
Queue Length 95th (ft)	#224	#240	104	44
Internal Link Dist (ft)	225	136	194	1198
Turn Bay Length (ft)				
Base Capacity (vph)	610	796	616	412
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	0.76	0.72	0.48	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

4: Scott St/Park St & Beacon St

12/2/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	382	0	0	362	163	40	206	12	107	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.96			0.99			0.98	
Flt Protected		0.99			1.00			0.99			0.96	
Satd. Flow (prot)		1870			1802			1837			1753	
Flt Permitted		0.77			1.00			0.93			0.59	
Satd. Flow (perm)		1446			1802			1722			1074	
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.87	0.87	0.87	0.74	0.74	0.74
Adj. Flow (vph)	55	406	0	0	398	179	46	237	14	145	0	23
RTOR Reduction (vph)	0	0	0	0	36	0	0	4	0	0	31	0
Lane Group Flow (vph)	0	461	0	0	541	0	0	293	0	0	137	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		19.0			19.0			16.0			16.0	
Effective Green, g (s)		19.0			19.0			16.0			16.0	
Actuated g/C Ratio		0.42			0.42			0.36			0.36	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		610			760			612			381	
v/s Ratio Prot					0.30							
v/s Ratio Perm		c0.32						c0.17			0.13	
v/c Ratio		0.76			0.71			0.48			0.36	
Uniform Delay, d1		11.0			10.7			11.3			10.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.5			5.6			2.7			2.6	
Delay (s)		19.5			16.4			13.9			13.3	
Level of Service		B			B			B			B	
Approach Delay (s)		19.5			16.4			13.9			13.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			45.0			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			89.4%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

1: Rite Aid/Central St & Somerville Ave

12/2/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	103	535	10	3	494	260	2	2	2	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.98	0.98	0.98	0.75	0.75	0.75	0.92	0.92	0.92
Hourly flow rate (vph)	120	622	12	3	504	265	3	3	3	0	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)					191							
pX, platoon unblocked	0.74						0.74	0.74		0.74	0.74	0.74
vC, conflicting volume	769			634			1510	1643	628	1514	1516	637
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	514			634			1514	1693	628	1519	1522	335
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	85			100			96	95	99	100	100	100
cM capacity (veh/h)	779			949			65	59	487	61	74	524
Direction, Lane #	EB 1	WB 1	NB 1									
Volume Total	753	772	8									
Volume Left	120	3	3									
Volume Right	12	265	3									
cSH	779	949	87									
Volume to Capacity	0.15	0.00	0.09									
Queue Length 95th (ft)	14	0	7									
Control Delay (s)	3.8	0.1	50.6									
Lane LOS	A	A	F									
Approach Delay (s)	3.8	0.1	50.6									
Approach LOS			F									
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			89.8%	ICU Level of Service				E				
Analysis Period (min)			15									

Queues

2: Park St/Driveway & Somerville Ave

12/2/2013



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	476	122	74	555	291	19
v/c Ratio	0.89	0.22	0.31	0.78	0.46	0.03
Control Delay	43.9	5.1	14.5	24.0	13.9	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.9	5.1	14.5	24.0	13.9	10.3
Queue Length 50th (ft)	169	0	16	158	66	4
Queue Length 95th (ft)	#337	31	37	262	127	11
Internal Link Dist (ft)	111			206	1198	16
Turn Bay Length (ft)			150			
Base Capacity (vph)	534	548	235	831	629	677
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	0.89	0.22	0.31	0.67	0.46	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

2: Park St/Driveway & Somerville Ave

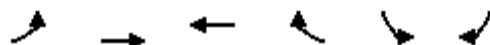
12/2/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	423	110	70	506	16	205	7	59	10	3	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Frt		1.00	0.85	1.00	1.00			0.97			0.99	
Flt Protected		1.00	1.00	0.95	1.00			0.96			0.96	
Satd. Flow (prot)		1862	1583	1787	1873			1742			1819	
Flt Permitted		0.99	1.00	0.19	1.00			0.77			0.81	
Satd. Flow (perm)		1847	1583	352	1873			1386			1529	
Peak-hour factor, PHF	0.90	0.90	0.90	0.94	0.94	0.94	0.93	0.93	0.93	0.70	0.70	0.70
Adj. Flow (vph)	6	470	122	74	538	17	220	8	63	14	4	1
RTOR Reduction (vph)	0	0	88	0	2	0	0	16	0	0	1	0
Lane Group Flow (vph)	0	476	34	74	553	0	0	275	0	0	18	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		16.4	16.4	23.7	23.7			25.1			25.1	
Effective Green, g (s)		16.4	16.4	23.7	23.7			25.1			25.1	
Actuated g/C Ratio		0.28	0.28	0.40	0.40			0.43			0.43	
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)		515	441	198	754			591			652	
v/s Ratio Prot				0.01	c0.30							
v/s Ratio Perm		c0.26	0.02	0.14				c0.20			0.01	
v/c Ratio		0.92	0.08	0.37	0.73			0.47			0.03	
Uniform Delay, d1		20.6	15.6	13.0	14.9			12.1			9.8	
Progression Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2		22.4	0.1	1.2	3.7			2.6			0.1	
Delay (s)		43.0	15.7	14.2	18.6			14.7			9.9	
Level of Service		D	B	B	B			B			A	
Approach Delay (s)		37.5			18.1			14.7			9.9	
Approach LOS		D			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			24.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			58.8			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			80.4%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Somerville Ave & Laurel St

12/2/2013

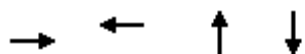


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↘
Volume (veh/h)	0	497	538	0	38	54
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.96	0.96	0.79	0.79
Hourly flow rate (vph)	0	558	560	0	48	68
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		286				
pX, platoon unblocked					0.75	
vC, conflicting volume	560				1119	560
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	560				992	560
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				77	87
cM capacity (veh/h)	1011				205	529
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	558	560	116			
Volume Left	0	0	48			
Volume Right	0	0	68			
cSH	1700	1700	321			
Volume to Capacity	0.33	0.33	0.36			
Queue Length 95th (ft)	0	0	40			
Control Delay (s)	0.0	0.0	22.5			
Lane LOS			C			
Approach Delay (s)	0.0	0.0	22.5			
Approach LOS			C			
Intersection Summary						
Average Delay		2.1				
Intersection Capacity Utilization		40.4%		ICU Level of Service		A
Analysis Period (min)		15				

Queues

4: Scott St/Park St & Beacon St

12/2/2013



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	446	510	84	212
v/c Ratio	0.62	0.65	0.13	0.43
Control Delay	14.7	13.7	10.1	11.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.7	13.7	10.1	11.7
Queue Length 50th (ft)	84	84	13	30
Queue Length 95th (ft)	157	161	33	57
Internal Link Dist (ft)	225	136	194	1198
Turn Bay Length (ft)				
Base Capacity (vph)	723	788	636	494
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	0.62	0.65	0.13	0.43
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

4: Scott St/Park St & Beacon St

12/2/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	359	0	0	316	138	10	59	4	131	0	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.96			0.99			0.97	
Flt Protected		0.99			1.00			0.99			0.96	
Satd. Flow (prot)		1871			1786			1854			1760	
Flt Permitted		0.91			1.00			0.95			0.71	
Satd. Flow (perm)		1714			1786			1781			1304	
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.87	0.87	0.87	0.77	0.77	0.77
Adj. Flow (vph)	47	399	0	0	355	155	11	68	5	170	0	42
RTOR Reduction (vph)	0	0	0	0	35	0	0	3	0	0	31	0
Lane Group Flow (vph)	0	446	0	0	475	0	0	81	0	0	181	0
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		19.0			19.0			16.0			16.0	
Effective Green, g (s)		19.0			19.0			16.0			16.0	
Actuated g/C Ratio		0.42			0.42			0.36			0.36	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		723			754			633			463	
v/s Ratio Prot					c0.27							
v/s Ratio Perm		0.26						0.05			c0.14	
v/c Ratio		0.62			0.63			0.13			0.39	
Uniform Delay, d1		10.2			10.2			9.8			10.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.9			4.0			0.4			2.5	
Delay (s)		14.1			14.2			10.2			13.3	
Level of Service		B			B			B			B	
Approach Delay (s)		14.1			14.2			10.2			13.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		13.7			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		45.0			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		74.6%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

2: Park St/Driveway & Somerville Ave

7/1/2014



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	618	216	104	520	310	41
v/c Ratio	0.85	0.29	0.44	0.57	0.75	0.10
Control Delay	29.5	3.2	11.9	11.1	33.6	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	3.2	11.9	11.1	33.6	17.2
Queue Length 50th (ft)	189	0	15	100	98	11
Queue Length 95th (ft)	#340	30	34	171	#190	24
Internal Link Dist (ft)	364			229	559	16
Turn Bay Length (ft)			150			
Base Capacity (vph)	830	824	239	1090	414	413
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	0.74	0.26	0.44	0.48	0.75	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

2: Park St/Driveway & Somerville Ave

7/1/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	535	188	96	435	43	187	16	51	20	8	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Frt		1.00	0.85	1.00	0.99			0.97			1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.96			0.97	
Satd. Flow (prot)		1809	1538	1671	1735			1731			1759	
Flt Permitted		1.00	1.00	0.15	1.00			0.76			0.77	
Satd. Flow (perm)		1806	1538	260	1735			1358			1401	
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.82	0.82	0.82	0.70	0.70	0.70
Adj. Flow (vph)	3	615	216	104	473	47	228	20	62	29	11	1
RTOR Reduction (vph)	0	0	131	0	7	0	0	14	0	0	1	0
Lane Group Flow (vph)	0	618	85	104	513	0	0	296	0	0	40	0
Heavy Vehicles (%)	5%	5%	5%	8%	8%	8%	3%	3%	3%	4%	4%	4%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		22.4	22.4	30.4	30.4			16.4			16.4	
Effective Green, g (s)		22.4	22.4	30.4	30.4			16.4			16.4	
Actuated g/C Ratio		0.39	0.39	0.54	0.54			0.29			0.29	
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)		712	606	213	928			392			404	
v/s Ratio Prot				0.03	c0.30							
v/s Ratio Perm		c0.34	0.06	0.23				c0.22			0.03	
v/c Ratio		0.87	0.14	0.49	0.55			0.75			0.10	
Uniform Delay, d1		15.8	11.0	9.8	8.7			18.4			14.8	
Progression Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2		10.9	0.1	1.8	0.7			12.7			0.5	
Delay (s)		26.7	11.1	11.6	9.4			31.0			15.3	
Level of Service		C	B	B	A			C			B	
Approach Delay (s)		22.7			9.8			31.0			15.3	
Approach LOS		C			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			19.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			56.8			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			83.2%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

2: Park St/Driveway & Somerville Ave

7/1/2014



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	449	112	77	600	497	11
v/c Ratio	0.87	0.21	0.35	0.83	0.80	0.02
Control Delay	42.4	5.2	16.3	28.9	28.5	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	5.2	16.3	28.9	28.5	10.7
Queue Length 50th (ft)	169	0	18	197	163	2
Queue Length 95th (ft)	#324	31	41	#363	#335	8
Internal Link Dist (ft)	226			199	559	16
Turn Bay Length (ft)			150			
Base Capacity (vph)	529	538	218	794	618	702
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	0.85	0.21	0.35	0.76	0.80	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

2: Park St/Driveway & Somerville Ave

7/1/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	401	102	76	572	22	415	7	50	5	3	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Frt		1.00	0.85	1.00	0.99			0.99			1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.96			0.97	
Satd. Flow (prot)		1861	1583	1752	1835			1759			1841	
Flt Permitted		0.99	1.00	0.18	1.00			0.74			0.83	
Satd. Flow (perm)		1838	1583	325	1835			1366			1570	
Peak-hour factor, PHF	0.91	0.91	0.91	0.99	0.99	0.99	0.95	0.95	0.95	0.67	0.67	0.67
Adj. Flow (vph)	8	441	112	77	578	22	437	7	53	7	4	0
RTOR Reduction (vph)	0	0	81	0	2	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	449	31	77	598	0	0	490	0	0	11	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	0%	0%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		17.7	17.7	25.8	25.8			28.1			28.1	
Effective Green, g (s)		17.7	17.7	25.8	25.8			28.1			28.1	
Actuated g/C Ratio		0.28	0.28	0.40	0.40			0.44			0.44	
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)		509	438	200	740			600			690	
v/s Ratio Prot				0.02	c0.33							
v/s Ratio Perm		0.24	0.02	0.14				c0.36			0.01	
v/c Ratio		0.88	0.07	0.39	0.81			0.82			0.02	
Uniform Delay, d1		22.1	17.0	13.9	16.9			15.7			10.1	
Progression Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2		16.3	0.1	1.2	6.5			11.7			0.0	
Delay (s)		38.4	17.1	15.1	23.3			27.4			10.1	
Level of Service		D	B	B	C			C			B	
Approach Delay (s)		34.2			22.4			27.4			10.1	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			27.5				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			63.9				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			98.5%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

2: Park St/Driveway & Somerville Ave

7/1/2014



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	502	129	79	588	306	21
v/c Ratio	0.77	0.20	0.29	0.70	0.59	0.04
Control Delay	25.5	4.0	10.4	16.4	21.3	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	4.0	10.4	16.4	21.3	14.3
Queue Length 50th (ft)	154	0	13	136	86	5
Queue Length 95th (ft)	#288	28	31	225	#187	14
Internal Link Dist (ft)	361			239	559	16
Turn Bay Length (ft)			150			
Base Capacity (vph)	774	740	273	1111	517	531
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	0.65	0.17	0.29	0.53	0.59	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

2: Park St/Driveway & Somerville Ave

7/1/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	445	116	74	534	19	215	7	62	11	3	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Frt		1.00	0.85	1.00	0.99			0.97			0.99	
Flt Protected		1.00	1.00	0.95	1.00			0.96			0.96	
Satd. Flow (prot)		1861	1583	1787	1872			1742			1819	
Flt Permitted		0.99	1.00	0.20	1.00			0.77			0.77	
Satd. Flow (perm)		1842	1583	372	1872			1383			1462	
Peak-hour factor, PHF	0.90	0.90	0.90	0.94	0.94	0.94	0.93	0.93	0.93	0.70	0.70	0.70
Adj. Flow (vph)	8	494	129	79	568	20	231	8	67	16	4	1
RTOR Reduction (vph)	0	0	85	0	2	0	0	16	0	0	1	0
Lane Group Flow (vph)	0	502	44	79	586	0	0	290	0	0	20	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		19.1	19.1	26.2	26.2			19.5			19.5	
Effective Green, g (s)		19.1	19.1	26.2	26.2			19.5			19.5	
Actuated g/C Ratio		0.34	0.34	0.47	0.47			0.35			0.35	
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)		631	542	228	880			484			511	
v/s Ratio Prot				0.01	c0.31							
v/s Ratio Perm		c0.27	0.03	0.15				c0.21			0.01	
v/c Ratio		0.80	0.08	0.35	0.67			0.60			0.04	
Uniform Delay, d1		16.5	12.4	10.1	11.4			14.9			11.9	
Progression Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2		6.9	0.1	0.9	1.9			5.4			0.1	
Delay (s)		23.4	12.4	11.1	13.3			20.3			12.1	
Level of Service		C	B	B	B			C			B	
Approach Delay (s)		21.2			13.0			20.3			12.1	
Approach LOS		C			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			17.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			55.7			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			83.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

2: Park St/Driveway & Somerville Ave

7/1/2014



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	621	216	104	520	311	41
v/c Ratio	0.86	0.29	0.44	0.57	0.75	0.10
Control Delay	29.8	3.2	12.0	11.1	33.8	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	3.2	12.0	11.1	33.8	17.2
Queue Length 50th (ft)	191	0	15	100	98	11
Queue Length 95th (ft)	#343	30	34	171	#191	24
Internal Link Dist (ft)	364			229	559	16
Turn Bay Length (ft)			150			
Base Capacity (vph)	829	823	237	1089	414	412
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	0.75	0.26	0.44	0.48	0.75	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

2: Park St/Driveway & Somerville Ave

7/1/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	538	188	96	435	43	187	16	52	20	8	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Frt		1.00	0.85	1.00	0.99			0.97			1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.96			0.97	
Satd. Flow (prot)		1809	1538	1671	1735			1731			1759	
Flt Permitted		1.00	1.00	0.15	1.00			0.76			0.77	
Satd. Flow (perm)		1806	1538	257	1735			1359			1400	
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.82	0.82	0.82	0.70	0.70	0.70
Adj. Flow (vph)	3	618	216	104	473	47	228	20	63	29	11	1
RTOR Reduction (vph)	0	0	131	0	7	0	0	15	0	0	1	0
Lane Group Flow (vph)	0	621	85	104	513	0	0	296	0	0	40	0
Heavy Vehicles (%)	5%	5%	5%	8%	8%	8%	3%	3%	3%	4%	4%	4%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		22.4	22.4	30.4	30.4			16.4			16.4	
Effective Green, g (s)		22.4	22.4	30.4	30.4			16.4			16.4	
Actuated g/C Ratio		0.39	0.39	0.54	0.54			0.29			0.29	
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)		712	606	212	928			392			404	
v/s Ratio Prot				0.03	c0.30							
v/s Ratio Perm		c0.34	0.06	0.24				c0.22			0.03	
v/c Ratio		0.87	0.14	0.49	0.55			0.76			0.10	
Uniform Delay, d1		15.9	11.0	9.9	8.7			18.4			14.8	
Progression Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2		11.4	0.1	1.8	0.7			12.7			0.5	
Delay (s)		27.3	11.1	11.7	9.4			31.1			15.3	
Level of Service		C	B	B	A			C			B	
Approach Delay (s)		23.1			9.8			31.1			15.3	
Approach LOS		C			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			19.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			56.8			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			83.4%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

4: Somerville Ave

7/1/2014

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	606	4	0	574	0	6
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)	659	4	0	624	0	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	309					
pX, platoon unblocked			0.68		0.68	0.68
vC, conflicting volume			663		1285	661
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			271		1184	268
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			880		142	525
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	663	624	7			
Volume Left	0	0	0			
Volume Right	4	0	7			
cSH	1700	1700	525			
Volume to Capacity	0.39	0.37	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	0.0	0.0	11.9			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.9			
Approach LOS			B			
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			42.1%	ICU Level of Service		A
Analysis Period (min)			15			

Queues

2: Park St/Driveway & Somerville Ave

7/1/2014



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	446	112	77	600	498	11
v/c Ratio	0.86	0.21	0.35	0.83	0.81	0.02
Control Delay	40.8	5.2	16.3	28.9	28.7	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	5.2	16.3	28.9	28.7	10.7
Queue Length 50th (ft)	167	0	18	197	164	2
Queue Length 95th (ft)	#321	31	41	#363	#336	8
Internal Link Dist (ft)	226			199	559	16
Turn Bay Length (ft)			150			
Base Capacity (vph)	534	538	218	794	617	702
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.21	0.35	0.76	0.81	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

2: Park St/Driveway & Somerville Ave

7/1/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	403	102	76	572	22	415	7	51	5	3	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Frt		1.00	0.85	1.00	0.99			0.99			1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.96			0.97	
Satd. Flow (prot)		1862	1583	1752	1835			1758			1841	
Flt Permitted		1.00	1.00	0.18	1.00			0.74			0.83	
Satd. Flow (perm)		1855	1583	325	1835			1366			1570	
Peak-hour factor, PHF	0.91	0.91	0.91	0.99	0.99	0.99	0.95	0.95	0.95	0.67	0.67	0.67
Adj. Flow (vph)	3	443	112	77	578	22	437	7	54	7	4	0
RTOR Reduction (vph)	0	0	81	0	2	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	446	31	77	598	0	0	491	0	0	11	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	0%	0%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		17.7	17.7	25.8	25.8			28.1			28.1	
Effective Green, g (s)		17.7	17.7	25.8	25.8			28.1			28.1	
Actuated g/C Ratio		0.28	0.28	0.40	0.40			0.44			0.44	
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)		513	438	200	740			600			690	
v/s Ratio Prot				0.02	c0.33							
v/s Ratio Perm		0.24	0.02	0.14				c0.36			0.01	
v/c Ratio		0.87	0.07	0.39	0.81			0.82			0.02	
Uniform Delay, d1		22.0	17.0	13.8	16.9			15.7			10.1	
Progression Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2		14.5	0.1	1.2	6.5			11.8			0.0	
Delay (s)		36.5	17.1	15.1	23.3			27.5			10.1	
Level of Service		D	B	B	C			C			B	
Approach Delay (s)		32.6			22.4			27.5			10.1	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			27.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			63.9			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			98.4%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

4: Somerville Ave

7/1/2014

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	456	3	0	670	0	3
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)	496	3	0	728	0	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	279					
pX, platoon unblocked			0.77		0.77	0.77
vC, conflicting volume			499		1226	497
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			196		1142	194
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1057		170	651
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	499	728	3			
Volume Left	0	0	0			
Volume Right	3	0	3			
cSH	1700	1700	651			
Volume to Capacity	0.29	0.43	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	10.6			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.6			
Approach LOS			B			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			38.6%	ICU Level of Service		A
Analysis Period (min)			15			

Queues

2: Park St/Driveway & Somerville Ave

7/1/2014



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	504	129	79	588	307	21
v/c Ratio	0.77	0.20	0.29	0.70	0.59	0.04
Control Delay	25.7	4.0	10.4	16.4	21.3	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	4.0	10.4	16.4	21.3	14.3
Queue Length 50th (ft)	154	0	13	136	87	5
Queue Length 95th (ft)	#291	28	31	225	#188	14
Internal Link Dist (ft)	361			239	559	16
Turn Bay Length (ft)			150			
Base Capacity (vph)	774	740	272	1111	518	531
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	0.65	0.17	0.29	0.53	0.59	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

2: Park St/Driveway & Somerville Ave

7/1/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	446	116	74	534	19	215	7	63	11	3	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Frt		1.00	0.85	1.00	0.99			0.97			0.99	
Flt Protected		1.00	1.00	0.95	1.00			0.96			0.96	
Satd. Flow (prot)		1861	1583	1787	1872			1742			1819	
Flt Permitted		0.99	1.00	0.20	1.00			0.77			0.77	
Satd. Flow (perm)		1842	1583	368	1872			1384			1462	
Peak-hour factor, PHF	0.90	0.90	0.90	0.94	0.94	0.94	0.93	0.93	0.93	0.70	0.70	0.70
Adj. Flow (vph)	8	496	129	79	568	20	231	8	68	16	4	1
RTOR Reduction (vph)	0	0	85	0	2	0	0	16	0	0	1	0
Lane Group Flow (vph)	0	504	44	79	586	0	0	291	0	0	20	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		19.1	19.1	26.2	26.2			19.5			19.5	
Effective Green, g (s)		19.1	19.1	26.2	26.2			19.5			19.5	
Actuated g/C Ratio		0.34	0.34	0.47	0.47			0.35			0.35	
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)		631	542	226	880			484			511	
v/s Ratio Prot				0.01	c0.31							
v/s Ratio Perm		c0.27	0.03	0.15				c0.21			0.01	
v/c Ratio		0.80	0.08	0.35	0.67			0.60			0.04	
Uniform Delay, d1		16.6	12.4	10.2	11.4			14.9			11.9	
Progression Factor		1.00	1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2		7.0	0.1	0.9	1.9			5.4			0.1	
Delay (s)		23.6	12.4	11.1	13.3			20.3			12.1	
Level of Service		C	B	B	B			C			B	
Approach Delay (s)		21.3			13.0			20.3			12.1	
Approach LOS		C			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			17.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			55.7			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			83.9%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

4: Somerville Ave

7/1/2014

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱		↱
Volume (veh/h)	518	2	0	627	0	3
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)	563	2	0	682	0	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	319					
pX, platoon unblocked			0.75		0.75	0.75
vC, conflicting volume			565		1246	564
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			256		1161	254
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			984		162	589
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	565	682	3			
Volume Left	0	0	0			
Volume Right	2	0	3			
cSH	1700	1700	589			
Volume to Capacity	0.33	0.40	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	11.1			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.1			
Approach LOS			B			
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		37.4%	ICU Level of Service	A		
Analysis Period (min)		15				