

# TRAFFIC IMPACT STUDY

## SWAMPSCOTT MIDDLE and ELEMENTARY SCHOOLS



Prepared for:

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April 29, 2014

**TABLE OF CONTENTS**

**INTRODUCTION ..... 3**

    ❖ **PROPOSED DEVELOPMENT ..... 3**

**PROJECT STUDY AREA ..... 3**

**EXISTING CONDITIONS ..... 4**

**ROADWAYS ..... 4**

        ❖ **FOREST AVENUE ..... 4**

        ❖ **SARGENT ROAD ..... 4**

        ❖ **NASON ROAD ..... 4**

        ❖ **LAUREL ROAD ..... 4**

**TRAFFIC COUNT VOLUMES ..... 5**

**SAFETY ANALYSIS ..... 5**

**OPERATIONAL ANALYSIS ..... 5**

**TRAFFIC ANALYSIS METHODOLOGY ..... 6**

    ❖ **TRIP GENERATION ..... 6**

    ❖ **TRIP DISTRIBUTION ..... 7**

**OPERATIONAL ANALYSIS – PROPOSED CONDITION ..... 7**

**EXECUTIVE SUMMARY ..... 8**

**APPENDICES**

**APPENDIX A – TRAFFIC COUNT DATA**

**APPENDIX B – MIDDLE SCHOOL - OPERATIONAL ANALYSIS CALCULATIONS**

**APPENDIX C – MIDDLE AND ELEMENTARY SCHOOL - OPERATIONAL ANALYSIS CALCULATIONS**

## **LIST OF FIGURES**

**FIGURE 1 – SITE LOCATION MAP**

**FIGURE 2 – PROPOSED SITE PLAN**

**FIGURE 3 – EXISTING WEEKDAY AM AND PM PEAK HOUR VOLUMES**

**FIGURE 4 – TRIP DISTRIBUTION**

**FIGURE 5 – ELEMENTARY SCHOOL GENERATED TRIPS AM AND PM PEAK HOUR VOLUMES**

**FIGURE 6 – PROPOSED ES AND MS AM AND PM PEAK HOUR VOLUMES**

## INTRODUCTION

The Swampscott School District is proposing to develop a portion of the Middle School site by adding an Elementary School which will encompass 635 students. The site is located at 207 Forest Avenue, Swampscott MA. The Middle School presently has 602 students and will continue to maintain this number after the Elementary School is constructed. The Middle School starts at 8:00am and the last regular class gets out at 2:20pm. The purpose of this Traffic Impact Study (TIS) Report is to assess the existing traffic conditions and the impacts of the Elementary School on the area street network. The site is located on the north side of Forest Avenue and is bounded by Forest Ave., Laurel Rd. to the east, playfields to the north, and Burke Dr. to the west. The proposed Elementary School is expected to be constructed to the northeast, or behind the Middle School on existing playfields with a direct connection to Nason Rd and a driveways to Forest Ave.

A locus map, **Figure 1**, Location Plan is provided with the site centrally located on a USGS map. A Site Plan, **Figure 2**, indicating the proposed Elementary School footprint relative to existing site conditions, including the Middle School and local street network is provided by the project architect, Mount Vernon Group (MVG).

GEOD Consulting Inc. has evaluated the existing traffic condition and the impacts of the new Elementary School. The results are presented in this Study Report. The Report includes an analysis of the existing study area intersections and roadways, and the future condition with the inclusion of the Elementary School.

### ❖ PROPOSED ELEMENTARY SCHOOL

The proposed Elementary School (ES) will include 635 students, teachers and administration staff necessary to operate the school. The students are presently located at three schools in Town, Hadley ES on Redington St, Clarke ES on Middlesex Ave. and Stanley ES on Whitman Rd. The elementary students at these three schools will be relocated to the new school location. The Hadley, Clarke and Stanley ES's are located southwest, northwest and east of the new ES, respectively. The ES hours are from 8:20am to 2:15pm.

The proposed ES will be accessed by three avenues, a continuation of Nason Rd, the existing eastern driveway and the main MS driveway both intersecting with Forest Avenue.

## PROJECT STUDY AREA

GEOD Consulting has met with the school building committee, the project team and town personnel on several occasions. We have visited the site during the peak AM and PM periods and assessed the existing conditions. The project study area, affected by the existing MS and the future ES, will be Forest Avenue, Laurel Road, Sargent Road and Nason Road. Each of these either presently or in the future will be the primary access routes to and from the schools. The schools will be directly accessible by Forest Ave. and Nason Rd. All of the roadways are owned and maintained by the Town of Swampscott.

All of the study driveways and intersection are unsignalized. The following intersection/driveways comprise the study area:





**GEOD CONSULTING**

ENGINEERING - SITE DEVELOPMENT - TRANSPORTATION

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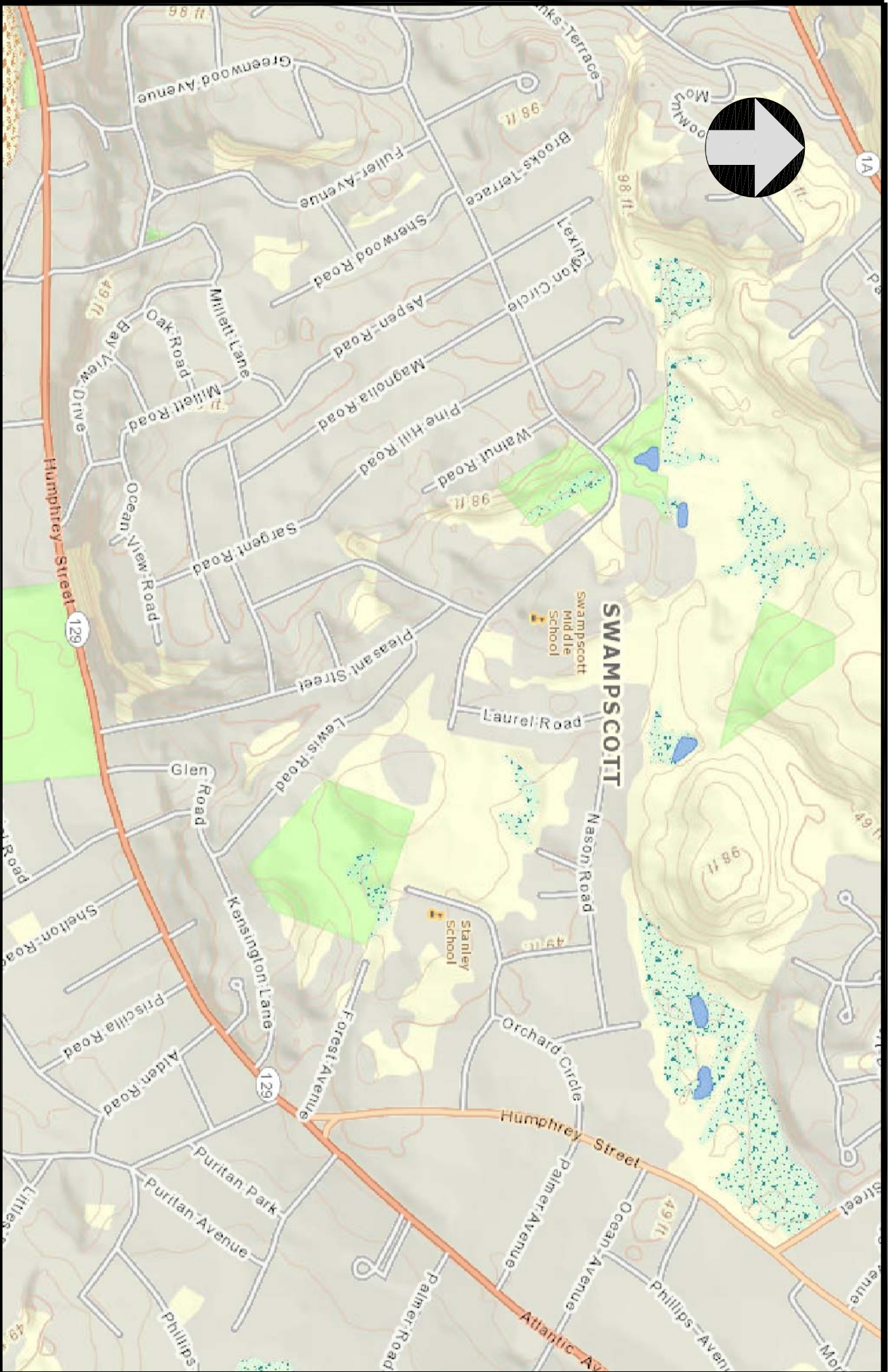
**SWAMPSCOTT MIDDLE SCHOOL**

207 FOREST AVENUE  
SWAMPSCOTT, MASSACHUSETTS

**SITE LOCATION MAP**

Figure:

**1**







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SWAMPSCOTT MS/ES  
207 FOREST AVE, SWAMPSCOTT, MA

### PROPOSED SITE PLAN

Figure:

# 2

- ◆ Forest Avenue/MS western driveway, exit only.
- ◆ Forest Avenue/MS central driveway, entrance only.
- ◆ Forest Avenue/MS eastern driveway, exit and entrance.
- ◆ Forest Avenue/Sargent Road.
- ◆ Nason Road driveway to the new ES.

## **EXISTING CONDITIONS**

Field investigations were conducted at the study area roadways and intersection/driveways to obtain an inventory of existing conditions, posted traffic controls, adjacent land uses, lane configurations, pavement widths, and existing vehicular traffic patterns.

### **ROADWAYS**

#### **❖ FOREST AVENUE**

Forest Ave. is a two-lane east-west local roadway under the Town's jurisdiction, which ultimately connects Humphrey St. (Rte 129) to Paradise Rd. (Rte 1A). The roadway is relatively flat in the study area with a posted speed limit of 20 mph. The area is exclusively residential. The pavement condition on Forest Ave. is fair with minor repairs and cracks and the roadway width is approximately 33 feet. The length of Forest Ave. in front of the MS has a sidewalk on the northerly side adjacent to the school, but not on the southerly side. Crosswalks are provided at the main driveway entrance and at the intersection with Sargent Rd. The north side of the roadway, adjacent to the MS, is signed for "1 Hr Parking, 8am – 3pm", and the south side of the road is signed for "No Parking, 8am – 3pm".

#### **❖ SARGENT ROAD**

Sargent Rd. is a two-lane north-south local roadway under the Town's jurisdiction. The roadway connects Forest Avenue to Pleasant Street, and then to Humphrey St. (Rte 129). The roadway has significant grades, however it's relatively flat before it intersects with Forest Ave. The roadway does not have a posted speed limit, however we assume it to be 20 mph. The area is exclusively residential. The pavement condition on Sargent Road Ave. is fair to poor with numerous pavement deficiencies. The roadway width is approximately 34 feet between Forest Ave. and Pleasant Street, and beyond Pleasant St. the width decreases to varying widths.

#### **❖ NASON ROAD**

Nason Rd. is a two-lane east-west local roadway under the Town's jurisdiction, which connects Humphrey St. (Rte 129) to Laurel Rd. and then onto Forest Ave. The roadway has moderate grades in the study area with a posted speed limit of 20 mph. The area is exclusively residential. The pavement condition on Nason Rd. is fair with minor repairs and cracks, and the roadway width is approximately 32 feet. Nason Rd. has sidewalks on both sides of the road and is signed for no parking.

#### **❖ LAUREL ROAD**

Laurel Rd. is a two-lane north-south local roadway under the Town's jurisdiction, which connects Nason Rd to Forest Ave. The roadway has minimal grades in the study area. The roadway does not have a posted speed limit, however we assume it to be 20 mph. The area is exclusively residential.

The pavement condition on Laurel Rd. is fair with minor repairs and cracks and the roadway width is approximately 23 feet. Laurel Rd. has sidewalks on both sides of the road and is signed for no parking.

**TRAFFIC COUNT VOLUMES**

Existing traffic counts were obtained from Transportation Data Corporation (TDC) for the study area intersection and driveways. The actual count data obtained by TDC is shown in **Appendix A**. Turning movement counts were collected on Tuesday, April 1, 2014 from 7:00 am to 9:00 am and from 2:00 pm to 4:00 pm. Additional counts were performed by Marshall-Gary Landscape Architects a couple of months previous to the TDC counts.

The existing turning movement counts for the AM and PM peak hours are shown in **Figure 3**.

**SAFETY ANALYSIS**

The Swampscott Police Department has been contacted to request accident traffic history for the project study area over the last three years. We have not received a report, however we were told verbally that there is not a history of accidents in the study area.

**OPERATIONAL ANALYSIS**

The Highway Capacity Manual (HCM) methodology uses LOS as an index to the operational qualities of an intersection. Level of service measures the operating conditions of signalized and unsignalized intersections for a specific period of time, which is usually the peak hour. The methodology evaluates operating conditions and assigns a level of service rating from LOS “A” to “F” with LOS A being the most desirable. The LOS is a function of the average vehicle delay at the intersection. **Table 1** illustrates the LOS thresholds for unsignalized and signalized intersections.

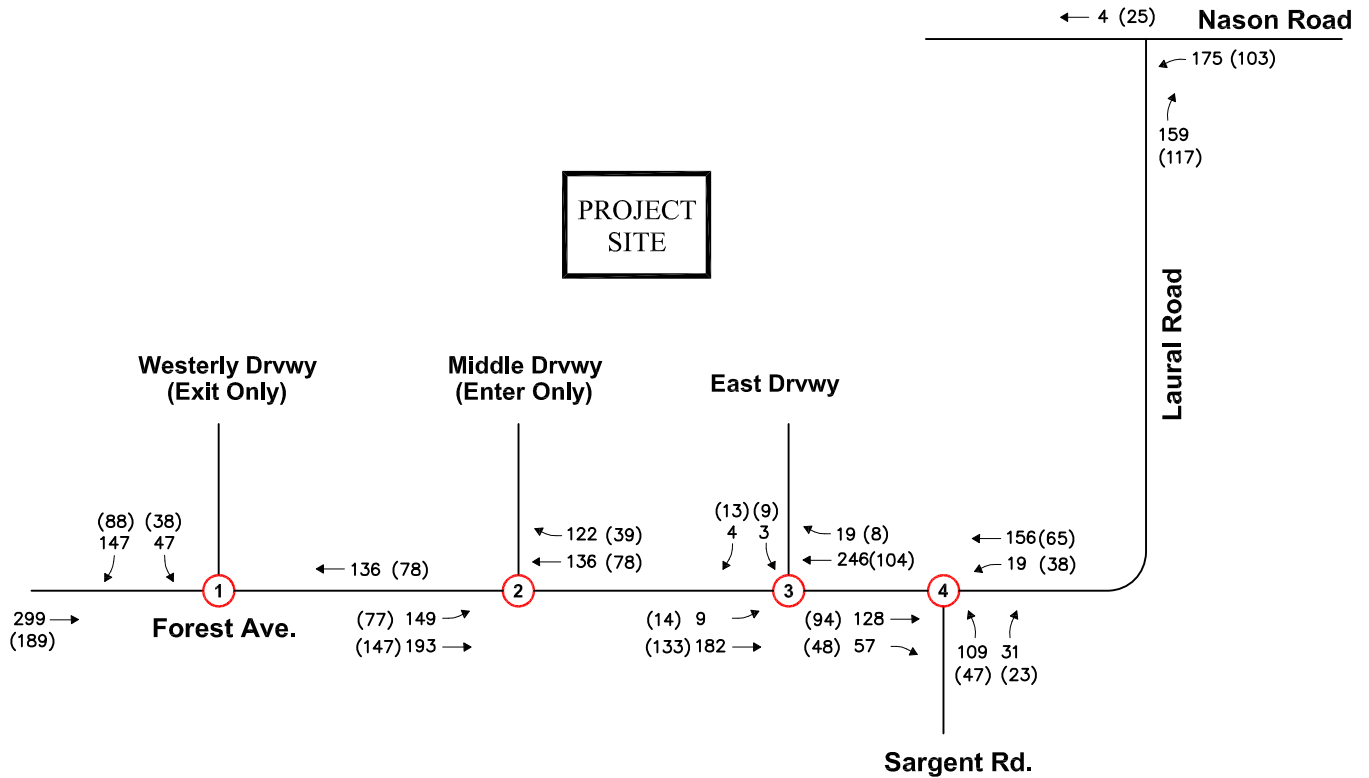
<b>TABLE 1</b>			
<b>LEVEL of SERVICE (LOS) DELAY THRESHOLD for INTERSECTIONS</b>			
<b>UNSIGNALIZED INTERSECTION AVERAGE VEHICLE DELAY (SECONDS)</b>	<b>SIGNALIZED INTERSECTION AVERAGE VEHICLE DELAY (SECONDS)</b>	<b>LEVEL OF SERVICE</b>	<b>EXPECTED DELAY</b>
Equal to or Less than 10.0	Equal to or Less than 10.0	A	Little or no delay
Between 10.1 and 15.0	Between 10.1 and 20.0	B	Short traffic delays
Between 15.1 and 25.0	Between 20.1 and 35.0	C	Average traffic delays
Between 25.1 and 35.0	Between 35.1 and 55.0	D	Long traffic delays
Between 35.1 and 50.0	Between 55.1 and 80.0	E	Very long traffic delays
Greater than 50.0	Greater than 80.0	F	Forced flow

The existing Middle School traffic operations were analyzed at the study area intersection and driveways, and are presented in **Table 2**. The LOS, volume to capacity ratios (v/c), and delay for the intersections existing condition have been calculated. The intersections operational/capacity analysis





PROJECT SITE



**LEGEND:**

- AM PEAK HOUR (xxx)
- PM PEAK HOUR (xxx)
- DIRECTION OF TRAVEL →
- UNSIGNALIZED INTERSECTION (2)



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**EXISTING WEEKDAY AM AND PM  
 PEAK HOUR VOLUMES**

Figure:

**3**

calculations are shown in **Appendix B**. Typically the model calculations gives us an understanding of the operational capacity of the school site drives and the Forest Ave. / Sargent Road intersection. However, due to the excessive student drop offs on Forest Ave., and the crossing guards preference to student walkers at the expense of the vehicles in queue, the human element is driving the modeling software to determinations which do not match field observations. Consequently, our analysis is derived by a combination of modeling analysis and field observations.

## TRAFFIC ANALYSIS METHODOLOGY

The methodology used for the analysis and development of the TIS was a means to assess the existing operational condition of the study area roadways and intersections, add the ES generated traffic and additional access and egress points, ie. the Nason Rd and eastern driveway connections, and re-assess the proposed operational conditions. To do this TMC's were obtained as previously described, the existing conditions of the intersection/driveways were modeled and assessed, the proposed ES traffic and network then added to the model, and the study area reassessed. The intersection/driveways were analyzed and the operational conditions (level of service, intersection delay, approach delays, v/c capacity, queue lengths, etc.) calculated. The existing condition, MS and the future condition, with the ES, are then evaluated.

The existing, and proposed condition operational analyses were performed using SYNCRO 8.05; Traffic Control Coordination Software for the studied intersections. The software utilizes the methods for intersection analyses contained in the latest version of the Highway Capacity Manual (HCM), Special Report 209; Transportation Research Board.

This project is classified as educational with peaks in the AM (7 – 9am) and PM (2 – 4pm) time periods. Consequently, all conditions were analyzed for these two peak hours. The AM peak period will have significantly greater volume of traffic in a more condense time than the PM period because after school programs, for both the MS and ES will span out the PM peak period, thereby reducing the net effect to the study area network.

### ❖ TRIP GENERATION

In order to assess the volume of traffic generated by the three ES's (Stanley, Hadley and Clarke), traffic counts were taken at each of the schools. Each school has kindergarten students which will not be coming to the MS site. Consequently we reduced the trip counts by the percentage of kindergarten students in the schools.

Another consideration for the trip generation, and the volume of existing trips visiting the site is the number of families that have students in both the MS and ES. Presently, of the 602 students in the MS, 202 of them have siblings in the ES. Therefore 33% of the generated trips are already coming to the site. To be conservative we have reduced the trip generation by 20%, simply because we don't know if the 33% overlap is consistent year in and year out.

The following illustrates the ES volume of trips expected to come to the MS site:

**AM Peak Hour**

Elementary School	Trips to School	% Kindergarten	ES Trips to School	20% Reduction	Adj. ES Trips
Clarke	101	17%	84	16	68
Hadley	94	21%	75	15	60
Stanley	144	21%	114	22	92
<b>TOTAL ES TRIPS =</b>					<b>220</b>

**PM Peak Hour**

Elementary School	Trips to School	% Kindergarten	ES Trips to School	20% Reduction	Adj. ES Trips
Clarke	34	17%	29	6	23
Hadley	70	21%	56	12	44
Stanley	105	21%	83	17	66
<b>TOTAL ES TRIPS =</b>					<b>133</b>

**❖ TRIP DISTRIBUTION**

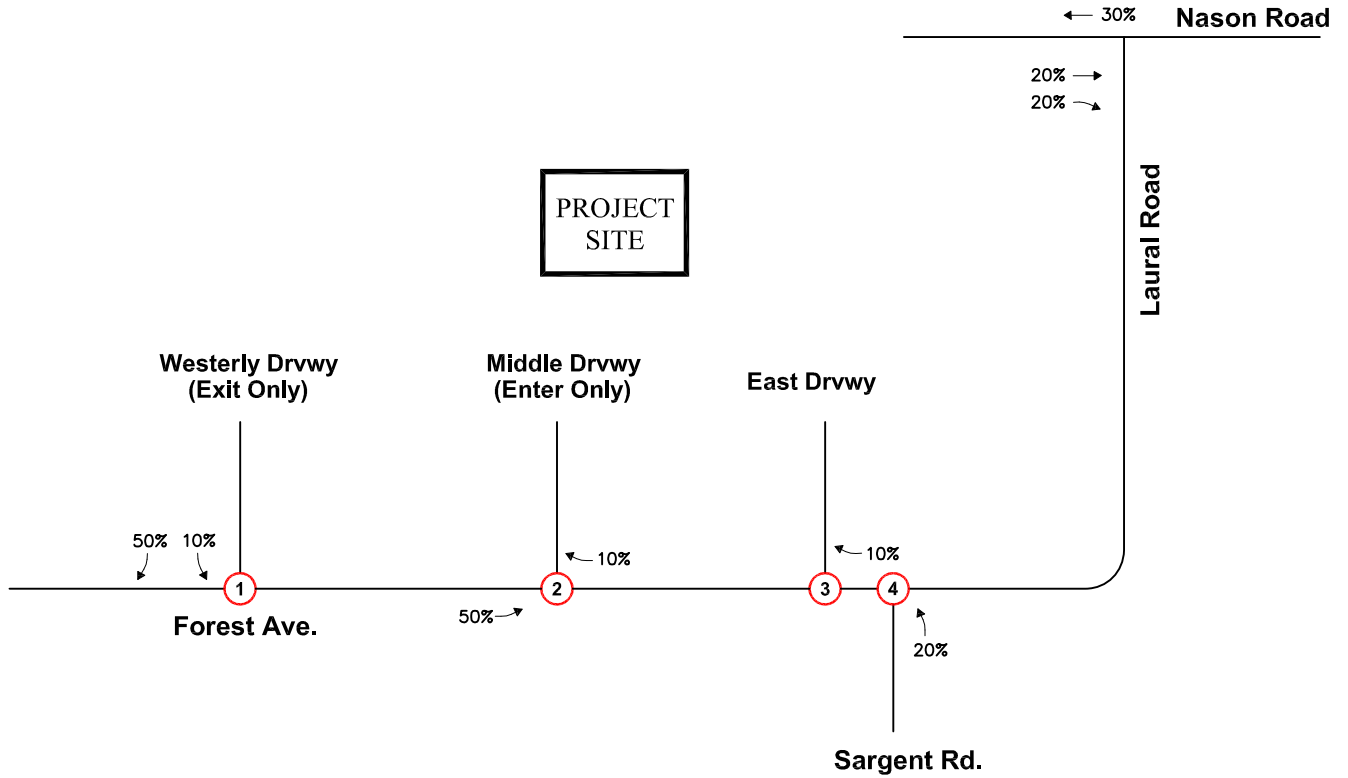
The trip distribution is illustrated in **Figure 4**, Trip Distribution – AM and PM Peak Hour Volumes. Three routes provide access and egress to/from the site, Forest Ave. from the west, Sargent Rd. from the south and Nason Rd/Laurel Rd/Forest Ave from the east. The distribution from each route was developed utilizing a combination of methods. First we calculated the existing distribution based on the existing MS traffic pattern, and then we considered the location of the three existing ES's relative to the MS site. The existing traffic pattern illustrated that approximately 50% of the traffic comes to the MS from the west on Forest Ave, 20% from the south on Sargent Rd and 30% from the east on Nason Rd. The Clarke, Hadley and Stanley schools are west, southwest and east of the MS, respectively. The three schools are similarly populated, and based on their locale to the MS, we believe the distribution will continue with the existing condition.

The trips generated by the ES are then distributed throughout the study area network utilizing the trip distribution. This is shown in **Figure 5**.

**OPERATIONAL ANALYSIS – PROPOSED CONDITION**

At this point we have analyzed the existing roadway network condition as it operates with the Middle School. We then calculate the expected trips generated by the Elementary School, distribute the trips throughout the network, add those trips to the existing peak hour volumes as shown in Figure 3, and run a new model which will represent the Proposed Condition. The resulting proposed total volume coming to the site is shown in **Figure 6**. Lastly, we analyze the proposed network and if the network level of service (LOS) degenerates at any of the site drives to an unacceptable LOS we mitigate the condition.

**Table 2** illustrates the operational capacity, delay and LOS, of the existing and proposed conditions at the site drives and Forest Ave/Sargent Rd intersection.



**LEGEND:**

- AM & PM XX%
- DIRECTION OF TRAVEL →
- UNSIGNALIZED INTERSECTION ②

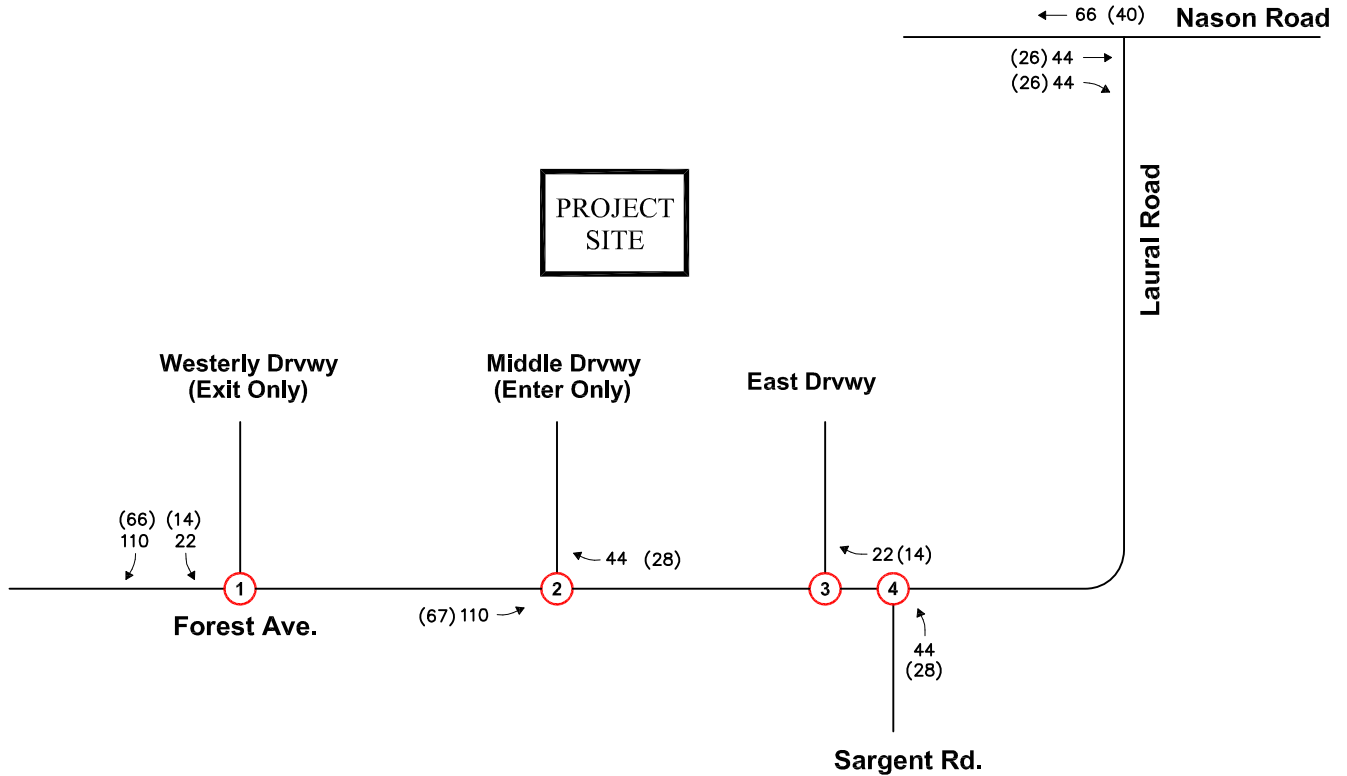


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**TRIP DISTRIBUTION AM AND PM  
PEAK HOUR VOLUMES**

Figure:  
**4**





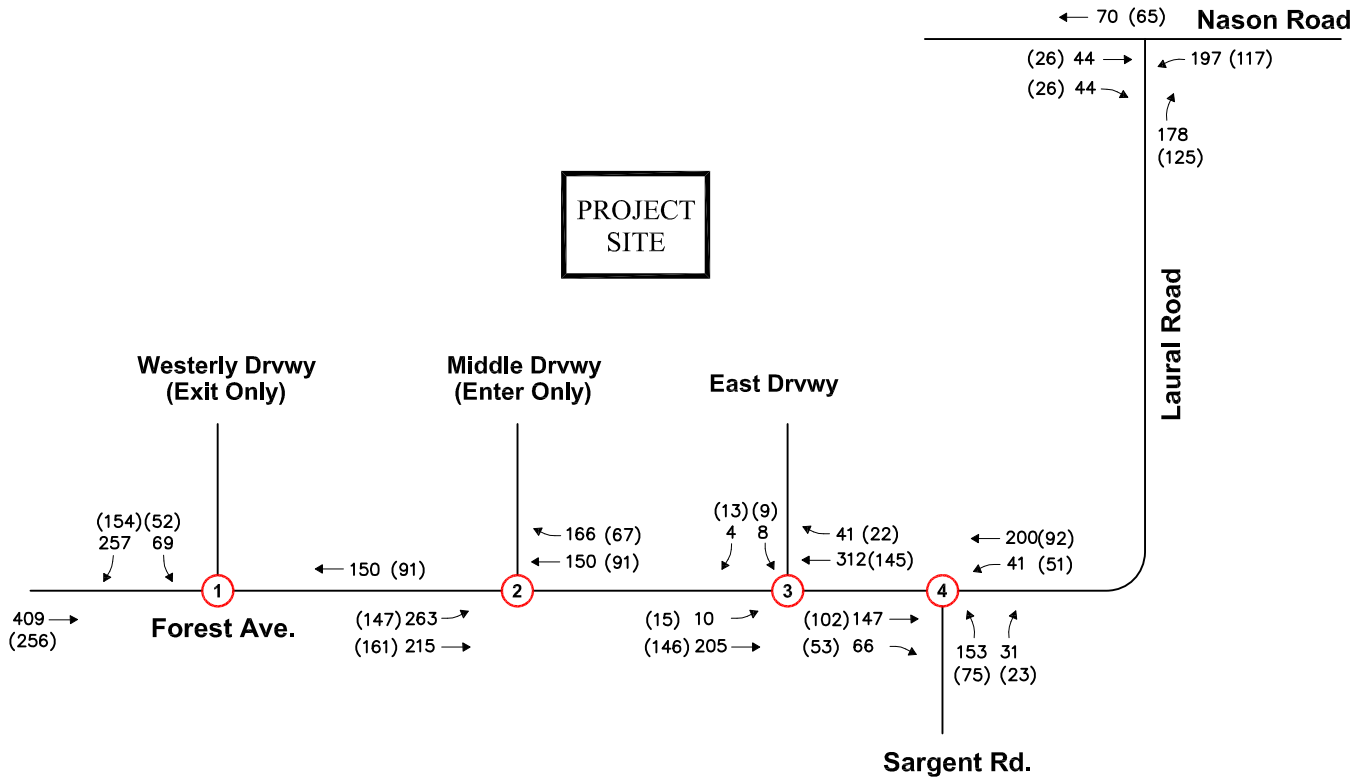
P:\13630MB\_Swampscott\_School\_Traffic\TIS Report\13630MB\_Graphics\_REPORT\_042514.dwg Apr 25 2014 10:19am



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SWAMPSCOTT MS/ES  
207 FOREST AVE, SWAMPSCOTT, MA  
**ES GENERATED TRIPS AM AND PM  
PEAK HOUR VOLUMES**

Figure:  
**5**



**LEGEND:**

- AM PEAK HOUR XXX
- PM PEAK HOUR ((XXX))
- DIRECTION OF TRAVEL →
- UNSIGNALIZED INTERSECTION (2)

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SWAMPSCOTT MS/ES  
207 FOREST AVE, SWAMPSCOTT, MA  
**PROPOSED ES & MS**  
**AM & PM PEAK HOUR VOLUMES**

Figure:

**6**

**TABLE 2**

**DRIVEWAY / INTERSECTION - OPERATIONAL ANALYSIS**

DRIVEWAY/ INTERSECTION	MIDDLE SCHOOL AM PEAK HOUR			MIDDLE & ELEM AM PEAK HOUR			MIDDLE SCHOOL PM PEAK HOUR			MIDDLE & ELEM PM PEAK HOUR		
	V/C <sup>1</sup>	Delay <sup>2</sup>	LOS <sup>3</sup>	V/C <sup>1</sup>	Delay <sup>2</sup>	LOS <sup>3</sup>	V/C <sup>1</sup>	Delay <sup>2</sup>	LOS <sup>3</sup>	V/C <sup>1</sup>	Delay <sup>2</sup>	LOS <sup>3</sup>
<b>Western Driveway</b>	~	~	~	~	~	~	~	~	~	~	~	~
<b>Middle Driveway</b>												
Driveway - Northbound	1.08	60.2	E	1.53	264.5	F	0.23	3.6	A	0.87	24.90	C
Forest Ave. - Westbound	0.93	35.2	D	~	~	~	0.47	6.7	A	~	~	~
Forest Ave. - Eastbound	1.07	70.7	E	~	~	~	0.62	8.9	A	~	~	~
<b>Eastern Driveway</b>	~	~	~	~	~	~	~	~	~	~	~	~
<b>Forest Ave. / Sargent Rd.</b>												
Sargent Rd. - Northbound	1.28	165.6	F	~	~	~	0.27	4.9	A	~	~	~
Forest Ave. - Westbound	**	**	**	~	~	~	~	~	~	~	~	~
Forest Ave. - Eastbound	**	**	**	~	~	~	~	~	~	~	~	~
<b>*Nason Road</b>	~	~	~	~	~	~	~	~	~	~	~	~

1 - Volume to Capacity Ratio

2 - Average Delay expressed in seconds per vehicle

3 - Level of Service

~ - Indicates that the intersection is operating as free flowing.

\* - In the AM and PM peak hrs 4 and 25 cars, respectively dropped/picked up students. This is an enforcement issue.

\*\* - 4/5 cars were observed queuing w/ 20 second delays, however the analysis showed no delay or queuing should occur if students were not being dropped off on the road.

The western driveway operates in a satisfactory condition in the existing and proposed conditions. The middle driveway analysis shows the existing Forest Ave movements and the northbound driveway (entrance into the MS) with LOS E and D. The proposed condition with the Elementary School shows Forest Ave. east and westbound free flowing with no delays, however the northbound movement operates at a LOS F. This is because the delayed vehicles on Forest Ave. are now on site in the expanded MS drop off/pick up location.

The same condition exists for Sargent Road. Opening up the eastern driveway and prohibiting drop offs on Sargent St will move the vehicles from Sargent Rd onto the school site, via the eastern driveway.

## EXECUTIVE SUMMARY

The study area roadways, school driveways and Forest Ave / Sargent Road intersection operate at a LOS A, except during the 15 – 20 minute period before school begins and ends. During this peak 15 – 20 minutes approximately 300 vehicles and 175 pedestrians operate in the study area to populate the MS. Additionally, another approximately 300 vehicles, having no business with the MS pass through the study area. We believe the additional traffic is predominately using the study area to by pass the congestion on Humphrey Street (Rte 129). The combination of this traffic, school and non school related, is causing the delays and queueing on Forest Ave. and Sargent Road.

The ES will attract approximately 220 and 133 vehicles in the AM and PM peak periods, respectively. However an additional access/egress point will be added by connecting Nason Rd to the ES, and the eastern driveway will be opened to provide greater access and egress. Additionally the main access driveway to the MS will be expanded providing greater drop off and queuing availability.

**The ES will start classes a minimum of 20 minutes after the MS. Based on our numerous observations the MS traffic will be dispersed at or close to 8am. The ES traffic will then begin to arrive and the drop off process will again run it's course from 8:00am – 8:20am. The analysis prepared for this TIS assumes a worse case scenario, that being both schools start at the same time. Our approach in this report is that if we can manage all of the drop offs, happening at the same time, on site we will have alleviated the congestion on the local street network. We have done this by designing three entrance/exit driveways with extensive drop off/pick up locations.**

The following is a discussion regarding the analytical data, and considering observed operating conditions in the study area.

### ***Forest Ave. – Western (Exit) Driveway***

The western driveway experiences queuing in the AM primarily because exiting vehicles are attempting to head eastbound on Forest Ave. to bring students to the Stanley ES. The queuing on Forest Ave eastbound resulting from the Middle driveway inhibits the left turn out of the western driveway. Adding the ES to the site should significantly reduce the need for this movement, and requiring parents to drop off on site should reduce the queue on Forest Ave. eastbound.



***Forest Ave. – Middle (Entrance) Driveway***

The middle driveway provides access to the MS and curbside drop off on site. The existing combination of limited curbside length for drop off, drop offs occurring on both sides of Forest Ave from both eastbound and westbound traffic, and the length of time the crossing guard is taking to process students, all of this is contributing to the queues on Forest Ave from both directions. The proposed design significantly increases the curb side drop off, the enforcement of prohibiting drop offs on Forest Ave, and the re-training of the crossing guard to consider processing vehicles as well as pedestrians should significantly reduce the congestion and queues on Forest Ave.

***Forest Ave. – Eastern (Exit / Entrance) Driveway***

The eastern driveway is presently underutilized and experiences no delays because it does not provide a drop off condition that the parents find useful. The proposed condition expands the eastern driveway to provide access to the ES, the MS and egress to Nason Rd and Forest Ave. at the western driveway. We expect expansion of the eastern driveway's capabilities should significantly mitigate additional traffic generated by the ES.

***Forest Ave. / Sargent Road***

Forest Ave, eastbound and westbound queue to approximately 4 – 5 vehicles and Sargent Road queues to approximately 5 – 6 vehicles based on field observations. The delay, or time it takes for a vehicle to get through the intersection, is approximately 30 seconds. The queuing and delay are largely a result of student drop offs on Sargent Rd and the crossing guard processing the students across both Sargent Rd and Forest Ave. Due to the expanded use of the eastern driveway parents will be able to drop off their students more conveniently and safely on site, resulting in less congestion at the intersection. Enforcement and signing will be helpful to encourage the use of the eastern driveway.

***Nason Road***

Nason Road presently processes approximately 4 drop offs in the AM peak hour and 25 pick ups in the PM peak hour. The parents pull of the road near the fenced area at the end of Nason Road which abuts the school site. In the future Nason Road will be extended into a new school driveway leading to curb side drop off/pick up in front of the new ES. This new point of access/egress to the site will provide extensive curbside drop-offs and queuing length on school property. Additionally the parents will be able to exit via Nason Rd and Forest Ave on the other side of the school property at the western, exit driveway. By creating the egress movement to the western driveway vehicles have been taken off the roadway from Nason Rd all the way to Forest Ave, beyond the school. This means the vehicle will not process through the Sargent Rd/Forest Ave intersection, or the eastern and western driveways.

Several issues contribute to the existing congestion. Those issues, and the issues which arise from the additional ES trips can be mitigated through design, enforcement and education. The following is an itemization of remedies which contribute to alleviating the congestion and queueing on the study area roadways:

1. The design of the new ES includes providing a drop off location with significant queue length on school property from Nason Rd.

2. The front entrance to the MS will be widened and lengthened to provide a longer drop off and queue length on school property.
3. The eastern driveway will be widened and extended to provide drop off locations for both the ES and MS. After the drop offs/pick ups occur the driver will be given the option to exit the school site via Nason Rd to the east, back out to Forest Ave in the same location they came in, or circle around the schools and exit out to Forest Ave from the western driveway.
4. The analysis assumed the MS and ES would be operating in the same peak period, however the schools presently open twenty minutes apart, the MS starts at 8:00am and the ES at 8:20am. The congestion and queues generally take place 15 – 20 minutes before school starts. If the schools start/end 20 – 30 minutes apart from each other the congestion and queues will not overlap, and consequently be more manageable.
5. Presently the crossing guards are providing a valuable service by shepherding students across the cross walks at the main access driveway and across Sargent Road/Forest Ave. The guards could be trained to facilitate the traffic in combination with safeguarding the student movements.
6. Signs and enforcement should be provided on Forest Ave, Laurel Rd, Nason Rd and Sargent Rd which restricts the parents from dropping off the students on the study area roadways. Students must be brought into the school site, and then dropped off / picked up. This will take the drop off movement from the study area roadways and allow traffic to move more freely.
7. As described above Forest Ave is used as a cut through to bypass the heavily congested Humphrey St. This situation accounts for approximately 50% of the traffic on Forest Ave in both peak hours, and more significantly in the AM. The cut through could be redirected, and this would significantly reduce the number of vehicles in the study area during the peak periods.
8. The school district is contemplating an increase use of buses. A single bus will take approximately 65 students, which will result in approximately 30 less vehicles coming to the school. Industry traffic analysis software cannot accurately measure the reduction in delay and queuing which results from 30 less vehicles, however we expect approximately 520 vehicles to come to the site (albeit over two peak periods, 7:40 – 8am and 8 – 8:20am) so we can assume four buses will result in a little less than 25% reduction in delay and queue.

It is GEOD's professional opinion that the study area roadway network should be able to process the existing Middle School and proposed Elementary School due to the design features, enforcement, education and staggered start times of the two schools. Redistributing the student drop-off location from Forest Ave. to on-site locations has the potential of reducing congestion within the study area network. The list of remedies above should provide adequate mitigation to process the existing and proposed traffic.

# **APPENDIX A**

## **TRAFFIC COUNT DATA**

# Transportation Data Corporation

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tel (781) 587-0086 cell (781) 439-4999

N: SMS Westerly Exit Driveway

E/W: Forest Avenue

City, State: Swampscott, MA

Client: GEOD/C. Emilius

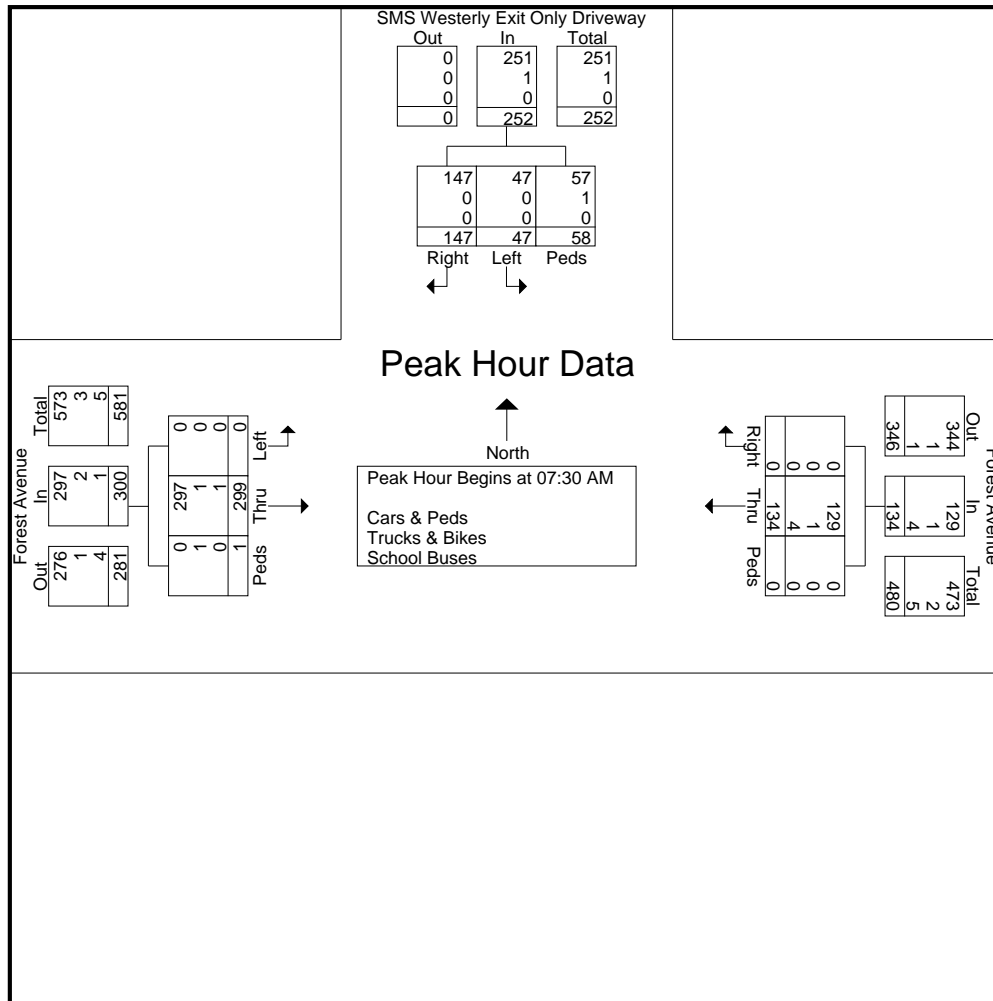
File Name : 04404A

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Start Time	SMS Westerly Exit Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	31	12	22	65	0	47	0	47	81	0	1	82	194
07:45 AM	88	21	30	139	0	38	0	38	122	0	0	122	299
08:00 AM	19	8	1	28	0	20	0	20	49	0	0	49	97
08:15 AM	9	6	5	20	0	29	0	29	47	0	0	47	96
Total Volume	147	47	58	252	0	134	0	134	299	0	1	300	686
% App. Total	58.3	18.7	23		0	100	0		99.7	0	0.3		
PHF	.418	.560	.483	.453	.000	.713	.000	.713	.613	.000	.250	.615	.574
Cars & Peds	147	47	57	251	0	129	0	129	297	0	0	297	677
% Cars & Peds	100	100	98.3	99.6	0	96.3	0	96.3	99.3	0	0	99.0	98.7
Trucks & Bikes	0	0	1	1	0	1	0	1	1	0	1	2	4
% Trucks & Bikes	0	0	1.7	0.4	0	0.7	0	0.7	0.3	0	100	0.7	0.6
School Buses	0	0	0	0	0	4	0	4	1	0	0	1	5
% School Buses	0	0	0	0	0	3.0	0	3.0	0.3	0	0	0.3	0.7





# Transportation Data Corporation

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tel (781) 587-0086 cell (781) 439-4999

N: SMS Westerly Exit Driveway  
 E/W: Forest Avenue  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404A  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- Cars & Peds - Trucks & Bikes - School Buses

Start Time	SMS Westerly Exit Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	4	0	0	0	14	0	12	0	0	30
07:15 AM	4	2	5	0	29	0	39	0	0	79
07:30 AM	31	12	22	0	47	0	81	0	1	194
07:45 AM	88	21	30	0	38	0	122	0	0	299
<b>Total</b>	<b>127</b>	<b>35</b>	<b>57</b>	<b>0</b>	<b>128</b>	<b>0</b>	<b>254</b>	<b>0</b>	<b>1</b>	<b>602</b>
08:00 AM	19	8	1	0	20	0	49	0	0	97
08:15 AM	9	6	5	0	29	0	47	0	0	96
08:30 AM	20	7	0	0	24	0	24	0	0	75
08:45 AM	7	2	0	0	12	0	11	0	0	32
<b>Total</b>	<b>55</b>	<b>23</b>	<b>6</b>	<b>0</b>	<b>85</b>	<b>0</b>	<b>131</b>	<b>0</b>	<b>0</b>	<b>300</b>
<b>Grand Total</b>	<b>182</b>	<b>58</b>	<b>63</b>	<b>0</b>	<b>213</b>	<b>0</b>	<b>385</b>	<b>0</b>	<b>1</b>	<b>902</b>
Apprch %	60.1	19.1	20.8	0	100	0	99.7	0	0.3	
Total %	20.2	6.4	7	0	23.6	0	42.7	0	0.1	
Cars & Peds	181	58	59	0	205	0	382	0	0	885
% Cars & Peds	99.5	100	93.7	0	96.2	0	99.2	0	0	98.1
Trucks & Bikes	0	0	4	0	2	0	2	0	1	9
% Trucks & Bikes	0	0	6.3	0	0.9	0	0.5	0	100	1
School Buses	1	0	0	0	6	0	1	0	0	8
% School Buses	0.5	0	0	0	2.8	0	0.3	0	0	0.9

Start Time	SMS Westerly Exit Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	31	12	22	65	0	47	0	47	81	0	1	82	194
07:45 AM	88	21	30	139	0	38	0	38	122	0	0	122	299
08:00 AM	19	8	1	28	0	20	0	20	49	0	0	49	97
08:15 AM	9	6	5	20	0	29	0	29	47	0	0	47	96
<b>Total Volume</b>	<b>147</b>	<b>47</b>	<b>58</b>	<b>252</b>	<b>0</b>	<b>134</b>	<b>0</b>	<b>134</b>	<b>299</b>	<b>0</b>	<b>1</b>	<b>300</b>	<b>686</b>
% App. Total	58.3	18.7	23		0	100	0		99.7	0	0.3		
PHF	.418	.560	.483	.453	.000	.713	.000	.713	.613	.000	.250	.615	.574
Cars & Peds	147	47	57	251	0	129	0	129	297	0	0	297	677
% Cars & Peds	100	100	98.3	99.6	0	96.3	0	96.3	99.3	0	0	99.0	98.7
Trucks & Bikes	0	0	1	1	0	1	0	1	1	0	1	2	4
% Trucks & Bikes	0	0	1.7	0.4	0	0.7	0	0.7	0.3	0	100	0.7	0.6
School Buses	0	0	0	0	0	4	0	4	1	0	0	1	5
% School Buses	0	0	0	0	0	3.0	0	3.0	0.3	0	0	0.3	0.7

# Transportation Data Corporation

Mario Perone, mperone1@verizon.net

tel (781) 587-0086 cell (781) 439-4999

N: SMS Westerly Exit Driveway  
 E/W: Forest Avenue  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404A  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- Cars & Peds

Start Time	SMS Westerly Exit Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	4	0	0	0	13	0	12	0	0	29
07:15 AM	4	2	2	0	27	0	39	0	0	74
07:30 AM	31	12	22	0	45	0	80	0	0	190
07:45 AM	88	21	30	0	36	0	122	0	0	297
<b>Total</b>	<b>127</b>	<b>35</b>	<b>54</b>	<b>0</b>	<b>121</b>	<b>0</b>	<b>253</b>	<b>0</b>	<b>0</b>	<b>590</b>
08:00 AM	19	8	1	0	20	0	49	0	0	97
08:15 AM	9	6	4	0	28	0	46	0	0	93
08:30 AM	19	7	0	0	24	0	24	0	0	74
08:45 AM	7	2	0	0	12	0	10	0	0	31
<b>Total</b>	<b>54</b>	<b>23</b>	<b>5</b>	<b>0</b>	<b>84</b>	<b>0</b>	<b>129</b>	<b>0</b>	<b>0</b>	<b>295</b>
<b>Grand Total</b>	<b>181</b>	<b>58</b>	<b>59</b>	<b>0</b>	<b>205</b>	<b>0</b>	<b>382</b>	<b>0</b>	<b>0</b>	<b>885</b>
Apprch %	60.7	19.5	19.8	0	100	0	100	0	0	
Total %	20.5	6.6	6.7	0	23.2	0	43.2	0	0	

Start Time	SMS Westerly Exit Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	31	12	22	65	0	45	0	45	80	0	0	80	190
07:45 AM	<b>88</b>	<b>21</b>	<b>30</b>	<b>139</b>	0	36	0	36	<b>122</b>	0	0	<b>122</b>	<b>297</b>
08:00 AM	19	8	1	28	0	20	0	20	49	0	0	49	97
08:15 AM	9	6	4	19	0	28	0	28	46	0	0	46	93
<b>Total Volume</b>	147	47	57	251	0	129	0	129	297	0	0	297	677
% App. Total	58.6	18.7	22.7		0	100	0		100	0	0		
PHF	.418	.560	.475	.451	.000	.717	.000	.717	.609	.000	.000	.609	.570

# Transportation Data Corporation

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N: SMS Westerly Exit Driveway  
 E/W: Forest Avenue  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404A  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- Trucks & Bikes

Start Time	SMS Westerly Exit Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	0	0	0	0	1	0	0	0	0	1
07:15 AM	0	0	3	0	0	0	0	0	0	3
07:30 AM	0	0	0	0	0	0	1	0	1	2
07:45 AM	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>6</b>
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	1	0	1	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	1	0	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>9</b>
Apprch %	0	0	100	0	100	0	66.7	0	33.3	
Total %	0	0	44.4	0	22.2	0	22.2	0	11.1	

Start Time	SMS Westerly Exit Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
07:15 AM	0	0	3	3	0	0	0	0	0	0	0	0	3
07:30 AM	0	0	0	0	0	0	0	0	1	0	1	2	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>6</b>
% App. Total	0	0	100		0	100	0		50	0	50		
PHF	.000	.000	.250	.250	.000	.250	.000	.250	.250	.000	.250	.250	.500

# Transportation Data Corporation

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N: SMS Westerly Exit Driveway  
 E/W: Forest Avenue  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404A  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- School Buses

Start Time	SMS Westerly Exit Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	2	0	0	0	0	2
07:30 AM	0	0	0	0	2	0	0	0	0	2
07:45 AM	0	0	0	0	2	0	0	0	0	2
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	1	0	0	1
08:30 AM	1	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Grand Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>8</b>
Apprch %	100	0	0	0	100	0	100	0	0	
Total %	12.5	0	0	0	75	0	12.5	0	0	

Start Time	SMS Westerly Exit Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	2
07:30 AM	0	0	0	0	0	2	0	2	0	0	0	0	2
07:45 AM	0	0	0	0	0	2	0	2	0	0	0	0	2
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>
<b>PHF</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.750</b>	<b>.000</b>	<b>.750</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.750</b>



# Transportation Data Corporation

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tel (781) 587-0086 cell (781) 439-4999

N: SMS Middle Enter Only Driveway

E/W: Forest Avenue

City, State: Swampscott, MA

Client: GEOD/C. Emilius

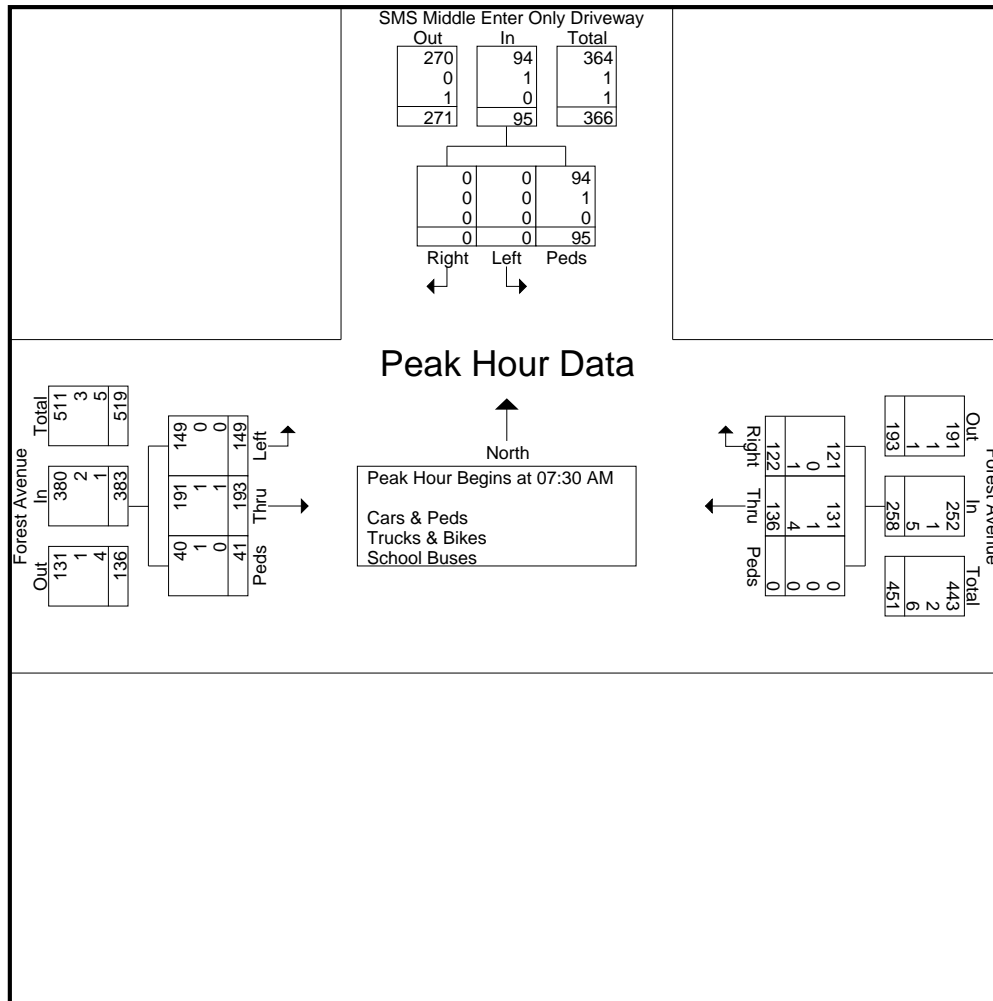
File Name : 04404B

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Start Time	SMS Middle Enter Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	0	0	30	30	30	48	0	78	52	40	9	101	209
07:45 AM	0	0	56	56	62	40	0	102	59	83	29	171	329
08:00 AM	0	0	1	1	19	19	0	38	49	7	0	56	95
08:15 AM	0	0	8	8	11	29	0	40	33	19	3	55	103
Total Volume	0	0	95	95	122	136	0	258	193	149	41	383	736
% App. Total	0	0	100		47.3	52.7	0		50.4	38.9	10.7		
PHF	.000	.000	.424	.424	.492	.708	.000	.632	.818	.449	.353	.560	.559
Cars & Peds	0	0	94	94	121	131	0	252	191	149	40	380	726
% Cars & Peds	0	0	98.9	98.9	99.2	96.3	0	97.7	99.0	100	97.6	99.2	98.6
Trucks & Bikes	0	0	1	1	0	1	0	1	1	0	1	2	4
% Trucks & Bikes	0	0	1.1	1.1	0	0.7	0	0.4	0.5	0	2.4	0.5	0.5
School Buses	0	0	0	0	1	4	0	5	1	0	0	1	6
% School Buses	0	0	0	0	0.8	2.9	0	1.9	0.5	0	0	0.3	0.8



# Transportation Data Corporation

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N: SMS Middle Enter Only Driveway  
 E/W: Forest Avenue  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404B  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- Cars & Peds - Trucks & Bikes - School Buses

Start Time	SMS Middle Enter Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	0	0	2	5	14	0	5	7	2	35
07:15 AM	0	0	7	13	29	0	25	16	2	92
07:30 AM	0	0	30	30	48	0	52	40	9	209
07:45 AM	0	0	56	62	40	0	59	83	29	329
<b>Total</b>	<b>0</b>	<b>0</b>	<b>95</b>	<b>110</b>	<b>131</b>	<b>0</b>	<b>141</b>	<b>146</b>	<b>42</b>	<b>665</b>
08:00 AM	0	0	1	19	19	0	49	7	0	95
08:15 AM	0	0	8	11	29	0	33	19	3	103
08:30 AM	0	0	0	7	25	0	23	8	0	63
08:45 AM	0	0	0	2	10	0	12	1	0	25
<b>Total</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>39</b>	<b>83</b>	<b>0</b>	<b>117</b>	<b>35</b>	<b>3</b>	<b>286</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>104</b>	<b>149</b>	<b>214</b>	<b>0</b>	<b>258</b>	<b>181</b>	<b>45</b>	<b>951</b>
Apprch %	0	0	100	41	59	0	53.3	37.4	9.3	
Total %	0	0	10.9	15.7	22.5	0	27.1	19	4.7	
Cars & Peds	0	0	100	148	206	0	255	181	44	934
% Cars & Peds	0	0	96.2	99.3	96.3	0	98.8	100	97.8	98.2
Trucks & Bikes	0	0	4	0	2	0	2	0	1	9
% Trucks & Bikes	0	0	3.8	0	0.9	0	0.8	0	2.2	0.9
School Buses	0	0	0	1	6	0	1	0	0	8
% School Buses	0	0	0	0.7	2.8	0	0.4	0	0	0.8

Start Time	SMS Middle Enter Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	0	0	30	30	30	<b>48</b>	0	78	52	40	9	101	209
07:45 AM	0	0	<b>56</b>	<b>56</b>	<b>62</b>	40	0	<b>102</b>	<b>59</b>	<b>83</b>	<b>29</b>	<b>171</b>	<b>329</b>
08:00 AM	0	0	1	1	19	19	0	38	49	7	0	56	95
08:15 AM	0	0	8	8	11	29	0	40	33	19	3	55	103
Total Volume	0	0	95	95	122	136	0	258	193	149	41	383	736
% App. Total	0	0	100		47.3	52.7	0		50.4	38.9	10.7		
PHF	.000	.000	.424	.424	.492	.708	.000	.632	.818	.449	.353	.560	.559
Cars & Peds	0	0	94	94	121	131	0	252	191	149	40	380	726
% Cars & Peds	0	0	98.9	98.9	99.2	96.3	0	97.7	99.0	100	97.6	99.2	98.6
Trucks & Bikes	0	0	1	1	0	1	0	1	1	0	1	2	4
% Trucks & Bikes	0	0	1.1	1.1	0	0.7	0	0.4	0.5	0	2.4	0.5	0.5
School Buses	0	0	0	0	1	4	0	5	1	0	0	1	6
% School Buses	0	0	0	0	0.8	2.9	0	1.9	0.5	0	0	0.3	0.8

# Transportation Data Corporation

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N: SMS Middle Enter Only Driveway  
 E/W: Forest Avenue  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404B  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- Cars & Peds

Start Time	SMS Middle Enter Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	0	0	2	5	13	0	5	7	2	34
07:15 AM	0	0	4	13	27	0	25	16	2	87
07:30 AM	0	0	30	30	46	0	51	40	8	205
07:45 AM	0	0	56	62	38	0	59	83	29	327
<b>Total</b>	<b>0</b>	<b>0</b>	<b>92</b>	<b>110</b>	<b>124</b>	<b>0</b>	<b>140</b>	<b>146</b>	<b>41</b>	<b>653</b>
08:00 AM	0	0	1	19	19	0	49	7	0	95
08:15 AM	0	0	7	10	28	0	32	19	3	99
08:30 AM	0	0	0	7	25	0	23	8	0	63
08:45 AM	0	0	0	2	10	0	11	1	0	24
<b>Total</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>38</b>	<b>82</b>	<b>0</b>	<b>115</b>	<b>35</b>	<b>3</b>	<b>281</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>148</b>	<b>206</b>	<b>0</b>	<b>255</b>	<b>181</b>	<b>44</b>	<b>934</b>
Apprch %	0	0	100	41.8	58.2	0	53.1	37.7	9.2	
Total %	0	0	10.7	15.8	22.1	0	27.3	19.4	4.7	

Start Time	SMS Middle Enter Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	0	0	30	30	30	<b>46</b>	0	76	51	40	8	99	205
07:45 AM	0	0	<b>56</b>	<b>56</b>	<b>62</b>	38	0	<b>100</b>	<b>59</b>	<b>83</b>	<b>29</b>	<b>171</b>	<b>327</b>
08:00 AM	0	0	1	1	19	19	0	38	49	7	0	56	95
08:15 AM	0	0	7	7	10	28	0	38	32	19	3	54	99
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>94</b>	<b>94</b>	<b>121</b>	<b>131</b>	<b>0</b>	<b>252</b>	<b>191</b>	<b>149</b>	<b>40</b>	<b>380</b>	<b>726</b>
% App. Total	0	0	100		48	52	0		50.3	39.2	10.5		
PHF	.000	.000	.420	.420	.488	.712	.000	.630	.809	.449	.345	.556	.555

# Transportation Data Corporation

Mario Perone, mperone1@verizon.net

tel (781) 587-0086 cell (781) 439-4999

N: SMS Middle Enter Only Driveway  
 E/W: Forest Avenue  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404B  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- Trucks & Bikes

Start Time	SMS Middle Enter Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	0	0	0	0	1	0	0	0	0	1
07:15 AM	0	0	3	0	0	0	0	0	0	3
07:30 AM	0	0	0	0	0	0	1	0	1	2
07:45 AM	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>6</b>
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	1	0	1	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	1	0	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>9</b>
Apprch %	0	0	100	0	100	0	66.7	0	33.3	
Total %	0	0	44.4	0	22.2	0	22.2	0	11.1	

Start Time	SMS Middle Enter Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
07:15 AM	0	0	3	3	0	0	0	0	0	0	0	0	3
07:30 AM	0	0	0	0	0	0	0	0	1	0	1	2	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>6</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>100</b>		<b>0</b>	<b>100</b>	<b>0</b>		<b>50</b>	<b>0</b>	<b>50</b>		
<b>PHF</b>	<b>.000</b>	<b>.000</b>	<b>.250</b>	<b>.250</b>	<b>.000</b>	<b>.250</b>	<b>.000</b>	<b>.250</b>	<b>.250</b>	<b>.000</b>	<b>.250</b>	<b>.250</b>	<b>.500</b>

# Transportation Data Corporation

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N: SMS Middle Enter Only Driveway  
 E/W: Forest Avenue  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404B  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- School Buses

Start Time	SMS Middle Enter Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	2	0	0	0	0	2
07:30 AM	0	0	0	0	2	0	0	0	0	2
07:45 AM	0	0	0	0	2	0	0	0	0	2
<b>Total</b>	0	0	0	0	6	0	0	0	0	6
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	1	0	0	1	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	0	0	0	1	0	0	1	0	0	2
<b>Grand Total</b>	0	0	0	1	6	0	1	0	0	8
Apprch %	0	0	0	14.3	85.7	0	100	0	0	
Total %	0	0	0	12.5	75	0	12.5	0	0	

Start Time	SMS Middle Enter Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	2
07:30 AM	0	0	0	0	0	2	0	2	0	0	0	0	2
07:45 AM	0	0	0	0	0	2	0	2	0	0	0	0	2
<b>Total Volume</b>	0	0	0	0	0	6	0	6	0	0	0	0	6
<b>% App. Total</b>	0	0	0	0	0	100	0	100	0	0	0	0	100
<b>PHF</b>	.000	.000	.000	.000	.000	.750	.000	.750	.000	.000	.000	.000	.750



# Transportation Data Corporation

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tel (781) 587-0086 cell (781) 439-4999

N/S: SMS East Drive/Sargent Road

E/W: Forest Avenue

City, State: Swampscott, MA

Client: GEOD/C. Emilius

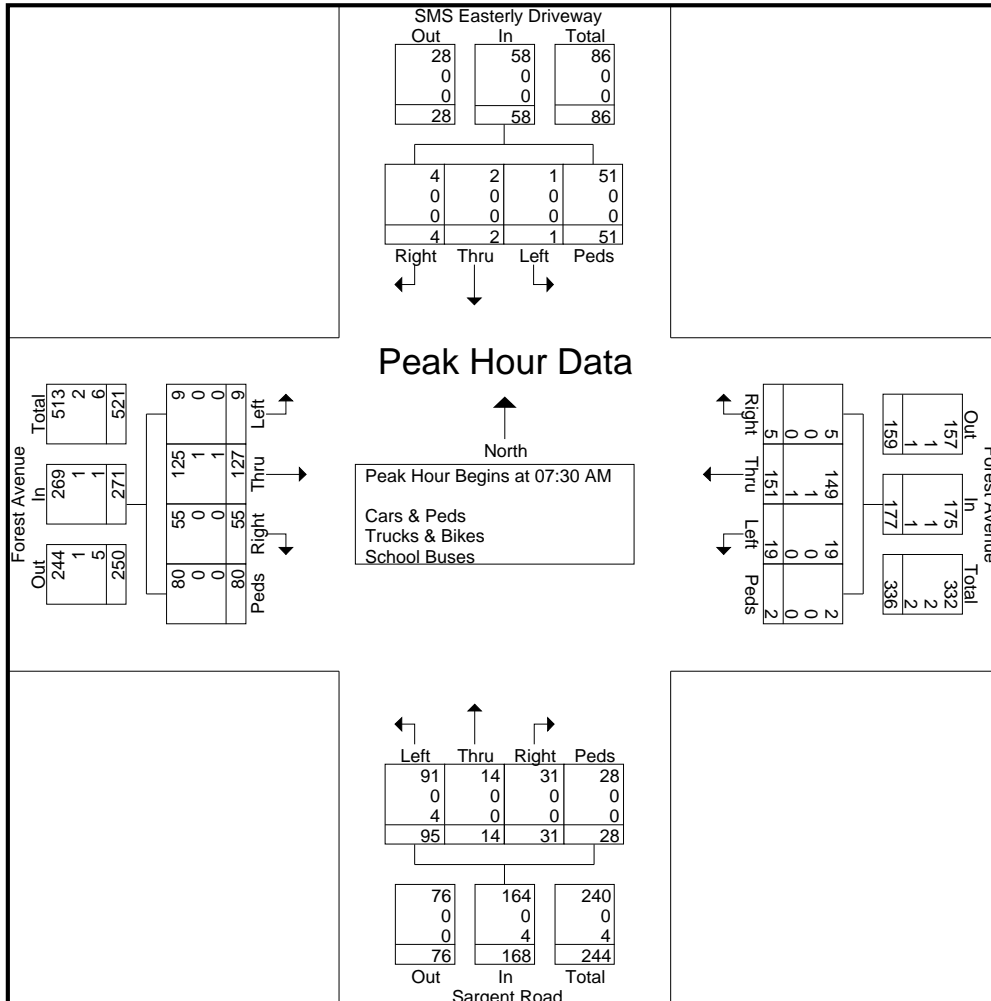
File Name : 04404C

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Start Time	SMS Easterly Driveway From North					Forest Avenue From East					Sargent Road From South					Forest Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	2	1	0	15	18	1	38	8	0	47	4	9	34	9	56	15	29	5	39	88	209
07:45 AM	0	0	1	31	32	2	56	7	0	65	9	4	41	13	67	27	29	0	38	94	258
08:00 AM	1	0	0	0	1	2	23	2	2	29	12	1	12	3	28	3	47	2	0	52	110
08:15 AM	1	1	0	5	7	0	34	2	0	36	6	0	8	3	17	10	22	2	3	37	97
Total Volume	4	2	1	51	58	5	151	19	2	177	31	14	95	28	168	55	127	9	80	271	674
% App. Total	6.9	3.4	1.7	87.9		2.8	85.3	10.7	1.1		18.5	8.3	56.5	16.7		20.3	46.9	3.3	29.5		
PHF	.500	.500	.250	.411	.453	.625	.674	.594	.250	.681	.646	.389	.579	.538	.627	.509	.676	.450	.513	.721	.653
Cars & Peds	4	2	1	51	58	5	149	19	2	175	31	14	91	28	164	55	125	9	80	269	666
% Cars & Peds	100	100	100	100	100	100	98.7	100	100	98.9	100	100	95.8	100	97.6	100	98.4	100	100	99.3	98.8
Trucks & Bikes	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% Trucks & Bikes	0	0	0	0	0	0	0.7	0	0	0.6	0	0	0	0	0	0	0.8	0	0	0.4	0.3
School Buses	0	0	0	0	0	0	1	0	0	1	0	0	4	0	4	0	1	0	0	1	6
% School Buses	0	0	0	0	0	0	0.7	0	0	0.6	0	0	4.2	0	2.4	0	0.8	0	0	0.4	0.9



# Transportation Data Corporation

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N/S: SMS East Drive/Sargent Road

E/W: Forest Avenue

City, State: Swampscott, MA

Client: GEOD/C. Emilius

File Name : 04404C

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Groups Printed- Cars & Peds - Trucks & Bikes - School Buses

Start Time	SMS Easterly Driveway From North				Forest Avenue From East				Sargent Road From South				Forest Avenue From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	1	0	0	0	3	8	1	0	2	0	9	0	0	3	1	0	28
07:15 AM	2	0	2	3	1	26	2	0	1	1	15	4	3	16	6	3	85
07:30 AM	2	1	0	15	1	38	8	0	4	9	34	9	15	29	5	39	209
07:45 AM	0	0	1	31	2	56	7	0	9	4	41	13	27	29	0	38	258
<b>Total</b>	<b>5</b>	<b>1</b>	<b>3</b>	<b>49</b>	<b>7</b>	<b>128</b>	<b>18</b>	<b>0</b>	<b>16</b>	<b>14</b>	<b>99</b>	<b>26</b>	<b>45</b>	<b>77</b>	<b>12</b>	<b>80</b>	<b>580</b>
08:00 AM	1	0	0	0	2	23	2	2	12	1	12	3	3	47	2	0	110
08:15 AM	1	1	0	5	0	34	2	0	6	0	8	3	10	22	2	3	97
08:30 AM	1	0	0	0	2	17	1	0	4	1	12	2	6	16	0	0	62
08:45 AM	1	0	0	0	0	5	3	0	5	0	6	1	6	5	2	0	34
<b>Total</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>5</b>	<b>4</b>	<b>79</b>	<b>8</b>	<b>2</b>	<b>27</b>	<b>2</b>	<b>38</b>	<b>9</b>	<b>25</b>	<b>90</b>	<b>6</b>	<b>3</b>	<b>303</b>
<b>Grand Total</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>54</b>	<b>11</b>	<b>207</b>	<b>26</b>	<b>2</b>	<b>43</b>	<b>16</b>	<b>137</b>	<b>35</b>	<b>70</b>	<b>167</b>	<b>18</b>	<b>83</b>	<b>883</b>
Apprch %	13.2	2.9	4.4	79.4	4.5	84.1	10.6	0.8	18.6	6.9	59.3	15.2	20.7	49.4	5.3	24.6	
Total %	1	0.2	0.3	6.1	1.2	23.4	2.9	0.2	4.9	1.8	15.5	4	7.9	18.9	2	9.4	
Cars & Peds	8	2	3	53	11	205	25	2	43	16	131	35	69	165	18	83	869
% Cars & Peds	88.9	100	100	98.1	100	99	96.2	100	100	100	95.6	100	98.6	98.8	100	100	98.4
Trucks & Bikes	1	0	0	1	0	1	1	0	0	0	0	0	1	1	0	0	6
% Trucks & Bikes	11.1	0	0	1.9	0	0.5	3.8	0	0	0	0	0	1.4	0.6	0	0	0.7
School Buses	0	0	0	0	0	1	0	0	0	0	6	0	0	1	0	0	8
% School Buses	0	0	0	0	0	0.5	0	0	0	0	4.4	0	0	0.6	0	0	0.9

Start Time	SMS Easterly Driveway From North					Forest Avenue From East					Sargent Road From South					Forest Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	2	1	0	15	18	1	38	8	0	47	4	9	34	9	56	15	29	5	39	88	209
07:45 AM	0	0	1	31	32	2	56	7	0	65	9	4	41	13	67	27	29	0	38	94	258
08:00 AM	1	0	0	0	1	2	23	2	2	29	12	1	12	3	28	3	47	2	0	52	110
08:15 AM	1	1	0	5	7	0	34	2	0	36	6	0	8	3	17	10	22	2	3	37	97
<b>Total Volume</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>51</b>	<b>58</b>	<b>5</b>	<b>151</b>	<b>19</b>	<b>2</b>	<b>177</b>	<b>31</b>	<b>14</b>	<b>95</b>	<b>28</b>	<b>168</b>	<b>55</b>	<b>127</b>	<b>9</b>	<b>80</b>	<b>271</b>	<b>674</b>
<b>% App. Total</b>	<b>6.9</b>	<b>3.4</b>	<b>1.7</b>	<b>87.9</b>		<b>2.8</b>	<b>85.3</b>	<b>10.7</b>	<b>1.1</b>		<b>18.5</b>	<b>8.3</b>	<b>56.5</b>	<b>16.7</b>		<b>20.3</b>	<b>46.9</b>	<b>3.3</b>	<b>29.5</b>		
<b>PHF</b>	<b>.500</b>	<b>.500</b>	<b>.250</b>	<b>.411</b>	<b>.453</b>	<b>.625</b>	<b>.674</b>	<b>.594</b>	<b>.250</b>	<b>.681</b>	<b>.646</b>	<b>.389</b>	<b>.579</b>	<b>.538</b>	<b>.627</b>	<b>.509</b>	<b>.676</b>	<b>.450</b>	<b>.513</b>	<b>.721</b>	<b>.653</b>
Cars & Peds	4	2	1	51	58	5	149	19	2	175	31	14	91	28	164	55	125	9	80	269	666
% Cars & Peds	100	100	100	100	100	100	98.7	100	100	98.9	100	100	95.8	100	97.6	100	98.4	100	100	99.3	98.8
Trucks & Bikes	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% Trucks & Bikes	0	0	0	0	0	0	0.7	0	0	0.6	0	0	0	0	0	0	0.8	0	0	0.4	0.3
School Buses	0	0	0	0	0	0	1	0	0	1	0	0	4	0	4	0	1	0	0	1	6
% School Buses	0	0	0	0	0	0	0.7	0	0	0.6	0	0	4.2	0	2.4	0	0.8	0	0	0.4	0.9

# Transportation Data Corporation

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N/S: SMS East Drive/Sargent Road

E/W: Forest Avenue

City, State: Swampscott, MA

Client: GEOD/C. Emilius

File Name : 04404C

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Groups Printed- Cars & Peds

Start Time	SMS Easterly Driveway From North				Forest Avenue From East				Sargent Road From South				Forest Avenue From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	0	0	3	8	1	0	2	0	9	0	0	3	1	0	27
07:15 AM	2	0	2	2	1	26	1	0	1	1	13	4	3	16	6	3	81
07:30 AM	2	1	0	15	1	38	8	0	4	9	31	9	15	28	5	39	205
07:45 AM	0	0	1	31	2	56	7	0	9	4	40	13	27	29	0	38	257
<b>Total</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>48</b>	<b>7</b>	<b>128</b>	<b>17</b>	<b>0</b>	<b>16</b>	<b>14</b>	<b>93</b>	<b>26</b>	<b>45</b>	<b>76</b>	<b>12</b>	<b>80</b>	<b>570</b>
08:00 AM	1	0	0	0	2	23	2	2	12	1	12	3	3	47	2	0	110
08:15 AM	1	1	0	5	0	32	2	0	6	0	8	3	10	21	2	3	94
08:30 AM	1	0	0	0	2	17	1	0	4	1	12	2	6	16	0	0	62
08:45 AM	1	0	0	0	0	5	3	0	5	0	6	1	5	5	2	0	33
<b>Total</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>5</b>	<b>4</b>	<b>77</b>	<b>8</b>	<b>2</b>	<b>27</b>	<b>2</b>	<b>38</b>	<b>9</b>	<b>24</b>	<b>89</b>	<b>6</b>	<b>3</b>	<b>299</b>
<b>Grand Total</b>	<b>8</b>	<b>2</b>	<b>3</b>	<b>53</b>	<b>11</b>	<b>205</b>	<b>25</b>	<b>2</b>	<b>43</b>	<b>16</b>	<b>131</b>	<b>35</b>	<b>69</b>	<b>165</b>	<b>18</b>	<b>83</b>	<b>869</b>
Apprch %	12.1	3	4.5	80.3	4.5	84.4	10.3	0.8	19.1	7.1	58.2	15.6	20.6	49.3	5.4	24.8	
Total %	0.9	0.2	0.3	6.1	1.3	23.6	2.9	0.2	4.9	1.8	15.1	4	7.9	19	2.1	9.6	

Start Time	SMS Easterly Driveway From North					Forest Avenue From East					Sargent Road From South					Forest Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	2	1	0	15	18	1	38	8	0	47	4	9	31	9	53	15	28	5	39	87	205
07:45 AM	0	0	1	31	32	2	56	7	0	65	9	4	40	13	66	27	29	0	38	94	257
08:00 AM	1	0	0	0	1	2	23	2	2	29	12	1	12	3	28	3	47	2	0	52	110
08:15 AM	1	1	0	5	7	0	32	2	0	34	6	0	8	3	17	10	21	2	3	36	94
Total Volume	4	2	1	51	58	5	149	19	2	175	31	14	91	28	164	55	125	9	80	269	666
% App. Total	6.9	3.4	1.7	87.9		2.9	85.1	10.9	1.1		18.9	8.5	55.5	17.1		20.4	46.5	3.3	29.7		
PHF	.500	.500	.250	.411	.453	.625	.665	.594	.250	.673	.646	.389	.569	.538	.621	.509	.665	.450	.513	.715	.648

# Transportation Data Corporation

Mario Perone, mperone1@verizon.net

tel (781) 587-0086 cell (781) 439-4999

N/S: SMS East Drive/Sargent Road

E/W: Forest Avenue

City, State: Swampscott, MA

Client: GEOD/C. Emilius

File Name : 04404C

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Groups Printed- Trucks & Bikes

Start Time	SMS Easterly Driveway From North				Forest Avenue From East				Sargent Road From South				Forest Avenue From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	1	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
<b>Total</b>	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2
<b>Grand Total</b>	1	0	0	1	0	1	1	0	0	0	0	0	1	1	0	0	6
Apprch %	50	0	0	50	0	50	50	0	0	0	0	0	50	50	0	0	
Total %	16.7	0	0	16.7	0	16.7	16.7	0	0	0	0	0	16.7	16.7	0	0	

Start Time	SMS Easterly Driveway From North					Forest Avenue From East					Sargent Road From South					Forest Avenue From West					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 07:00 AM																						
07:00 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	1	0	0	1	2	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	4
<b>% App. Total</b>	50	0	0	50		0	0	100	0		0	0	0	0		0	100	0	0			
<b>PHF</b>	.250	.000	.000	.250	.500	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.500	



# Transportation Data Corporation

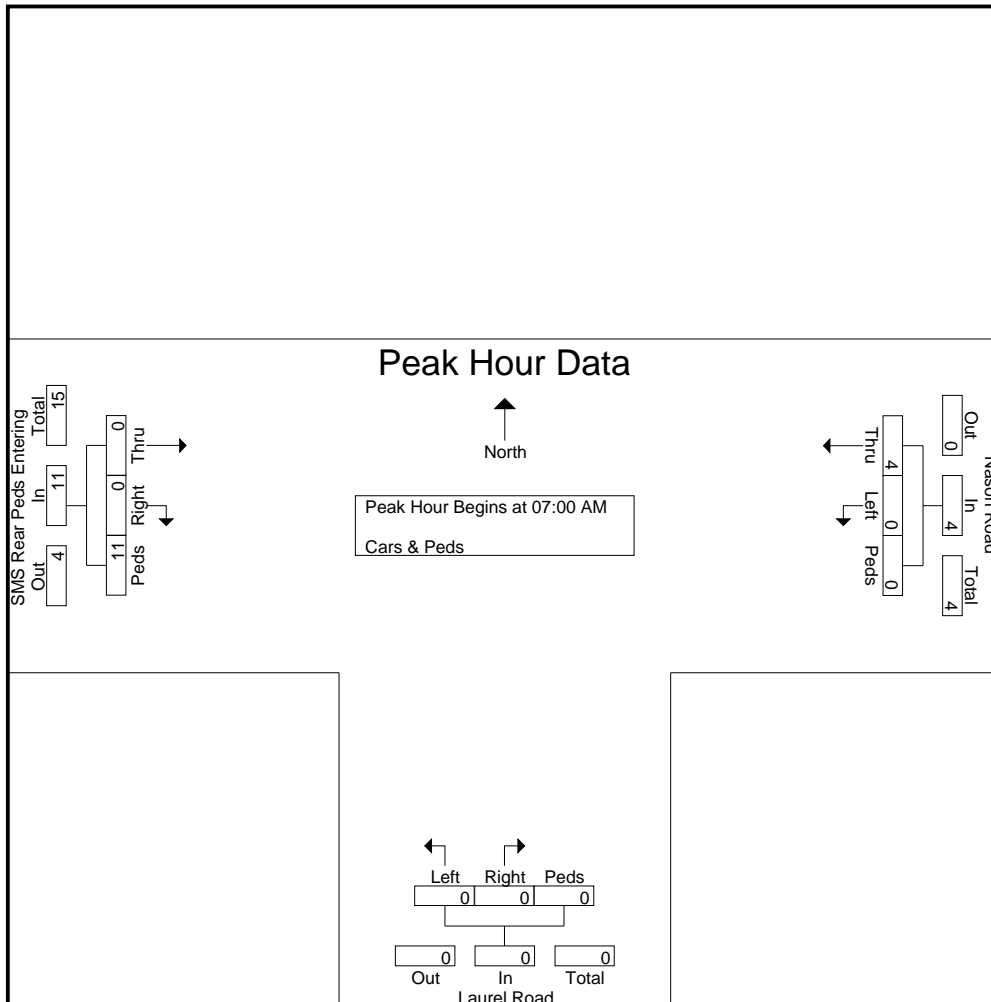
Mario Perone, mperone1@verizon.net

tel (781) 587-0086 cell (781) 439-4999

S: Laurel Road  
 E/W: Nason Road/SMS Peds Only Access  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404D  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Start Time	Nason Road From East				Laurel Road From South				SMS Rear Peds Entering From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	3	0	0	3	0	0	0	0	0	0	8	8	11
07:45 AM	1	0	0	1	0	0	0	0	0	0	3	3	4
Total Volume	4	0	0	4	0	0	0	0	0	0	11	11	15
% App. Total	100	0	0		0	0	0		0	0	100		
PHF	.333	.000	.000	.333	.000	.000	.000	.000	.000	.000	.344	.344	.341



# Transportation Data Corporation

Mario Perone, mperone1@verizon.net

tel (781) 587-0086 cell (781) 439-4999

S: Laurel Road  
 E/W: Nason Road/SMS Peds Only Access  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404D  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- Cars & Peds

Start Time	Nason Road From East			Laurel Road From South			SMS Rear Peds Entering From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	3	0	0	0	0	0	0	0	8	11
07:45 AM	1	0	0	0	0	0	0	0	3	4
<b>Total</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>15</b>
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Grand Total	4	0	0	0	0	0	0	0	11	15
Apprch %	100	0	0	0	0	0	0	0	100	
Total %	26.7	0	0	0	0	0	0	0	73.3	

Start Time	Nason Road From East				Laurel Road From South				SMS Rear Peds Entering From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	3	0	0	3	0	0	0	0	0	0	8	8	11
07:45 AM	1	0	0	1	0	0	0	0	0	0	3	3	4
Total Volume	4	0	0	4	0	0	0	0	0	0	11	11	15
% App. Total	100	0	0		0	0	0		0	0	100		
PHF	.333	.000	.000	.333	.000	.000	.000	.000	.000	.000	.344	.344	.341

# Transportation Data Corporation

Mario Perone, mperone1@verizon.net

tel (781) 587-0086 cell (781) 439-4999

N: SMS Westerly Exit Driveway

E/W: Forest Avenue

City, State: Swampscott, MA

Client: GEOD/C. Emilius

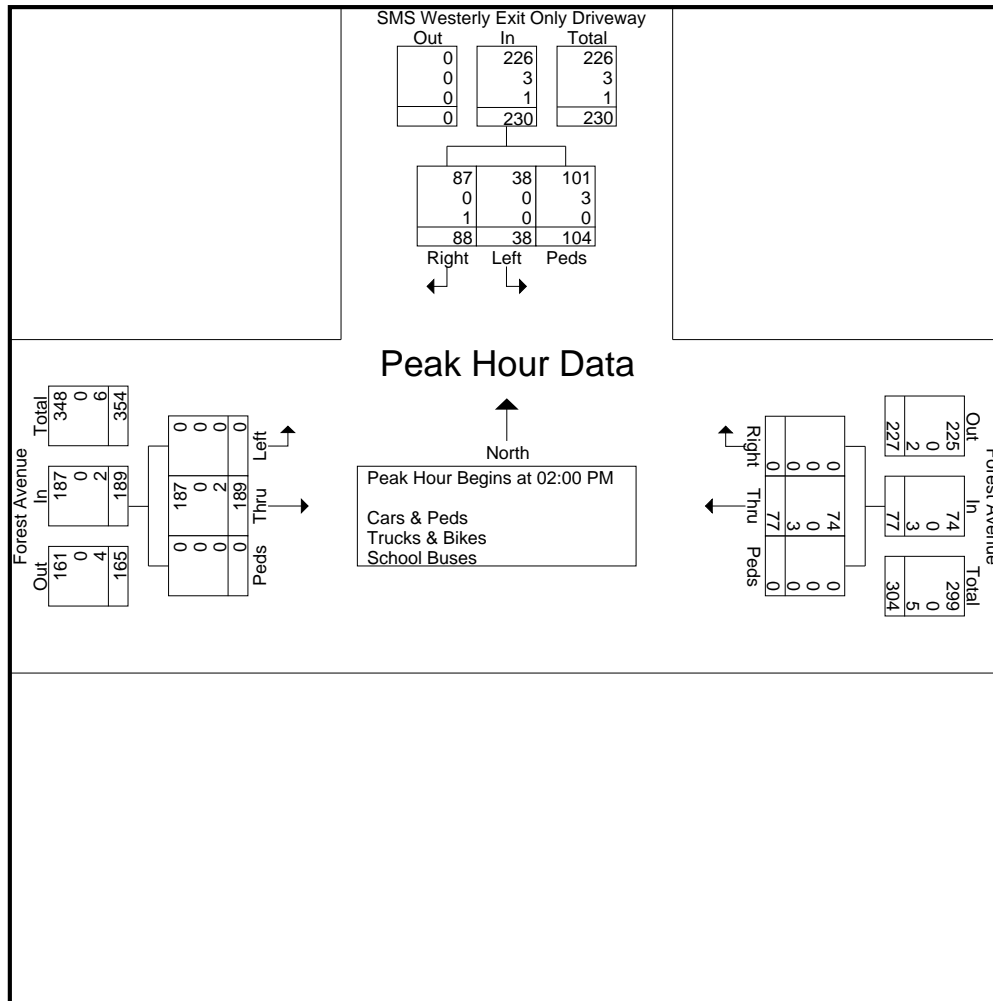
File Name : 0440AA

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Start Time	SMS Westerly Exit Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 02:00 PM													
02:00 PM	23	14	1	38	0	12	0	12	58	0	0	58	108
02:15 PM	10	6	56	72	0	22	0	22	42	0	0	42	136
02:30 PM	48	13	47	108	0	22	0	22	51	0	0	51	181
02:45 PM	7	5	0	12	0	21	0	21	38	0	0	38	71
Total Volume	88	38	104	230	0	77	0	77	189	0	0	189	496
% App. Total	38.3	16.5	45.2		0	100	0		100	0	0		
PHF	.458	.679	.464	.532	.000	.875	.000	.875	.815	.000	.000	.815	.685
Cars & Peds	87	38	101	226	0	74	0	74	187	0	0	187	487
% Cars & Peds	98.9	100	97.1	98.3	0	96.1	0	96.1	98.9	0	0	98.9	98.2
Trucks & Bikes	0	0	3	3	0	0	0	0	0	0	0	0	3
% Trucks & Bikes	0	0	2.9	1.3	0	0	0	0	0	0	0	0	0.6
School Buses	1	0	0	1	0	3	0	3	2	0	0	2	6
% School Buses	1.1	0	0	0.4	0	3.9	0	3.9	1.1	0	0	1.1	1.2





# Transportation Data Corporation

Mario Perone, mperone1@verizon.net

tel (781) 587-0086 cell (781) 439-4999

N: SMS Westerly Exit Driveway  
 E/W: Forest Avenue  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 0440AA  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- Cars & Peds - Trucks & Bikes - School Buses

Start Time	SMS Westerly Exit Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
02:00 PM	23	14	1	0	12	0	58	0	0	108
02:15 PM	10	6	56	0	22	0	42	0	0	136
02:30 PM	48	13	47	0	22	0	51	0	0	181
02:45 PM	7	5	0	0	21	0	38	0	0	71
<b>Total</b>	<b>88</b>	<b>38</b>	<b>104</b>	<b>0</b>	<b>77</b>	<b>0</b>	<b>189</b>	<b>0</b>	<b>0</b>	<b>496</b>
03:00 PM	11	6	7	0	18	0	31	0	0	73
03:15 PM	7	1	1	0	11	0	22	0	0	42
03:30 PM	2	6	2	0	19	0	23	0	0	52
03:45 PM	5	4	0	0	11	0	19	0	0	39
<b>Total</b>	<b>25</b>	<b>17</b>	<b>10</b>	<b>0</b>	<b>59</b>	<b>0</b>	<b>95</b>	<b>0</b>	<b>0</b>	<b>206</b>
<b>Grand Total</b>	<b>113</b>	<b>55</b>	<b>114</b>	<b>0</b>	<b>136</b>	<b>0</b>	<b>284</b>	<b>0</b>	<b>0</b>	<b>702</b>
Apprch %	40.1	19.5	40.4	0	100	0	100	0	0	
Total %	16.1	7.8	16.2	0	19.4	0	40.5	0	0	
Cars & Peds	112	55	110	0	132	0	282	0	0	691
% Cars & Peds	99.1	100	96.5	0	97.1	0	99.3	0	0	98.4
Trucks & Bikes	0	0	4	0	0	0	0	0	0	4
% Trucks & Bikes	0	0	3.5	0	0	0	0	0	0	0.6
School Buses	1	0	0	0	4	0	2	0	0	7
% School Buses	0.9	0	0	0	2.9	0	0.7	0	0	1

Start Time	SMS Westerly Exit Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 02:00 PM													
02:00 PM	23	14	1	38	0	12	0	12	58	0	0	58	108
02:15 PM	10	6	56	72	0	22	0	22	42	0	0	42	136
02:30 PM	48	13	47	108	0	22	0	22	51	0	0	51	181
02:45 PM	7	5	0	12	0	21	0	21	38	0	0	38	71
<b>Total Volume</b>	<b>88</b>	<b>38</b>	<b>104</b>	<b>230</b>	<b>0</b>	<b>77</b>	<b>0</b>	<b>77</b>	<b>189</b>	<b>0</b>	<b>0</b>	<b>189</b>	<b>496</b>
% App. Total	38.3	16.5	45.2		0	100	0		100	0	0		
PHF	.458	.679	.464	.532	.000	.875	.000	.875	.815	.000	.000	.815	.685
Cars & Peds	87	38	101	226	0	74	0	74	187	0	0	187	487
% Cars & Peds	98.9	100	97.1	98.3	0	96.1	0	96.1	98.9	0	0	98.9	98.2
Trucks & Bikes	0	0	3	3	0	0	0	0	0	0	0	0	3
% Trucks & Bikes	0	0	2.9	1.3	0	0	0	0	0	0	0	0	0.6
School Buses	1	0	0	1	0	3	0	3	2	0	0	2	6
% School Buses	1.1	0	0	0.4	0	3.9	0	3.9	1.1	0	0	1.1	1.2

# Transportation Data Corporation

Mario Perone, [mperone1@verizon.net](mailto:mperone1@verizon.net)

tel (781) 587-0086 cell (781) 439-4999

N: SMS Westerly Exit Driveway  
 E/W: Forest Avenue  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404AA  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- Cars & Peds

Start Time	SMS Westerly Exit Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
02:00 PM	22	14	1	0	12	0	58	0	0	107
02:15 PM	10	6	53	0	22	0	42	0	0	133
02:30 PM	48	13	47	0	20	0	49	0	0	177
02:45 PM	7	5	0	0	20	0	38	0	0	70
<b>Total</b>	<b>87</b>	<b>38</b>	<b>101</b>	<b>0</b>	<b>74</b>	<b>0</b>	<b>187</b>	<b>0</b>	<b>0</b>	<b>487</b>
03:00 PM	11	6	6	0	18	0	31	0	0	72
03:15 PM	7	1	1	0	10	0	22	0	0	41
03:30 PM	2	6	2	0	19	0	23	0	0	52
03:45 PM	5	4	0	0	11	0	19	0	0	39
<b>Total</b>	<b>25</b>	<b>17</b>	<b>9</b>	<b>0</b>	<b>58</b>	<b>0</b>	<b>95</b>	<b>0</b>	<b>0</b>	<b>204</b>
Grand Total	112	55	110	0	132	0	282	0	0	691
Apprch %	40.4	19.9	39.7	0	100	0	100	0	0	
Total %	16.2	8	15.9	0	19.1	0	40.8	0	0	

Start Time	SMS Westerly Exit Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 02:00 PM													
02:00 PM	22	<b>14</b>	1	37	0	12	0	12	<b>58</b>	0	0	<b>58</b>	107
02:15 PM	10	6	<b>53</b>	69	0	<b>22</b>	0	<b>22</b>	42	0	0	42	133
02:30 PM	<b>48</b>	13	47	<b>108</b>	0	20	0	20	49	0	0	49	<b>177</b>
02:45 PM	7	5	0	12	0	20	0	20	38	0	0	38	70
Total Volume	87	38	101	226	0	74	0	74	187	0	0	187	487
% App. Total	38.5	16.8	44.7		0	100	0		100	0	0		
PHF	.453	.679	.476	.523	.000	.841	.000	.841	.806	.000	.000	.806	.688



# Transportation Data Corporation

Mario Perone, mperone1@verizon.net

tel (781) 587-0086 cell (781) 439-4999

N: SMS Westerly Exit Driveway  
 E/W: Forest Avenue  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404AA  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- School Buses

Start Time	SMS Westerly Exit Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
02:00 PM	1	0	0	0	0	0	0	0	0	1
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	2	0	2	0	0	4
02:45 PM	0	0	0	0	1	0	0	0	0	1
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>6</b>
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	1	0	0	0	0	1
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>
<b>Grand Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>7</b>
Apprch %	100	0	0	0	100	0	100	0	0	
Total %	14.3	0	0	0	57.1	0	28.6	0	0	

Start Time	SMS Westerly Exit Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 02:00 PM													
02:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	2	0	2	2	0	0	2	4
02:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
<b>Total Volume</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>6</b>
<b>% App. Total</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b></b>	<b>0</b>	<b>100</b>	<b>0</b>	<b></b>	<b>100</b>	<b>0</b>	<b>0</b>	<b></b>	<b></b>
PHF	.250	.000	.000	.250	.000	.375	.000	.375	.250	.000	.000	.250	.375

# Transportation Data Corporation

Mario Perone, mperone1@verizon.net

tel (781) 587-0086 cell (781) 439-4999

N: SMS Middle Enter Only Driveway

E/W: Forest Avenue

City, State: Swampscott, MA

Client: GEOD/C. Emilius

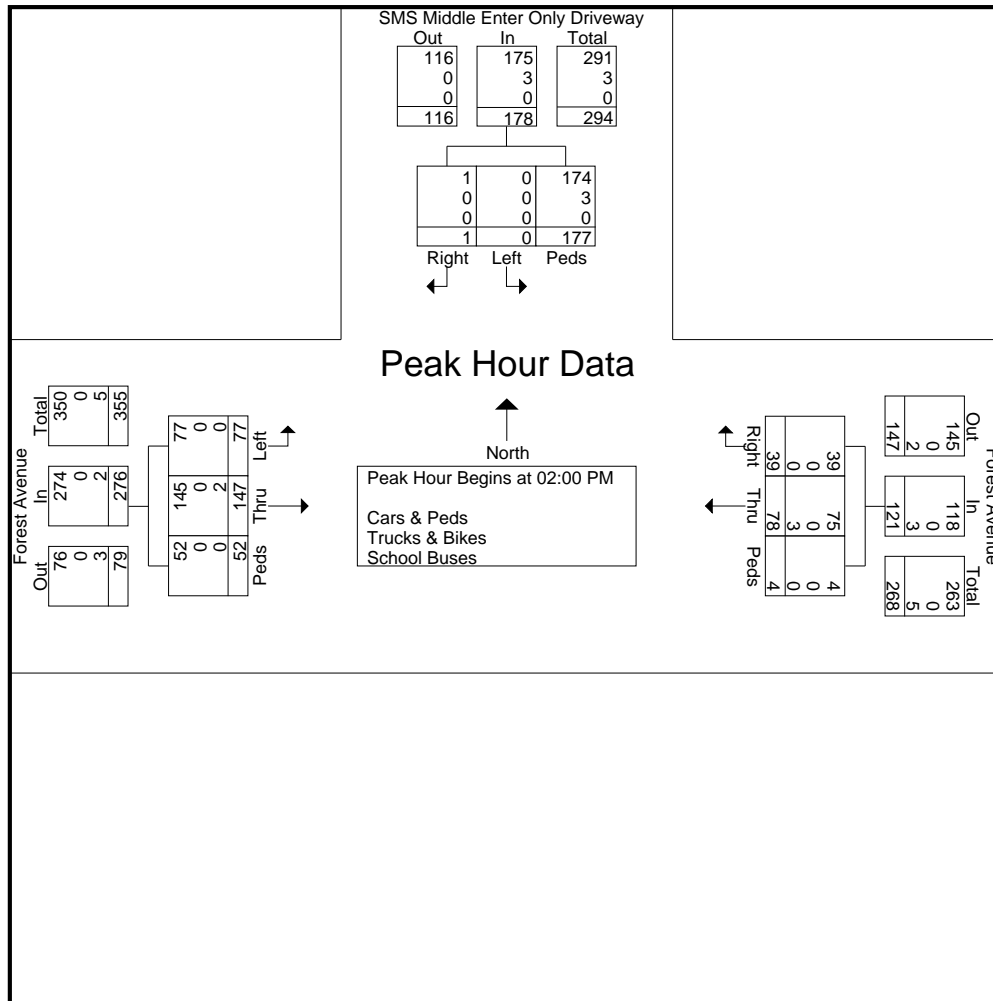
File Name : 04404BB

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Start Time	SMS Middle Enter Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 02:00 PM													
02:00 PM	1	0	1	2	11	13	0	24	54	16	0	70	96
02:15 PM	0	0	105	105	14	23	2	39	22	26	25	73	217
02:30 PM	0	0	71	71	11	22	1	34	43	22	27	92	197
02:45 PM	0	0	0	0	3	20	1	24	28	13	0	41	65
Total Volume	1	0	177	178	39	78	4	121	147	77	52	276	575
% App. Total	0.6	0	99.4		32.2	64.5	3.3		53.3	27.9	18.8		
PHF	.250	.000	.421	.424	.696	.848	.500	.776	.681	.740	.481	.750	.662
Cars & Peds	1	0	174	175	39	75	4	118	145	77	52	274	567
% Cars & Peds	100	0	98.3	98.3	100	96.2	100	97.5	98.6	100	100	99.3	98.6
Trucks & Bikes	0	0	3	3	0	0	0	0	0	0	0	0	3
% Trucks & Bikes	0	0	1.7	1.7	0	0	0	0	0	0	0	0	0.5
School Buses	0	0	0	0	0	3	0	3	2	0	0	2	5
% School Buses	0	0	0	0	0	3.8	0	2.5	1.4	0	0	0.7	0.9



# Transportation Data Corporation

Mario Perone, mperone1@verizon.net

tel (781) 587-0086 cell (781) 439-4999

N: SMS Middle Enter Only Driveway  
 E/W: Forest Avenue  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404BB  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- Cars & Peds - Trucks & Bikes - School Buses

Start Time	SMS Middle Enter Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
02:00 PM	1	0	1	11	13	0	54	16	0	96
02:15 PM	0	0	105	14	23	2	22	26	25	217
02:30 PM	0	0	71	11	22	1	43	22	27	197
02:45 PM	0	0	0	3	20	1	28	13	0	65
<b>Total</b>	<b>1</b>	<b>0</b>	<b>177</b>	<b>39</b>	<b>78</b>	<b>4</b>	<b>147</b>	<b>77</b>	<b>52</b>	<b>575</b>
03:00 PM	0	0	9	4	19	0	30	6	0	68
03:15 PM	0	0	1	0	10	0	19	3	0	33
03:30 PM	0	0	3	3	19	1	27	2	1	56
03:45 PM	0	0	0	3	12	0	17	6	0	38
<b>Total</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>10</b>	<b>60</b>	<b>1</b>	<b>93</b>	<b>17</b>	<b>1</b>	<b>195</b>
<b>Grand Total</b>	<b>1</b>	<b>0</b>	<b>190</b>	<b>49</b>	<b>138</b>	<b>5</b>	<b>240</b>	<b>94</b>	<b>53</b>	<b>770</b>
Apprch %	0.5	0	99.5	25.5	71.9	2.6	62	24.3	13.7	
Total %	0.1	0	24.7	6.4	17.9	0.6	31.2	12.2	6.9	
Cars & Peds	1	0	186	49	134	5	238	94	53	760
% Cars & Peds	100	0	97.9	100	97.1	100	99.2	100	100	98.7
Trucks & Bikes	0	0	4	0	0	0	0	0	0	4
% Trucks & Bikes	0	0	2.1	0	0	0	0	0	0	0.5
School Buses	0	0	0	0	4	0	2	0	0	6
% School Buses	0	0	0	0	2.9	0	0.8	0	0	0.8

Start Time	SMS Middle Enter Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 02:00 PM													
02:00 PM	1	0	1	2	11	13	0	24	54	16	0	70	96
02:15 PM	0	0	105	105	14	23	2	39	22	26	25	73	217
02:30 PM	0	0	71	71	11	22	1	34	43	22	27	92	197
02:45 PM	0	0	0	0	3	20	1	24	28	13	0	41	65
<b>Total Volume</b>	<b>1</b>	<b>0</b>	<b>177</b>	<b>178</b>	<b>39</b>	<b>78</b>	<b>4</b>	<b>121</b>	<b>147</b>	<b>77</b>	<b>52</b>	<b>276</b>	<b>575</b>
% App. Total	0.6	0	99.4		32.2	64.5	3.3		53.3	27.9	18.8		
PHF	.250	.000	.421	.424	.696	.848	.500	.776	.681	.740	.481	.750	.662
Cars & Peds	1	0	174	175	39	75	4	118	145	77	52	274	567
% Cars & Peds	100	0	98.3	98.3	100	96.2	100	97.5	98.6	100	100	99.3	98.6
Trucks & Bikes	0	0	3	3	0	0	0	0	0	0	0	0	3
% Trucks & Bikes	0	0	1.7	1.7	0	0	0	0	0	0	0	0	0.5
School Buses	0	0	0	0	0	3	0	3	2	0	0	2	5
% School Buses	0	0	0	0	0	3.8	0	2.5	1.4	0	0	0.7	0.9

# Transportation Data Corporation

Mario Perone, mperone1@verizon.net

tel (781) 587-0086 cell (781) 439-4999

N: SMS Middle Enter Only Driveway

E/W: Forest Avenue

City, State: Swampscott, MA

Client: GEOD/C. Emilius

File Name : 04404BB

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Groups Printed- Cars & Peds

Start Time	SMS Middle Enter Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
02:00 PM	1	0	1	11	13	0	54	16	0	96
02:15 PM	0	0	102	14	23	2	22	26	25	214
02:30 PM	0	0	71	11	19	1	41	22	27	192
02:45 PM	0	0	0	3	20	1	28	13	0	65
<b>Total</b>	<b>1</b>	<b>0</b>	<b>174</b>	<b>39</b>	<b>75</b>	<b>4</b>	<b>145</b>	<b>77</b>	<b>52</b>	<b>567</b>
03:00 PM	0	0	8	4	19	0	30	6	0	67
03:15 PM	0	0	1	0	9	0	19	3	0	32
03:30 PM	0	0	3	3	19	1	27	2	1	56
03:45 PM	0	0	0	3	12	0	17	6	0	38
<b>Total</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>10</b>	<b>59</b>	<b>1</b>	<b>93</b>	<b>17</b>	<b>1</b>	<b>193</b>
<b>Grand Total</b>	<b>1</b>	<b>0</b>	<b>186</b>	<b>49</b>	<b>134</b>	<b>5</b>	<b>238</b>	<b>94</b>	<b>53</b>	<b>760</b>
Apprch %	0.5	0	99.5	26.1	71.3	2.7	61.8	24.4	13.8	
Total %	0.1	0	24.5	6.4	17.6	0.7	31.3	12.4	7	

Start Time	SMS Middle Enter Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 02:00 PM													
02:00 PM	1	0	1	2	11	13	0	24	54	16	0	70	96
02:15 PM	0	0	102	102	14	23	2	39	22	26	25	73	214
02:30 PM	0	0	71	71	11	19	1	31	41	22	27	90	192
02:45 PM	0	0	0	0	3	20	1	24	28	13	0	41	65
<b>Total Volume</b>	<b>1</b>	<b>0</b>	<b>174</b>	<b>175</b>	<b>39</b>	<b>75</b>	<b>4</b>	<b>118</b>	<b>145</b>	<b>77</b>	<b>52</b>	<b>274</b>	<b>567</b>
% App. Total	0.6	0	99.4		33.1	63.6	3.4		52.9	28.1	19		
PHF	.250	.000	.426	.429	.696	.815	.500	.756	.671	.740	.481	.761	.662





# Transportation Data Corporation

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tel (781) 587-0086 cell (781) 439-4999

N: SMS Middle Enter Only Driveway

E/W: Forest Avenue

City, State: Swampscott, MA

Client: GEOD/C. Emilius

File Name : 04404BB

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Groups Printed- School Buses

Start Time	SMS Middle Enter Only Driveway From North			Forest Avenue From East			Forest Avenue From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
02:00 PM	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	3	0	2	0	0	5
02:45 PM	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>5</b>
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	1	0	0	0	0	1
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>6</b>
Apprch %	0	0	0	0	100	0	100	0	0	0
Total %	0	0	0	0	66.7	0	33.3	0	0	0

Start Time	SMS Middle Enter Only Driveway From North				Forest Avenue From East				Forest Avenue From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 02:30 PM													
02:30 PM	0	0	0	0	0	3	0	3	2	0	0	2	5
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>6</b>
% App. Total	0	0	0	0	0	100	0	100	100	0	0	0	0
PHF	.000	.000	.000	.000	.000	.333	.000	.333	.250	.000	.000	.250	.300

# Transportation Data Corporation

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N/S: SMS East Drive/Sargent Road

E/W: Forest Avenue

City, State: Swampscott, MA

Client: GEOD/C. Emilius

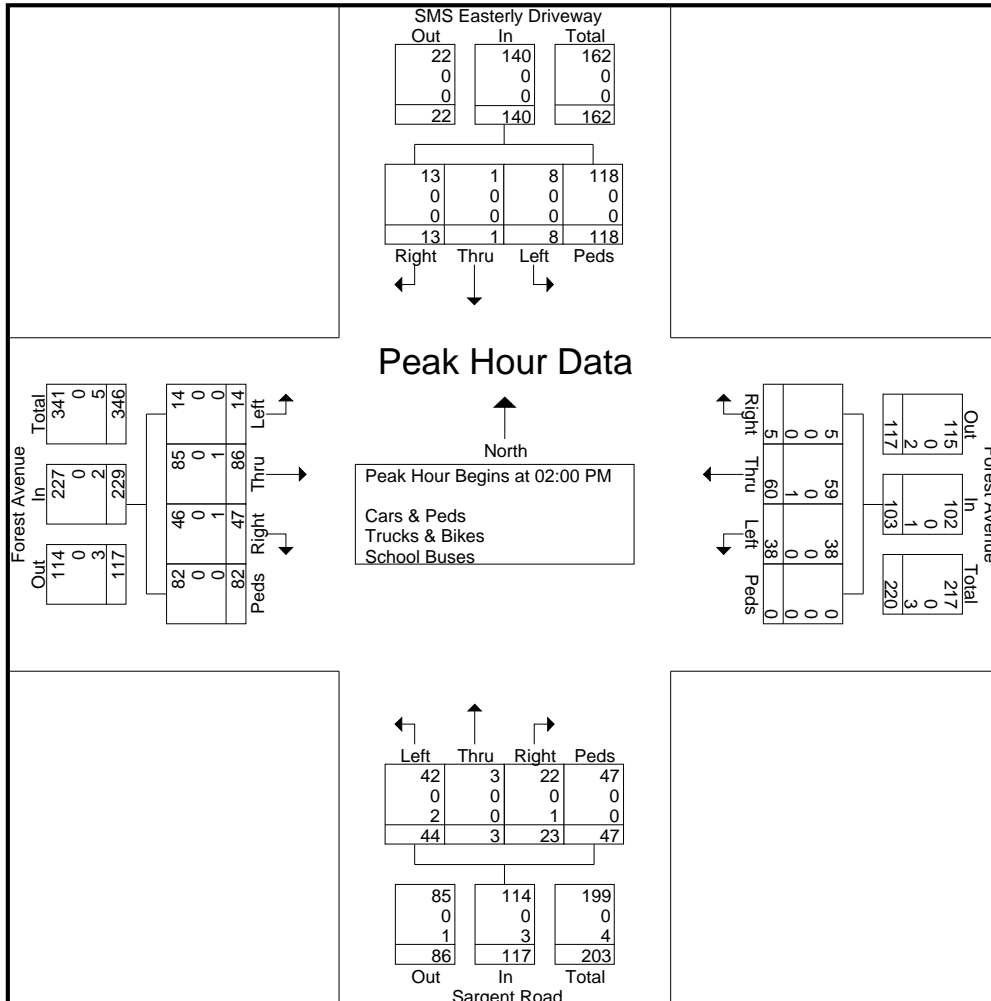
File Name : 0440CC

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Start Time	SMS Easterly Driveway From North					Forest Avenue From East					Sargent Road From South					Forest Avenue From West					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 02:00 PM																						
02:00 PM	1	0	1	0	2	1	14	6	0	21	11	0	12	0	23	8	41	5	0	54	100	
02:15 PM	2	0	2	56	60	0	23	18	0	41	4	2	14	25	45	10	9	1	35	55	201	
02:30 PM	3	0	1	62	66	1	14	14	0	29	6	0	12	22	40	23	19	1	47	90	225	
02:45 PM	7	1	4	0	12	3	9	0	0	12	2	1	6	0	9	6	17	7	0	30	63	
Total Volume	13	1	8	118	140	5	60	38	0	103	23	3	44	47	117	47	86	14	82	229	589	
% App. Total	9.3	0.7	5.7	84.3		4.9	58.3	36.9	0		19.7	2.6	37.6	40.2		20.5	37.6	6.1	35.8			
PHF	.464	.250	.500	.476	.530	.417	.652	.528	.000	.628	.523	.375	.786	.470	.650	.511	.524	.500	.436	.636	.654	
Cars & Peds	13	1	8	118	140	5	59	38	0	102	22	3	42	47	114	46	85	14	82	227	583	
% Cars & Peds	100	100	100	100	100	100	98.3	100	0	99.0	95.7	100	95.5	100	97.4	97.9	98.8	100	100	99.1	99.0	
Trucks & Bikes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks & Bikes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
School Buses	0	0	0	0	0	0	1	0	0	1	1	0	2	0	3	1	1	0	0	2	6	
% School Buses	0	0	0	0	0	0	1.7	0	0	1.0	4.3	0	4.5	0	2.6	2.1	1.2	0	0	0.9	1.0	



# Transportation Data Corporation

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N/S: SMS East Drive/Sargent Road  
 E/W: Forest Avenue  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404CC  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- Cars & Peds - Trucks & Bikes - School Buses

Start Time	SMS Easterly Driveway From North				Forest Avenue From East				Sargent Road From South				Forest Avenue From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
02:00 PM	1	0	1	0	1	14	6	0	11	0	12	0	8	41	5	0	100
02:15 PM	2	0	2	56	0	23	18	0	4	2	14	25	10	9	1	35	201
02:30 PM	3	0	1	62	1	14	14	0	6	0	12	22	23	19	1	47	225
02:45 PM	7	1	4	0	3	9	0	0	2	1	6	0	6	17	7	0	63
<b>Total</b>	<b>13</b>	<b>1</b>	<b>8</b>	<b>118</b>	<b>5</b>	<b>60</b>	<b>38</b>	<b>0</b>	<b>23</b>	<b>3</b>	<b>44</b>	<b>47</b>	<b>47</b>	<b>86</b>	<b>14</b>	<b>82</b>	<b>589</b>
03:00 PM	5	6	3	3	0	12	1	0	1	2	5	3	9	19	3	5	77
03:15 PM	2	2	1	0	0	4	4	0	4	0	3	0	4	12	4	0	40
03:30 PM	1	1	2	0	1	18	3	0	8	0	3	0	9	16	1	0	63
03:45 PM	1	0	0	0	0	12	3	0	2	0	2	0	7	9	1	0	37
<b>Total</b>	<b>9</b>	<b>9</b>	<b>6</b>	<b>3</b>	<b>1</b>	<b>46</b>	<b>11</b>	<b>0</b>	<b>15</b>	<b>2</b>	<b>13</b>	<b>3</b>	<b>29</b>	<b>56</b>	<b>9</b>	<b>5</b>	<b>217</b>
<b>Grand Total</b>	<b>22</b>	<b>10</b>	<b>14</b>	<b>121</b>	<b>6</b>	<b>106</b>	<b>49</b>	<b>0</b>	<b>38</b>	<b>5</b>	<b>57</b>	<b>50</b>	<b>76</b>	<b>142</b>	<b>23</b>	<b>87</b>	<b>806</b>
Apprch %	13.2	6	8.4	72.5	3.7	65.8	30.4	0	25.3	3.3	38	33.3	23.2	43.3	7	26.5	
Total %	2.7	1.2	1.7	15	0.7	13.2	6.1	0	4.7	0.6	7.1	6.2	9.4	17.6	2.9	10.8	
Cars & Peds	22	10	14	121	6	105	48	0	37	5	54	50	75	141	23	87	798
% Cars & Peds	100	100	100	100	100	99.1	98	0	97.4	100	94.7	100	98.7	99.3	100	100	99
Trucks & Bikes	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
% Trucks & Bikes	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0.1
School Buses	0	0	0	0	0	1	0	0	1	0	3	0	1	1	0	0	7
% School Buses	0	0	0	0	0	0.9	0	0	2.6	0	5.3	0	1.3	0.7	0	0	0.9

Start Time	SMS Easterly Driveway From North					Forest Avenue From East					Sargent Road From South					Forest Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	1	0	1	0	2	1	14	6	0	21	<b>11</b>	0	12	0	23	8	<b>41</b>	5	0	54	100
02:15 PM	2	0	2	56	60	0	<b>23</b>	<b>18</b>	0	<b>41</b>	4	2	<b>14</b>	<b>25</b>	<b>45</b>	10	9	1	35	55	201
02:30 PM	3	0	1	<b>62</b>	<b>66</b>	1	14	14	0	29	6	0	12	22	40	<b>23</b>	19	1	<b>47</b>	<b>90</b>	<b>225</b>
02:45 PM	7	<b>1</b>	<b>4</b>	0	12	<b>3</b>	9	0	0	12	2	1	6	0	9	6	17	<b>7</b>	0	30	63
<b>Total Volume</b>	<b>13</b>	<b>1</b>	<b>8</b>	<b>118</b>	<b>140</b>	<b>5</b>	<b>60</b>	<b>38</b>	<b>0</b>	<b>103</b>	<b>23</b>	<b>3</b>	<b>44</b>	<b>47</b>	<b>117</b>	<b>47</b>	<b>86</b>	<b>14</b>	<b>82</b>	<b>229</b>	<b>589</b>
<b>% App. Total</b>	<b>9.3</b>	<b>0.7</b>	<b>5.7</b>	<b>84.3</b>		<b>4.9</b>	<b>58.3</b>	<b>36.9</b>	<b>0</b>		<b>19.7</b>	<b>2.6</b>	<b>37.6</b>	<b>40.2</b>		<b>20.5</b>	<b>37.6</b>	<b>6.1</b>	<b>35.8</b>		
<b>PHF</b>	<b>.464</b>	<b>.250</b>	<b>.500</b>	<b>.476</b>	<b>.530</b>	<b>.417</b>	<b>.652</b>	<b>.528</b>	<b>.000</b>	<b>.628</b>	<b>.523</b>	<b>.375</b>	<b>.786</b>	<b>.470</b>	<b>.650</b>	<b>.511</b>	<b>.524</b>	<b>.500</b>	<b>.436</b>	<b>.636</b>	<b>.654</b>
Cars & Peds	13	1	8	118	140	5	59	38	0	102	22	3	42	47	114	46	85	14	82	227	583
% Cars & Peds	100	100	100	100	100	100	98.3	100	0	99.0	95.7	100	95.5	100	97.4	97.9	98.8	100	100	99.1	99.0
Trucks & Bikes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks & Bikes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
School Buses	0	0	0	0	0	0	1	0	0	1	1	0	2	0	3	1	1	0	0	2	6
% School Buses	0	0	0	0	0	0	1.7	0	0	1.0	4.3	0	4.5	0	2.6	2.1	1.2	0	0	0.9	1.0

# Transportation Data Corporation

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N/S: SMS East Drive/Sargent Road

E/W: Forest Avenue

City, State: Swampscott, MA

Client: GEOD/C. Emilius

File Name : 04404CC

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Groups Printed- Cars & Peds

Start Time	SMS Easterly Driveway From North				Forest Avenue From East				Sargent Road From South				Forest Avenue From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
02:00 PM	1	0	1	0	1	14	6	0	11	0	12	0	8	41	5	0	100
02:15 PM	2	0	2	56	0	23	18	0	3	2	13	25	10	9	1	35	199
02:30 PM	3	0	1	62	1	13	14	0	6	0	11	22	22	18	1	47	221
02:45 PM	7	1	4	0	3	9	0	0	2	1	6	0	6	17	7	0	63
<b>Total</b>	<b>13</b>	<b>1</b>	<b>8</b>	<b>118</b>	<b>5</b>	<b>59</b>	<b>38</b>	<b>0</b>	<b>22</b>	<b>3</b>	<b>42</b>	<b>47</b>	<b>46</b>	<b>85</b>	<b>14</b>	<b>82</b>	<b>583</b>
03:00 PM	5	6	3	3	0	12	1	0	1	2	4	3	9	19	3	5	76
03:15 PM	2	2	1	0	0	4	4	0	4	0	3	0	4	12	4	0	40
03:30 PM	1	1	2	0	1	18	2	0	8	0	3	0	9	16	1	0	62
03:45 PM	1	0	0	0	0	12	3	0	2	0	2	0	7	9	1	0	37
<b>Total</b>	<b>9</b>	<b>9</b>	<b>6</b>	<b>3</b>	<b>1</b>	<b>46</b>	<b>10</b>	<b>0</b>	<b>15</b>	<b>2</b>	<b>12</b>	<b>3</b>	<b>29</b>	<b>56</b>	<b>9</b>	<b>5</b>	<b>215</b>
<b>Grand Total</b>	<b>22</b>	<b>10</b>	<b>14</b>	<b>121</b>	<b>6</b>	<b>105</b>	<b>48</b>	<b>0</b>	<b>37</b>	<b>5</b>	<b>54</b>	<b>50</b>	<b>75</b>	<b>141</b>	<b>23</b>	<b>87</b>	<b>798</b>
Apprch %	13.2	6	8.4	72.5	3.8	66	30.2	0	25.3	3.4	37	34.2	23	43.3	7.1	26.7	
Total %	2.8	1.3	1.8	15.2	0.8	13.2	6	0	4.6	0.6	6.8	6.3	9.4	17.7	2.9	10.9	

Start Time	SMS Easterly Driveway From North					Forest Avenue From East					Sargent Road From South					Forest Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	1	0	1	0	2	1	14	6	0	21	11	0	12	0	23	8	41	5	0	54	100
02:15 PM	2	0	2	56	60	0	23	18	0	41	3	2	13	25	43	10	9	1	35	55	199
02:30 PM	3	0	1	62	66	1	13	14	0	28	6	0	11	22	39	22	18	1	47	88	221
02:45 PM	7	1	4	0	12	3	9	0	0	12	2	1	6	0	9	6	17	7	0	30	63
Total Volume	13	1	8	118	140	5	59	38	0	102	22	3	42	47	114	46	85	14	82	227	583
% App. Total	9.3	0.7	5.7	84.3		4.9	57.8	37.3	0		19.3	2.6	36.8	41.2		20.3	37.4	6.2	36.1		
PHF	.464	.250	.500	.476	.530	.417	.641	.528	.000	.622	.500	.375	.808	.470	.663	.523	.518	.500	.436	.645	.660

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Client: GEOD/C. Emilius

File Name : 04404CC

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Groups Printed- Trucks & Bikes

Start Time	SMS Easterly Driveway From North				Forest Avenue From East				Sargent Road From South				Forest Avenue From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	
Total %	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	

Start Time	SMS Easterly Driveway From North					Forest Avenue From East					Sargent Road From South					Forest Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:45 PM																					
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

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Client: GEOD/C. Emilius

File Name : 04404CC

Site Code : 04404

Start Date : 4/1/2014

Page No : 1

Groups Printed- School Buses

Start Time	SMS Easterly Driveway From North				Forest Avenue From East				Sargent Road From South				Forest Avenue From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
02:30 PM	0	0	0	0	0	1	0	0	0	0	1	0	1	1	0	0	4
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	0	0	0	0	0	1	0	0	1	0	2	0	1	1	0	0	6
03:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
<b>Grand Total</b>	0	0	0	0	0	1	0	0	1	0	3	0	1	1	0	0	7
<b>Apprch %</b>	0	0	0	0	0	100	0	0	25	0	75	0	50	50	0	0	
<b>Total %</b>	0	0	0	0	0	14.3	0	0	14.3	0	42.9	0	14.3	14.3	0	0	

Start Time	SMS Easterly Driveway From North					Forest Avenue From East					Sargent Road From South					Forest Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:15 PM																					
02:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	2
02:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	1	1	0	0	2	4
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
<b>Total Volume</b>	0	0	0	0	0	0	1	0	0	1	1	0	3	0	4	1	1	0	0	2	7
<b>% App. Total</b>	0	0	0	0	0	0	100	0	0		25	0	75	0		50	50	0	0		
<b>PHF</b>	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.250	.000	.750	.000	.500	.250	.250	.000	.000	.250	.438

# Transportation Data Corporation

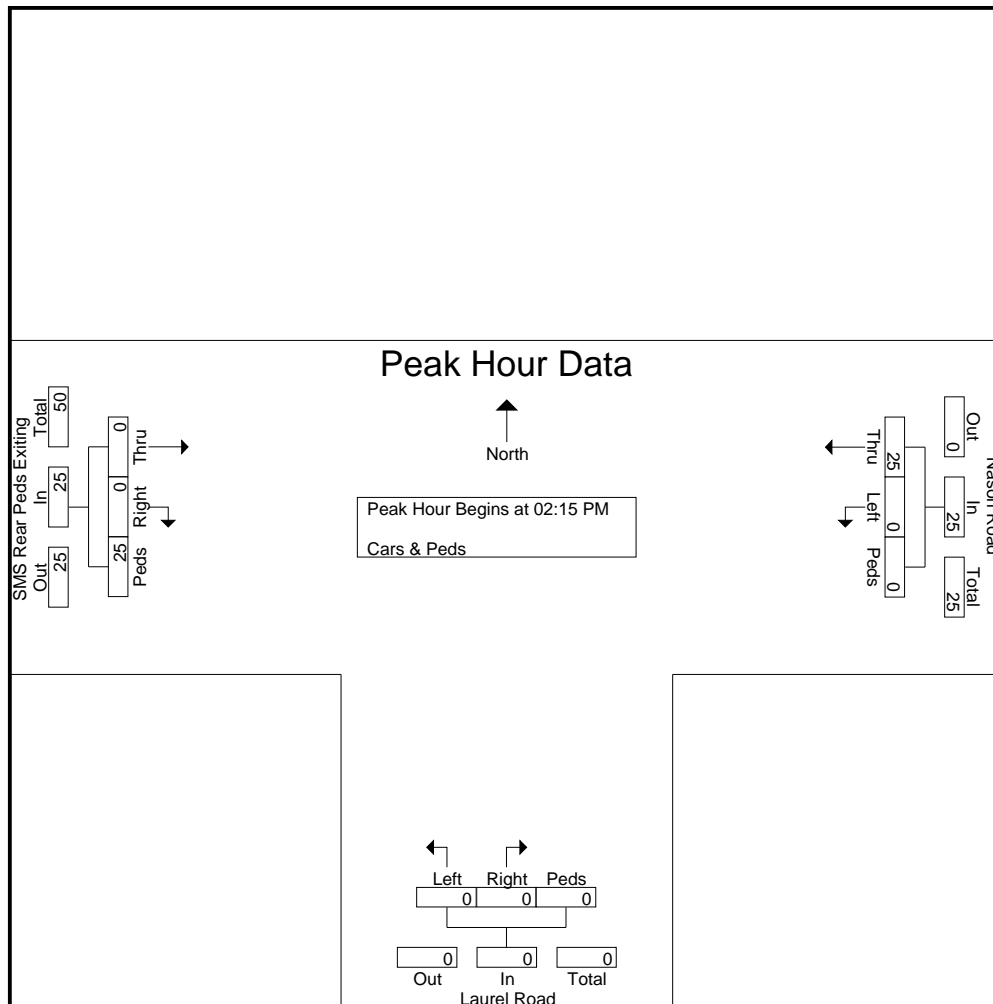
Mario Perone, mperone1@verizon.net

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S: Laurel Road  
 E/W: Nason Road/SMS Peds Only Access  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404DD  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Start Time	Nason Road From East				Laurel Road From South				SMS Rear Peds Exiting From West				Int. Total	
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total		
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 02:15 PM														
02:15 PM	16	0	0	16	0	0	0	0	0	0	0	9	9	25
02:30 PM	8	0	0	8	0	0	0	0	0	0	0	14	14	22
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	1	0	0	1	0	0	0	0	0	0	0	2	2	3
Total Volume	25	0	0	25	0	0	0	0	0	0	0	25	25	50
% App. Total	100	0	0		0	0	0		0	0	0	100		
PHF	.391	.000	.000	.391	.000	.000	.000	.000	.000	.000	.000	.446	.446	.500



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S: Laurel Road  
 E/W: Nason Road/SMS Peds Only Access  
 City, State: Swampscott, MA  
 Client: GEOD/C. Emilius

File Name : 04404DD  
 Site Code : 04404  
 Start Date : 4/1/2014  
 Page No : 1

Groups Printed- Cars & Peds

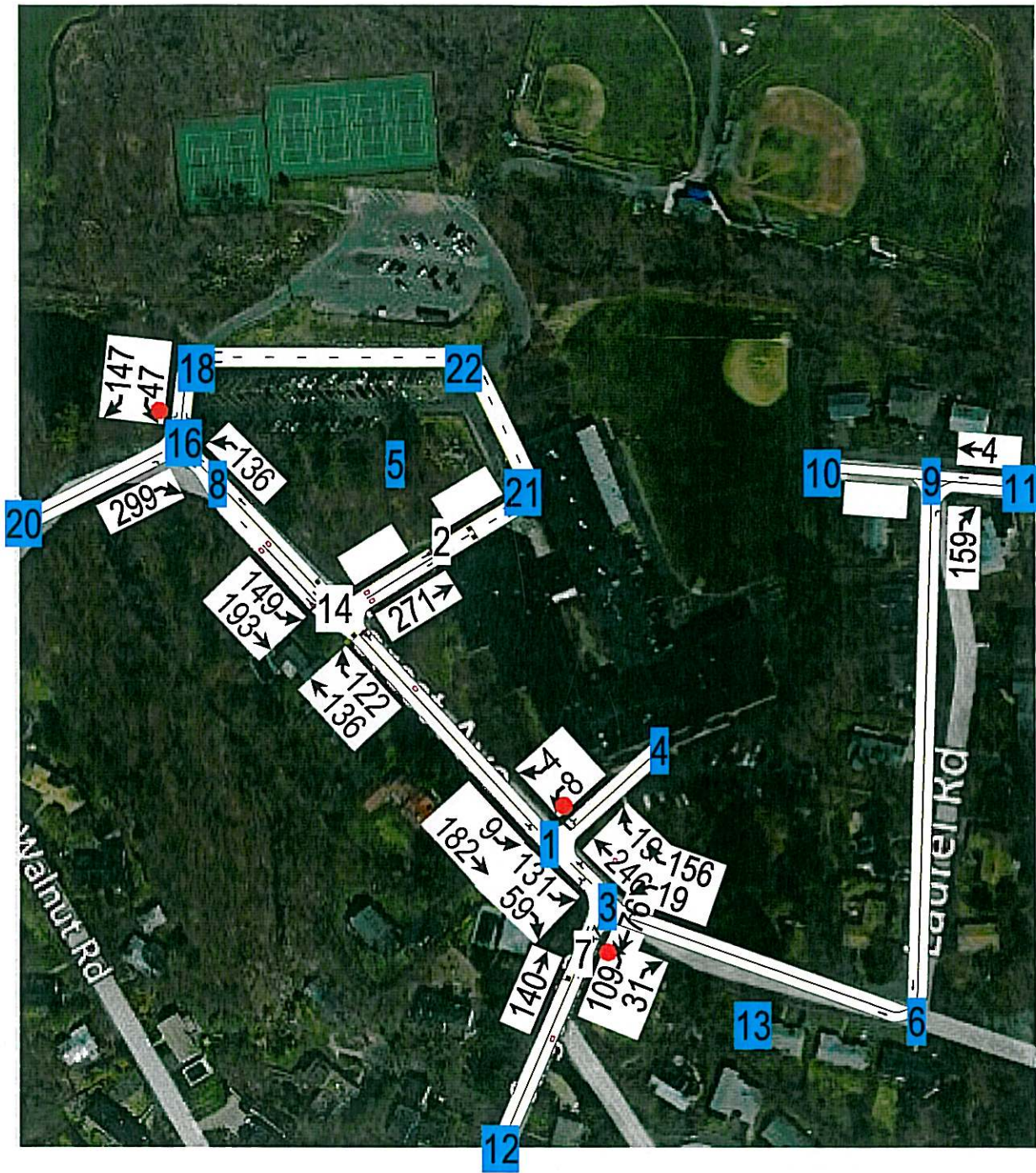
Start Time	Nason Road From East			Laurel Road From South			SMS Rear Peds Exiting From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
02:00 PM	0	0	0	0	0	0	0	0	0	0
02:15 PM	16	0	0	0	0	0	0	0	9	25
02:30 PM	8	0	0	0	0	0	0	0	14	22
02:45 PM	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>24</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>47</b>
03:00 PM	1	0	0	0	0	0	0	0	2	3
03:15 PM	0	0	0	0	0	0	0	0	1	1
03:30 PM	0	0	0	0	0	0	0	0	2	2
03:45 PM	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>6</b>
Grand Total	25	0	0	0	0	0	0	0	28	53
Apprch %	100	0	0	0	0	0	0	0	100	
Total %	47.2	0	0	0	0	0	0	0	52.8	

Start Time	Nason Road From East				Laurel Road From South				SMS Rear Peds Exiting From West				Int. Total	
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total		
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 02:15 PM														
02:15 PM	<b>16</b>	0	0	<b>16</b>	0	0	0	0	0	0	0	9	9	<b>25</b>
02:30 PM	8	0	0	8	0	0	0	0	0	0	0	<b>14</b>	<b>14</b>	22
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	1	0	0	1	0	0	0	0	0	0	0	2	2	3
Total Volume	25	0	0	25	0	0	0	0	0	0	0	25	25	50
% App. Total	100	0	0		0	0	0		0	0	0	100		
PHF	.391	.000	.000	.391	.000	.000	.000	.000	.000	.000	.000	.446	.446	.500



## **APPENDIX B**

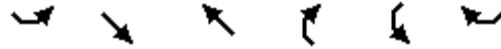
### **MIDDLE SCHOOL OPERATIONAL ANALYSIS CALCULATIONS**



# Lanes, Volumes, Timings

1:

4/28/2014



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	9	182	246	19	8	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.990		0.973	
Flt Protected		0.997			0.962	
Satd. Flow (prot)	0	1894	1814	0	1778	0
Flt Permitted		0.997			0.962	
Satd. Flow (perm)	0	1894	1814	0	1778	0
Link Speed (mph)		10	10		10	
Link Distance (ft)		395	105		180	
Travel Time (s)		26.9	7.2		12.3	
Confl. Peds. (#/hr)	80				51	
Peak Hour Factor	0.45	0.68	0.67	0.63	0.25	0.50
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%
Adj. Flow (vph)	20	268	367	30	32	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	288	397	0	40	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

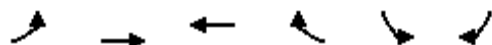
## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	26.9%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

2:

4/28/2014

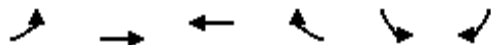


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø2
Lane Configurations		↑↑					
Volume (vph)	0	271	0	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	3610	0	0	0	0	
Flt Permitted							
Satd. Flow (perm)	0	3610	0	0	0	0	
Right Turn on Red	Yes			Yes	Yes	Yes	
Satd. Flow (RTOR)							
Link Speed (mph)		10	10		10		
Link Distance (ft)		157	118		112		
Travel Time (s)		10.7	8.0		7.6		
Peak Hour Factor	0.92	0.45	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	0	602	0	0	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	602	0	0	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		0	0		0		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15			9	15	9	
Turn Type		NA					
Protected Phases		4				2	
Permitted Phases							
Minimum Split (s)		3.0				3.5	
Total Split (s)		3.0				3.5	
Total Split (%)		46.2%				54%	
Maximum Green (s)		1.0				1.0	
Yellow Time (s)		2.0				2.0	
All-Red Time (s)		0.0				0.5	
Lost Time Adjust (s)		0.0					
Total Lost Time (s)		2.0					
Lead/Lag							
Lead-Lag Optimize?							
Act Effct Green (s)		1.0					
Actuated g/C Ratio		0.15					
v/c Ratio		1.08					
Control Delay		60.2					
Queue Delay		0.0					
Total Delay		60.2					
LOS		E					
Approach Delay		60.2					
Approach LOS		E					

# Lanes, Volumes, Timings

2:

4/28/2014



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø2
Stops (vph)		115					
Fuel Used(gal)		4					
CO Emissions (g/hr)		271					
NOx Emissions (g/hr)		53					
VOC Emissions (g/hr)		63					
Dilemma Vehicles (#)		0					
Queue Length 50th (ft)		0					
Queue Length 95th (ft)		0					
Internal Link Dist (ft)		77	38		32		
Turn Bay Length (ft)							
Base Capacity (vph)		555					
Starvation Cap Reductn		0					
Spillback Cap Reductn		0					
Storage Cap Reductn		0					
Reduced v/c Ratio		1.08					

## Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:Hold and 6:, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	1.08
Intersection Signal Delay:	60.2
Intersection LOS:	E
Intersection Capacity Utilization	10.8%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 2:



### Lanes, Volumes, Timings

3:

4/28/2014



Lane Group	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	19	156	109	31	131	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.880		0.980		0.949	
Flt Protected	0.994		0.959		0.970	
Satd. Flow (prot)	1662	0	1699	0	1749	0
Flt Permitted	0.994		0.959		0.970	
Satd. Flow (perm)	1662	0	1699	0	1749	0
Link Speed (mph)	10		10		10	
Link Distance (ft)	408		65		105	
Travel Time (s)	27.8		4.4		7.2	
Confl. Peds. (#/hr)	28	2	28			28
Peak Hour Factor	0.59	0.63	0.39	0.65	0.68	0.51
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%
Adj. Flow (vph)	32	248	279	48	193	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	280	0	327	0	309	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Stop		Free	

#### Intersection Summary









Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.6%
Analysis Period (min)	15
	ICU Level of Service A



# Lanes, Volumes, Timings

7:

4/28/2014

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø8
Lane Configurations							
Volume (vph)	0	0	140	0	0	76	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	0	1827	0	0	1900	
Flt Permitted							
Satd. Flow (perm)	0	0	1827	0	0	1900	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)							
Link Speed (mph)	10		10			10	
Link Distance (ft)	228		261			65	
Travel Time (s)	15.5		17.8			4.4	
Peak Hour Factor	0.92	0.92	0.39	0.92	0.92	0.51	
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	
Adj. Flow (vph)	0	0	359	0	0	149	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	359	0	0	149	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	0		0			0	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Turn Type			NA			NA	
Protected Phases			2			6	8
Permitted Phases							
Minimum Split (s)			3.0			3.0	3.5
Total Split (s)			3.0			3.0	3.5
Total Split (%)			46.2%			46.2%	54%
Maximum Green (s)			1.0			1.0	1.0
Yellow Time (s)			2.0			2.0	2.0
All-Red Time (s)			0.0			0.0	0.5
Lost Time Adjust (s)			0.0			0.0	
Total Lost Time (s)			2.0			2.0	
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)			1.0			1.0	
Actuated g/C Ratio			0.15			0.15	
v/c Ratio			1.28			0.51	
Control Delay			165.6			6.8	
Queue Delay			0.0			0.0	
Total Delay			165.6			6.8	
LOS			F			A	
Approach Delay			165.6			6.8	
Approach LOS			F			A	

Lanes, Volumes, Timings

7:

4/28/2014

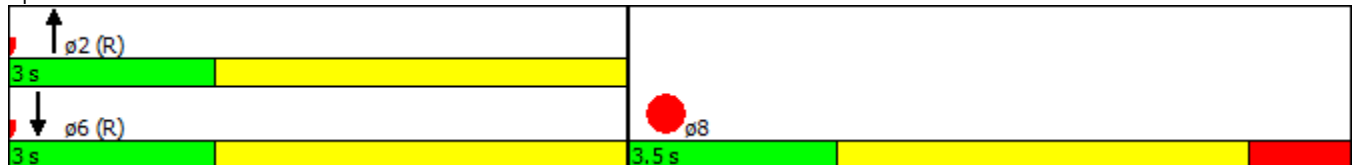


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø8
Stops (vph)			157			7	
Fuel Used(gal)			5			0	
CO Emissions (g/hr)			366			12	
NOx Emissions (g/hr)			71			2	
VOC Emissions (g/hr)			85			3	
Dilemma Vehicles (#)			0			0	
Queue Length 50th (ft)			0			0	
Queue Length 95th (ft)			0			m0	
Internal Link Dist (ft)	148		181			1	
Turn Bay Length (ft)							
Base Capacity (vph)			281			292	
Starvation Cap Reductn			0			0	
Spillback Cap Reductn			0			0	
Storage Cap Reductn			0			0	
Reduced v/c Ratio			1.28			0.51	

Intersection Summary

Area Type: Other  
 Cycle Length: 6.5  
 Actuated Cycle Length: 6.5  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Pretimed  
 Maximum v/c Ratio: 1.28  
 Intersection Signal Delay: 119.0  
 Intersection LOS: F  
 Intersection Capacity Utilization 10.7%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7:

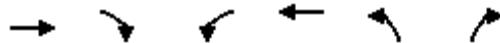




# Lanes, Volumes, Timings

9:

4/28/2014



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑		↗
Volume (vph)	0	0	0	4	0	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	0	0	1900	0	1644
Flt Permitted						
Satd. Flow (perm)	0	0	0	1900	0	1644
Link Speed (mph)	10			10	10	
Link Distance (ft)	135			111	668	
Travel Time (s)	9.2			7.6	45.5	
Confl. Peds. (#/hr)						11
Peak Hour Factor	0.92	0.92	0.92	0.33	0.92	0.68
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	12	0	234
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	12	0	234
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Stop			Free	Free	

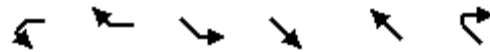
## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.4%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

14:

4/28/2014

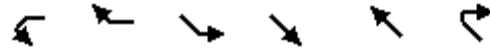


Lane Group	WBL	WBR	SEL	SET	NWT	NWR	ø8
Lane Configurations				↕↕	↕		
Volume (vph)	0	0	149	193	136	122	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00	
Ped Bike Factor							
Frt					0.924		
Flt Protected				0.972			
Satd. Flow (prot)	0	0	0	3509	1726	0	
Flt Permitted				0.955			
Satd. Flow (perm)	0	0	0	3448	1726	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)					249		
Link Speed (mph)	10			10	10		
Link Distance (ft)	157			212	395		
Travel Time (s)	10.7			14.5	26.9		
Confl. Peds. (#/hr)	95	41					
Peak Hour Factor	0.42	0.35	0.45	0.82	0.71	0.49	
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	
Adj. Flow (vph)	0	0	331	235	192	249	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	566	441	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Turn Type			Perm	NA	NA		
Protected Phases				6	2		8
Permitted Phases			6				
Minimum Split (s)			3.0	3.0	3.0		3.5
Total Split (s)			3.0	3.0	3.0		3.5
Total Split (%)			46.2%	46.2%	46.2%		54%
Maximum Green (s)			1.0	1.0	1.0		1.0
Yellow Time (s)			2.0	2.0	2.0		2.0
All-Red Time (s)			0.0	0.0	0.0		0.5
Lost Time Adjust (s)				0.0	0.0		
Total Lost Time (s)				2.0	2.0		
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)				1.0	1.0		
Actuated g/C Ratio				0.15	0.15		
v/c Ratio				1.13dl	0.93		
Control Delay				70.7	35.2		
Queue Delay				0.0	0.0		
Total Delay				70.7	35.2		
LOS				E	D		

Lanes, Volumes, Timings

14:

4/28/2014

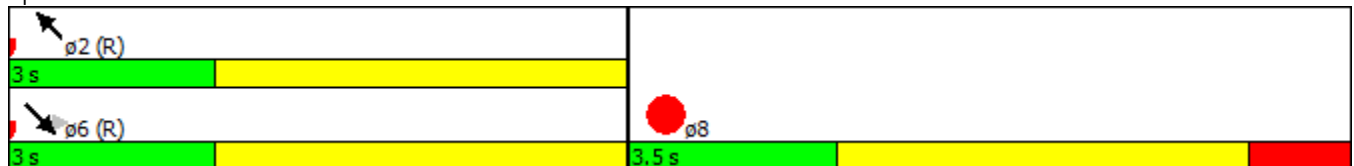


Lane Group	WBL	WBR	SEL	SET	NWT	NWR	ø8
Approach Delay				70.7	35.2		
Approach LOS				E	D		
Stops (vph)				172	59		
Fuel Used(gal)				6	3		
CO Emissions (g/hr)				428	214		
NOx Emissions (g/hr)				83	42		
VOC Emissions (g/hr)				99	50		
Dilemma Vehicles (#)				0	0		
Queue Length 50th (ft)				0	0		
Queue Length 95th (ft)				0	0		
Internal Link Dist (ft)	77			132	315		
Turn Bay Length (ft)							
Base Capacity (vph)				530	476		
Starvation Cap Reductn				0	0		
Spillback Cap Reductn				0	0		
Storage Cap Reductn				0	0		
Reduced v/c Ratio				1.07	0.93		

Intersection Summary

Area Type: Other  
 Cycle Length: 6.5  
 Actuated Cycle Length: 6.5  
 Offset: 0 (0%), Referenced to phase 2:NWT and 6:SETL, Start of Green  
 Natural Cycle: 40  
 Control Type: Pretimed  
 Maximum v/c Ratio: 1.07  
 Intersection Signal Delay: 55.2 Intersection LOS: E  
 Intersection Capacity Utilization 45.1% ICU Level of Service A  
 Analysis Period (min) 15  
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 14:



# Lanes, Volumes, Timings

16:

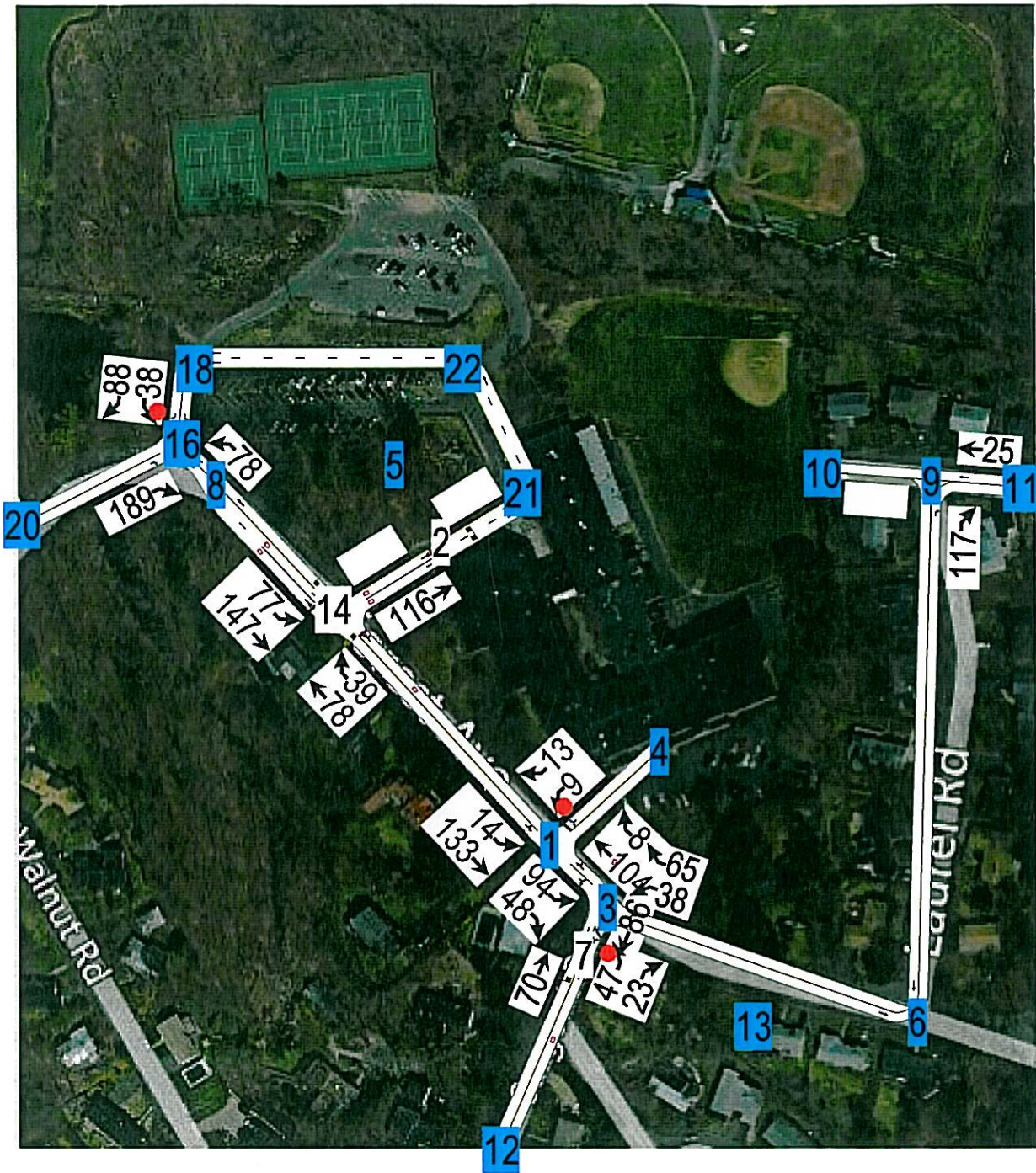
4/28/2014



Lane Group	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Volume (vph)	0	299	47	147	136	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865		0.850		
Flt Protected			0.950		0.950	
Satd. Flow (prot)	0	1644	1805	1615	1736	0
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	0	1644	1805	1615	1736	0
Link Speed (mph)	10		10		10	
Link Distance (ft)	223		93		66	
Travel Time (s)	15.2		6.3		4.5	
Confl. Peds. (#/hr)			58			
Peak Hour Factor	0.92	0.61	0.56	0.42	0.71	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%
Adj. Flow (vph)	0	490	84	350	192	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	490	84	350	192	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	0		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Stop		Free	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.8%
Analysis Period (min)	15
	ICU Level of Service A

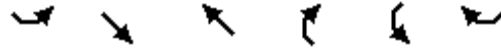




# Lanes, Volumes, Timings

1:

4/28/2014



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	14	133	104	8	9	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.986		0.941	
Flt Protected		0.995			0.973	
Satd. Flow (prot)	0	1890	1809	0	1740	0
Flt Permitted		0.995			0.973	
Satd. Flow (perm)	0	1890	1809	0	1740	0
Link Speed (mph)		10	10		10	
Link Distance (ft)		395	105		180	
Travel Time (s)		26.9	7.2		12.3	
Confl. Peds. (#/hr)	82				118	118
Peak Hour Factor	0.50	0.51	0.65	0.42	0.25	0.46
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%
Adj. Flow (vph)	28	261	160	19	36	28
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	289	179	0	64	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.3%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

2:

4/28/2014

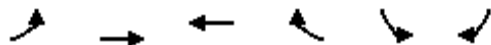


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø2
Lane Configurations		↑↑					
Volume (vph)	0	116	0	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	3610	0	0	0	0	
Flt Permitted							
Satd. Flow (perm)	0	3610	0	0	0	0	
Right Turn on Red	Yes			Yes	Yes	Yes	
Satd. Flow (RTOR)							
Link Speed (mph)		10	10		10		
Link Distance (ft)		157	118		112		
Travel Time (s)		10.7	8.0		7.6		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	0	126	0	0	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	126	0	0	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		0	0		0		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15			9	15	9	
Turn Type		NA					
Protected Phases		4				2	
Permitted Phases							
Minimum Split (s)		3.0				3.5	
Total Split (s)		3.0				3.5	
Total Split (%)		46.2%				54%	
Maximum Green (s)		1.0				1.0	
Yellow Time (s)		2.0				2.0	
All-Red Time (s)		0.0				0.5	
Lost Time Adjust (s)		0.0					
Total Lost Time (s)		2.0					
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)		1.0					
Actuated g/C Ratio		0.15					
v/c Ratio		0.23					
Control Delay		3.6					
Queue Delay		0.0					
Total Delay		3.6					
LOS		A					
Approach Delay		3.6					
Approach LOS		A					

# Lanes, Volumes, Timings

2:

4/28/2014

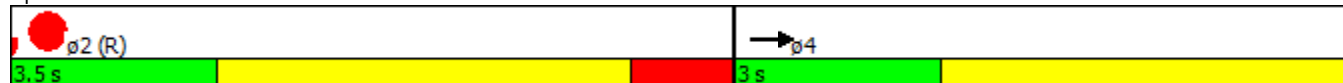


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø2
Stops (vph)		12					
Fuel Used(gal)		0					
CO Emissions (g/hr)		21					
NOx Emissions (g/hr)		4					
VOC Emissions (g/hr)		5					
Dilemma Vehicles (#)		0					
Queue Length 50th (ft)		0					
Queue Length 95th (ft)		m0					
Internal Link Dist (ft)		77	38		32		
Turn Bay Length (ft)							
Base Capacity (vph)		555					
Starvation Cap Reductn		0					
Spillback Cap Reductn		0					
Storage Cap Reductn		0					
Reduced v/c Ratio		0.23					

## Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:Hold and 6:, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	0.23
Intersection Signal Delay:	3.6
Intersection LOS:	A
Intersection Capacity Utilization:	6.7%
ICU Level of Service:	A
Analysis Period (min):	15
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2:





# Lanes, Volumes, Timings

3:

4/28/2014



Lane Group	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	38	65	47	23	94	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.922		0.965		0.954	
Flt Protected	0.979		0.964		0.968	
Satd. Flow (prot)	1715	0	1693	0	1755	0
Flt Permitted	0.979		0.964		0.968	
Satd. Flow (perm)	1715	0	1693	0	1755	0
Link Speed (mph)	10		10		10	
Link Distance (ft)	408		65		105	
Travel Time (s)	27.8		4.4		7.2	
Confl. Peds. (#/hr)			47			82
Confl. Bikes (#/hr)				47		
Peak Hour Factor	0.53	0.65	0.38	0.52	0.52	0.51
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%
Adj. Flow (vph)	72	100	124	44	181	94
Shared Lane Traffic (%)						
Lane Group Flow (vph)	172	0	168	0	275	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Stop		Free	









## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.2%
ICU Level of Service	A
Analysis Period (min)	15

# Lanes, Volumes, Timings

7:

4/28/2014

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø8
Lane Configurations							
Volume (vph)	0	0	70	0	0	86	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	0	1827	0	0	1900	
Flt Permitted							
Satd. Flow (perm)	0	0	1827	0	0	1900	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)							
Link Speed (mph)	10		10			10	
Link Distance (ft)	228		261			65	
Travel Time (s)	15.5		17.8			4.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	
Adj. Flow (vph)	0	0	76	0	0	93	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	76	0	0	93	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	0		0			0	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Turn Type			NA			NA	
Protected Phases			2			6	8
Permitted Phases							
Minimum Split (s)			3.0			3.0	3.5
Total Split (s)			3.0			3.0	3.5
Total Split (%)			46.2%			46.2%	54%
Maximum Green (s)			1.0			1.0	1.0
Yellow Time (s)			2.0			2.0	2.0
All-Red Time (s)			0.0			0.0	0.5
Lost Time Adjust (s)			0.0			0.0	
Total Lost Time (s)			2.0			2.0	
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)			1.0			1.0	
Actuated g/C Ratio			0.15			0.15	
v/c Ratio			0.27			0.32	
Control Delay			4.9			4.5	
Queue Delay			0.0			0.0	
Total Delay			4.9			4.5	
LOS			A			A	
Approach Delay			4.9			4.5	
Approach LOS			A			A	

# Lanes, Volumes, Timings

7:

4/28/2014

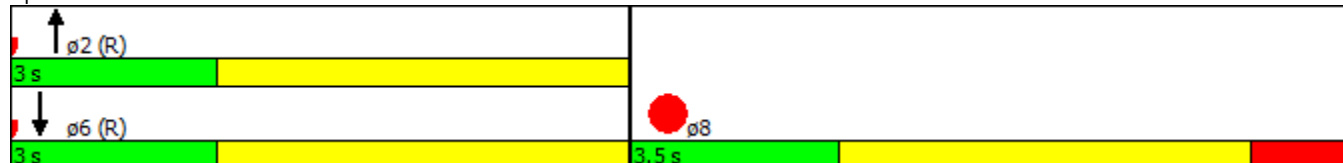


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø8
Stops (vph)			9			8	
Fuel Used(gal)			0			0	
CO Emissions (g/hr)			20			10	
NOx Emissions (g/hr)			4			2	
VOC Emissions (g/hr)			5			2	
Dilemma Vehicles (#)			0			0	
Queue Length 50th (ft)			0			0	
Queue Length 95th (ft)			0			m0	
Internal Link Dist (ft)	148		181			1	
Turn Bay Length (ft)							
Base Capacity (vph)			281			292	
Starvation Cap Reductn			0			0	
Spillback Cap Reductn			0			0	
Storage Cap Reductn			0			0	
Reduced v/c Ratio			0.27			0.32	

## Intersection Summary

Area Type: Other  
 Cycle Length: 6.5  
 Actuated Cycle Length: 6.5  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.32  
 Intersection Signal Delay: 4.7  
 Intersection LOS: A  
 Intersection Capacity Utilization 7.9%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

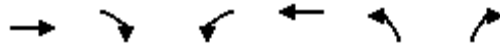
## Splits and Phases: 7:



# Lanes, Volumes, Timings

9:

4/28/2014



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑		↗
Volume (vph)	0	0	0	25	0	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	0	0	1900	0	1644
Flt Permitted						
Satd. Flow (perm)	0	0	0	1900	0	1644
Link Speed (mph)	10			10	10	
Link Distance (ft)	135			111	668	
Travel Time (s)	9.2			7.6	45.5	
Confl. Peds. (#/hr)						11
Peak Hour Factor	0.92	0.92	0.92	0.39	0.92	0.52
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	64	0	225
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	64	0	225
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Stop			Free	Free	

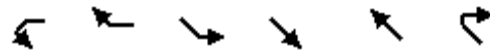
## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.4%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

14:

4/28/2014

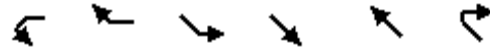


Lane Group	WBL	WBR	SEL	SET	NWT	NWR	ø8
Lane Configurations				↕↕	↕		
Volume (vph)	0	0	77	147	78	39	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00	
Ped Bike Factor				0.97	0.99		
Frt					0.949		
Flt Protected				0.984			
Satd. Flow (prot)	0	0	0	3552	1746	0	
Flt Permitted				0.955			
Satd. Flow (perm)	0	0	0	3355	1746	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)					56		
Link Speed (mph)	10			10	10		
Link Distance (ft)	157			212	395		
Travel Time (s)	10.7			14.5	26.9		
Confl. Peds. (#/hr)	177	52	52			4	
Peak Hour Factor	0.92	0.92	0.74	0.68	0.85	0.70	
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	
Adj. Flow (vph)	0	0	104	216	92	56	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	320	148	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Turn Type			Perm	NA	NA		
Protected Phases				6	2		8
Permitted Phases			6				
Minimum Split (s)			3.0	3.0	3.0		3.5
Total Split (s)			3.0	3.0	3.0		3.5
Total Split (%)			46.2%	46.2%	46.2%		54%
Maximum Green (s)			1.0	1.0	1.0		1.0
Yellow Time (s)			2.0	2.0	2.0		2.0
All-Red Time (s)			0.0	0.0	0.0		0.5
Lost Time Adjust (s)				0.0	0.0		
Total Lost Time (s)				2.0	2.0		
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)				1.0	1.0		
Actuated g/C Ratio				0.15	0.15		
v/c Ratio				0.62	0.47		
Control Delay				8.9	6.7		
Queue Delay				0.0	0.0		
Total Delay				8.9	6.7		
LOS				A	A		

Lanes, Volumes, Timings

14:

4/28/2014

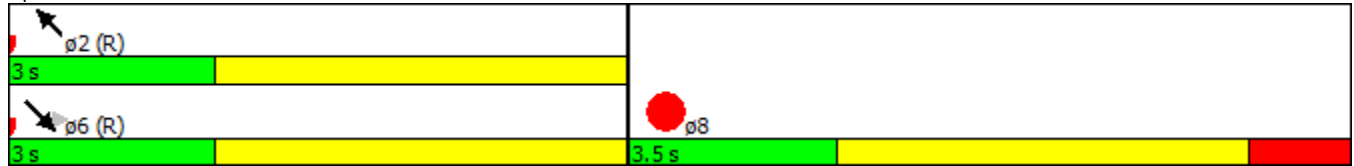


Lane Group	WBL	WBR	SEL	SET	NWT	NWR	ø8
Approach Delay				8.9	6.7		
Approach LOS				A	A		
Stops (vph)				33	13		
Fuel Used(gal)				1	1		
CO Emissions (g/hr)				80	49		
NOx Emissions (g/hr)				16	10		
VOC Emissions (g/hr)				19	11		
Dilemma Vehicles (#)				0	0		
Queue Length 50th (ft)				0	0		
Queue Length 95th (ft)				0	0		
Internal Link Dist (ft)	77			132	315		
Turn Bay Length (ft)							
Base Capacity (vph)				516	316		
Starvation Cap Reductn				0	0		
Spillback Cap Reductn				0	0		
Storage Cap Reductn				0	0		
Reduced v/c Ratio				0.62	0.47		

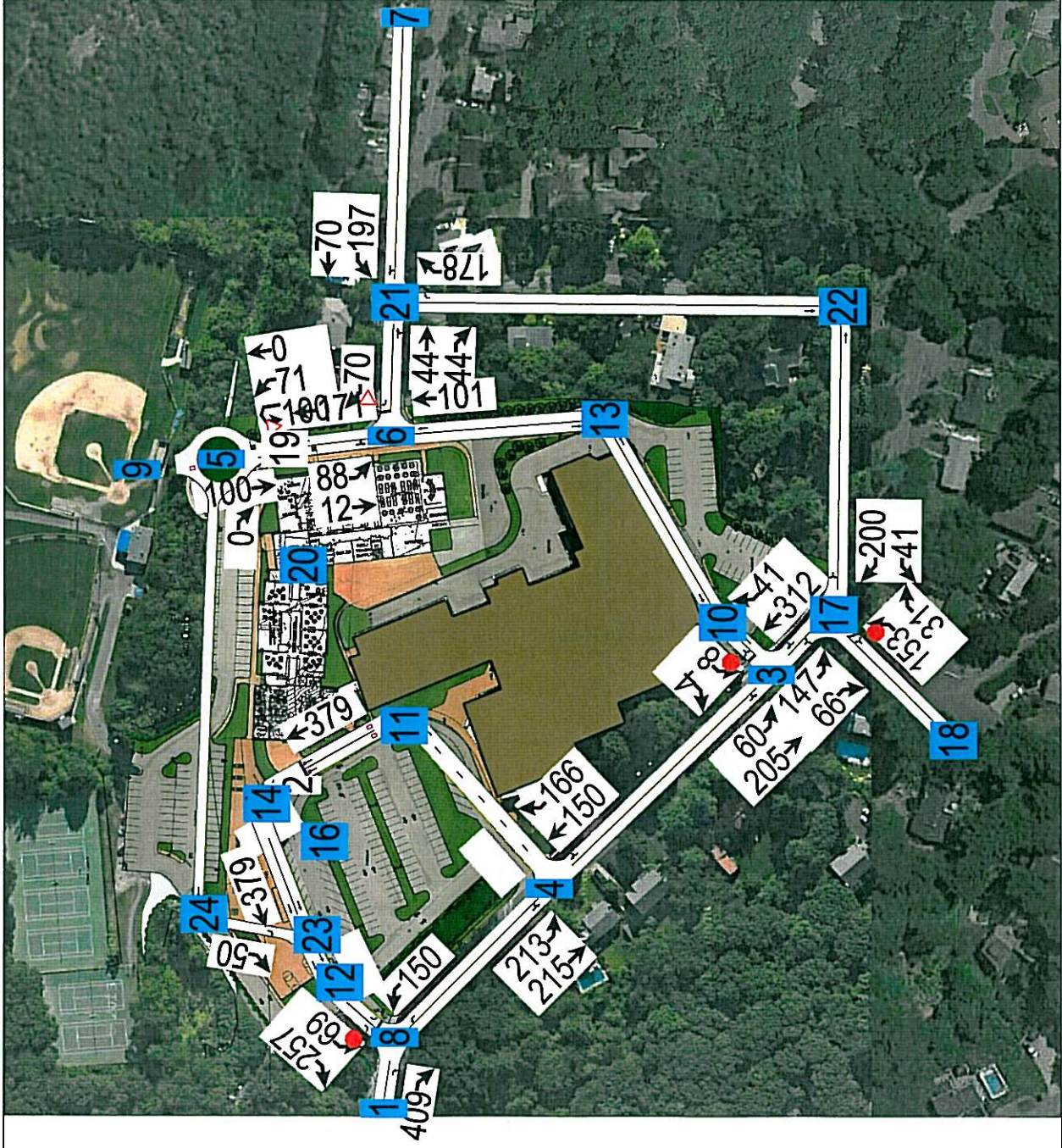
Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:NWT and 6:SETL, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	8.2
Intersection LOS:	A
Intersection Capacity Utilization	29.2%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 14:







# Lanes, Volumes, Timings

2:

4/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Lane Configurations				↑↑			
Volume (vph)	0	0	0	379	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	0	0	3574	0	0	
Flt Permitted							
Satd. Flow (perm)	0	0	0	3574	0	0	
Right Turn on Red	Yes	Yes	Yes			Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	10			10	10		
Link Distance (ft)	76			150	44		
Travel Time (s)	5.2			10.2	3.0		
Peak Hour Factor	0.92	0.92	0.92	0.45	0.92	0.92	
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	
Adj. Flow (vph)	0	0	0	842	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	842	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Turn Type							
Protected Phases				2		4	
Permitted Phases							
Minimum Split (s)				3.0		3.5	
Total Split (s)				3.0		3.5	
Total Split (%)				46.2%		54%	
Maximum Green (s)				1.0		1.0	
Yellow Time (s)				2.0		2.0	
All-Red Time (s)				0.0		0.5	
Lost Time Adjust (s)				0.0			
Total Lost Time (s)				2.0			
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)				1.0			
Actuated g/C Ratio				0.15			
v/c Ratio				1.53			
Control Delay				264.5			
Queue Delay				0.0			
Total Delay				264.5			
LOS				F			
Approach Delay				264.5			
Approach LOS				F			



Lanes, Volumes, Timings

2:

4/28/2014

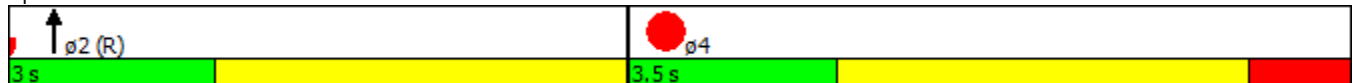


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Stops (vph)				685			
Fuel Used(gal)				23			
CO Emissions (g/hr)				1584			
NOx Emissions (g/hr)				308			
VOC Emissions (g/hr)				367			
Dilemma Vehicles (#)				0			
Queue Length 50th (ft)				-15			
Queue Length 95th (ft)				0			
Internal Link Dist (ft)	1			70	1		
Turn Bay Length (ft)							
Base Capacity (vph)				549			
Starvation Cap Reductn				0			
Spillback Cap Reductn				0			
Storage Cap Reductn				0			
Reduced v/c Ratio				1.53			

Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:NBT and 6:, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	1.53
Intersection Signal Delay:	264.5
Intersection LOS:	F
Intersection Capacity Utilization:	20.5%
ICU Level of Service:	A
Analysis Period (min):	15
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	

Splits and Phases: 2:



# Lanes, Volumes, Timings

3:

4/28/2014



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	60	205	312	41	8	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Flt			0.983		0.973	
Flt Protected		0.988			0.962	
Satd. Flow (prot)	0	1877	1820	0	1778	0
Flt Permitted		0.988			0.962	
Satd. Flow (perm)	0	1877	1820	0	1778	0
Link Speed (mph)		10	10		10	
Link Distance (ft)		379	107		88	
Travel Time (s)		25.8	7.3		6.0	
Confl. Peds. (#/hr)	80			2	51	
Peak Hour Factor	0.45	0.51	0.67	0.62	0.25	0.50
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%
Adj. Flow (vph)	133	402	466	66	32	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	535	532	0	40	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.4%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

4:

4/28/2014



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↕	↗			
Volume (vph)	213	215	150	166	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.917			
Flt Protected		0.969				
Satd. Flow (prot)	0	1841	1700	0	0	0
Flt Permitted		0.969				
Satd. Flow (perm)	0	1841	1700	0	0	0
Link Speed (mph)		10	10		10	
Link Distance (ft)		263	379		267	
Travel Time (s)		17.9	25.8		18.2	
Confl. Peds. (#/hr)	41			95	95	
Peak Hour Factor	0.45	0.82	0.71	0.49	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	473	262	211	339	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	735	550	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.9%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

5:

4/28/2014



Lane Group	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations					↕	↕	
Volume (vph)	0	0	100	71	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt							
Flt Protected					0.950		
Satd. Flow (prot)	0	0	0	0	1805	1900	0
Flt Permitted					0.950		
Satd. Flow (perm)	0	0	0	0	1805	1900	0
Link Speed (mph)	10				10	10	
Link Distance (ft)	558				79	105	
Travel Time (s)	38.0				5.4	7.2	
Peak Hour Factor	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	250	178	0	0	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	0	428	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	0				0	0	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	9	15			9
Sign Control	Yield				Yield	Yield	

## Intersection Summary

Area Type:	Other
Control Type:	Roundabout
Intersection Capacity Utilization	12.8%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

6:

4/28/2014



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	70	101	0	88	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						0.958
Satd. Flow (prot)	0	1644	1900	0	0	1820
Flt Permitted						0.958
Satd. Flow (perm)	0	1644	1900	0	0	1820
Link Speed (mph)	10		10			10
Link Distance (ft)	164		264			132
Travel Time (s)	11.2		18.0			9.0
Peak Hour Factor	0.40	0.40	0.40	0.40	0.40	0.40
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	175	253	0	220	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	175	252	0	0	250
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Yield		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.3%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

8:

4/28/2014



Lane Group	EBL	EBR	NWL	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	0	409	150	0	69	257
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	0	1644	1805	0	1805	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	0	1644	1805	0	1805	1583
Link Speed (mph)	10		10		10	
Link Distance (ft)	88		263		95	
Travel Time (s)	6.0		17.9		6.5	
Confl. Peds. (#/hr)		1			58	
Peak Hour Factor	0.92	0.61	0.71	0.92	0.56	0.42
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%
Adj. Flow (vph)	0	670	211	0	123	612
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	670	211	0	123	612
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	0		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Free		Stop	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.8%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

17:

4/28/2014



Lane Group	WBL	WBR	SEL	SER	NEL	NER
Lane Configurations						
Volume (vph)	41	200	147	66	153	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.889		0.950		0.985	
Flt Protected	0.991		0.970		0.957	
Satd. Flow (prot)	1674	0	1751	0	1729	0
Flt Permitted	0.991		0.970		0.957	
Satd. Flow (perm)	1674	0	1751	0	1729	0
Link Speed (mph)	10		10		10	
Link Distance (ft)	379		107		213	
Travel Time (s)	25.8		7.3		14.5	
Confl. Peds. (#/hr)	2	2	80	80	28	28
Peak Hour Factor	0.63	0.67	0.68	0.51	0.39	0.65
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%
Adj. Flow (vph)	65	299	216	129	392	48
Shared Lane Traffic (%)						
Lane Group Flow (vph)	364	0	345	0	440	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.0%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

19:

4/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Lane Configurations				↑	↑		
Volume (vph)	0	0	0	171	100	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	0	0	1900	1900	0	
Flt Permitted							
Satd. Flow (perm)	0	0	0	1900	1900	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	145			132	79		
Travel Time (s)	3.3			3.0	1.8		
Peak Hour Factor	0.40	0.40	0.40	0.40	0.40	0.40	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	0	0	0	428	250	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	428	250	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Turn Type							
Protected Phases				2	6	4	
Permitted Phases							
Minimum Split (s)				3.0	3.0	3.5	
Total Split (s)				3.0	3.0	3.5	
Total Split (%)				46.2%	46.2%	54%	
Maximum Green (s)				1.0	1.0	1.0	
Yellow Time (s)				2.0	2.0	2.0	
All-Red Time (s)				0.0	0.0	0.5	
Lost Time Adjust (s)				0.0	0.0		
Total Lost Time (s)				2.0	2.0		
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)				1.0	1.0		
Actuated g/C Ratio				0.15	0.15		
v/c Ratio				1.47	0.86		
Control Delay				243.8	37.4		
Queue Delay				0.0	0.0		
Total Delay				243.8	37.4		
LOS				F	D		
Approach Delay				243.8	37.4		
Approach LOS				F	D		



Lanes, Volumes, Timings

19:

4/28/2014

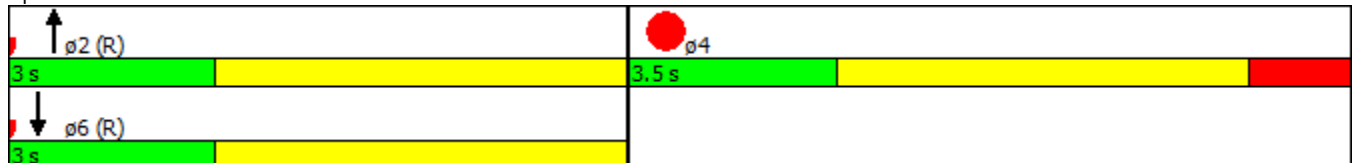


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Stops (vph)				283	28		
Fuel Used(gal)				10	1		
CO Emissions (g/hr)				715	68		
NOx Emissions (g/hr)				139	13		
VOC Emissions (g/hr)				166	16		
Dilemma Vehicles (#)				0	0		
Queue Length 50th (ft)				0	0		
Queue Length 95th (ft)				0	0		
Internal Link Dist (ft)	65			52	1		
Turn Bay Length (ft)							
Base Capacity (vph)				292	292		
Starvation Cap Reductn				0	0		
Spillback Cap Reductn				0	0		
Storage Cap Reductn				0	0		
Reduced v/c Ratio				1.47	0.86		

Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	1.47
Intersection Signal Delay:	167.7
Intersection LOS:	F
Intersection Capacity Utilization	12.3%
ICU Level of Service	A
Analysis Period (min)	15

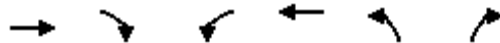
Splits and Phases: 19:



# Lanes, Volumes, Timings

21:

4/28/2014



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	44	44	197	70	0	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.932				0.865	
Flt Protected				0.964		
Satd. Flow (prot)	1771	0	0	1832	0	1644
Flt Permitted				0.964		
Satd. Flow (perm)	1771	0	0	1832	0	1644
Link Speed (mph)	10			10	10	
Link Distance (ft)	164			348	551	
Travel Time (s)	11.2			23.7	37.6	
Confl. Peds. (#/hr)		11				
Peak Hour Factor	0.33	0.33	0.33	0.33	0.92	0.33
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	133	133	597	212	0	539
Shared Lane Traffic (%)						
Lane Group Flow (vph)	266	0	0	809	0	539
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

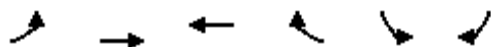
## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	25.6%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

23:

4/28/2014



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑			↗
Volume (vph)	0	0	379	0	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.865
Flt Protected						
Satd. Flow (prot)	0	0	3539	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	0	3539	0	0	1611
Link Speed (mph)		10	10		30	
Link Distance (ft)		64	172		141	
Travel Time (s)		4.4	11.7		3.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	412	0	0	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	412	0	0	54
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.5%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

16:

4/28/2014



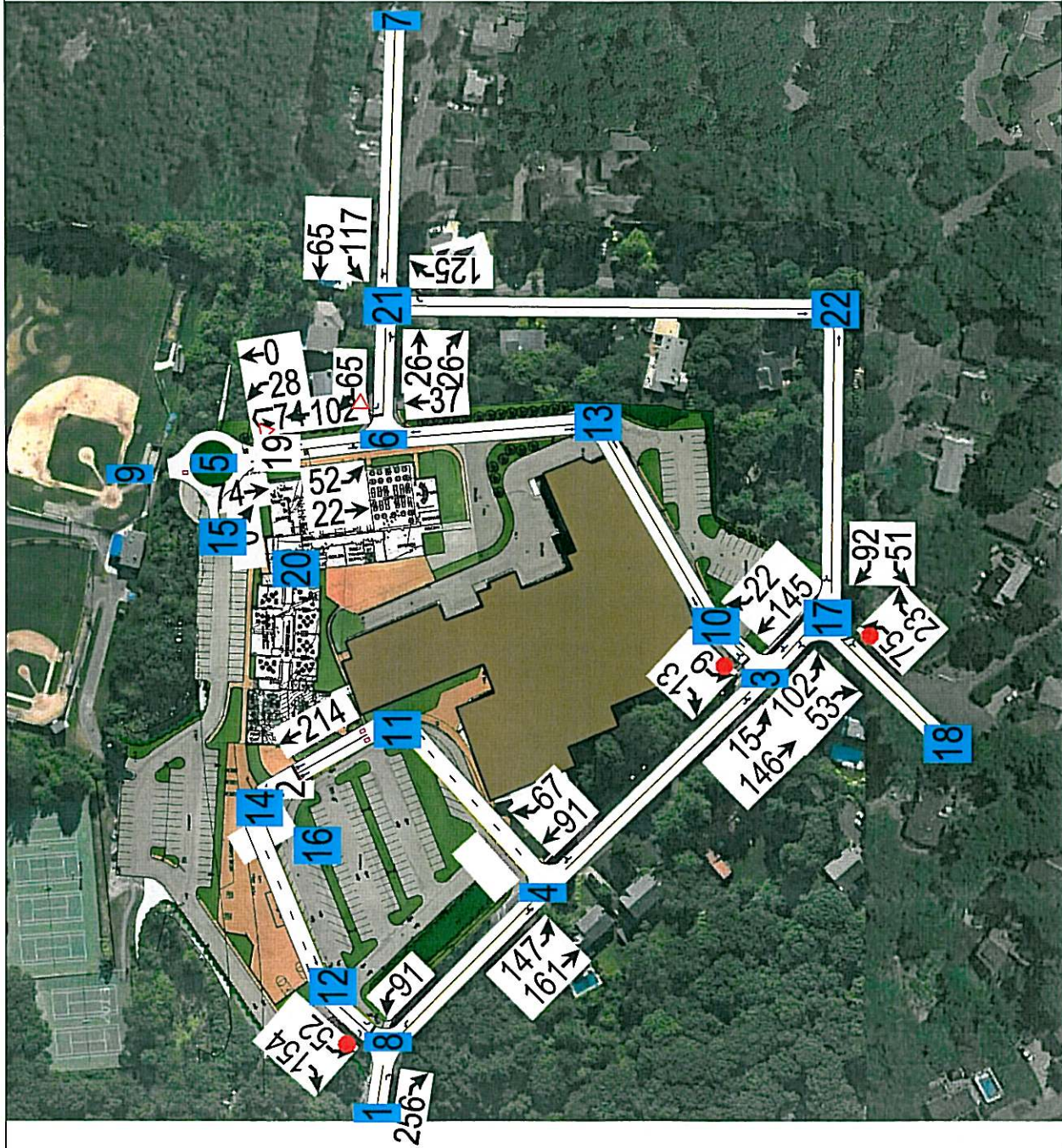
Lane Group	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Volume (vph)	0	189	38	88	78	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865		0.850		
Flt Protected			0.950		0.950	
Satd. Flow (prot)	0	1644	1805	1615	1736	0
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	0	1644	1805	1615	1736	0
Link Speed (mph)	10		10		10	
Link Distance (ft)	223		93		66	
Travel Time (s)	15.2		6.3		4.5	
Confl. Peds. (#/hr)			104			
Peak Hour Factor	0.92	0.82	0.68	0.46	0.88	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%
Adj. Flow (vph)	0	230	56	191	89	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	230	56	191	89	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	0		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Stop		Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.0%
Analysis Period (min)	15
	ICU Level of Service A

Map - Shaw School  
Node Numbers

4/28/2014



Shaw School Baseline

P:\13630MB Swampscott School Traffic\Synchro\13630MB\_Swampscott\_PM\_Build\_042414.syn



# Lanes, Volumes, Timings

2:

4/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Lane Configurations				↑↑			
Volume (vph)	0	0	0	214	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	0	0	3574	0	0	
Flt Permitted							
Satd. Flow (perm)	0	0	0	3574	0	0	
Right Turn on Red	Yes	Yes	Yes			Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	10			10	10		
Link Distance (ft)	76			150	44		
Travel Time (s)	5.2			10.2	3.0		
Peak Hour Factor	0.92	0.92	0.92	0.45	0.92	0.92	
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	
Adj. Flow (vph)	0	0	0	476	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	476	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Turn Type				NA			
Protected Phases				2		4	
Permitted Phases							
Minimum Split (s)				3.0		3.5	
Total Split (s)				3.0		3.5	
Total Split (%)				46.2%		54%	
Maximum Green (s)				1.0		1.0	
Yellow Time (s)				2.0		2.0	
All-Red Time (s)				0.0		0.5	
Lost Time Adjust (s)				0.0			
Total Lost Time (s)				2.0			
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)				1.0			
Actuated g/C Ratio				0.15			
v/c Ratio				0.87			
Control Delay				24.9			
Queue Delay				0.0			
Total Delay				24.9			
LOS				C			
Approach Delay				24.9			
Approach LOS				C			

# Lanes, Volumes, Timings

2:

4/28/2014

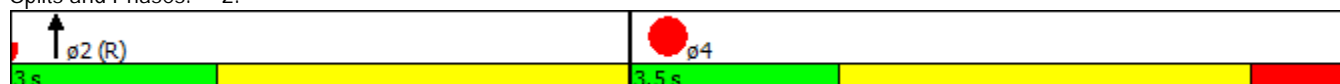


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Stops (vph)				47			
Fuel Used(gal)				2			
CO Emissions (g/hr)				150			
NOx Emissions (g/hr)				29			
VOC Emissions (g/hr)				35			
Dilemma Vehicles (#)				0			
Queue Length 50th (ft)				0			
Queue Length 95th (ft)				0			
Internal Link Dist (ft)	1			70	1		
Turn Bay Length (ft)							
Base Capacity (vph)				549			
Starvation Cap Reductn				0			
Spillback Cap Reductn				0			
Storage Cap Reductn				0			
Reduced v/c Ratio				0.87			

## Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:NBT and 6:, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	0.87
Intersection Signal Delay:	24.9
Intersection LOS:	C
Intersection Capacity Utilization:	9.2%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 2:



# Lanes, Volumes, Timings

3:

4/28/2014



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	15	146	145	22	9	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.974		0.941	
Flt Protected		0.995			0.973	
Satd. Flow (prot)	0	1890	1807	0	1740	0
Flt Permitted		0.995			0.973	
Satd. Flow (perm)	0	1890	1807	0	1740	0
Link Speed (mph)		10	10		10	
Link Distance (ft)		379	107		88	
Travel Time (s)		25.8	7.3		6.0	
Confl. Peds. (#/hr)	82				118	
Peak Hour Factor	0.50	0.51	0.65	0.42	0.25	0.46
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%
Adj. Flow (vph)	30	286	223	52	36	28
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	316	275	0	64	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

## Intersection Summary

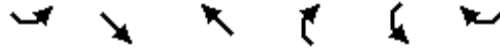
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.2%
Analysis Period (min)	15
	ICU Level of Service A



# Lanes, Volumes, Timings

4:

4/28/2014



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	147	161	91	67	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.936			
Flt Protected		0.978				
Satd. Flow (prot)	0	1858	1745	0	0	0
Flt Permitted		0.978				
Satd. Flow (perm)	0	1858	1745	0	0	0
Link Speed (mph)		10	10		10	
Link Distance (ft)		263	379		267	
Travel Time (s)		17.9	25.8		18.2	
Confl. Peds. (#/hr)	52			4	177	
Peak Hour Factor	0.74	0.68	0.85	0.70	0.42	0.92
Heavy Vehicles (%)	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	199	237	107	96	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	436	203	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.9%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

5:

4/28/2014



Lane Group	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations					↕	↕	
Volume (vph)	0	0	74	28	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt							
Flt Protected					0.950		
Satd. Flow (prot)	0	0	0	0	1805	1900	0
Flt Permitted					0.950		
Satd. Flow (perm)	0	0	0	0	1805	1900	0
Link Speed (mph)	10				10	10	
Link Distance (ft)	92				79	105	
Travel Time (s)	6.3				5.4	7.2	
Peak Hour Factor	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	185	70	0	0	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	0	255	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	0				0	0	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	9	15			9
Sign Control	Yield				Yield	Yield	

## Intersection Summary

Area Type:	Other
Control Type:	Roundabout
Intersection Capacity Utilization	9.0%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

6:

4/28/2014



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	65	37	0	52	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						0.966
Satd. Flow (prot)	0	1644	1900	0	0	1835
Flt Permitted						0.966
Satd. Flow (perm)	0	1644	1900	0	0	1835
Link Speed (mph)	10		10			10
Link Distance (ft)	164		264			132
Travel Time (s)	11.2		18.0			9.0
Peak Hour Factor	0.40	0.40	0.40	0.40	0.40	0.40
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	163	93	0	130	55
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	162	92	0	0	185
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Yield		Free			Free

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.0%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

8:

4/28/2014



Lane Group	EBL	EBR	NWL	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	0	256	91	0	52	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	0	1644	1805	0	1805	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	0	1644	1805	0	1805	1583
Link Speed (mph)	10		10		10	
Link Distance (ft)	88		263		95	
Travel Time (s)	6.0		17.9		6.5	
Confl. Peds. (#/hr)					104	
Peak Hour Factor	0.92	0.82	0.88	0.92	0.68	0.46
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%
Adj. Flow (vph)	0	312	103	0	76	335
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	312	103	0	76	335
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	0		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Free		Stop	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.2%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

17:

4/28/2014



Lane Group	WBL	WBR	SEL	SER	NEL	NER
Lane Configurations						
Volume (vph)	51	92	102	53	75	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.906		0.953		0.975	
Flt Protected	0.985		0.968		0.961	
Satd. Flow (prot)	1696	0	1753	0	1724	0
Flt Permitted	0.985		0.968		0.961	
Satd. Flow (perm)	1696	0	1753	0	1724	0
Link Speed (mph)	10		10		10	
Link Distance (ft)	379		107		213	
Travel Time (s)	25.8		7.3		14.5	
Confl. Peds. (#/hr)		2	82		47	
Peak Hour Factor	0.53	0.42	0.52	0.51	0.38	0.52
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%
Adj. Flow (vph)	96	219	196	104	197	44
Shared Lane Traffic (%)						
Lane Group Flow (vph)	315	0	300	0	241	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Free		Stop	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.4%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

19:

4/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Lane Configurations				↑	↑		
Volume (vph)	0	0	0	102	74	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	0	0	1900	1900	0	
Flt Permitted							
Satd. Flow (perm)	0	0	0	1900	1900	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	145			132	79		
Travel Time (s)	3.3			3.0	1.8		
Peak Hour Factor	0.40	0.40	0.40	0.40	0.40	0.40	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	0	0	0	255	185	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	255	185	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Turn Type							
Protected Phases				2	6	4	
Permitted Phases							
Minimum Split (s)				3.0	3.0	3.5	
Total Split (s)				3.0	3.0	3.5	
Total Split (%)				46.2%	46.2%	54%	
Maximum Green (s)				1.0	1.0	1.0	
Yellow Time (s)				2.0	2.0	2.0	
All-Red Time (s)				0.0	0.0	0.5	
Lost Time Adjust (s)				0.0	0.0		
Total Lost Time (s)				2.0	2.0		
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)				1.0	1.0		
Actuated g/C Ratio				0.15	0.15		
v/c Ratio				0.87	0.63		
Control Delay				40.1	16.3		
Queue Delay				0.0	0.0		
Total Delay				40.1	16.3		
LOS				D	B		
Approach Delay				40.1	16.3		
Approach LOS				D	B		

Lanes, Volumes, Timings

19:

4/28/2014

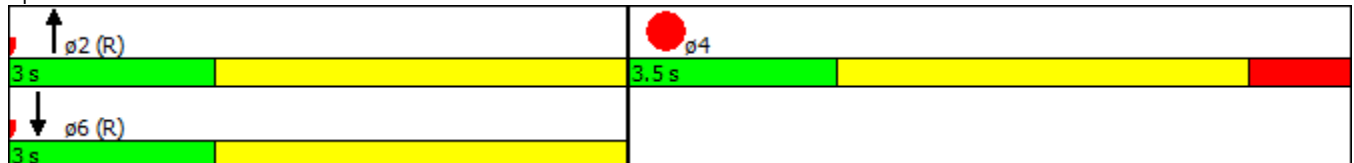


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Stops (vph)				30	13		
Fuel Used(gal)				1	0		
CO Emissions (g/hr)				77	25		
NOx Emissions (g/hr)				15	5		
VOC Emissions (g/hr)				18	6		
Dilemma Vehicles (#)				0	0		
Queue Length 50th (ft)				0	0		
Queue Length 95th (ft)				0	0		
Internal Link Dist (ft)	65			52	1		
Turn Bay Length (ft)							
Base Capacity (vph)				292	292		
Starvation Cap Reductn				0	0		
Spillback Cap Reductn				0	0		
Storage Cap Reductn				0	0		
Reduced v/c Ratio				0.87	0.63		

Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	0.87
Intersection Signal Delay:	30.1
Intersection LOS:	C
Intersection Capacity Utilization:	8.7%
ICU Level of Service:	A
Analysis Period (min):	15

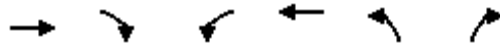
Splits and Phases: 19:



# Lanes, Volumes, Timings

21:

4/28/2014



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	26	26	117	65	0	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.932					0.865
Flt Protected				0.967		
Satd. Flow (prot)	1771	0	0	1837	0	1644
Flt Permitted				0.967		
Satd. Flow (perm)	1771	0	0	1837	0	1644
Link Speed (mph)	10			10	10	
Link Distance (ft)	164			348	551	
Travel Time (s)	11.2			23.7	37.6	
Confl. Peds. (#/hr)		25				
Peak Hour Factor	0.33	0.33	0.33	0.39	0.92	0.33
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	79	79	355	167	0	379
Shared Lane Traffic (%)						
Lane Group Flow (vph)	158	0	0	522	0	379
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

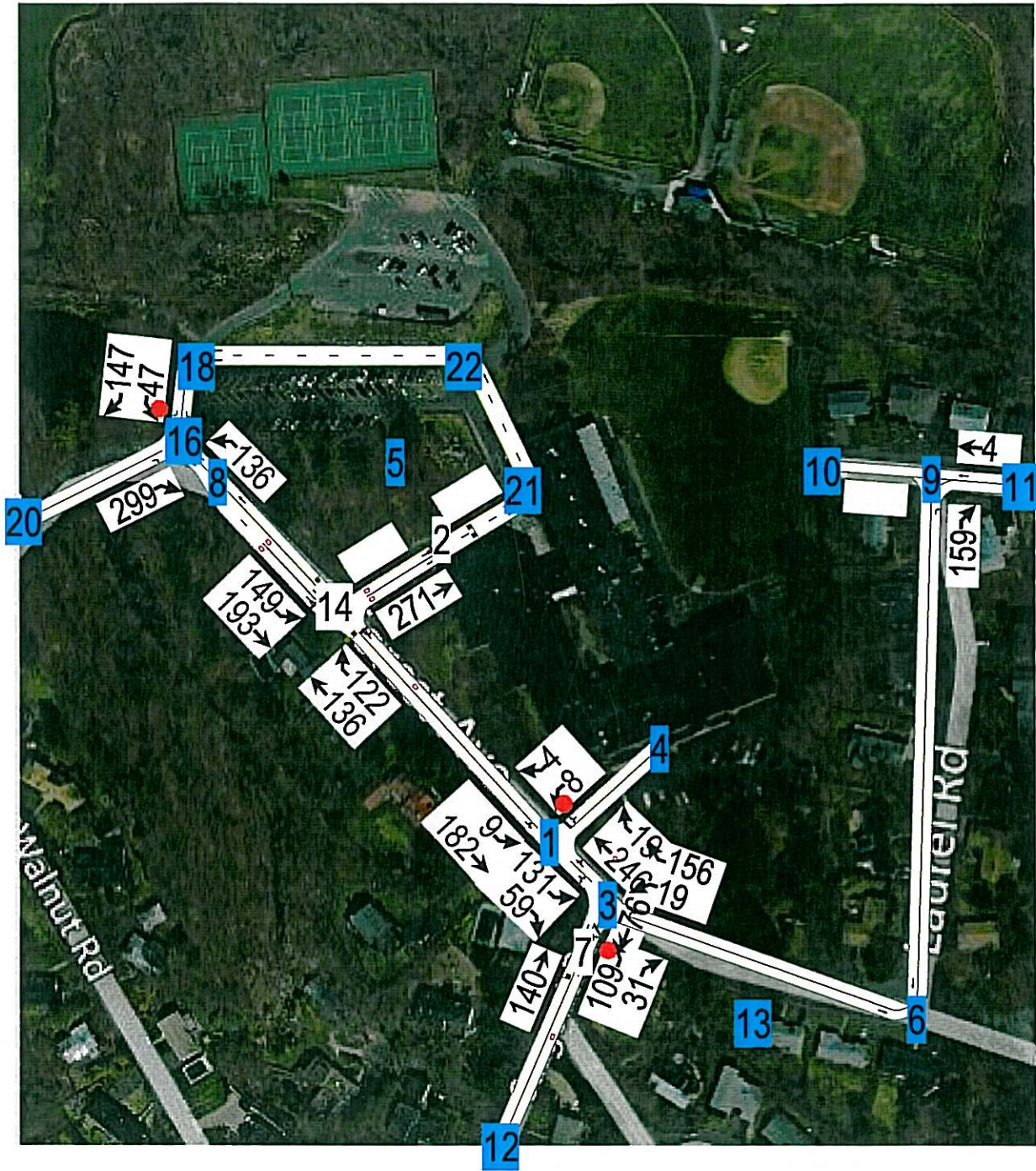
## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.7%
Analysis Period (min)	15
	ICU Level of Service A



## **APPENDIX C**

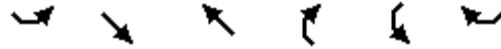
### **MIDDLE AND ELEMENTARY SCHOOLS OPERATIONAL ANALYSIS CALCULATIONS**



# Lanes, Volumes, Timings

1:

4/28/2014



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	9	182	246	19	8	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.990		0.973	
Flt Protected		0.997			0.962	
Satd. Flow (prot)	0	1894	1814	0	1778	0
Flt Permitted		0.997			0.962	
Satd. Flow (perm)	0	1894	1814	0	1778	0
Link Speed (mph)		10	10		10	
Link Distance (ft)		395	105		180	
Travel Time (s)		26.9	7.2		12.3	
Confl. Peds. (#/hr)	80				51	
Peak Hour Factor	0.45	0.68	0.67	0.63	0.25	0.50
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%
Adj. Flow (vph)	20	268	367	30	32	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	288	397	0	40	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

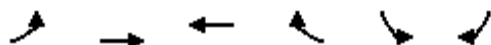
## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	26.9%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

2:

4/28/2014

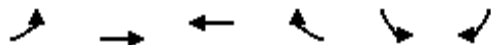


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø2
Lane Configurations		↑↑					
Volume (vph)	0	271	0	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	3610	0	0	0	0	
Flt Permitted							
Satd. Flow (perm)	0	3610	0	0	0	0	
Right Turn on Red	Yes			Yes	Yes	Yes	
Satd. Flow (RTOR)							
Link Speed (mph)		10	10		10		
Link Distance (ft)		157	118		112		
Travel Time (s)		10.7	8.0		7.6		
Peak Hour Factor	0.92	0.45	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	0	602	0	0	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	602	0	0	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		0	0		0		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15			9	15	9	
Turn Type		NA					
Protected Phases		4				2	
Permitted Phases							
Minimum Split (s)		3.0				3.5	
Total Split (s)		3.0				3.5	
Total Split (%)		46.2%				54%	
Maximum Green (s)		1.0				1.0	
Yellow Time (s)		2.0				2.0	
All-Red Time (s)		0.0				0.5	
Lost Time Adjust (s)		0.0					
Total Lost Time (s)		2.0					
Lead/Lag							
Lead-Lag Optimize?							
Act Effct Green (s)		1.0					
Actuated g/C Ratio		0.15					
v/c Ratio		1.08					
Control Delay		60.2					
Queue Delay		0.0					
Total Delay		60.2					
LOS		E					
Approach Delay		60.2					
Approach LOS		E					

# Lanes, Volumes, Timings

2:

4/28/2014



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø2
Stops (vph)		115					
Fuel Used(gal)		4					
CO Emissions (g/hr)		271					
NOx Emissions (g/hr)		53					
VOC Emissions (g/hr)		63					
Dilemma Vehicles (#)		0					
Queue Length 50th (ft)		0					
Queue Length 95th (ft)		0					
Internal Link Dist (ft)		77	38		32		
Turn Bay Length (ft)							
Base Capacity (vph)		555					
Starvation Cap Reductn		0					
Spillback Cap Reductn		0					
Storage Cap Reductn		0					
Reduced v/c Ratio		1.08					

## Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:Hold and 6:, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	1.08
Intersection Signal Delay:	60.2
Intersection LOS:	E
Intersection Capacity Utilization	10.8%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 2:



### Lanes, Volumes, Timings

3:

4/28/2014



Lane Group	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	19	156	109	31	131	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.880		0.980		0.949	
Flt Protected	0.994		0.959		0.970	
Satd. Flow (prot)	1662	0	1699	0	1749	0
Flt Permitted	0.994		0.959		0.970	
Satd. Flow (perm)	1662	0	1699	0	1749	0
Link Speed (mph)	10		10		10	
Link Distance (ft)	408		65		105	
Travel Time (s)	27.8		4.4		7.2	
Confl. Peds. (#/hr)	28	2	28			28
Peak Hour Factor	0.59	0.63	0.39	0.65	0.68	0.51
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%
Adj. Flow (vph)	32	248	279	48	193	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	280	0	327	0	309	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Stop		Free	

#### Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.6%
Analysis Period (min)	15
	ICU Level of Service A



# Lanes, Volumes, Timings

7:

4/28/2014



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø8
Lane Configurations			↑			↑	
Volume (vph)	0	0	140	0	0	76	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	0	1827	0	0	1900	
Flt Permitted							
Satd. Flow (perm)	0	0	1827	0	0	1900	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)							
Link Speed (mph)	10		10			10	
Link Distance (ft)	228		261			65	
Travel Time (s)	15.5		17.8			4.4	
Peak Hour Factor	0.92	0.92	0.39	0.92	0.92	0.51	
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	
Adj. Flow (vph)	0	0	359	0	0	149	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	359	0	0	149	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	0		0			0	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Turn Type			NA			NA	
Protected Phases			2			6	8
Permitted Phases							
Minimum Split (s)			3.0			3.0	3.5
Total Split (s)			3.0			3.0	3.5
Total Split (%)			46.2%			46.2%	54%
Maximum Green (s)			1.0			1.0	1.0
Yellow Time (s)			2.0			2.0	2.0
All-Red Time (s)			0.0			0.0	0.5
Lost Time Adjust (s)			0.0			0.0	
Total Lost Time (s)			2.0			2.0	
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)			1.0			1.0	
Actuated g/C Ratio			0.15			0.15	
v/c Ratio			1.28			0.51	
Control Delay			165.6			6.8	
Queue Delay			0.0			0.0	
Total Delay			165.6			6.8	
LOS			F			A	
Approach Delay			165.6			6.8	
Approach LOS			F			A	

Lanes, Volumes, Timings

7:

4/28/2014

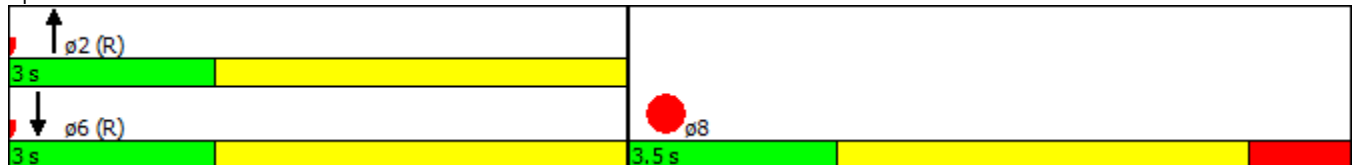


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø8
Stops (vph)			157			7	
Fuel Used(gal)			5			0	
CO Emissions (g/hr)			366			12	
NOx Emissions (g/hr)			71			2	
VOC Emissions (g/hr)			85			3	
Dilemma Vehicles (#)			0			0	
Queue Length 50th (ft)			0			0	
Queue Length 95th (ft)			0			m0	
Internal Link Dist (ft)	148		181			1	
Turn Bay Length (ft)							
Base Capacity (vph)			281			292	
Starvation Cap Reductn			0			0	
Spillback Cap Reductn			0			0	
Storage Cap Reductn			0			0	
Reduced v/c Ratio			1.28			0.51	

Intersection Summary

Area Type: Other  
 Cycle Length: 6.5  
 Actuated Cycle Length: 6.5  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Pretimed  
 Maximum v/c Ratio: 1.28  
 Intersection Signal Delay: 119.0  
 Intersection LOS: F  
 Intersection Capacity Utilization 10.7%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7:

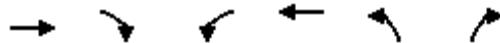




# Lanes, Volumes, Timings

9:

4/28/2014



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑		↗
Volume (vph)	0	0	0	4	0	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	0	0	1900	0	1644
Flt Permitted						
Satd. Flow (perm)	0	0	0	1900	0	1644
Link Speed (mph)	10			10	10	
Link Distance (ft)	135			111	668	
Travel Time (s)	9.2			7.6	45.5	
Confl. Peds. (#/hr)						11
Peak Hour Factor	0.92	0.92	0.92	0.33	0.92	0.68
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	12	0	234
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	12	0	234
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Stop			Free	Free	

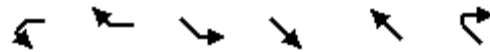
## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.4%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

14:

4/28/2014

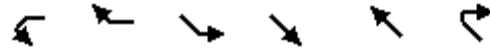


Lane Group	WBL	WBR	SEL	SET	NWT	NWR	ø8
Lane Configurations				↕↕	↕		
Volume (vph)	0	0	149	193	136	122	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00	
Ped Bike Factor							
Frt					0.924		
Flt Protected				0.972			
Satd. Flow (prot)	0	0	0	3509	1726	0	
Flt Permitted				0.955			
Satd. Flow (perm)	0	0	0	3448	1726	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)					249		
Link Speed (mph)	10			10	10		
Link Distance (ft)	157			212	395		
Travel Time (s)	10.7			14.5	26.9		
Confl. Peds. (#/hr)	95	41					
Peak Hour Factor	0.42	0.35	0.45	0.82	0.71	0.49	
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	
Adj. Flow (vph)	0	0	331	235	192	249	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	566	441	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Turn Type			Perm	NA	NA		
Protected Phases				6	2		8
Permitted Phases			6				
Minimum Split (s)			3.0	3.0	3.0		3.5
Total Split (s)			3.0	3.0	3.0		3.5
Total Split (%)			46.2%	46.2%	46.2%		54%
Maximum Green (s)			1.0	1.0	1.0		1.0
Yellow Time (s)			2.0	2.0	2.0		2.0
All-Red Time (s)			0.0	0.0	0.0		0.5
Lost Time Adjust (s)				0.0	0.0		
Total Lost Time (s)				2.0	2.0		
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)				1.0	1.0		
Actuated g/C Ratio				0.15	0.15		
v/c Ratio				1.13dl	0.93		
Control Delay				70.7	35.2		
Queue Delay				0.0	0.0		
Total Delay				70.7	35.2		
LOS				E	D		

Lanes, Volumes, Timings

14:

4/28/2014

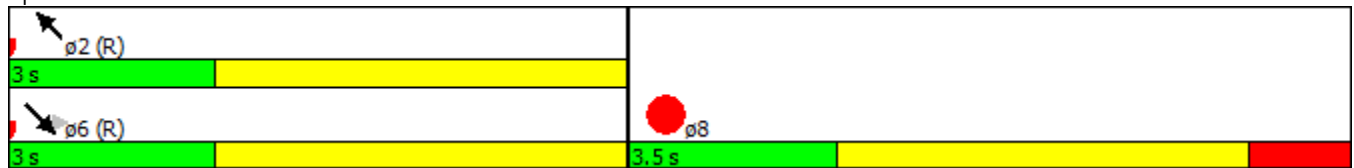


Lane Group	WBL	WBR	SEL	SET	NWT	NWR	ø8
Approach Delay				70.7	35.2		
Approach LOS				E	D		
Stops (vph)				172	59		
Fuel Used(gal)				6	3		
CO Emissions (g/hr)				428	214		
NOx Emissions (g/hr)				83	42		
VOC Emissions (g/hr)				99	50		
Dilemma Vehicles (#)				0	0		
Queue Length 50th (ft)				0	0		
Queue Length 95th (ft)				0	0		
Internal Link Dist (ft)	77			132	315		
Turn Bay Length (ft)							
Base Capacity (vph)				530	476		
Starvation Cap Reductn				0	0		
Spillback Cap Reductn				0	0		
Storage Cap Reductn				0	0		
Reduced v/c Ratio				1.07	0.93		

Intersection Summary

Area Type: Other  
 Cycle Length: 6.5  
 Actuated Cycle Length: 6.5  
 Offset: 0 (0%), Referenced to phase 2:NWT and 6:SETL, Start of Green  
 Natural Cycle: 40  
 Control Type: Pretimed  
 Maximum v/c Ratio: 1.07  
 Intersection Signal Delay: 55.2 Intersection LOS: E  
 Intersection Capacity Utilization 45.1% ICU Level of Service A  
 Analysis Period (min) 15  
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 14:



# Lanes, Volumes, Timings

16:

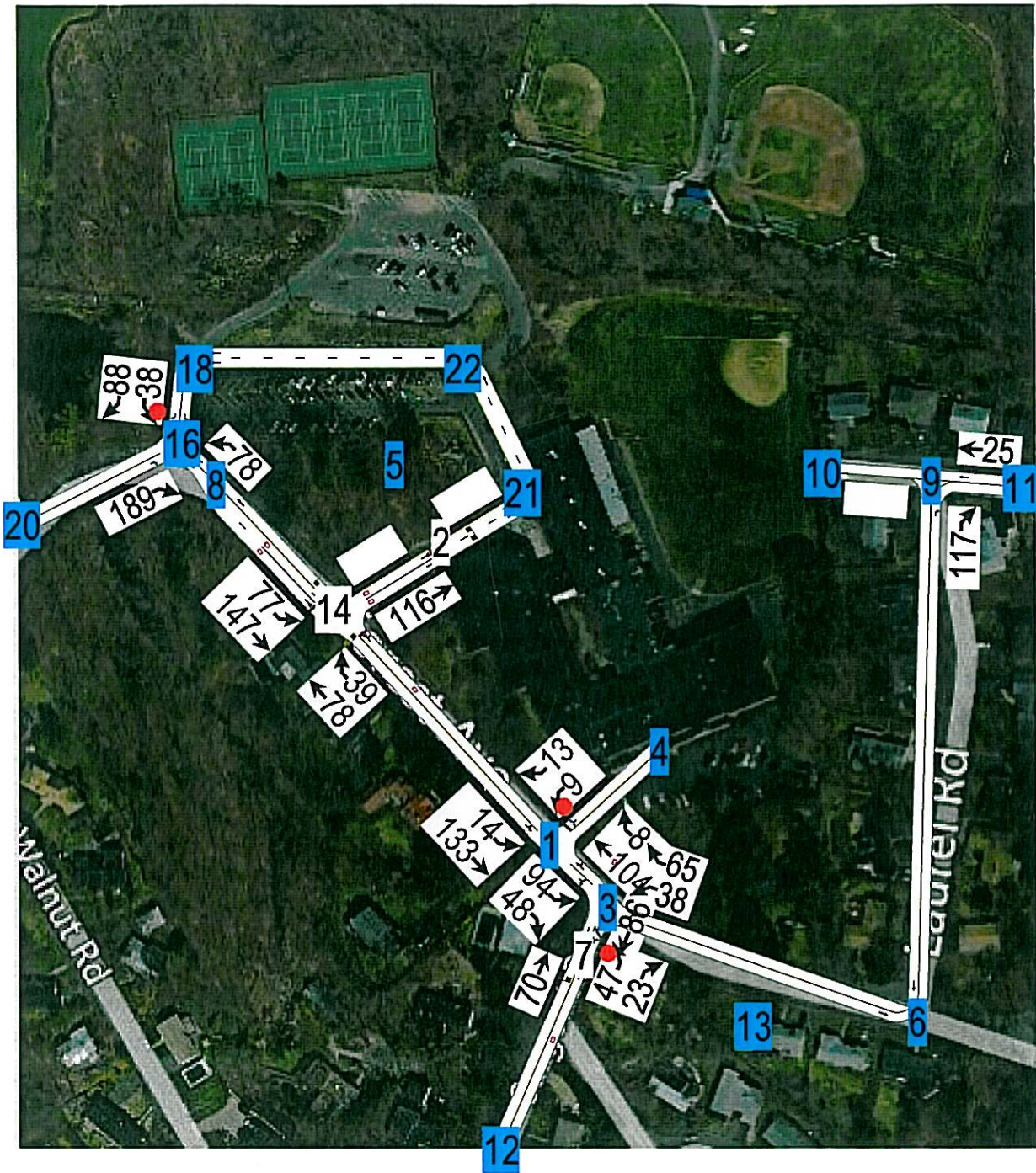
4/28/2014



Lane Group	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Volume (vph)	0	299	47	147	136	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865		0.850		
Flt Protected			0.950		0.950	
Satd. Flow (prot)	0	1644	1805	1615	1736	0
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	0	1644	1805	1615	1736	0
Link Speed (mph)	10		10		10	
Link Distance (ft)	223		93		66	
Travel Time (s)	15.2		6.3		4.5	
Confl. Peds. (#/hr)			58			
Peak Hour Factor	0.92	0.61	0.56	0.42	0.71	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%
Adj. Flow (vph)	0	490	84	350	192	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	490	84	350	192	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	0		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Stop		Free	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.8%
Analysis Period (min)	15
	ICU Level of Service A

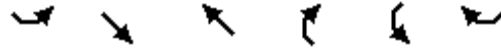




# Lanes, Volumes, Timings

1:

4/28/2014



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	14	133	104	8	9	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.986		0.941	
Flt Protected		0.995			0.973	
Satd. Flow (prot)	0	1890	1809	0	1740	0
Flt Permitted		0.995			0.973	
Satd. Flow (perm)	0	1890	1809	0	1740	0
Link Speed (mph)		10	10		10	
Link Distance (ft)		395	105		180	
Travel Time (s)		26.9	7.2		12.3	
Confl. Peds. (#/hr)	82				118	118
Peak Hour Factor	0.50	0.51	0.65	0.42	0.25	0.46
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%
Adj. Flow (vph)	28	261	160	19	36	28
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	289	179	0	64	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.3%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

2:

4/28/2014

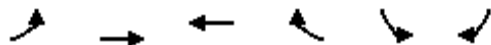


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø2
Lane Configurations		↑↑					
Volume (vph)	0	116	0	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	3610	0	0	0	0	
Flt Permitted							
Satd. Flow (perm)	0	3610	0	0	0	0	
Right Turn on Red	Yes			Yes	Yes	Yes	
Satd. Flow (RTOR)							
Link Speed (mph)		10	10		10		
Link Distance (ft)		157	118		112		
Travel Time (s)		10.7	8.0		7.6		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	0	126	0	0	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	126	0	0	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		0	0		0		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15			9	15	9	
Turn Type		NA					
Protected Phases		4				2	
Permitted Phases							
Minimum Split (s)		3.0				3.5	
Total Split (s)		3.0				3.5	
Total Split (%)		46.2%				54%	
Maximum Green (s)		1.0				1.0	
Yellow Time (s)		2.0				2.0	
All-Red Time (s)		0.0				0.5	
Lost Time Adjust (s)		0.0					
Total Lost Time (s)		2.0					
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)		1.0					
Actuated g/C Ratio		0.15					
v/c Ratio		0.23					
Control Delay		3.6					
Queue Delay		0.0					
Total Delay		3.6					
LOS		A					
Approach Delay		3.6					
Approach LOS		A					

# Lanes, Volumes, Timings

2:

4/28/2014

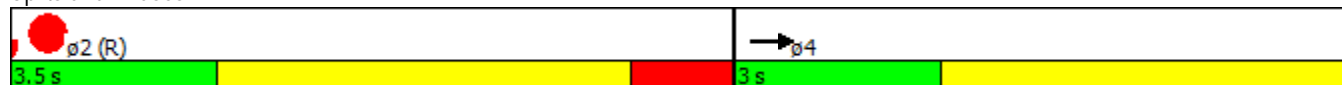


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø2
Stops (vph)		12					
Fuel Used(gal)		0					
CO Emissions (g/hr)		21					
NOx Emissions (g/hr)		4					
VOC Emissions (g/hr)		5					
Dilemma Vehicles (#)		0					
Queue Length 50th (ft)		0					
Queue Length 95th (ft)		m0					
Internal Link Dist (ft)		77	38		32		
Turn Bay Length (ft)							
Base Capacity (vph)		555					
Starvation Cap Reductn		0					
Spillback Cap Reductn		0					
Storage Cap Reductn		0					
Reduced v/c Ratio		0.23					

## Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:Hold and 6:, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	0.23
Intersection Signal Delay:	3.6
Intersection LOS:	A
Intersection Capacity Utilization:	6.7%
ICU Level of Service:	A
Analysis Period (min):	15
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2:














### Lanes, Volumes, Timings

3:

4/28/2014

						
Lane Group	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	38	65	47	23	94	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.922		0.965		0.954	
Flt Protected	0.979		0.964		0.968	
Satd. Flow (prot)	1715	0	1693	0	1755	0
Flt Permitted	0.979		0.964		0.968	
Satd. Flow (perm)	1715	0	1693	0	1755	0
Link Speed (mph)	10		10		10	
Link Distance (ft)	408		65		105	
Travel Time (s)	27.8		4.4		7.2	
Confl. Peds. (#/hr)			47			82
Confl. Bikes (#/hr)				47		
Peak Hour Factor	0.53	0.65	0.38	0.52	0.52	0.51
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%
Adj. Flow (vph)	72	100	124	44	181	94
Shared Lane Traffic (%)						
Lane Group Flow (vph)	172	0	168	0	275	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Stop		Free	









#### Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.2%
ICU Level of Service	A
Analysis Period (min)	15

# Lanes, Volumes, Timings

7:

4/28/2014

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø8
Lane Configurations							
Volume (vph)	0	0	70	0	0	86	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	0	1827	0	0	1900	
Flt Permitted							
Satd. Flow (perm)	0	0	1827	0	0	1900	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)							
Link Speed (mph)	10		10			10	
Link Distance (ft)	228		261			65	
Travel Time (s)	15.5		17.8			4.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	
Adj. Flow (vph)	0	0	76	0	0	93	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	76	0	0	93	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	0		0			0	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Turn Type			NA			NA	
Protected Phases			2			6	8
Permitted Phases							
Minimum Split (s)			3.0			3.0	3.5
Total Split (s)			3.0			3.0	3.5
Total Split (%)			46.2%			46.2%	54%
Maximum Green (s)			1.0			1.0	1.0
Yellow Time (s)			2.0			2.0	2.0
All-Red Time (s)			0.0			0.0	0.5
Lost Time Adjust (s)			0.0			0.0	
Total Lost Time (s)			2.0			2.0	
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)			1.0			1.0	
Actuated g/C Ratio			0.15			0.15	
v/c Ratio			0.27			0.32	
Control Delay			4.9			4.5	
Queue Delay			0.0			0.0	
Total Delay			4.9			4.5	
LOS			A			A	
Approach Delay			4.9			4.5	
Approach LOS			A			A	

# Lanes, Volumes, Timings

7:

4/28/2014

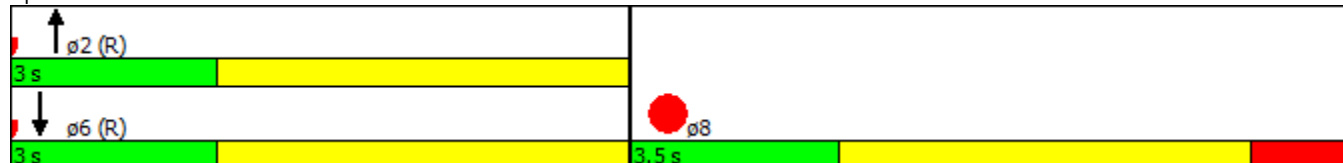


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø8
Stops (vph)			9			8	
Fuel Used(gal)			0			0	
CO Emissions (g/hr)			20			10	
NOx Emissions (g/hr)			4			2	
VOC Emissions (g/hr)			5			2	
Dilemma Vehicles (#)			0			0	
Queue Length 50th (ft)			0			0	
Queue Length 95th (ft)			0			m0	
Internal Link Dist (ft)	148		181			1	
Turn Bay Length (ft)							
Base Capacity (vph)			281			292	
Starvation Cap Reductn			0			0	
Spillback Cap Reductn			0			0	
Storage Cap Reductn			0			0	
Reduced v/c Ratio			0.27			0.32	

## Intersection Summary

Area Type: Other  
 Cycle Length: 6.5  
 Actuated Cycle Length: 6.5  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.32  
 Intersection Signal Delay: 4.7  
 Intersection LOS: A  
 Intersection Capacity Utilization 7.9%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

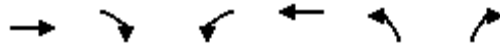
## Splits and Phases: 7:



# Lanes, Volumes, Timings

9:

4/28/2014



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑		↗
Volume (vph)	0	0	0	25	0	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	0	0	1900	0	1644
Flt Permitted						
Satd. Flow (perm)	0	0	0	1900	0	1644
Link Speed (mph)	10			10	10	
Link Distance (ft)	135			111	668	
Travel Time (s)	9.2			7.6	45.5	
Confl. Peds. (#/hr)						11
Peak Hour Factor	0.92	0.92	0.92	0.39	0.92	0.52
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	64	0	225
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	64	0	225
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Stop			Free	Free	

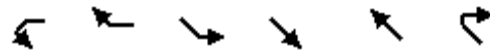
## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.4%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

14:

4/28/2014

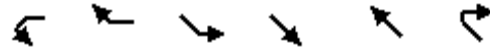


Lane Group	WBL	WBR	SEL	SET	NWT	NWR	ø8
Lane Configurations				↕↕	↕		
Volume (vph)	0	0	77	147	78	39	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00	
Ped Bike Factor				0.97	0.99		
Frt					0.949		
Flt Protected				0.984			
Satd. Flow (prot)	0	0	0	3552	1746	0	
Flt Permitted				0.955			
Satd. Flow (perm)	0	0	0	3355	1746	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)					56		
Link Speed (mph)	10			10	10		
Link Distance (ft)	157			212	395		
Travel Time (s)	10.7			14.5	26.9		
Confl. Peds. (#/hr)	177	52	52			4	
Peak Hour Factor	0.92	0.92	0.74	0.68	0.85	0.70	
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	
Adj. Flow (vph)	0	0	104	216	92	56	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	320	148	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Turn Type			Perm	NA	NA		
Protected Phases				6	2		8
Permitted Phases			6				
Minimum Split (s)			3.0	3.0	3.0		3.5
Total Split (s)			3.0	3.0	3.0		3.5
Total Split (%)			46.2%	46.2%	46.2%		54%
Maximum Green (s)			1.0	1.0	1.0		1.0
Yellow Time (s)			2.0	2.0	2.0		2.0
All-Red Time (s)			0.0	0.0	0.0		0.5
Lost Time Adjust (s)				0.0	0.0		
Total Lost Time (s)				2.0	2.0		
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)				1.0	1.0		
Actuated g/C Ratio				0.15	0.15		
v/c Ratio				0.62	0.47		
Control Delay				8.9	6.7		
Queue Delay				0.0	0.0		
Total Delay				8.9	6.7		
LOS				A	A		

Lanes, Volumes, Timings

14:

4/28/2014

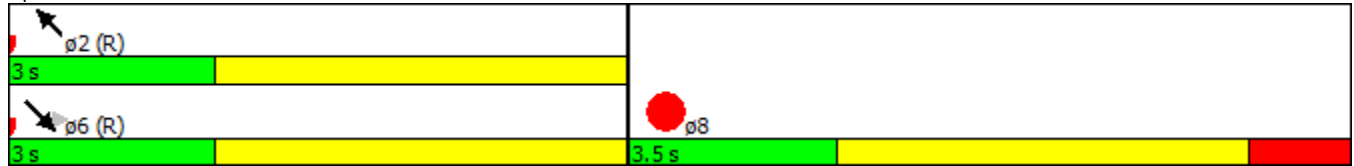


Lane Group	WBL	WBR	SEL	SET	NWT	NWR	ø8
Approach Delay				8.9	6.7		
Approach LOS				A	A		
Stops (vph)				33	13		
Fuel Used(gal)				1	1		
CO Emissions (g/hr)				80	49		
NOx Emissions (g/hr)				16	10		
VOC Emissions (g/hr)				19	11		
Dilemma Vehicles (#)				0	0		
Queue Length 50th (ft)				0	0		
Queue Length 95th (ft)				0	0		
Internal Link Dist (ft)	77			132	315		
Turn Bay Length (ft)							
Base Capacity (vph)				516	316		
Starvation Cap Reductn				0	0		
Spillback Cap Reductn				0	0		
Storage Cap Reductn				0	0		
Reduced v/c Ratio				0.62	0.47		

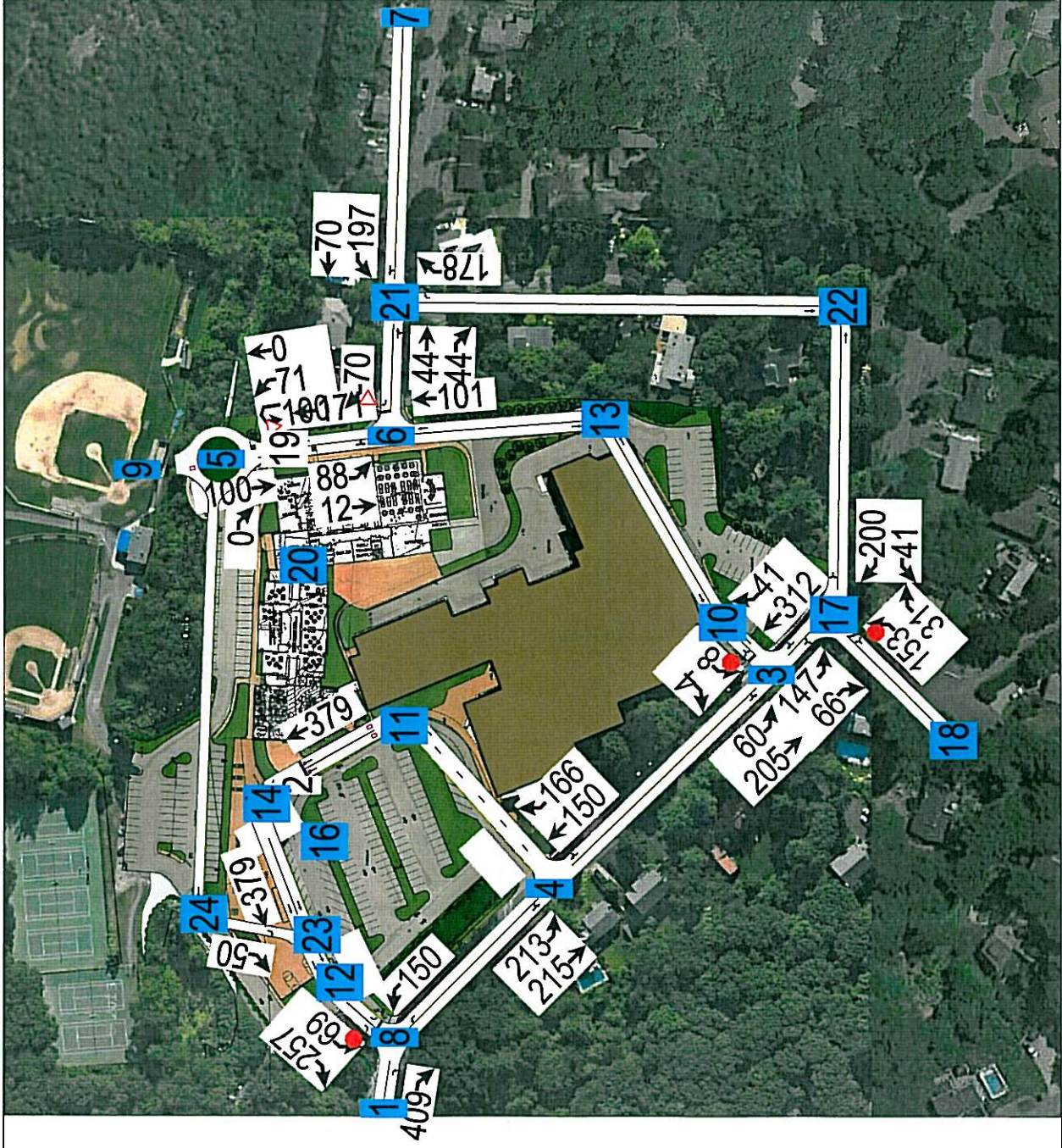
Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:NWT and 6:SETL, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	8.2
Intersection LOS:	A
Intersection Capacity Utilization	29.2%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 14:







# Lanes, Volumes, Timings

2:

4/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Lane Configurations				↑↑			
Volume (vph)	0	0	0	379	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	0	0	3574	0	0	
Flt Permitted							
Satd. Flow (perm)	0	0	0	3574	0	0	
Right Turn on Red	Yes	Yes	Yes			Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	10			10	10		
Link Distance (ft)	76			150	44		
Travel Time (s)	5.2			10.2	3.0		
Peak Hour Factor	0.92	0.92	0.92	0.45	0.92	0.92	
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	
Adj. Flow (vph)	0	0	0	842	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	842	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Turn Type							
Protected Phases				2		4	
Permitted Phases							
Minimum Split (s)				3.0		3.5	
Total Split (s)				3.0		3.5	
Total Split (%)				46.2%		54%	
Maximum Green (s)				1.0		1.0	
Yellow Time (s)				2.0		2.0	
All-Red Time (s)				0.0		0.5	
Lost Time Adjust (s)				0.0			
Total Lost Time (s)				2.0			
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)				1.0			
Actuated g/C Ratio				0.15			
v/c Ratio				1.53			
Control Delay				264.5			
Queue Delay				0.0			
Total Delay				264.5			
LOS				F			
Approach Delay				264.5			
Approach LOS				F			



Lanes, Volumes, Timings

2:

4/28/2014

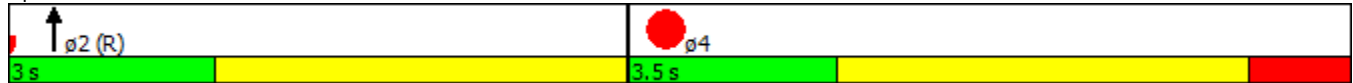


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Stops (vph)				685			
Fuel Used(gal)				23			
CO Emissions (g/hr)				1584			
NOx Emissions (g/hr)				308			
VOC Emissions (g/hr)				367			
Dilemma Vehicles (#)				0			
Queue Length 50th (ft)				-15			
Queue Length 95th (ft)				0			
Internal Link Dist (ft)	1			70	1		
Turn Bay Length (ft)							
Base Capacity (vph)				549			
Starvation Cap Reductn				0			
Spillback Cap Reductn				0			
Storage Cap Reductn				0			
Reduced v/c Ratio				1.53			

Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:NBT and 6:, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	1.53
Intersection Signal Delay:	264.5
Intersection LOS:	F
Intersection Capacity Utilization:	20.5%
ICU Level of Service:	A
Analysis Period (min):	15
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	

Splits and Phases: 2:



# Lanes, Volumes, Timings

3:

4/28/2014



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	60	205	312	41	8	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Flt			0.983		0.973	
Flt Protected		0.988			0.962	
Satd. Flow (prot)	0	1877	1820	0	1778	0
Flt Permitted		0.988			0.962	
Satd. Flow (perm)	0	1877	1820	0	1778	0
Link Speed (mph)		10	10		10	
Link Distance (ft)		379	107		88	
Travel Time (s)		25.8	7.3		6.0	
Confl. Peds. (#/hr)	80			2	51	
Peak Hour Factor	0.45	0.51	0.67	0.62	0.25	0.50
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%
Adj. Flow (vph)	133	402	466	66	32	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	535	532	0	40	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.4%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

4:

4/28/2014



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	213	215	150	166	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.917			
Flt Protected		0.969				
Satd. Flow (prot)	0	1841	1700	0	0	0
Flt Permitted		0.969				
Satd. Flow (perm)	0	1841	1700	0	0	0
Link Speed (mph)		10	10		10	
Link Distance (ft)		263	379		267	
Travel Time (s)		17.9	25.8		18.2	
Confl. Peds. (#/hr)	41			95	95	
Peak Hour Factor	0.45	0.82	0.71	0.49	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	473	262	211	339	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	735	550	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.9%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

5:

4/28/2014



Lane Group	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations					↕	↕	
Volume (vph)	0	0	100	71	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt							
Flt Protected					0.950		
Satd. Flow (prot)	0	0	0	0	1805	1900	0
Flt Permitted					0.950		
Satd. Flow (perm)	0	0	0	0	1805	1900	0
Link Speed (mph)	10				10	10	
Link Distance (ft)	558				79	105	
Travel Time (s)	38.0				5.4	7.2	
Peak Hour Factor	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	250	178	0	0	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	0	428	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	0				0	0	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	9	15			9
Sign Control	Yield				Yield	Yield	

## Intersection Summary

Area Type:	Other
Control Type:	Roundabout
Intersection Capacity Utilization	12.8%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

6:

4/28/2014



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	70	101	0	88	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						0.958
Satd. Flow (prot)	0	1644	1900	0	0	1820
Flt Permitted						0.958
Satd. Flow (perm)	0	1644	1900	0	0	1820
Link Speed (mph)	10		10			10
Link Distance (ft)	164		264			132
Travel Time (s)	11.2		18.0			9.0
Peak Hour Factor	0.40	0.40	0.40	0.40	0.40	0.40
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	175	253	0	220	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	175	252	0	0	250
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Yield		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.3%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

8:

4/28/2014



Lane Group	EBL	EBR	NWL	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	0	409	150	0	69	257
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	0	1644	1805	0	1805	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	0	1644	1805	0	1805	1583
Link Speed (mph)	10		10		10	
Link Distance (ft)	88		263		95	
Travel Time (s)	6.0		17.9		6.5	
Confl. Peds. (#/hr)		1			58	
Peak Hour Factor	0.92	0.61	0.71	0.92	0.56	0.42
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%
Adj. Flow (vph)	0	670	211	0	123	612
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	670	211	0	123	612
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	0		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Free		Stop	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.8%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

17:

4/28/2014



Lane Group	WBL	WBR	SEL	SER	NEL	NER
Lane Configurations						
Volume (vph)	41	200	147	66	153	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.889		0.950		0.985	
Flt Protected	0.991		0.970		0.957	
Satd. Flow (prot)	1674	0	1751	0	1729	0
Flt Permitted	0.991		0.970		0.957	
Satd. Flow (perm)	1674	0	1751	0	1729	0
Link Speed (mph)	10		10		10	
Link Distance (ft)	379		107		213	
Travel Time (s)	25.8		7.3		14.5	
Confl. Peds. (#/hr)	2	2	80	80	28	28
Peak Hour Factor	0.63	0.67	0.68	0.51	0.39	0.65
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%
Adj. Flow (vph)	65	299	216	129	392	48
Shared Lane Traffic (%)						
Lane Group Flow (vph)	364	0	345	0	440	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.0%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

19:

4/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Lane Configurations				↑	↑		
Volume (vph)	0	0	0	171	100	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	0	0	1900	1900	0	
Flt Permitted							
Satd. Flow (perm)	0	0	0	1900	1900	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	145			132	79		
Travel Time (s)	3.3			3.0	1.8		
Peak Hour Factor	0.40	0.40	0.40	0.40	0.40	0.40	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	0	0	0	428	250	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	428	250	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Turn Type				NA	NA		
Protected Phases				2	6	4	
Permitted Phases							
Minimum Split (s)				3.0	3.0	3.5	
Total Split (s)				3.0	3.0	3.5	
Total Split (%)				46.2%	46.2%	54%	
Maximum Green (s)				1.0	1.0	1.0	
Yellow Time (s)				2.0	2.0	2.0	
All-Red Time (s)				0.0	0.0	0.5	
Lost Time Adjust (s)				0.0	0.0		
Total Lost Time (s)				2.0	2.0		
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)				1.0	1.0		
Actuated g/C Ratio				0.15	0.15		
v/c Ratio				1.47	0.86		
Control Delay				243.8	37.4		
Queue Delay				0.0	0.0		
Total Delay				243.8	37.4		
LOS				F	D		
Approach Delay				243.8	37.4		
Approach LOS				F	D		



Lanes, Volumes, Timings

19:

4/28/2014

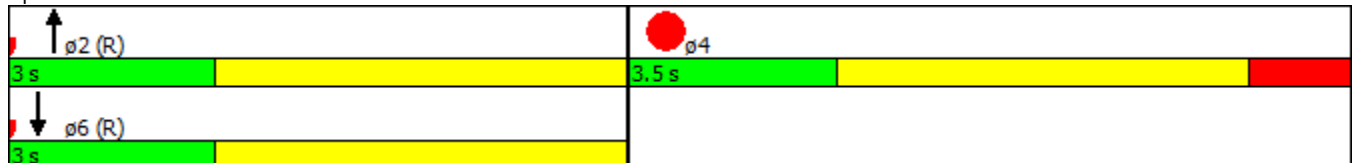


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Stops (vph)				283	28		
Fuel Used(gal)				10	1		
CO Emissions (g/hr)				715	68		
NOx Emissions (g/hr)				139	13		
VOC Emissions (g/hr)				166	16		
Dilemma Vehicles (#)				0	0		
Queue Length 50th (ft)				0	0		
Queue Length 95th (ft)				0	0		
Internal Link Dist (ft)	65			52	1		
Turn Bay Length (ft)							
Base Capacity (vph)				292	292		
Starvation Cap Reductn				0	0		
Spillback Cap Reductn				0	0		
Storage Cap Reductn				0	0		
Reduced v/c Ratio				1.47	0.86		

Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	1.47
Intersection Signal Delay:	167.7
Intersection LOS:	F
Intersection Capacity Utilization:	12.3%
ICU Level of Service:	A
Analysis Period (min):	15

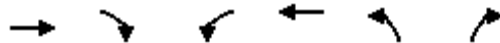
Splits and Phases: 19:



# Lanes, Volumes, Timings

21:

4/28/2014



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	44	44	197	70	0	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.932			0.865		
Flt Protected				0.964		
Satd. Flow (prot)	1771	0	0	1832	0	1644
Flt Permitted				0.964		
Satd. Flow (perm)	1771	0	0	1832	0	1644
Link Speed (mph)	10			10		
Link Distance (ft)	164			348		551
Travel Time (s)	11.2			23.7		37.6
Confl. Peds. (#/hr)	11					
Peak Hour Factor	0.33	0.33	0.33	0.33	0.92	0.33
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	133	133	597	212	0	539
Shared Lane Traffic (%)						
Lane Group Flow (vph)	266	0	0	809	0	539
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0		
Link Offset(ft)	0			0		
Crosswalk Width(ft)	16			16		16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15		9	
Sign Control	Free			Free		Free

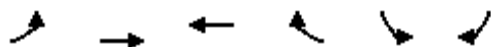
## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	25.6%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

23:

4/28/2014



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑			↗
Volume (vph)	0	0	379	0	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	1.00
Fr <sub>t</sub>						0.865
Flt Protected						
Satd. Flow (prot)	0	0	3539	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	0	3539	0	0	1611
Link Speed (mph)		10	10		30	
Link Distance (ft)		64	172		141	
Travel Time (s)		4.4	11.7		3.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	412	0	0	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	412	0	0	54
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.5%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

16:

4/28/2014



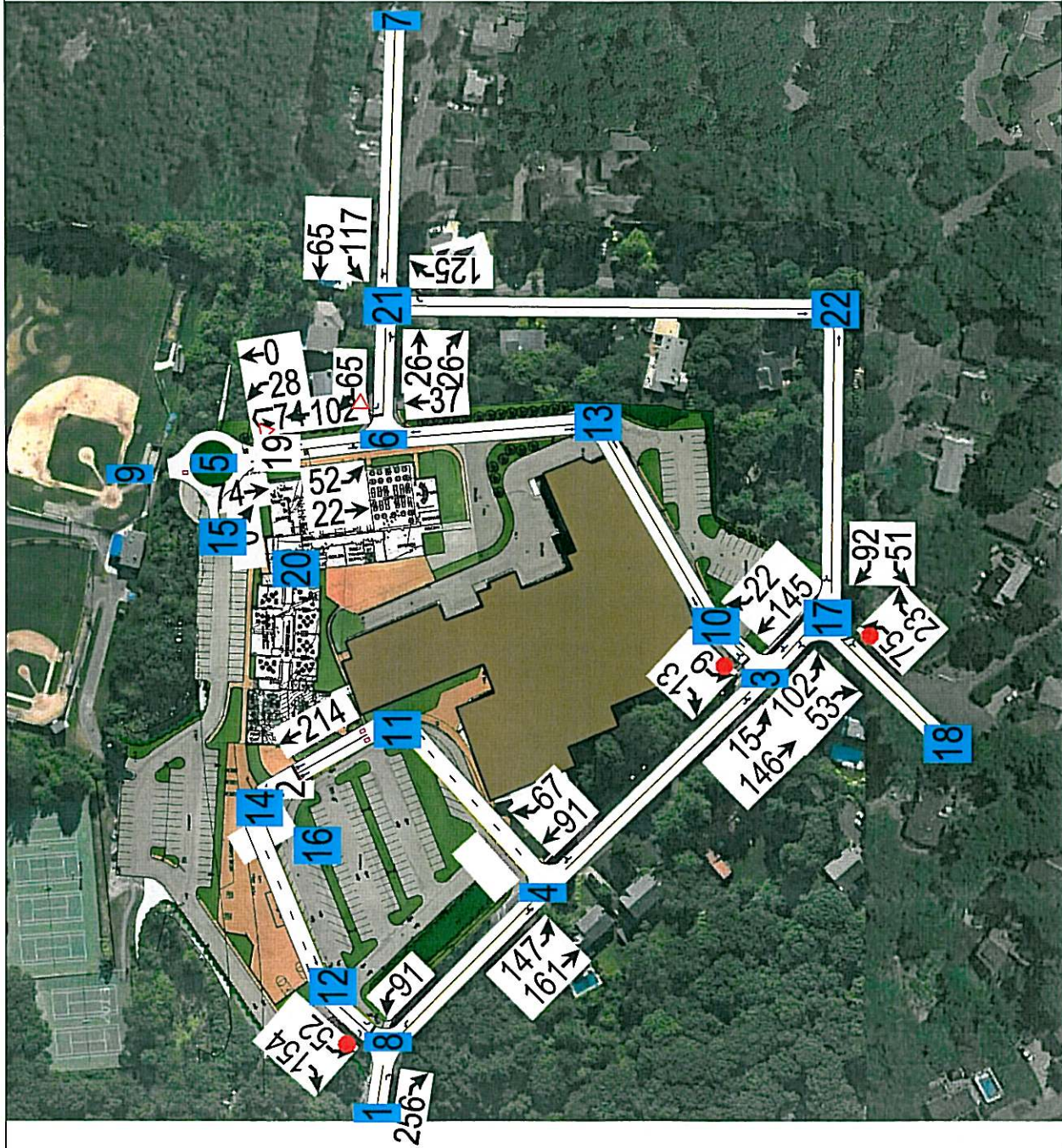
Lane Group	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Volume (vph)	0	189	38	88	78	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865		0.850		
Flt Protected			0.950		0.950	
Satd. Flow (prot)	0	1644	1805	1615	1736	0
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	0	1644	1805	1615	1736	0
Link Speed (mph)	10		10		10	
Link Distance (ft)	223		93		66	
Travel Time (s)	15.2		6.3		4.5	
Confl. Peds. (#/hr)			104			
Peak Hour Factor	0.92	0.82	0.68	0.46	0.88	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%
Adj. Flow (vph)	0	230	56	191	89	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	230	56	191	89	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	0		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Stop		Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.0%
Analysis Period (min)	15
	ICU Level of Service A

Map - Shaw School  
Node Numbers

4/28/2014



Shaw School Baseline

P:\13630MB Swampscott School Traffic\Synchro\13630MB\_Swampscott\_PM\_Build\_042414.syn



# Lanes, Volumes, Timings

2:

4/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Lane Configurations				↑↑			
Volume (vph)	0	0	0	214	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	0	0	3574	0	0	
Flt Permitted							
Satd. Flow (perm)	0	0	0	3574	0	0	
Right Turn on Red	Yes	Yes	Yes			Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	10			10	10		
Link Distance (ft)	76			150	44		
Travel Time (s)	5.2			10.2	3.0		
Peak Hour Factor	0.92	0.92	0.92	0.45	0.92	0.92	
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	
Adj. Flow (vph)	0	0	0	476	0	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	476	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Turn Type				NA			
Protected Phases				2		4	
Permitted Phases							
Minimum Split (s)				3.0		3.5	
Total Split (s)				3.0		3.5	
Total Split (%)				46.2%		54%	
Maximum Green (s)				1.0		1.0	
Yellow Time (s)				2.0		2.0	
All-Red Time (s)				0.0		0.5	
Lost Time Adjust (s)				0.0			
Total Lost Time (s)				2.0			
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)				1.0			
Actuated g/C Ratio				0.15			
v/c Ratio				0.87			
Control Delay				24.9			
Queue Delay				0.0			
Total Delay				24.9			
LOS				C			
Approach Delay				24.9			
Approach LOS				C			

# Lanes, Volumes, Timings

2:

4/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Stops (vph)				47			
Fuel Used(gal)				2			
CO Emissions (g/hr)				150			
NOx Emissions (g/hr)				29			
VOC Emissions (g/hr)				35			
Dilemma Vehicles (#)				0			
Queue Length 50th (ft)				0			
Queue Length 95th (ft)				0			
Internal Link Dist (ft)	1			70	1		
Turn Bay Length (ft)							
Base Capacity (vph)				549			
Starvation Cap Reductn				0			
Spillback Cap Reductn				0			
Storage Cap Reductn				0			
Reduced v/c Ratio				0.87			

## Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:NBT and 6:, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	0.87
Intersection Signal Delay:	24.9
Intersection LOS:	C
Intersection Capacity Utilization	9.2%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 2:



# Lanes, Volumes, Timings

3:

4/28/2014



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	15	146	145	22	9	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.974		0.941	
Flt Protected		0.995			0.973	
Satd. Flow (prot)	0	1890	1807	0	1740	0
Flt Permitted		0.995			0.973	
Satd. Flow (perm)	0	1890	1807	0	1740	0
Link Speed (mph)		10	10		10	
Link Distance (ft)		379	107		88	
Travel Time (s)		25.8	7.3		6.0	
Confl. Peds. (#/hr)	82				118	
Peak Hour Factor	0.50	0.51	0.65	0.42	0.25	0.46
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%
Adj. Flow (vph)	30	286	223	52	36	28
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	316	275	0	64	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

## Intersection Summary

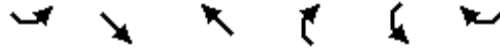
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.2%
Analysis Period (min)	15
	ICU Level of Service A



# Lanes, Volumes, Timings

4:

4/28/2014



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	147	161	91	67	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.936			
Flt Protected		0.978				
Satd. Flow (prot)	0	1858	1745	0	0	0
Flt Permitted		0.978				
Satd. Flow (perm)	0	1858	1745	0	0	0
Link Speed (mph)		10	10		10	
Link Distance (ft)		263	379		267	
Travel Time (s)		17.9	25.8		18.2	
Confl. Peds. (#/hr)	52			4	177	
Peak Hour Factor	0.74	0.68	0.85	0.70	0.42	0.92
Heavy Vehicles (%)	0%	0%	0%	4%	0%	0%
Adj. Flow (vph)	199	237	107	96	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	436	203	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Free	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.9%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

5:

4/28/2014



Lane Group	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations					↕	↕	
Volume (vph)	0	0	74	28	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt							
Flt Protected					0.950		
Satd. Flow (prot)	0	0	0	0	1805	1900	0
Flt Permitted					0.950		
Satd. Flow (perm)	0	0	0	0	1805	1900	0
Link Speed (mph)	10				10	10	
Link Distance (ft)	92				79	105	
Travel Time (s)	6.3				5.4	7.2	
Peak Hour Factor	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	185	70	0	0	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	0	255	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	0				0	0	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	9	15			9
Sign Control	Yield				Yield	Yield	

## Intersection Summary

Area Type:	Other
Control Type:	Roundabout
Intersection Capacity Utilization	9.0%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

6:

4/28/2014



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	65	37	0	52	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						0.966
Satd. Flow (prot)	0	1644	1900	0	0	1835
Flt Permitted						0.966
Satd. Flow (perm)	0	1644	1900	0	0	1835
Link Speed (mph)	10		10			10
Link Distance (ft)	164		264			132
Travel Time (s)	11.2		18.0			9.0
Peak Hour Factor	0.40	0.40	0.40	0.40	0.40	0.40
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	163	93	0	130	55
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	162	92	0	0	185
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Yield		Free			Free

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.0%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

8:

4/28/2014



Lane Group	EBL	EBR	NWL	NWR	SWL	SWR
Lane Configurations						
Volume (vph)	0	256	91	0	52	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	0	1644	1805	0	1805	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	0	1644	1805	0	1805	1583
Link Speed (mph)	10		10		10	
Link Distance (ft)	88		263		95	
Travel Time (s)	6.0		17.9		6.5	
Confl. Peds. (#/hr)					104	
Peak Hour Factor	0.92	0.82	0.88	0.92	0.68	0.46
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%
Adj. Flow (vph)	0	312	103	0	76	335
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	312	103	0	76	335
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	0		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Free		Stop	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.2%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

17:

4/28/2014



Lane Group	WBL	WBR	SEL	SER	NEL	NER
Lane Configurations						
Volume (vph)	51	92	102	53	75	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.906		0.953		0.975	
Flt Protected	0.985		0.968		0.961	
Satd. Flow (prot)	1696	0	1753	0	1724	0
Flt Permitted	0.985		0.968		0.961	
Satd. Flow (perm)	1696	0	1753	0	1724	0
Link Speed (mph)	10		10		10	
Link Distance (ft)	379		107		213	
Travel Time (s)	25.8		7.3		14.5	
Confl. Peds. (#/hr)		2	82		47	
Peak Hour Factor	0.53	0.42	0.52	0.51	0.38	0.52
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%
Adj. Flow (vph)	96	219	196	104	197	44
Shared Lane Traffic (%)						
Lane Group Flow (vph)	315	0	300	0	241	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Sign Control	Free		Free		Stop	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.4%
Analysis Period (min)	15
	ICU Level of Service A

# Lanes, Volumes, Timings

19:

4/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Lane Configurations				↑	↑		
Volume (vph)	0	0	0	102	74	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt							
Flt Protected							
Satd. Flow (prot)	0	0	0	1900	1900	0	
Flt Permitted							
Satd. Flow (perm)	0	0	0	1900	1900	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	145			132	79		
Travel Time (s)	3.3			3.0	1.8		
Peak Hour Factor	0.40	0.40	0.40	0.40	0.40	0.40	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	0	0	0	255	185	0	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	255	185	0	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	0			0	0		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9	15			9	
Turn Type							
Protected Phases				2	6	4	
Permitted Phases							
Minimum Split (s)				3.0	3.0	3.5	
Total Split (s)				3.0	3.0	3.5	
Total Split (%)				46.2%	46.2%	54%	
Maximum Green (s)				1.0	1.0	1.0	
Yellow Time (s)				2.0	2.0	2.0	
All-Red Time (s)				0.0	0.0	0.5	
Lost Time Adjust (s)				0.0	0.0		
Total Lost Time (s)				2.0	2.0		
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)				1.0	1.0		
Actuated g/C Ratio				0.15	0.15		
v/c Ratio				0.87	0.63		
Control Delay				40.1	16.3		
Queue Delay				0.0	0.0		
Total Delay				40.1	16.3		
LOS				D	B		
Approach Delay				40.1	16.3		
Approach LOS				D	B		

Lanes, Volumes, Timings

19:

4/28/2014

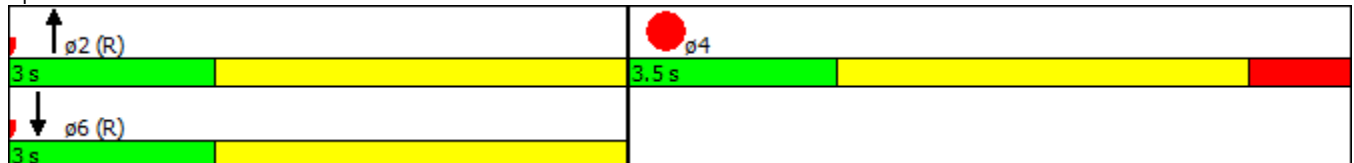


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø4
Stops (vph)				30	13		
Fuel Used(gal)				1	0		
CO Emissions (g/hr)				77	25		
NOx Emissions (g/hr)				15	5		
VOC Emissions (g/hr)				18	6		
Dilemma Vehicles (#)				0	0		
Queue Length 50th (ft)				0	0		
Queue Length 95th (ft)				0	0		
Internal Link Dist (ft)	65			52	1		
Turn Bay Length (ft)							
Base Capacity (vph)				292	292		
Starvation Cap Reductn				0	0		
Spillback Cap Reductn				0	0		
Storage Cap Reductn				0	0		
Reduced v/c Ratio				0.87	0.63		

Intersection Summary

Area Type:	Other
Cycle Length:	6.5
Actuated Cycle Length:	6.5
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	40
Control Type:	Pretimed
Maximum v/c Ratio:	0.87
Intersection Signal Delay:	30.1
Intersection LOS:	C
Intersection Capacity Utilization:	8.7%
ICU Level of Service:	A
Analysis Period (min):	15

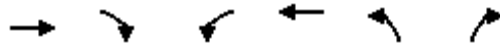
Splits and Phases: 19:



# Lanes, Volumes, Timings

21:

4/28/2014



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	26	26	117	65	0	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.932					0.865
Flt Protected				0.967		
Satd. Flow (prot)	1771	0	0	1837	0	1644
Flt Permitted				0.967		
Satd. Flow (perm)	1771	0	0	1837	0	1644
Link Speed (mph)	10			10	10	
Link Distance (ft)	164			348	551	
Travel Time (s)	11.2			23.7	37.6	
Confl. Peds. (#/hr)		25				
Peak Hour Factor	0.33	0.33	0.33	0.39	0.92	0.33
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	79	79	355	167	0	379
Shared Lane Traffic (%)						
Lane Group Flow (vph)	158	0	0	522	0	379
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

## Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.7%
Analysis Period (min)	15
	ICU Level of Service A