TRAFFIC, BICYCLIST AND PEDESTRIAN REPORT

DANIEL WARREN ELEMENTARY SCHOOL
F. E. BELLOWS ELEMENTARY SCHOOL

VILLAGE OF MAMARONECK, NEW YORK

Prepared for

VILLAGE OF MAMARONECK/
RYE NECK SCHOOL DISTRICT

Prepared by

Provident Design Engineering, PLLC
Hawthorne, New York

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TRAFFIC, BICYCLIST AND PEDESTRIAN REPORT

1.0 Introduction

On behalf of the Village of Mamaroneck and the Rye Neck School District, Provident Design Engineering, PLLC (PDE) has been retained to review the current drop-off and pick-up operations at the Daniel Warren Elementary School as well as the F. E. Bellows Elementary School in the Village and to make recommendations to improve vehicular, bicyclist and pedestrian traffic and parking conditions. (see Figures #1 and 2 in Appendix A)

To conduct this review, PDE held meetings with Village and School officials, performed observations of the existing pick-up and drop-off conditions during various days with different weather conditions, and performed traffic counts at the key intersections and driveways in the vicinity of the two Schools. Additional discussions were held with the Village Police Department and others. Based upon this review and analysis, PDE has developed recommendations to improve traffic and pedestrian operating conditions.

In general, and similar to multiple other schools in the County, both Schools were originally neighborhood schools designed to support children walking to and from the school. They were not designed for the amount of cars that currently travel to and from each of the Schools and thus the vehicular queueing that currently exists occurs for the 15-30 minute periods before and after school. While there is a small drop-off/pick-up loop at Daniel Warren, there is none at F. E. Bellows. Both schools only have limited parking for teachers and staff. Discussions with the Police Department indicate that there appears to just be more cars going to and from the schools than in the past. Parents and children are encouraged by the School District to walk to/from the Schools or park away from the School and walk from there. Carpooling has also been encouraged by the Schools.

In this Study, “Parents” refers to parents and guardians who are dropping-off or picking-up children at the Schools. Some pictures are included in this Study, however, it is PDE’s Policy to limit photographs taken in the vicinity of schools. Thus some photographs are from Google Earth.

The main purpose of the existing drop-off and pick-up procedures as well as this Study is the safety of the children. It is essential that the established drop-off and pick-up procedures be followed by the parents and children.

2.0 Overview

Daniel Warren Elementary School

Daniel Warren Elementary School is located on Harrison Avenue (NY Route 127) in the Village of Mamaroneck. Harrison Avenue/Keeler Avenue forms the southeastern border of the School property. The School has a driveway with an entrance and two exits along Harrison Avenue/Keeler Avenue. This also contains the main entrance into the School building as well as feeds the main parking areas for the School. There is a supplemental parking lot for staff along Florence Street, which then has a pedestrian path to the School.

Two key intersections in the vicinity of the School are Keeler Avenue & Florence Street and School Driveway/Harrison Avenue & Keeler Avenue.

Keeler Avenue & Florence Street is a three-legged unsignalized intersection. Keeler Avenue consists of one-lane in each direction and forms the westbound and eastbound approaches. Florence Street also consists of one-lane in each direction and forms the southbound approach. No crosswalk, pedestrian push button or pedestrian signals are provided at this intersection.

The School Driveway/Harrison Avenue & Keeler Avenue is a four-legged unsignalized intersection. The School Driveway is one lane for exiting vehicles only and forms the southbound approach, allowing through movements and right turn movements (left turns are prohibited). Harrison Avenue consists of one-lane in each direction and forms the westbound approach as well as the northbound approach (widens to a left turn lane and a right turn lane at the intersection). Keeler Avenue consists of one-lane in each direction and forms the eastbound approach. In addition, there is a crosswalk (but no pedestrian push button or signal) across the northern leg of the intersection. A crossing guard is present during the pick-up and drop-off periods.

F. E. Bellows Elementary School

F. E. Bellows Elementary School is located on Carroll Avenue in the Village of Mamaroneck. It is bounded by East Boston Post Road (US Route 1) in the south, North Barry Avenue on the west, and Carroll Avenue on the east, along with residences to the north.

Two key intersections in the vicinity of the School are East Boston Post Road & North Barry Avenue and East Boston Post Road & Carroll Avenue.

East Boston Post Road consists of two lanes in each direction and forms the east-west approaches with North Barry Avenue/South Barry Avenue. North Barry Avenue/South Barry

Avenue consists of one lane in each direction and forms the north-south approaches with East Boston Post Road to form a four-legged signalized Intersection. The northbound leg of South Barry Avenue widens to two lanes at the intersection. There are crosswalks on all four legs of the intersection along with pedestrian signals. A crossing guard is present during the pick-up and drop-off periods.

At Carroll Avenue, East Boston Post Road also consists of two lanes in each direction and forms the east-west approaches. At the intersection, Carroll Avenue is a one-lane, one-way roadway travelling in the northbound direction. (Carroll Avenue eventually becomes a two-way roadway at its intersection with Lorena Street.) The three-legged intersection with East Boston Post Road is unsignalized. There is a crosswalk across Carroll Avenue. North of the intersection of East Boston Post Road & Carroll Avenue, another crosswalk is provided at the main entrance of the F. E. Bellows Elementary School. This crosswalk also does not provide any pedestrian push buttons or pedestrian signals but a crossing guard is present during the pick-up and drop-off periods.

Jurisdiction of Roadways

The Boston Post Road is under the jurisdiction of the New York State Department of Transportation (NYSDOT) as US Route 1. The portion of Harrison Avenue that extends from the Harrison Town Line to Keeler Avenue is also under the jurisdiction of the NYSDOT, as is Keeler Avenue, as NY Route 127. The portion of Harrison Avenue that runs north/south between Keeler Avenue and the Boston Post Road is under local jurisdiction, as are the other roadways in the Study Areas.

Observations and Analyses

Field observations of the intersection were performed at different times of the day, both on weekdays and weekends. Traffic and pedestrian counts were conducted. Capacity analyses were performed to review existing conditions and the possible impacts of potential modifications.

3.0 Description of the Drop-Off and Pick-Up Procedures

Daniel Warren Elementary School

Located on Harrison Avenue, the Daniel Warren Elementary School serves the kindergarten through the second grade. There are approximately 120 Kindergarten students and 250 First and Second Graders.

Doors open at 8:25 AM and classes begin at 8:50 AM. Dismissal for the kindergarten is at 2:45 PM, while dismissal for the first and second grades is at 3:00 PM. The purpose of the split dismissal is to distribute the vehicles arriving to pick-up students, reducing the amount of vehicles at the School at one time. In addition, because of their age, the dismissal of an individual in kindergarten tends to take longer than that of a first or second grader. Thus the early kindergarten dismissal helps to improve traffic flow. This is discussed further in the Observations section.

Vehicular access for parents/guardians is provided by a small one-way drop-off/pick-up area in front of the School on School property that has one entrance to the east and two exits at the western end. There is a staff parking lot in the rear of the School, connected to this roadway as well as some parking along the entrance loop. During drop-off and pick-up, no left turns are permitted from Harrison Avenue into the School driveway. No left turns are permitted exiting the driveways. In addition, during drop-off and pick-up, the parking lane along westbound Harrison Avenue east of the School is converted to a queue storage lane. No stopping or parking is permitted on Harrison Avenue in front of the School. There is additional staff parking provided in a parking lot along Florence Avenue.

The parents have large color cards in their vehicles that contain the student name and the grade/class name to permit the staff to identify the child quickly.

F. E. Bellows Elementary School

Located on Carroll Avenue, the F.E. Bellows Elementary School serves the third grade through the fifth grade. Supervision starts at 8:30 AM. Doors open at 8:40 AM and classes begin at 9:00 AM. Dismissal is at 3:10.

There is no drop-off/pick-up area provided on the School property. Most students are dropped off and picked up along Carroll Avenue, although some are dropped off and picked up along North Barry Avenue. Parents also park on side streets such as Lorena Street and Wagner Avenue, among others for drop-off and pick-up.

The only staff parking provided is in a small lot on North Barry Avenue.

4.0 Traffic Counts and Traffic Volumes

Representatives of PDE conducted traffic counts at the key intersections and driveways in the vicinity of the two Schools. The traffic counts were performed on Wednesday April 19, 2017 from 7:30 AM to 9:30 AM and from 2:00 PM to 4:00 PM to isolate the Peak AM and Peak PM Hours at the key locations, identified as follows:

1. East Boston Post Road and Carroll Avenue
2. East Boston Post Road and North Barry Avenue
3. Carroll Avenue and Lorena Street
4. Harrison Avenue and Daniel Warren Entrance Driveway
5. Keeler Avenue and Harrison Avenue/Daniel Warren Exit Driveway No. 1
6. Keeler Avenue and Daniel Warren Exit Driveway No. 2
7. Wagner Avenue and Lorena Street
8. Frank Avenue and Lorena Street
9. Wagner Avenue and East Boston Post Road
10. Keeler Avenue and East Boston Post Road
11. Frank Avenue and Keeler Avenue
12. Beach Avenue and Tompkins Avenue
13. Frank Avenue and Wagner Avenue
14. North Barry Avenue and Southern Shopping Center Driveway
15. North Barry Avenue and Center Shopping Center Driveway/School Parking Lot Driveway
16. North Barry Avenue and Northern Shopping Center Driveway
17. Keeler Avenue and Florence Street

The traffic volumes observed were summarized and the Peak Hours at the two Schools and the adjacent roadway network were determined to be:

Peak AM Hour: 8:00 AM – 9:00 AM
Peak PM Hour: 2:30 PM – 3:30 PM

The Existing Peak Hour Traffic Volumes for the Peak AM Hour and the Peak PM Hour are illustrated on Figure No. 3.

The Existing Peak Hour Pedestrian Volumes for the various intersections are illustrated on Figure No. 4 and Figure No. 5. As illustrated in the Figures, there are some locations where there are more than 150 pedestrians crossing a specific crosswalk within the one hour, particularly along Keeler Avenue.

More than 70 pedestrians cross the Daniel Warren Entrance Driveway during both Peak Hours. The Crossing Guard at Daniel Warren School crosses over 100 pedestrians crossing Harrison Avenue in the Peak AM Hour and almost 200 pedestrians in the Peak PM Hour, not including the amount crossing at the other approaches of the intersection that are unmarked.

In the PM Peak Hour, there are more than 100 pedestrians crossing Carroll Avenue along the Boston Post Road, which adds to the delays experienced for drivers on the Boston Post Road attempting to turn into Carroll Avenue. Almost another 100 cross Carroll Avenue at Lorena Street. The Crossing Guard at the front of the F. E. Bellows School crosses approximately 30 pedestrians in the morning and 75 pedestrians in the afternoon. The crossing guard helps control the flow of traffic along Carroll Avenue.

There are additional crossing guards at other locations away from the Schools including along Keeler Avenue and North Barry Avenue.

At both Schools, it is difficult to get an actual number of the true amount of children walking to/from school, not only due to the difference during good and bad weather, but also because many children are dropped off near the Schools and then the children walk the rest of the way to the School by themselves or the parents park locally and the children walk to/from there with their parents. The numbers for pedestrians included above and in Figures No. 4 and 5 include parents crossing in addition to the School children.

The number of children riding their bicycle to/from the Daniel Warren School was minimal. As the weather got nicer, some more children rode their bicycles to F. E. Bellows School and the bike rack was pretty full (see Photo # 30 in Appendix B), although the total number was not significant enough to impact the traffic patterns.

There is no regular busing at either of the Schools. Busing would have some limited impacts as a location for the buses to load/unload would be needed (possibly on Harrison Avenue in front of Daniel Warren where parking is prohibited and along Carroll Avenue eliminating either parking area or waiting area for F. E. Bellows). Some of the problems with busing in this area is that parents don't want their children waiting outside for a bus and they feel that they can get their children to School quicker and safer by driving them, thus the buses are not fully utilized.

5.0 Traffic Operation Conditions/Levels of Service

PDE performed traffic capacity analyses at each of the intersections to determine existing conditions and to identify the levels of service utilizing Synchro software. These analyses incorporate the traffic volumes, pedestrians, roadway geometry, and traffic control to determine operating conditions. As opposed to standard intersections, intersections in the vicinity of Schools tend to have a sharper peaking characteristic of approximately 15-30 minutes during drop-off and pick-up times.

Capacity analyses were conducted for the study locations to identify the operating characteristics under the existing conditions. The following is a brief description of the procedures utilized in preparation of this analysis:

- Capacity analysis is a method by which traffic volumes are compared to the calculated roadway and intersection capacities to evaluate future traffic conditions. The Highway Research Board describes the methodology used in the 2010 Highway Capacity Manual. In general, the terminology "Level of Service" is used to provide a "qualitative" evaluation based on certain "quantitative" calculations related to empirical values.

- Levels of Service range from A to F. In general, Level of Service A represents the best traffic operating condition. Level of Service for unsignalized and signalized intersections is defined in terms of average delay. Delay is used as a measure of driver discomfort, frustration, efficiency, etc.

A more complete description of the above is contained in Appendix C. Capacity analyses were performed for the study locations as described below including the various phasing options. The capacity analysis worksheets for the study locations are contained in Appendix E.

6.0 Existing Conditions

The following is a discussion of each of the Study Intersections.

Capacity analyses were conducted for this intersection using the existing traffic volumes for the drop-off and pick-up peak periods. The results of the analysis are summarized below and the details are illustrated in the tables in Appendix D. The actual capacity analyses are contained in Appendix E.

East Boston Post Road and Carroll Avenue – This unsignalized intersection is the main intersection leading to the F. E. Bellows School. At this location, Carroll Avenue is one-way in the northbound direction. A significant amount of pedestrians cross here. From a traffic capacity analysis standpoint, the intersection operates at good levels of service. However, particularly during the pick-up period, traffic backs up on Carroll Avenue at times, and thus vehicles are sitting on the Boston Post Road and are temporarily not able to turn into Carroll Avenue. In addition, vehicles in the queue stop on the crosswalk prohibiting pedestrians from crossing.

East Boston Post Road and North Barry Avenue – This signalized intersection generally operates at appropriate levels of service. There are some delays experienced during peak times, mainly due to the overall volume of traffic, particularly the turning traffic, as well as the pedestrians crossing at the intersection.

Carroll Avenue and Lorena Street – Carroll Avenue between the Boston Post Road and Lorena Street is one-way, with traffic travelling in the northbound direction. This section of Carroll Avenue is approximately 30 feet wide. The eastern portion is utilized for on-street parking while the western portion is used for parents to pullover during drop-off and pick-up. Thus the center portion is used for vehicles proceeding north along the roadway. Just prior to Lorena Street, there is a Stop sign facing northbound Carroll Avenue. North of Lorena Street, Carroll Avenue becomes a two-way roadway extending to Halstead Avenue. There is no traffic control sign for southbound Carroll Avenue traffic. Lorena Street is a two-way roadway with a Stop sign controlling westbound traffic. More Carroll Avenue traffic exiting the School Area turns right onto Lorena Street when compared to the traffic that continues northbound on Carroll Avenue. From a traffic capacity analysis standpoint, the intersection operates at very good levels of service. However, particularly during the pick-up period, traffic does back up on Carroll Avenue at times.

Harrison Avenue and Daniel Warren Entrance Driveway – This intersection is unsignalized. During drop-off and pick-up times, only vehicles on westbound Harrison Avenue can enter the School Driveway, thus making a right turn. These vehicles queue up along the northern curb of Harrison Avenue and can extend a significant distance

back. No left turns from eastbound Harrison Avenue into the School Driveway are permitted during drop-off and pick-up times (although some were observed). The School Driveway is an entrance only (although a vehicle was observed exiting this driveway and turning left onto Harrison Avenue after the pick-up was completed). Between 70 – 80 pedestrians cross the driveway during both drop-off and pick-up. A School Official is located at the intersection to assist people crossing the driveway, to control the flow of traffic into the driveway, and to discourage drivers desiring to turn left into the driveway. Even with the School Official present, some parents were observed turning into the School Driveway before there was sufficient room and thus block the use of the sidewalk by pedestrians. From a traffic capacity analysis standpoint, the intersection operates at good levels of service. However, during both the drop-off period and the pick-up period, traffic is backed-up along the driveway and then along Harrison Avenue.

Keeler Avenue and Harrison Avenue/Daniel Warren Exit Driveway No. 1 – A crossing guard helps students and parents cross at this unsignalized intersection. Almost 200 pedestrians cross Harrison Avenue during the pick-up time. As a result of the angles of Keeler Avenue and Harrison Avenue, the intersection is very wide compared to a typical four-legged intersection. Harrison Avenue forms the westbound and the northbound legs of the intersection. Thus westbound traffic desiring to stay on Harrison Avenue must turn left. Keeler Avenue forms the eastbound approach to the intersection. The Exit Driveway for the School is one lane and permits through movements onto southbound Harrison Avenue as well as right turn movements on to Keeler Avenue. The intersection does experience some delays during the drop-off and pick-up periods, particularly for vehicles turning left onto Keeler Avenue from northbound Harrison Avenue. When the crossing guard is crossing children, gaps are created to make this turning maneuver easier. There are further delays experienced at the intersection as a result of drivers attempting to park on southbound Harrison Avenue, which backs up vehicles into the intersection.

Keeler Avenue and Daniel Warren Exit Driveway No. 2 – The western School Exit Driveway permits only right turns exiting the driveway after stopping. The intersection operates at good levels of service from a capacity standpoint. However, vehicles park on Keeler Avenue right up to the School Driveway which makes the turn difficult to perform. In addition, vegetation at the corner makes it difficult for pedestrians coming from the west to be seen.

Wagner Avenue and Lorena Street – As the portion of Carroll Avenue adjacent to the School is one-way, drivers utilize this intersection when exiting the School Area. In addition, 70 pedestrians cross Wagner Avenue in the Peak PM Hour, the majority of which utilize the existing crosswalk. The intersection is controlled by a four-way Stop and operates at a good level of service.

Frank Avenue and Lorena Street – This intersection is controlled by a three-way stop and operates at good levels of service. While there is a crosswalk across the north side of Frank Avenue at the end of Lorena Street, the roadways are narrow and there are no sidewalks. In addition, there are bushes that are right up against the road leaving limited room for a pedestrian to walk and no room to bail out if necessary, and the crosswalk leads to bushes. (See Photos # 41 and 42) Even so, 53 people cross Frank Avenue at this location during the Peak PM Hour.

Wagner Avenue and Keeler Avenue/East Boston Post Road – This unsignalized intersection is complex as the two side streets that are controlled by Stop signs, Wagner Avenue and Keeler Avenue, both intersect Boston Post Road on the north side. One issue that occurs at this intersection because both side streets are on the north side is that vehicles turning right from Wagner Avenue onto Boston Post Road compete for the same gaps in Boston Post Road traffic that traffic exiting Keeler Avenue are trying to enter. There are also a significant number of pedestrians at this intersection, particularly crossing Wagner Avenue and Keeler Avenue during the Peak PM Hour. The intersection, which had to be analyzed as two intersections due to its geometry, operates at good levels of service but queues are observed along Keeler Avenue.

Frank Avenue and Keeler Avenue – This intersection operates as a four-way Stop controlled intersection. There is a crossing guard who assists pedestrians crossing Frank Avenue on the north side of Keeler Avenue, of which between 60 and 90 cross during the Peak Hours. A significant amount of pedestrians also cross Keeler Avenue, particularly in the afternoon, including those coming from the High School/Middle School as well as those going to/from Ralph's Italian Ices and Ice Cream. The intersection operates at a good level of service but there is some queueing that occurs at times when pedestrians are crossing.

Beach Avenue and Tompkins Avenue – This intersection operates as a four-way Stop controlled intersection, with one of the Tompkins Avenue legs being one-way. Sight distance is limited on certain legs of the intersection. About 30 pedestrians cross Beach Avenue in the crosswalk during drop-off and pick-up. The intersection operates at good levels of service. Queues generally do not get too long but there is limited stacking room on the two legs that extend back to Boston Post Road. Also, there can sometimes be backups on Beach Avenue back towards the intersection when vehicles are waiting to turn left onto the Boston Post Road.

Frank Avenue and Wagner Avenue – Good levels of service are maintained at this T-intersection which operates as a three-way Stop. There are limited pedestrians crossing any particular leg of this intersection (less than 10) at this intersection during drop-off and pick-up.

North Barry Avenue and Southern Shopping Center Driveway – This T intersection operates at good levels of service. Some pedestrians cross North Barry Avenue here.

North Barry Avenue and Center Shopping Center Driveway/School Parking Lot Driveway – This four-way intersection also operates at a good level of service. Between 30 and 50 pedestrians cross the School Parking Lot Driveway during both drop-off and pick-up.

North Barry Avenue and Northern Shopping Center Driveway – This T intersection operates at good levels of service. Some pedestrians cross North Barry Avenue here to utilize the pathway to the School. There were a few parents who parked in the shopping center lot.

Keeler Avenue and Florence Street – This T intersection operates at acceptable levels of service, although there are some delays experienced when turning left from Florence Street onto Keeler Avenue. While some pedestrians cross Keeler Avenue, a significant amount, 160 pedestrians, cross Florence Street during both drop-off and pick-up times. Parents utilize both Keeler Avenue and Florence Street to park their vehicles and walk to the School.

7.0 Additional Observations

The following are additional observations from the drop-off and pick-up procedures and actual operations at each of the Schools. Observations were performed on days with good weather as well as bad weather. Obviously, the delays are greater during the bad weather days as there are less children walking and many parents want to drop-off and pick-up only directly in front of the front door of the School.

Daniel Warren School:

- The crossing guards are at their posts by 8:00 AM and are present until after drop-off ends. In the afternoon they are present by 2:30 PM.
- At 8:00 AM, most parking spaces are already taken. Some parents are already stopped/parked in the school's driveway waiting to drop-off their child. These parents do not leave until 8:25 when the children are let into the school. (see Photo #5)
- The teacher/staff parking lot behind the school was generally always full or close to it. The parking area in the front of the school was generally close to full. The supplemental parking lot along Florence Street was sometimes full, but had available spaces during other times. There were some times when a few spaces were available. Some teachers/staff were observed parking on Keeler Avenue. Some of the vehicles parked on Keeler Avenue are residents.
- 140 vehicles enter the School Driveway in the AM Peak Hour while 65 enter in the PM Peak Hour.
- Parents were also observed parking on Keeler Avenue, as left turns are not permitted into the School Driveway, and then crossing Keeler Avenue with their children, not utilizing the crossing guard. Some illegal parking was observed. (see Photo #12)
- Traffic at the school is very busy between 8:30 and 8:45 AM. The queues along Harrison Avenue can sometimes extend past West Street to Standish Place. Although the Village Police would prefer the queue to remain on Harrison Avenue, the queue also occurs on West Street itself. The Village Police have received comments regarding West Street being blocked as well as Pine Knoll Lane and Rose Avenue being blocked, as well as Laura Joy Circle, thus residents cannot enter/exit the sidestreets at times, especially when raining. After 8:45, there are generally no more queued vehicles on Harrison Avenue.
- During both drop-off and particularly pick-up, a significant number of parents/guardians park on the side streets adjacent to the school and then walk to the school to drop-off or pick-up their child. Parents park on various side streets such as Laura Joy Circle, Florence Street, Jensen Avenue and Stoneybrook Avenue. Some of these people block driveways when they park. (Some parents park in the CVS parking lot, although it is signed for customers only.) Parking away from the

School is beneficial as it reduces the vehicles that are present at the school. However, some of the side streets such as Stoneybrook Avenue are narrow and the parked vehicles limit the area for pedestrians and vehicles to get by. The School and the Village Police have received complaints from residents of Laura Joy Circle and other streets due to parent vehicles blocking their driveways. (See Photos # 4, 13 and 14)

- Some parents were observed dropping off their children on Laura Joy Circle. A parent was observed stopping her SUV on Laura Joy Circle, blocking traffic in both directions, having her children get out of the vehicle to walk to the School. Meanwhile, the parent drove slowly along Harrison Avenue in the travel lane staying parallel with the children until they entered the School.
- Various parents parked on Florence Avenue and then made U-turns after they returned to their cars.
- To get in the queue along Harrison Avenue to get onto the school property, many parents/guardians perform a u-turn directly on Harrison Avenue to go from traveling northbound to traveling southbound. There have been occurrences of the police pulling people over for making this maneuver. Others were observed turning around utilizing driveways or side streets. Some parents will pull into Laura Joy Circle and then turnaround to join the queue during both drop-off and pick-up.
- Even though a school representative is present, parents turn right from the Harrison Avenue queue into the School Driveway when there is not enough room. They then block the sidewalk and pedestrians cannot get by. (see Photo # 8)
- One very noticeable key factor in the delays experienced during the drop-off procedures which results in the process going much slower than necessary and resulting in the long queues is that many parents stay in their vehicles until their child goes all of the way into the school building, even though there is a school representative present to assist them if necessary. This adds up to a significant amount of time when several parents in a row do this. In addition, the vehicles all stop immediately in front of the door and do not pull up. This is understandable in the beginning of the school year and possibly for certain children but by the end of the school year, it should not be happening. Some parents would get out of their cars which further adds delays. Some children would be sitting in the backseat but have their bag in the front seat so they would then have to open the front door to get their bag.
- Parents in the front circle were attempting to pass other parents who were taking too long, which then further slowed the process as they both attempted to go at the same time.
- The staggered dismissal for kindergarten provides a significant benefit in limiting the queueing and delays in the afternoon. Even so, the queue can be past Laura Joy Circle by 2:30.
- During pick-up, having the identification cards does help significantly. School representatives and a volunteer also help the process move. However, not all parents follow the procedures or listen to the representatives, particularly in moving

up their vehicles. Again, this is understandable in the beginning of the school year but should not be the issue that it is late in the school years. In addition, some parents got out of their cars although they were told not to.

- During pick-up, students are kept in the front of the school's main entrance, unless there is inclement weather where the school conducts an indoor dismissal. However, some of the children start to wander around and thus are harder to find quickly to load into the respective cars.
- Most vehicles drop-off or pick-up only one child.
- At the intersection of Harrison Avenue and Keeler Avenue at the eastern Exit Driveway of the school, a crosswalk had been relocated to shorten the crossing distance for pedestrians. The previous crosswalk can still be seen. Although the crossing guard is present and the new shorter crosswalk exists, some parents/students still use the old crosswalk path because it is slightly closer to their destination and the new crosswalk is essentially at a resident's driveway. The crossing guard did state to them to utilize the new crosswalk. (see Photo #10)
- Also at the intersection of Harrison Avenue and Keeler Avenue, some pedestrians cross Keeler Avenue where there is no crosswalk or crossing guard. (see Photo #11)
- Traffic can back up at the intersection at times, particularly when vehicles are turning left from Harrison Avenue to Keeler Avenue or when there are a number of people crossing.
- Traffic also backs up during pick-up when a parent is parallel parking along southbound Harrison Avenue.
- The two exit driveways result in some confusion, which would not be expected to occur late in the school year.
- Both exiting driveways have limited sight distance, mainly due to vehicles parked on the street. Multiple times there was a car parked just west of the western exit driveway that limited the ability of a driver to turn right. (see Photos # 1, 2 and 3)
- Also at the western exit driveway, in addition to views being limited by parked cars, there is also limited sight distance for a vehicle exiting to see a pedestrian due to existing vegetation. (There is a sidewalk that goes along the driveway but some people do cross the driveway itself). (see Photos # 1 and 2)
- Essentially all pick-up traffic is gone by 3:10.
- New York State Law indicates that a vehicle cannot park within 30 feet of a Stop sign (as the view of the Stop sign could be blocked) unless there is specific signage stating parking is permitted. Observations indicated cars parking immediately next to Stop signs, particularly along westbound Stoneybrook Avenue just before its intersection with Harrison Avenue.
- The Pedestrian Ramps at many locations do not meet current ADA standards. (see Photos # 6 and 7)
- The Middle School Lacrosse Team practices at Daniel Warren so Middle School students are walking to the School during pick-up.

F. E. Bellows School:

- During drop-off, parents were observed dropping off their children early along Carroll Avenue but then remain with their car pulled up along the western curb for extended periods of time as they watch their children as they play outside. Some leave when the supervision begins at 8:30. However, others stay until 8:40 when the children enter the School. These vehicles staying in the drop-off lane limits the ability for the flow along Carroll Avenue.
- The majority of the parents who are just dropping-off go straight to the main entrance.
- Students who are dropped off, depending upon the time, play outside or go into the Education Center or the Main Entrance.
- Although more cars turn onto Carroll Avenue in the morning then in the afternoon (212 versus 114), the back-ups in the morning are less than those in the afternoon but still exist. At 8:20 AM, Carroll Avenue starts to back-up and the back-up extends to Boston Post Road at 8:30. At 8:37 the first bell rings and students start to go into the School and the queueing clears.
- Most vehicles drop-off or pick-up only one child. On average, only 1 out of every 15 cars dropped off more than one child along Carroll Avenue.
- Parents have complained about the pedestrian crossing of Carroll Avenue along the Boston Post Road and would like the pedestrians to walk north along Carroll Avenue and cross at the crossing guard in front of the School, as they interfere with the turning onto Carroll Avenue. (More pedestrians cross Carroll Avenue along the Boston Post Road than cross at the crosswalk in front of the School.) This could be encouraged for students walking to or from F. E. Bellows but some students are destined to or from the playground and would likely not walk the extra distance. As it is, some students, generally High School/Middle School students who are walking and turn from the Boston Post Road onto Carroll Avenue then cross in the middle of the street between parked cars, particularly when destined to the playground. In addition, not everyone crossing along the Boston Post Road is affiliated with F. E. Bellows, as some are connected with the High School/Middle School while others are local residents and thus they would not travel north to the crossing guard and then back up to the Boston Post Road.
- Another comment from parents is people stopping in the middle lane near the school crosswalk to drop-off or pick-up instead of pulling to the side and thus disrupting the traffic flow along Carroll Avenue. Some parents “double park” to pick-up their child who has walked to the car. Various children were observed getting into vehicles that were in the middle lane. Students should not be permitted to enter vehicles that are in the center travel lane as this disrupts the flow of traffic along Carroll Avenue. This action was observed even though the School Administration has sent out communications regarding this. (see Photo # 21)
- There have also been complaints from residents about driveways being blocked by

parents. There were cases of this observed.

- A Sanitation truck was picking up refuse on Carroll Avenue at 8:43 AM which was during the end of the drop-off time. It would be beneficial if it could arrive a little later, after the drop-off period is over.
- There were over 40 drop-offs of students along North Barry Avenue.
- Some parents travel at a higher rate of speed on Carroll Avenue than is appropriate, generally when they are late for School.
- A limited number of parents parked in the shopping center parking lot off of North Barry Avenue and walked their children across during both pick-up and drop-off. During the pick-up period, more parents parked in the shopping center parking lot than in the morning. Some of these appeared to have picked up a child at Daniel Warren and then were picking up another child at F. E. Bellows. The shopping center has complained about the use of their parking lot and have added signs while the School has advised parents not to park there.
- An issue with the drop-off and pick-up at this School is that Carroll Avenue is one-way northbound and the School is on the left hand, or western, side. It is generally more appropriate to drop-off and pick-up on the right hand side. Thus, children were observed crossing the street to enter and exit vehicles or getting out/in their vehicles on the right hand side, adjacent to traffic.
- During pick-up, the queued vehicles on Carroll Avenue back up to and then wrap around onto the Boston Post Road past Wagner Avenue. Some vehicles turn before there is enough room and thus block the crosswalk along the Boston Post Road across Carroll Avenue. (see Photos #32 and 33) During this time, some parents try to turn left from the Boston Post Road onto Carroll Avenue, and since Carroll Avenue is full, they cause some backups on the Boston Post Road. Vehicles were parked on both sides of Carroll Avenue from the Boston Post Road to all of the way past Lorena Street. Some parents left their vehicles while others parents remained in their vehicles. (see Photo #28)
- The Village Police have considered prohibiting the left turn movement from Boston Post Road onto Carroll Avenue but have decided not to go forward with that at this time.
- Before pick-up actually begins, 18 vehicles were parked on the east side of Carroll Avenue from the School building entrance to the Boston Post Road while 24 vehicles were parked on the west side (the School side). The reason for the difference is because of the driveways on the east side. There were another 3 vehicles parked on the Boston Post Road. These numbers do not include the vehicles that are queued up or the vehicles parked to the north of Carroll Avenue or the sidestreets. Some parents had their child meet them at the vehicle while others got out of their vehicles and met their child at the front of the School. (see Photos #28 and 31)
- Some residents along Carroll Avenue have complained about their driveways being blocked. (see Photos #35 and 36)
- Some parents park along Carroll Avenue during pick-up when their children are

playing in the playground. Thus they are parked for a significant amount of time, occupying spaces and no turnover is occurring. These parents should either arrive later or park on a different street.

- Some vehicles were lined up on North Barry Avenue to pick-up students in the back of the School.
- Parents were observed parking on Lorena Street, Wagner Avenue and Frank Avenue, while others parked on Carroll Avenue north of Lorena Street. Some parents were observed parking on Boston Post Road. (see Photo #31)
- By 3:20, traffic is much more settled and by 3:25, only a few vehicles remain while some children are in the playground.
- New York State Law indicates that a vehicle cannot park within 30 feet of a Stop sign (as the view of the Stop sign could be blocked) unless there is specific signage stating parking is permitted. Observations indicated cars parking immediately next to Stop signs, particularly along westbound Lorena Street just before its intersection with Carroll Avenue. (see Photo #26 - although this is a truck in this picture, parents were also observed parking here multiple times)
- New York State Law indicates that vehicles should not park within 20 feet of a crosswalk unless striping/signage permit it, which was observed in various locations. There are some parking spaces along Carroll Avenue that are striped up to the crosswalk. Vehicles parked in these spaces can block the driver's visibility of seeing pedestrians who are trying to cross. (see Photos #23, 28 and 29)
- Vehicles were also observed parked in other areas that were striped out indicating no parking permitted (see Photos #21 and 27), in "No Standing" areas (see Photo #34) and in "No Parking" areas (see Photo #37).
- The crosswalk in front of the School is missing an ADA ramp on the far side. Also a utility pole blocks part of the crosswalk.
- Providing additional sidewalks would improve pedestrian safety but there may not be right-of-way available.
- The only teacher/staff parking is the small lot on North Barry Avenue and thus most teachers and staff park on the street. However, even with this being the only School lot, there were 11 empty parking spaces in the lot as teachers/staff park on Carroll Avenue. If more teachers/staff parked in the lot on North Barry Avenue and not on the street, it would help traffic flow during drop-off and pick-up. (see Photo #22)
- Crossing guards were present at the main entrance at the School along Carroll Avenue, at the intersection of Boston Post Road and North Barry Avenue, at the intersection of North Barry Avenue and Brook Street, and at the intersection of North Barry Avenue and Halstead Avenue.

8.0 Possible Improvements/Modifications

Based upon our field observations as well as discussions with representatives of the Village and the Schools, performing physical improvements at either of the Schools is generally not possible due to existing uses and available land. There are no realistic solutions that will completely solve all of the issues and some of the modifications would improve some locations but would hinder others, resulting in some trade-offs.

Almost all cars have only one child per car. The more children that walk to and from the Schools, the better the conditions would be. Both Schools have had various communications with the parents about drop-off and pick-up procedures. However some parents still do not follow the policies. Parent Education including explaining the importance of following the procedures is critical, as is being considerate of others.

Neither School has enough off-street parking for teachers and staff and thus some teachers and staff are parking on the adjacent streets.

The following are possible improvements/modifications for the drop-off and pick-up procedures at each of the Schools. The implementation of the improvements would be through coordination of the Village (VOM) and the School District (RNSD).

Daniel Warren School:

- During drop-off, parents sitting in their vehicle in the front loop should not be permitted to watch their child the entire way into the building when there are School representatives there assisting the children. Also, if drivers would pull up some, then more than one vehicle could be processed at a time and the procedure would be much more efficient. (RNSD)
- The parking lot behind the building is generally filled. The Florence Avenue Lot had some parking spaces available at times. Having this lot fully utilized would reduce the number of vehicles parked near the School and improve traffic flow. (RNSD)
- A potential measure to reduce the queueing on Harrison Avenue and the sidestreets is to utilize the parking lot behind the School to increase the stacking length and to reduce the number of vehicles stacking on Harrison Avenue. This would reduce some of the neighborhood impacts. However, as the queue begins to form early, this could impact staff entering/exiting the teacher parking lot in the back of the School. (RNSD)
- Reducing the amount of teachers/staff parking on Harrison Avenue and Keeler Avenue will provide some benefits. However, there is no significant room to add additional parking without losing playground or green space on the School property. There is not sufficient room (as well as infrastructure constraints) to provide

additional parking in front of the School. (see Photo #9) (RNSD)

- For the two exits, a possibility is to close the first exit (the easterly exit) and thus all traffic must turn right (out of the westerly exit). Thus traffic would no longer be able to go directly onto Harrison Avenue, of which currently 45 vehicles do in the Peak AM Hour and 22 do in the Peak PM Hour. This would reduce confusion in the loop in front of the School extend the storage area, and add parking (in the area where the driveway would be eliminated). However, it would make it more difficult for those destined to Harrison Avenue, including those who can now utilize the traffic signal at the Boston Post Road to cross or turn onto the Boston Post Road. (RNSD)
- Another alternative for the two exits is to convert the first exit so that vehicles can only go straight across onto Harrison Avenue. Thus all traffic desiring to turn right would perform that maneuver at the westerly exit. (RNSD)
- A walkie–talkie system was tried previously but was not continued. It is PDE's opinion that this system could be beneficial as it helps to have the children ready to be pick-up and can save some processing time, especially during rainy/snowy days when the children are inside. The staff member who is at the entrance driveway along Carroll Avenue would radio in the names of the children for the next few cars to the staff member at the door so that those children are ready to go. (RNSD)
- Although some parents have asked for a police officer to direct traffic, similar to Boston Post Road and Hornidge Road (for the High School/Middle School), it is not necessary here. The main issues here are the operations within the driveway circle and the unloading and loading of the children. The current crossing guard provides the gaps in the traffic for pedestrians to cross the street and vehicles to exit. (RNSD)
- Although usually not necessary, painting a crosswalk across each of the school driveways, particularly the entrance driveway, may further alert drivers of potential pedestrians and limit drivers stopping on the sidewalk, blocking pedestrians. (RNSD)
- Providing a second drop-off lane in the School circle via utilization of the inside lane adjacent to the island was considered but is not currently recommended. With this concept, a sidewalk would be constructed and students would be dropped off on the inside loop also. This would require at least one other School representative to assist the children getting out of the vehicles and crossing the circle to get to the School. An issue with this is that parents would not know what side of the driveway that they would be dropping students off on until they get to the School so they would not know what side of the vehicle the student should be sitting on. This lane could also be used during pick-up but the students would need to be alerted earlier and then would need to cross the circle and thus this would not be as effective during pick-up. Another disadvantage is if a car is waiting to drop-off/pick-up a student, someone behind them cannot get around them. (RNSD)
- Utilizing the area along Harrison Avenue in front of the School as a second means of drop-off and pick-up would require additional staff to help children cross the driveway loop is not recommended. This would be more beneficial if the children

were older but is not efficient here as many of the children need assistance getting into or out of the vehicle. The children during drop-off would then need assistance to get to the School. During pick-up, children would not know where they would be being picked up. However, there is the possibility of permitting some vehicles to park there during drop-off and pick-up. The parents would then get out of their car and walk over with their child to the School entrance or to meet their child. However, there are only a limited number of spots and parents trying to parallel park or find a spot (especially when none are available) will block traffic on Harrison Avenue. This is currently prohibited so past experience should be considered. Also, it is important that the parked vehicles do not block the sightline views of the crosswalk or vehicles exiting the School Driveways. (RNSD and VOM)

- Utilizing the School building entrance to the west for a second drop-off spot, such as for Second Graders would help improve the efficiency of the drop-off. It could also be utilized for pick-up. Additional staff would be required. (RNSD)
- Utilizing the back of the School for dropping off and picking up second graders would be another alternative. Similar to the condition above, this would also require additional staff. In addition, there will be a conflict point as second grade parents are exiting the back area and crossing first grade parents who are lining up in front of the School. (RNSD)
- Providing a full drop-off loop around the entire School was reviewed and would provide some benefits but is not physically possible. A connection could be made to the Florence Avenue lot/driveway, but only after the modification to various outdoor features of the School property and the benefits are likely not significant enough. A possibility is to widen the pathway between the Florence parking lot and the back of the School. This would require the loss of field space. A turnaround could then be provided and this could be used as another drop-off and pick-up location (although in bad weather to use as a pick-up location). If it was made wide enough, parking could be added. However, due to the loss of field space and the other factors, it is not recommended at this time. (RNSD)
- Another possibility is to consider opening the School doors five minutes earlier in the morning to further disperse the arriving traffic. It is understood that this will slightly modify some staff services. (RNSD)
- Install “Do Not Block Intersection” signs on West Street at Pine Knoll Lane and on Harrison Avenue at West Street. (VOM)
- The vegetation at the corner of Keeler Avenue and the westerly School Driveway should be trimmed to improve sight distance. A “No Parking Here To Corner” sign should also be added to the intersection. (VOM)
- Crosswalks along Keeler Avenue could possibly be added along Keeler Avenue across Jensen Avenue and Florence Avenue due to the number of pedestrians that cross at these locations. (VOM)

F. E. Bellows School:

- An ADA accessible ramp should be added at the Carroll Avenue crosswalk in front of the School, on the opposite side of the School. The crosswalk is partially blocked by a utility pole. There are various other locations where the pedestrian ramps should be updated to current standards. (RNSD and VOM)
- There were various parking spaces available in the teacher lot along North Barry Avenue. Having this lot fully utilized would reduce the number of vehicles parked on Carroll Avenue and improve traffic flow. (RNSD)
- There has been the suggestion to remove the Stop sign facing northbound Carroll Avenue traffic at Lorena Street as this tends to back up traffic in front of the School during pick-up. (see Photos #38 and 39) This removal would help traffic flow and if it is done, a sign should be placed below the Stop sign on Lorena Street stating crossing traffic does not stop, which would be a new traffic operation. However a significant negative of this is that the Stop sign makes it easier for people to cross Carroll Avenue to/from Lorena Street and if the Stop sign is removed, less people will likely stop for pedestrians here. 94 people were observed crossing Carroll Avenue at this intersection during the Peak PM Hour. (VOM)
- Reversing the direction of traffic flow on the one-way section of Carroll Avenue could be considered. A significant benefit of this would be children would be dropped-off and picked-up on the right side of the car. A second advantage is that there would be more stacking available and cars would not be sitting/queueing on Boston Post Road. However, one disadvantage of this is that vehicles would then have to turn onto the Boston Post Road after dropping-off or picking-up. Another disadvantage is that on-street parking on southbound Carroll Avenue would need to be prohibited during certain time periods (similar to Harrison Avenue at Daniel Warren School) to allow for queueing. Otherwise the queue would block all traffic and residents would not be able to get through. (VOM)
- If the intersection of Carroll Avenue and Lorena Street remains as is, a "No Left Turn" sign should be added. (see Photo #25) (VOM)
- Increase the outside supervision to 8:20 AM and/or allow entrance into the school five minutes earlier so that more vehicles arrive earlier to further distribute the traffic. This would impact staff duties. (RNSD)
- Eliminate parking spaces (at least during pick-up and drop-off) that are located within 20 feet of a crosswalk in the direction of the vehicular traffic. This will provided better visibility of the pedestrians. (VOM)
- Additional afterschool and/or before-school programs that could further disperse traffic would be beneficial if they could be scheduled. (RNSD)
- The majority of the sidewalks are the standard four feet wide. However some are only three feet wide, such as on Lorena Street. Although not absolutely necessary, providing wider sidewalks would be beneficial and could increase the amount of walkers. However, there are bushes and utility poles that are restricting the sidewalk

width and right-of-way would need to be reviewed. Providing additional sidewalks would be beneficial if right-of-way is available. (VOM)

- Consider adding an additional bike rack as the Village is looking to expand on the bike lanes in the community. (RNSD and VOM)
- Changing the parking regulations on Carroll Avenue to something like a two hour limit would reduce the amount of vehicles parked all day there, opening up the road more for drop-off and pick-up. However, this would likely not be favorable to the residents and would result in some teachers/staff parking on other side streets. (VOM)

9.0 Conclusions

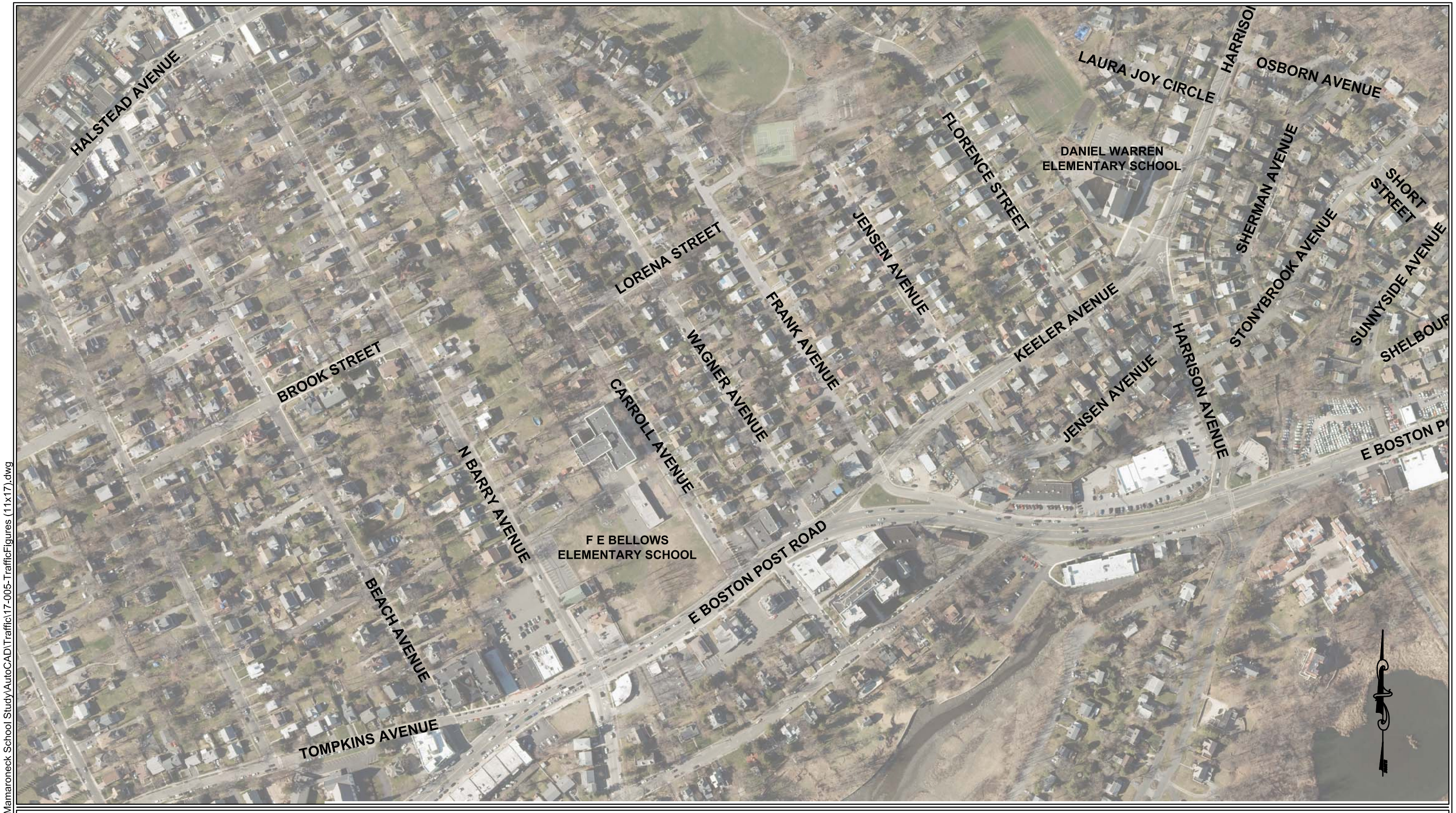
Some of the above possible improvements and modifications are illustrated on Figures No. 6 and 7. As there is no room to do full physical improvements, these other modifications are suggested to improve conditions to the fullest extent possible. However, most of the modifications would have other impacts such as increased staff duties or costs. The existing procedures as well as the modifications will not be able to work without parent cooperation.

The implementation of these improvements would need to be through a coordinated effort between the Village and the School District, as some are on School property while others are on Village property.

The School District has made a concerted effort to get more children to walk to School. The more children that walk, the less queues will occur and thus these efforts should continue including through various programs such as Walk-to-School Day, Walking School Buses, and others. Significant information on these type programs including how to operate these programs and the health benefits are available online. Carpooling should also continue to be encouraged.

APPENDIX A

FIGURES



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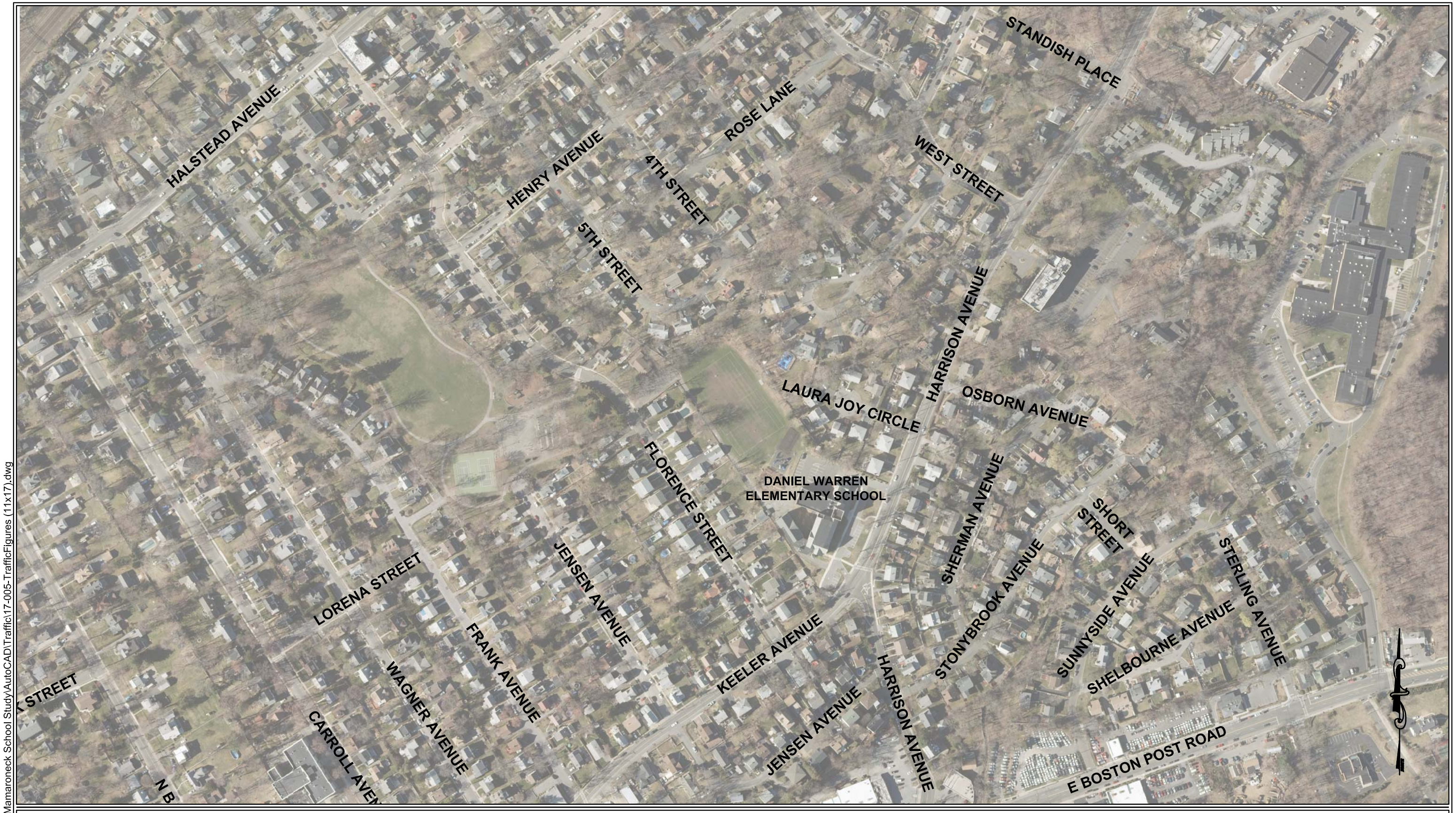
Site Location Map - FE Bellows Elementary School
Mamaroneck, Westchester County, New York

Project No. 17-005
Not To Scale
June 2017

Figure No. 01



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Site Location Map - Daniel Warren Elementary School
Mamaroneck, Westchester County, New York

Project No. 17-005
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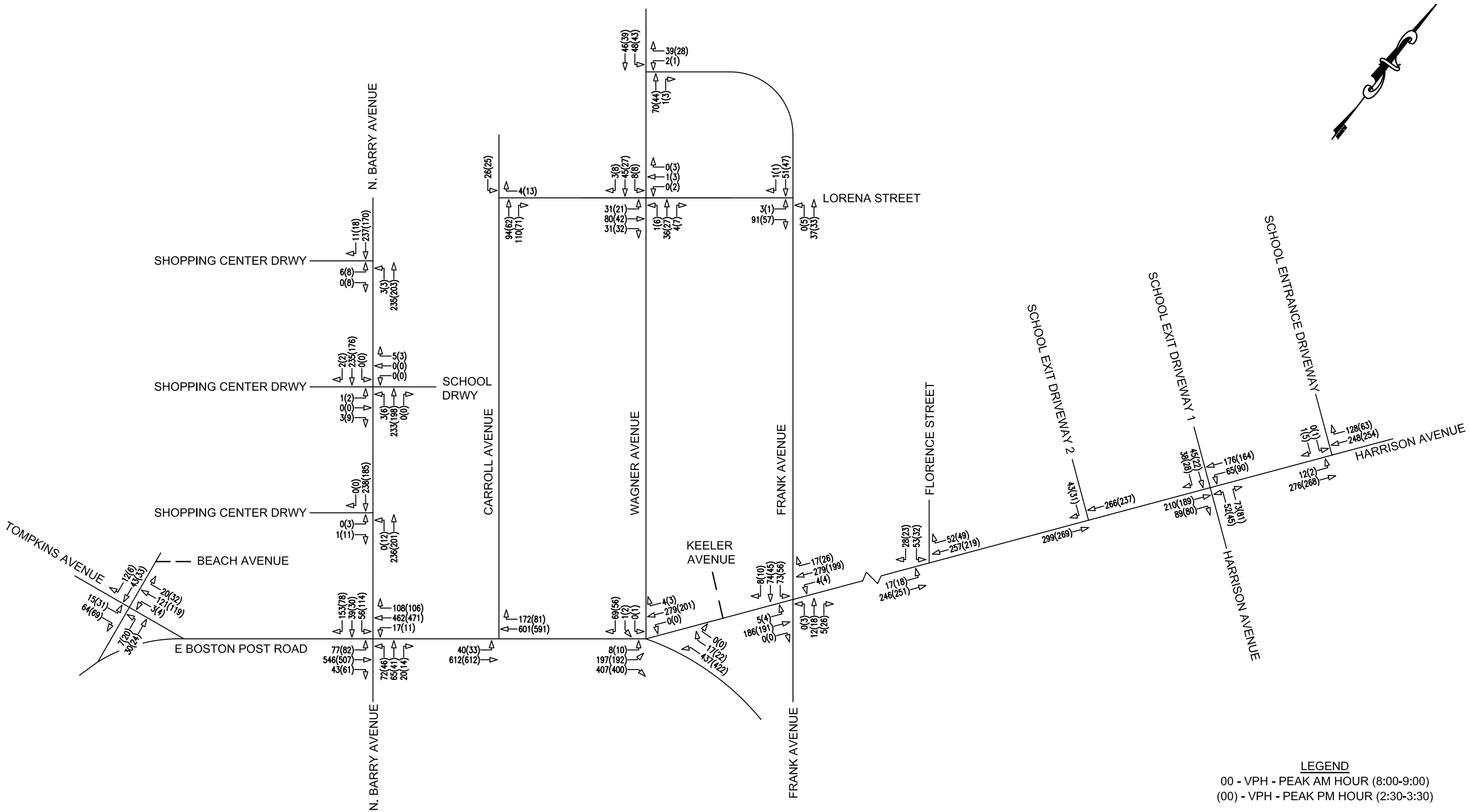
June 2017

Figure No. 02



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2017 Existing Traffic Volumes

Mamaroneck, Westchester County, New York

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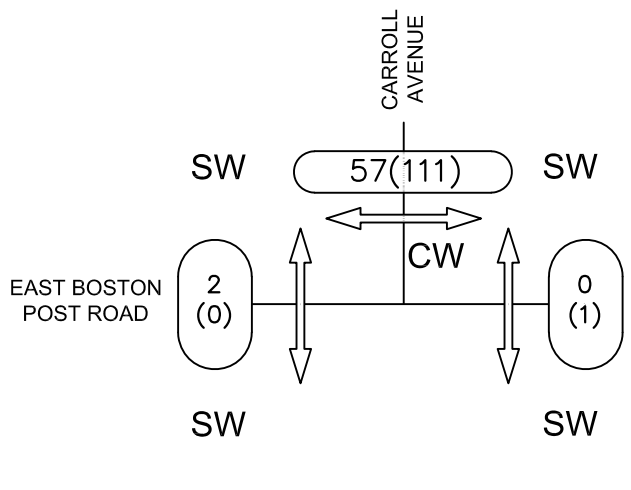
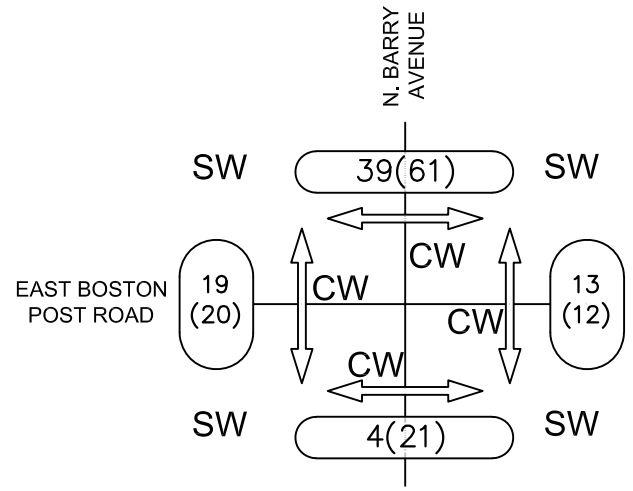
Figure No. 03

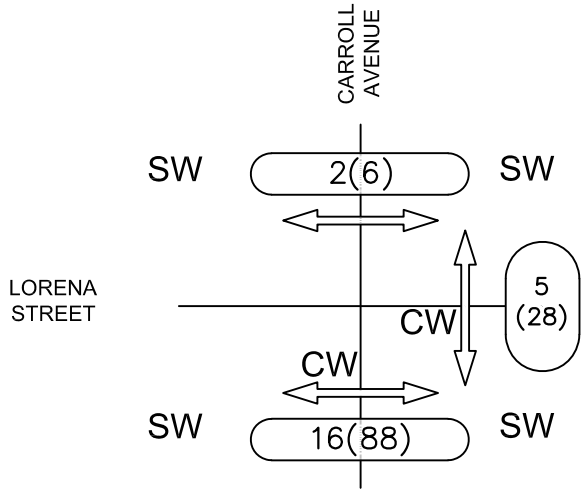
EAST BOSTON POST ROAD & CARROLL AVENUE



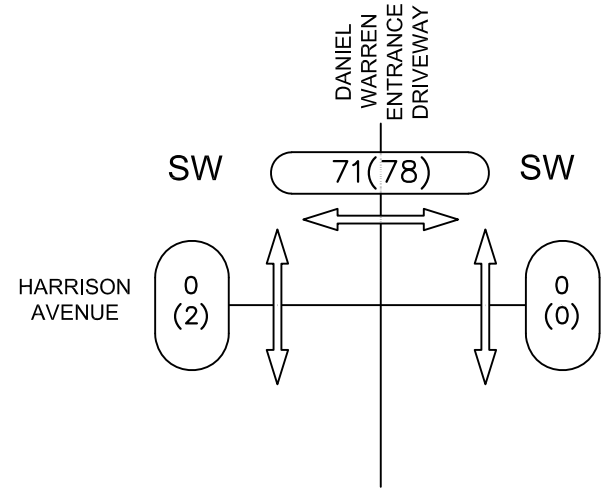
EAST BOSTON POST ROAD & N. BARRY AVENUE



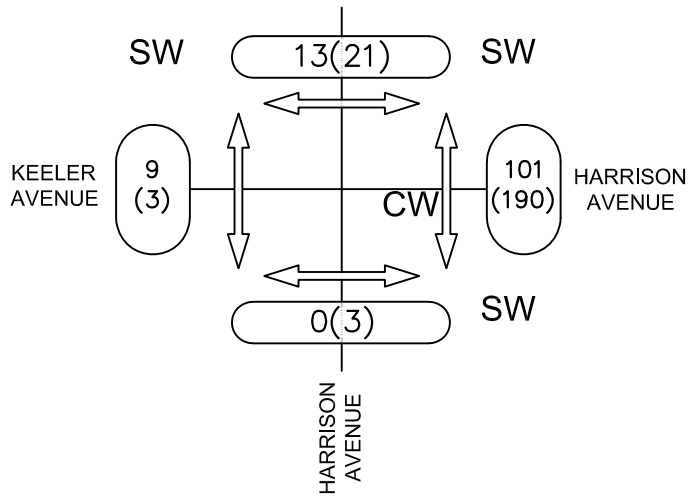
LORENA STREET & CARROLL AVENUE



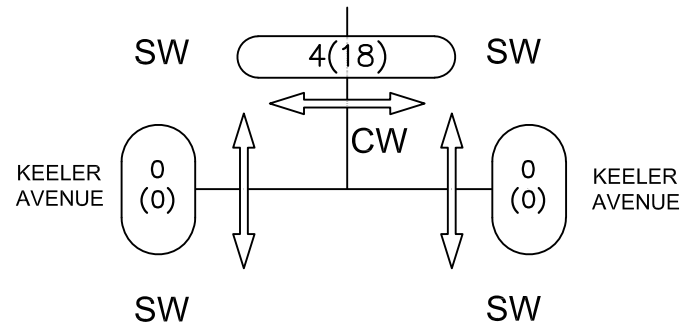
HARRISON AVENUE & DANIEL WARREN ENTRANCE DRIVEWAY



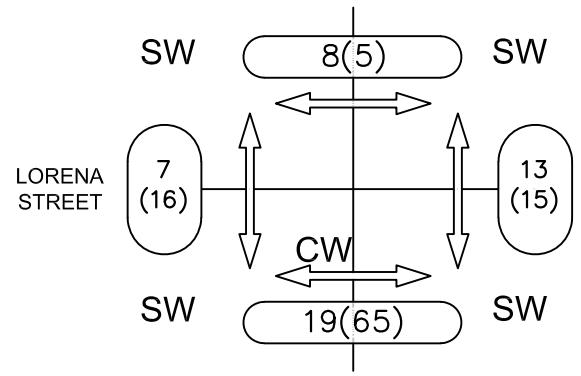
KEELER AVENUE/HARRISON AVENUE & DANIEL WARREN EXIT DRIVEWAY 1



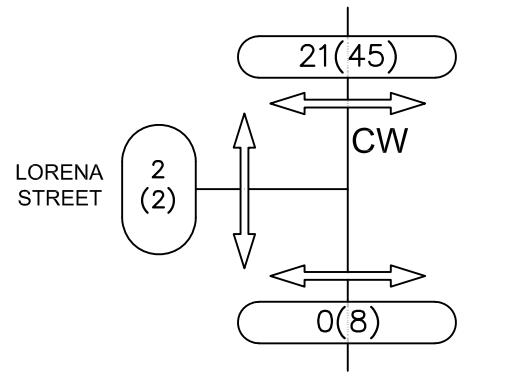
KEELER AVENUE/HARRISON AVENUE & DANIEL WARREN EXIT DRIVEWAY 2



LORENA STREET & WAGNER AVENUE



LORENA STREET & FRANK AVENUE



LEGEND

00 - VPH - PEAK AM HOUR (8:00-9:00)

(00) - VPH - PEAK PM HOUR (2:30-3:30)

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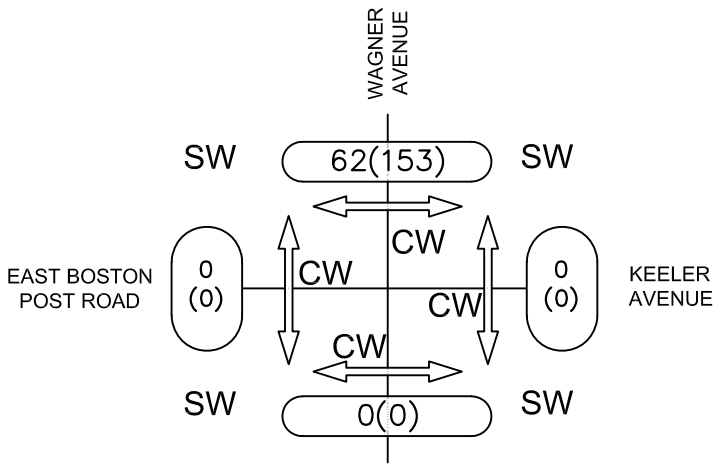
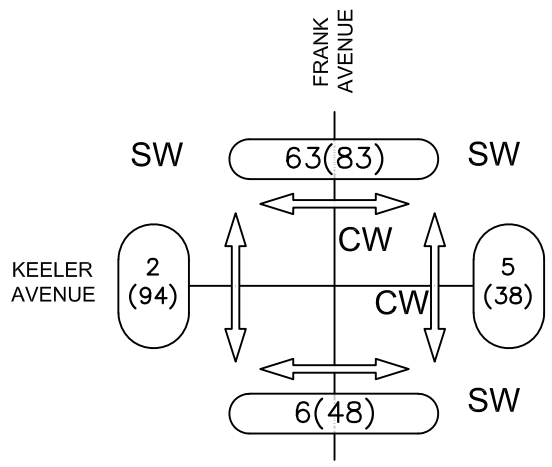
Figure No. 04

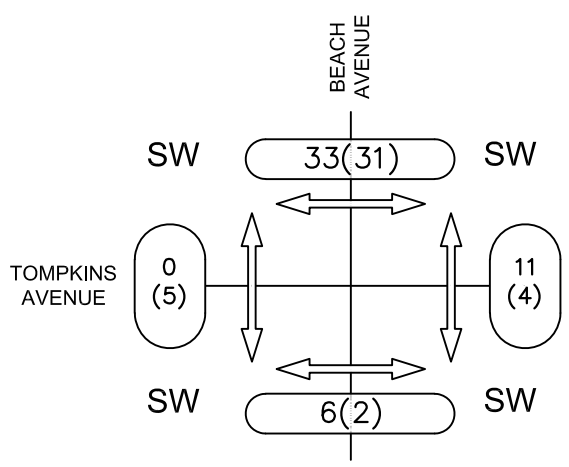
EAST BOSTON POST ROAD/KEELER AVENUE & WAGNER AVENUE



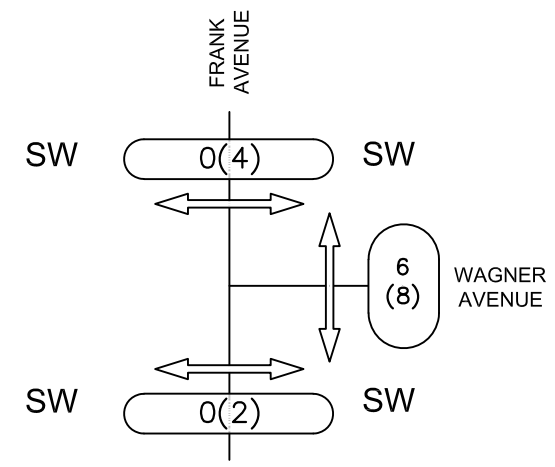
KEELER AVENUE & FRANK AVENUE



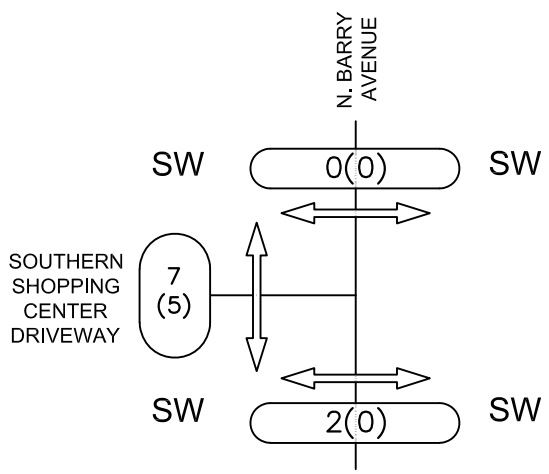
TOMPKINS AVENUE & N. BEACH AVENUE



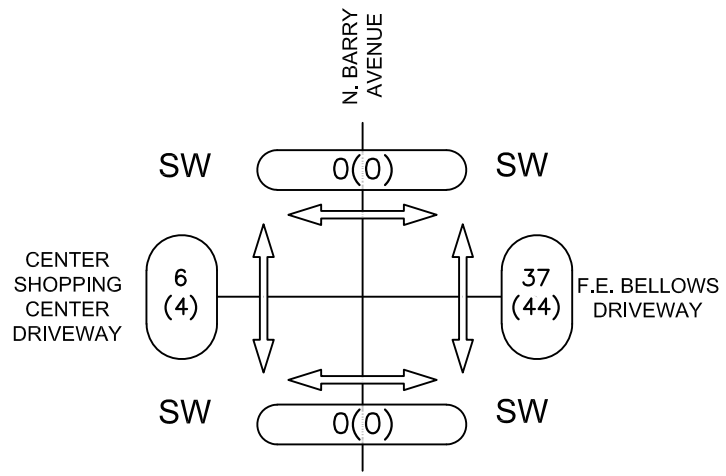
WAGNER AVENUE & FRANK AVENUE



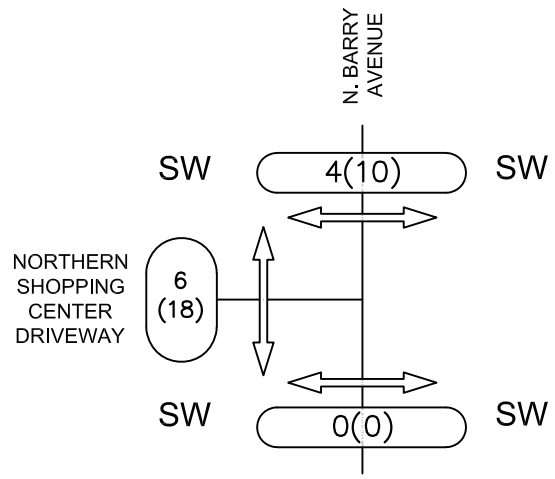
N. BARRY AVENUE & SOUTHERN SHOPPING CENTER DRIVEWAY



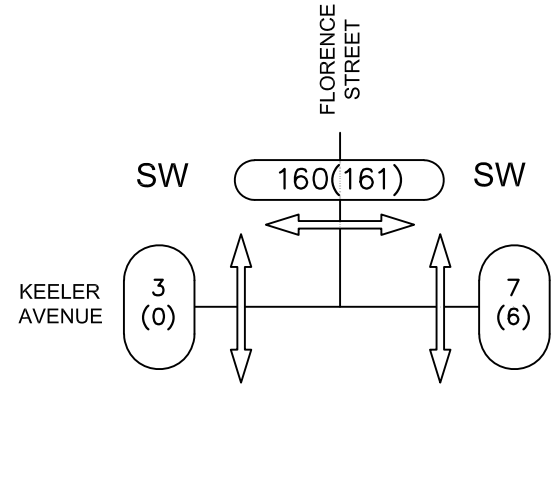
N. BARRY AVENUE & CENTER SHOPPING CENTER DRIVEWAY



N. BARRY AVENUE & NORTHERN SHOPPING CENTER DRIVEWAY



KEELER AVENUE & FLORENCE STREET



CARROLL AVENUE & FE BELLOWS SCHOOL CROSSWALK

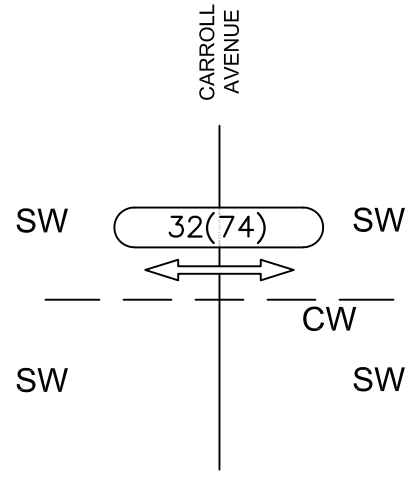


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Figure No. 05

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Daniel Warren Elementary School Improvements
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Figure No. 06

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FE Bellows Elementary School Improvements
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Figure No. 07

APPENDIX B

PHOTOGRAPHS

Daniel Warren Pictures

#1: Parking too close to corner, blocking sight distance

#2: Car at corner

#3: Parked cars make turn difficult from exit driveway

#4:Cars parked on both sides make for difficult movement

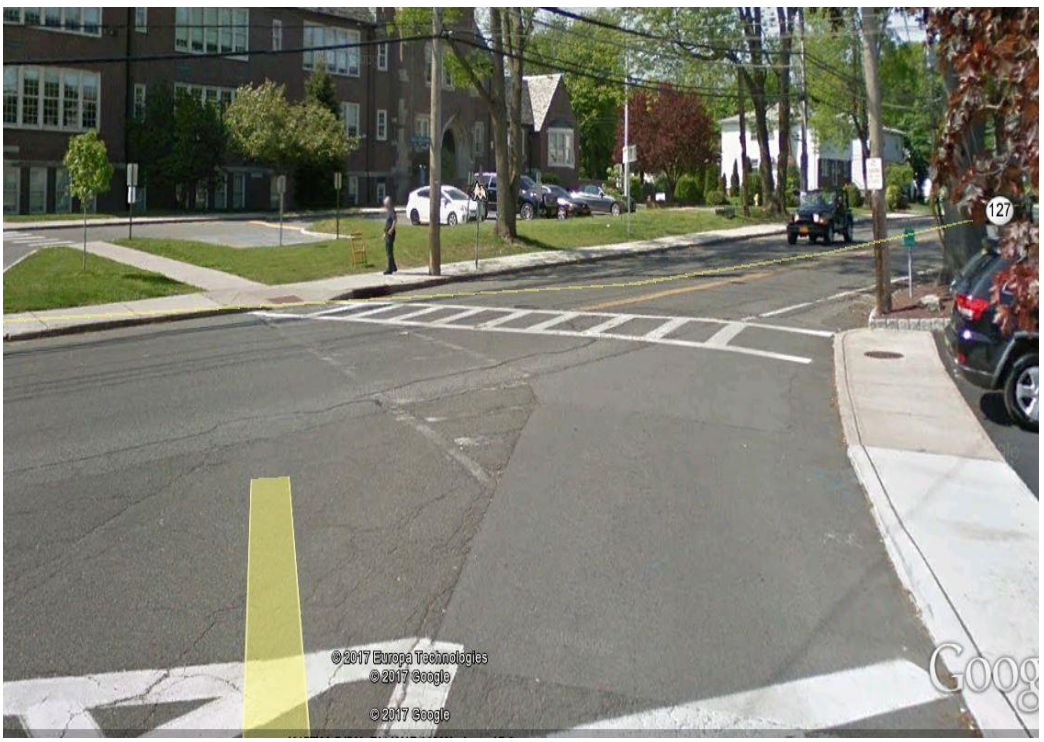
#5: Cars lined up early

#6: Utility pole in sidewalk, no ADA ramp

#7: No ADA ramps

#8: Van waiting for pick-up blocking sidewalk

#9: Infrastructure limits widening

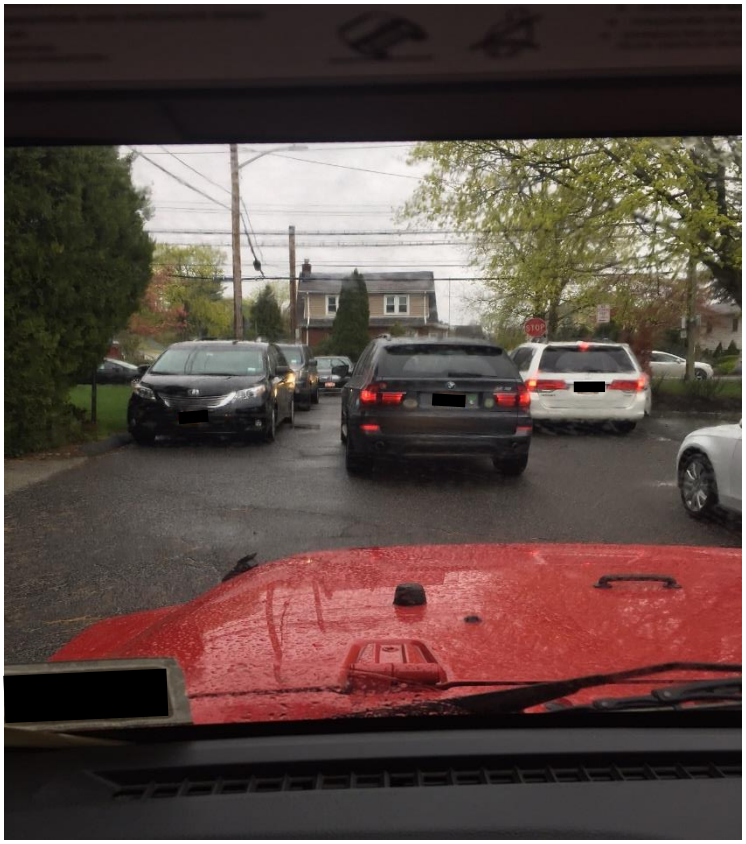


#10: Old crosswalk vs. new crosswalk

#11: Not crossing at sidewalk

#12: Illegally parked car

#13: Laura Joy Circle



#14: Laura Joy Circle

F.E Bellows Pictures

#21: Car in no parking area, other vehicle stopped in drive aisle

#22: Parking on Carroll Avenue full during school hours

#23: No one in car, close to crosswalk

#24: Pole limits crosswalk functionality

#25: Should add “No Left Turn” sign

#26: Sign prohibits parking. Also blocking view of stop sign

#27: Parking in No Parking area

#28: Cars fill street before pickup begins

#29: Cars block view of children in crosswalk

#30: Bike rack half full

#31: Cars parked on Boston Post Road

#32: Van waiting in line for pick-up, blocking crosswalk

#33: Van waiting in line for pick-up, blocking crosswalk

#34: Cars in “No Standing” area

#35: Vehicles blocking driveway

#36: Vehicles blocking driveway

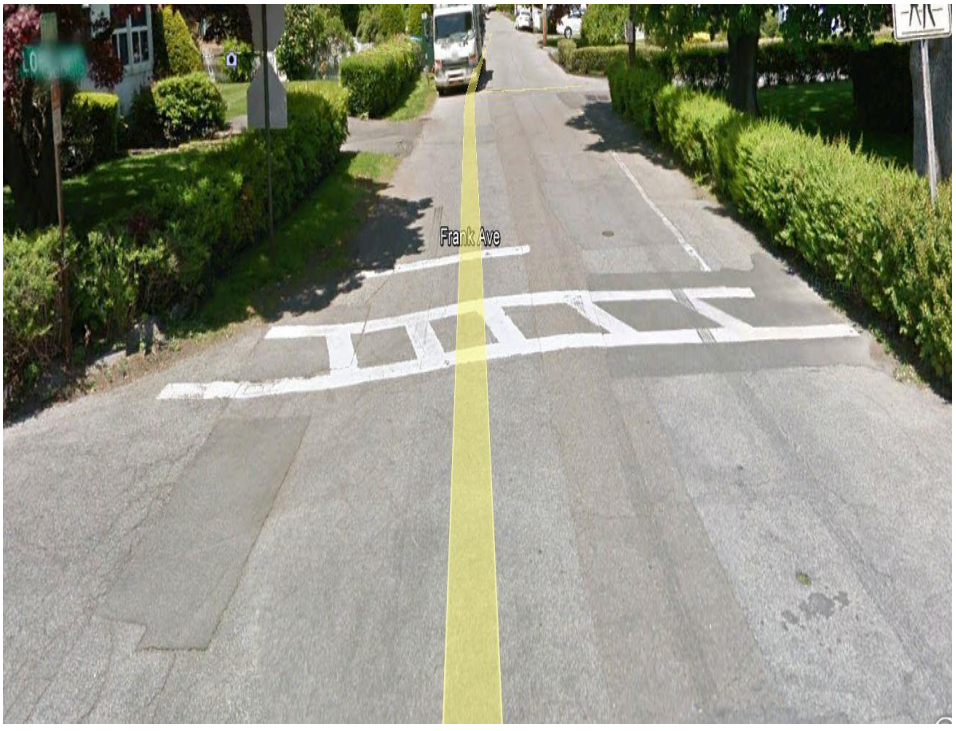
#37: Car in “No Parking” area

#38: Backup from Stop Sign

#39: Confusion at intersection

#40: Illegal parking on striping although other spaces available

#41: Parked car and bushes limit walking area



#42: Crosswalk leads to bushes

APPENDIX C

LEVEL OF SERVICE STANDARDS

1. LEVEL OF SERVICE

CONCEPT

The 2010 Highway Capacity Manual, published by the Transportation Research Board of the U.S. Government, established a system by which highway facilities are examined for their adequacy to handle traffic volumes. The terminology "Level of Service" is used to provide a "qualitative" evaluation based on certain "quantitative" calculations which are related to empirical values.

Intersection Capacity, Delay and resultant Levels of Service are dependent upon a number of factors, including the following:

- Area Type
- Intersection geometrics
- Traffic volumes
- Parking conditions
- Pedestrian activity
- Vehicle Mix
- Bus Stop location and activity
- Peak Hour Factor
- Traffic Signal operation, if applicable

Ramp and weaving area Densities and resultant Levels of Service are dependent upon a number of factors, including the following:

- Number of lanes
- Configuration of weaving area
- Length of acceleration/deceleration lanes
- Vehicle speeds
- Traffic volumes
- Vehicle Mix
- Peak Hour Factor

FACTORS

SIGNALIZED INTERSECTIONS

Level of Service for Signalized Intersections is defined in terms of Delay, which is a measure of driver discomfort, frustration, fuel consumption, and loss of travel time. Specifically, Level of Service criteria are stated in terms of the Average Control Delay per vehicle for the peak 15-minute period within the hour analyzed.

Delay is a complex measure and is dependent upon a number of variables, including:

- Cycle length
- Ratio of Green time to Cycle length (G/C)

- Ratio of Volume to Capacity (V/C) for lane group or approach
- Traffic signal progression

UNSIGNALIZED INTERSECTIONS

Level of Service for Unsignalized Intersections is also defined in terms of Delay. The amount of Delay is based upon the availability of "gaps" in the mainline traffic stream and the acceptance of these gaps by motorists waiting on the side street to enter the main street traffic flow.

RAMP AND RAMP JUNCTIONS

Level of Service for ramp freeway junctions and the ramp proper are defined in terms of Density (passenger cars per mile per lane). Density is related to the traffic flow in the area of influence.

WEAVING AREAS

Level of Service for weaving areas is defined in terms of Density (passenger cars per mile per lane). Density is based on the ratio of weaving vehicles to non-weaving vehicles and on vehicle speeds in the weaving area of influence

CRITERIA

The criteria for the various Level of Service designations are as follows:

	SIGNALIZED	UNSIGNALIZED
LEVEL OF SERVICE	**Average Control Delay per Vehicle (Seconds)**	**Average Control Delay per Vehicle (Seconds)**
A	10.0 or less	10.0 or less
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	80.1 or greater	50.1 or greater

Level of Service	Ramp-Freeway Junction	Ramp Proper	Weaving Areas	
	Maximum Density pc/mi/ln	Density Range pc/mi/ln	Maximum Density pc/mi/ln	
			Freeway Weaving Area	Multi-lane + C-D Weaving Area
A	≤10	≤11	≤10	≤12
B	>10 - 20	>11 – 18	>10 - 20	>12 - 24
C	>20 - 28	>18 – 26	> 20 - 28	>24 - 32
D	>28 - 35	>26 – 35	>28 - 35	>32 - 36
E	>35	>35 – 45	>35 - 43	>36 - 40
F	Demand exceeds capacity	>45	>43	>40

DESCRIPTION

The following is a brief description of each of the six Level of Service designations as defined by the Highway Capacity Manual:

SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE A

Average Control Delay - 10.0 secs. or less

Describes operations with very low delay. Occurs when progression is extremely favorable and most vehicles arrive during the Green Phase and do not stop at all. Short cycle lengths may also contribute to low delay.

LEVEL OF SERVICE B

Average Control Delay - 10.1 to 20.0 secs.

Generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average delay.

LEVEL OF SERVICE C

Average Control Delay - 20.1 to 35.0 secs.

Higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this Level of Service. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.

LEVEL OF SERVICE D

Average Control Delay - 35.1 to 55.0 secs.

The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high Volume/Capacity (V/C) Ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LEVEL OF SERVICE E

Average Control Delay - 55.1 to 80.0 secs.

The limit of acceptable delay.

Higher delay values generally indicate poor progression, long cycle lengths, and high V/C Ratios. Individual cycle failures are frequent occurrences.

LEVEL OF SERVICE F

Average Control Delay - in excess of 80.0 secs.

Unacceptable to most drivers.

Occurs with oversaturation, i.e., arrival flow rates exceed the capacity of the intersection. May also occur at high V/C Ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.

UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE A
Average Control Delay - 10.0 secs. or less
Operations with little or no delay to minor turning movements.

LEVEL OF SERVICE B
Average Control Delay - 10.1 to 15.0 secs.
Operations with short delays on minor turning movements.

LEVEL OF SERVICE C
Average Control Delay - 15.1 to 25.0 secs.
Operations with average delays on minor turning movements.

LEVEL OF SERVICE D
Average Control Delay - 25.1 to 35.0 secs.
Operations with some delays on minor turning movements.

LEVEL OF SERVICE E
Average Control Delay - 35.1 to 50.0 secs.
Operations with long delays on minor turning movements.

LEVEL OF SERVICE F
Average Control Delay - In excess of 50.0 secs.
Operations where demand exceeds capacity. Very long delays with queuing may be experienced on the minor street approach.

RAMPS AND RAMP JUNCTIONS

LEVEL OF SERVICE A

Maximum Density - 10 pc/mi/ln

Unrestricted operations with no noticeable turbulence in the ramp influence area.

LEVEL OF SERVICE B

Maximum Density - 20 pc/mi/ln

Minimal levels of turbulence exist and speeds of vehicles in the influence area begin to decline.

LEVEL OF SERVICE C

Maximum Density - 28 pc/mi/ln

Level of turbulence becomes noticeable as average speed within the influence area declines. Driving conditions are still relatively comfortable at this level.

LEVEL OF SERVICE D

Maximum Density - 35 pc/mi/ln

.

Turbulence levels become intrusive. Queues may form on some high volume on-ramps but freeway operation remains stable.

LEVEL OF SERVICE E

Maximum Density - >35 pc/mi/ln

.

Conditions approaching and reaching capacity. Speeds are reduced and turbulence of merging/diverging vehicles becomes intrusive to all vehicles in the influence area. Flow levels approach capacity limits and minor changes in demand can cause ramp and freeway queues to occur.

LEVEL OF SERVICE F

Maximum Density – Demand flow exceeds limits

Unstable, or breakdown, operation. Approaching demand flows exceed the discharge capacity of the downstream freeway or ramp. Queues are visibly formed on the freeway and on-ramps and will continue to grow as long as the approaching demand exceeds the discharge capacity.

APPENDIX D

LEVEL OF SERVICE RESULTS

TABLE NO. 1
PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE
East Boston Post Road & Carroll Avenue

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
East Boston Post Road			
EB	LT	a 2.3	a 1.7
	T	a 0.0	a 0.0
	OVERALL	***a*** ***2.3***	***a*** ***1.7***
WB	T	a 0.0	a 0.0
	TR	a 0.0	a 0.0
	OVERALL	***a*** ***0.0***	***a*** ***0.0***
INTERSECTION		**a** **2.3**	**a** **1.7**

TABLE NO. 2

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

East Boston Post Road & N. Barry Avenue

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
N. Barry Avenue			
NB	L	B 10.2	B 10.1
	TR	A 8.4	A 8.0
	OVERALL	***A*** ***9.2***	***A*** ***9.0***
SB	LTR	C 20.8	B 16.8
	OVERALL	***C*** ***20.8***	***B*** ***16.8***
East Boston Post Road			
EB	LTR	D 47.2	D 47.8
	OVERALL	***D*** ***47.2***	***D*** ***47.8***
WB	LTR	C 27.8	C 27.0
	OVERALL	***C*** ***27.8***	***C*** ***27.0***
INTERSECTION		**C** **32.3**	**C** **33.0**

TABLE NO. 3

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

Carroll Avenue & Lorena Street

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
Carroll Avenue			
NB	TR	a 8.6	a 8.4
	OVERALL	***a*** ***8.6***	***a*** ***8.4***
SB	L	a 7.7	a 7.8
	OVERALL	***a*** ***7.7***	***a*** ***7.8***
Lorena Street			
WB	R	a 7.1	a 7.2
	OVERALL	***a*** ***7.1***	***a*** ***7.2***
INTERSECTION		**a** **8.6**	**a** **8.4**

TABLE NO. 4

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

Harrison Avenue & Daniel Warren Entrance Driveway

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
Harrison Avenue			
NB	LT	a 0.5	a 0.1
	OVERALL	***a*** ***0.5***	***a*** ***0.1***
SB	TR	a 0.0	a 0.0
	OVERALL	***a*** ***0.0***	***a*** ***0.0***
INTERSECTION		**a** **0.5**	**a** **0.1**

TABLE NO. 5

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

Keeler Avenue & Harrison Avenue/Daniel Warren Exit driveway 1

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
Keeler Avenue			
NB	TR	a 0.0	a 0.0
	OVERALL	***a*** ***0.0***	***a*** ***0.0***
SB	LT	a 8.7	a 8.5
	OVERALL	***a*** ***8.7***	***a*** ***8.5***
Schhol Exit Driveway 1/Harrison Avenue			
EB	LTR	c 17.3	b 13.4
	OVERALL	***c*** ***17.3***	***b*** ***13.4***
WB	L	d 29.5	c 20.0
	R	b 12.8	b 12.0
	OVERALL	***d*** ***29.5***	***c*** ***20.0***
INTERSECTION		**d** **29.5**	**c** **20.0**

TABLE NO. 6

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

Keeler Avenue & Daniel Warren Exit Driveway 2

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
Daniel Warren Exit Driveway 2			
SB	R	b 10.7	a 10.0
	OVERALL	***b*** ***10.7***	***a*** ***10.0***
INTERSECTION		**b** **10.7**	**a** **10.0**

TABLE NO. 7

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

Wagner Avenue & Lorena Street

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
Wagner Avenue			
NB	LTR	a 8.1	a 7.5
	OVERALL	***a*** ***8.1***	***a*** ***7.5***
SB	LTR	a 8.3	a 7.6
	OVERALL	***a*** ***8.3***	***a*** ***7.6***
Lorena Street			
EB	LTR	a 9.1	a 7.8
	OVERALL	***a*** ***9.1***	***a*** ***7.8***
WB	LTR	a 7.7	a 7.2
	OVERALL	***a*** ***7.7***	***a*** ***7.2***
INTERSECTION		**a** **9.1**	**a** **7.8**

TABLE NO. 8

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

Frank Avenue & Lorena Street

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
Frank Avenue			
NB	LT	a 7.5	a 7.4
	OVERALL	***a*** ***7.5***	***a*** ***7.4***
SB	TR	a 7.6	a 7.4
	OVERALL	***a*** ***7.6***	***a*** ***7.4***
Lorena Street			
EB	LR	a 7.1	a 6.9
	OVERALL	***a*** ***7.1***	***a*** ***6.9***
INTERSECTION		**a** **7.6**	**a** **7.4**

TABLE NO. 9

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

Wagner Avenue & East Boston Post Road

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
Wagner Avenue			
SB	TR	b 12.1	b 11.9
	OVERALL	***b*** ***12.1***	***b*** ***11.9***
East Boston Post Road			
EB	LT	a 9.4	a 9.1
	T	a 0.1	a 0.1
	OVERALL	***a*** ***9.4***	***a*** ***9.1***
WB	TR	a 0.0	a 0.0
	T	a 0.0	a 0.0
	OVERALL	***a*** ***0.0***	***a*** ***0.0***
INTERSECTION		**b** **12.1**	**b** **11.9**

TABLE NO. 10

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

Keeler Avenue/East Boston Post Road

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
Keeler Avenue			
SWB	TR	b 13.0	b 11.7
	OVERALL	***b*** ***13.0***	***b*** ***11.7***
East Boston Post Road			
EB	LT	a 9.2	a 9.2
	T	a 0.6	a 0.6
	OVERALL	***a*** ***9.2***	***a*** ***9.2***
WB	TR	a 0.0	a 0.0
	T	a 0.0	a 0.0
	OVERALL	***a*** ***0.0***	***a*** ***0.0***
INTERSECTION		**b** **13.0**	**b** **11.7**

TABLE NO. 11

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

Frank Avenue & Keeler Avenue

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
Frank Avenue			
NB	LTR	a 8.9	a 8.2
	OVERALL	***a*** ***8.9***	***a*** ***8.2***
SB	LTR	b 11.0	a 9.1
	OVERALL	***b*** ***11.0***	***a*** ***9.1***
Keeler Avenue			
EB	LTR	b 10.7	a 9.3
	OVERALL	***b*** ***10.7***	***a*** ***9.3***
WB	LTR	b 12.8	a 9.5
	OVERALL	***b*** ***12.8***	***a*** ***9.5***
INTERSECTION		**b** **12.8**	**a** **9.5**

TABLE NO. 12

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

Beach Avenue & Tompkins Avenue

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
Beach Avenue			
NB	LT	a 7.8	a 8.2
	OVERALL	***a*** ***7.8***	***a*** ***8.2***
SB	TR	a 7.7	a 7.9
	OVERALL	***a*** ***7.7***	***a*** ***7.9***
Tompkins Avenue			
EB	LTR	a 7.3	a 7.7
	OVERALL	***a*** ***7.3***	***a*** ***7.7***
WB	LR	a 8.1	a 8.5
	OVERALL	***a*** ***8.1***	***a*** ***8.5***
INTERSECTION		**a** **8.1**	**a** **8.5**

TABLE NO. 13

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

Frank Avenue & Wagner Avenue

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
Wagner Avenue			
NB	TR	a 7.6	a 7.3
	OVERALL	***a*** ***7.6***	***a*** ***7.3***
SB	LT	a 7.9	a 7.7
	OVERALL	***a*** ***7.9***	***a*** ***7.7***
Frank Avenue			
WB	LR	a 7.1	a 6.8
	OVERALL	***a*** ***7.1***	***a*** ***6.8***
INTERSECTION		**a** **7.9**	**a** **7.7**

TABLE NO. 14

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

N. Barry Avenue & Southern Shopping Center Driveway

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
N. Barry Avenue			
NB	LT	a 0.0	a 7.7
	OVERALL	***a*** ***0.0***	***a*** ***7.7***
SB	TR	a 0.0	a 0.0
	OVERALL	***a*** ***0.0***	***a*** ***0.0***
Southern Shopping Center Driveway			
EB	LR	a 9.8	a 9.9
	OVERALL	***a*** ***9.8***	***a*** ***9.9***
INTERSECTION		**a** **9.8**	**a** **9.9**

TABLE NO. 15

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

N. Barry Avenue & Center Shopping Center Driveway/School Parking Lot Driveway

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
N. Barry Avenue			
NB	LTR	a 7.8	a 7.6
	OVERALL	***a*** ***7.8***	***a*** ***7.6***
SB	LTR	a 0.0	a 0.0
	OVERALL	***a*** ***0.0***	***a*** ***0.0***
Center Shopping Center Driveway/School Parking Lot Driveway			
EB	LTR	b 10.6	a 9.8
	OVERALL	***b*** ***10.6***	***a*** ***9.8***
WB	LTR	b 10.1	a 9.8
	OVERALL	***b*** ***10.1***	***a*** ***9.8***
INTERSECTION		**b** **10.6**	**a** **9.8**

TABLE NO. 16

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

N. Barry Avenue & Northern Shopping Center Driveway

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
N. Barry Avenue			
NB	LT	a 7.8	a 7.7
	OVERALL	***a*** ***7.8***	***a*** ***7.7***
SB	TR	a 0.0	a 0.0
	OVERALL	***a*** ***0.0***	***a*** ***0.0***
Northern Shopping Center Driveway			
EB	LR	b 12.5	b 10.5
	OVERALL	***b*** ***12.5***	***b*** ***10.5***
INTERSECTION		**b** **12.5**	**b** **10.5**

TABLE NO. 17

PEAK HOUR LEVEL OF SERVICE SUMMARY TABLE

Keeler Avenue & Florence Street

APPROACH		PEAK AM HOUR (8:00 - 9:00 AM)	PEAK PM HOUR (2:30 - 3:30 PM)
		2017 EXISTING	**2017 EXISTING**
		LOS DELAY (sec)	LOS DELAY (sec)
Florence Street			
SB	LR	d 26.4	c 17.5
	OVERALL	***d*** ***26.4***	***c*** ***17.5***
Keeler Avenue			
EB	LT	a 8.5	a 8.3
	OVERALL	***a*** ***8.5***	***a*** ***8.3***
WB	TR	a 0.0	a 0.0
	OVERALL	***a*** ***0.0***	***a*** ***0.0***
INTERSECTION		**d** **26.4**	**c** **17.5**

APPENDIX E

CAPACITY ANALYSES

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	15	0	64	0	3	121	20	0	7	30	0
Future Vol, veh/h	0	15	0	64	0	3	121	20	0	7	30	0
Peak Hour Factor	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	17	0	72	0	3	136	22	0	8	34	0
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.3	8.1	7.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	19%	2%	0%
Vol Thru, %	81%	0%	84%	78%
Vol Right, %	0%	81%	14%	22%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	37	79	144	55
LT Vol	7	15	3	0
Through Vol	30	0	121	43
RT Vol	0	64	20	12
Lane Flow Rate	42	89	162	62
Geometry Grp	1	1	1	1
Degree of Util (X)	0.053	0.096	0.184	0.075
Departure Headway (Hd)	4.574	3.897	4.103	4.383
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	786	925	862	821
Service Time	2.582	1.897	2.188	2.391
HCM Lane V/C Ratio	0.053	0.096	0.188	0.076
HCM Control Delay	7.8	7.3	8.1	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.7	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	43	12
Future Vol, veh/h	0	0	43	12
Peak Hour Factor	0.92	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	0	48	13
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.7
HCM LOS	A

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations									
Traffic Vol, veh/h	0	0	6	0	94	110	0	26	0
Future Vol, veh/h	0	0	6	0	94	110	0	26	0
Peak Hour Factor	0.92	0.61	0.61	0.92	0.61	0.61	0.92	0.61	0.61
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	10	0	154	180	0	43	0
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.1	8.6	7.7
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	100%
Vol Thru, %	46%	0%	0%
Vol Right, %	54%	100%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	204	6	26
LT Vol	0	0	26
Through Vol	94	0	0
RT Vol	110	6	0
Lane Flow Rate	334	10	43
Geometry Grp	1	1	1
Degree of Util (X)	0.34	0.011	0.052
Departure Headway (Hd)	3.66	4.084	4.401
Convergence, Y/N	Yes	Yes	Yes
Cap	983	882	811
Service Time	1.675	2.084	2.441
HCM Lane V/C Ratio	0.34	0.011	0.053
HCM Control Delay	8.6	7.1	7.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1.5	0	0.2

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	31	80	31	0	0	1	0	0	1	36	4
Future Vol, veh/h	0	31	80	31	0	0	1	0	0	1	36	4
Peak Hour Factor	0.92	0.56	0.56	0.56	0.92	0.56	0.56	0.56	0.92	0.56	0.56	0.56
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	55	143	55	0	0	2	0	0	2	64	7
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	9.1	7.7	8.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	22%	0%	14%
Vol Thru, %	88%	56%	100%	80%
Vol Right, %	10%	22%	0%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	41	142	1	56
LT Vol	1	31	0	8
Through Vol	36	80	1	45
RT Vol	4	31	0	3
Lane Flow Rate	73	254	2	100
Geometry Grp	1	1	1	1
Degree of Util (X)	0.093	0.3	0.002	0.128
Departure Headway (Hd)	4.574	4.258	4.617	4.593
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	785	847	776	782
Service Time	2.595	2.273	2.641	2.612
HCM Lane V/C Ratio	0.093	0.3	0.003	0.128
HCM Control Delay	8.1	9.1	7.7	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	1.3	0	0.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	8	45	3
Future Vol, veh/h	0	8	45	3
Peak Hour Factor	0.92	0.56	0.56	0.56
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	14	80	5
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.3
HCM LOS	A

Intersection	
Intersection Delay, s/veh	11.7
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	5	186	0	0	4	279	17	0	0	12	5
Future Vol, veh/h	0	5	186	0	0	4	279	17	0	0	12	5
Peak Hour Factor	0.92	0.79	0.79	0.79	0.92	0.79	0.79	0.79	0.92	0.79	0.79	0.79
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	235	0	0	5	353	22	0	0	15	6
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	10.7	12.8	8.9
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	3%	1%	47%
Vol Thru, %	71%	97%	93%	48%
Vol Right, %	29%	0%	6%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	17	191	300	155
LT Vol	0	5	4	73
Through Vol	12	186	279	74
RT Vol	5	0	17	8
Lane Flow Rate	22	242	380	196
Geometry Grp	1	1	1	1
Degree of Util (X)	0.034	0.342	0.506	0.304
Departure Headway (Hd)	5.692	5.096	4.798	5.575
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	630	711	741	647
Service Time	3.714	3.096	2.897	3.588
HCM Lane V/C Ratio	0.035	0.34	0.513	0.303
HCM Control Delay	8.9	10.7	12.8	11
HCM Lane LOS	A	B	B	B
HCM 95th-tile Q	0.1	1.5	2.9	1.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	73	74	8
Future Vol, veh/h	0	73	74	8
Peak Hour Factor	0.92	0.79	0.79	0.79
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	92	94	10
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11
HCM LOS	B

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBU	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations									
Traffic Vol, veh/h	0	3	91	0	0	37	0	51	1
Future Vol, veh/h	0	3	91	0	0	37	0	51	1
Peak Hour Factor	0.92	0.76	0.76	0.92	0.76	0.76	0.92	0.76	0.76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	120	0	0	49	0	67	1
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.1	7.5	7.6
HCM LOS	A	A	A

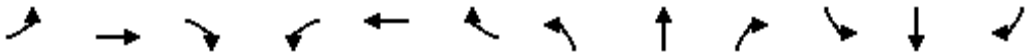
Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	0%	3%	0%
Vol Thru, %	100%	0%	98%
Vol Right, %	0%	97%	2%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	37	94	52
LT Vol	0	3	0
Through Vol	37	0	51
RT Vol	0	91	1
Lane Flow Rate	49	124	68
Geometry Grp	1	1	1
Degree of Util (X)	0.057	0.122	0.079
Departure Headway (Hd)	4.205	3.56	4.177
Convergence, Y/N	Yes	Yes	Yes
Cap	849	996	855
Service Time	2.245	1.621	2.214
HCM Lane V/C Ratio	0.058	0.124	0.08
HCM Control Delay	7.5	7.1	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0.4	0.3

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	NBU	NBT	NBR	SBU	SBL	SBT	SWU	SWL	SWR
Lane Configurations									
Traffic Vol, veh/h	0	70	1	0	48	46	0	2	39
Future Vol, veh/h	0	70	1	0	48	46	0	2	39
Peak Hour Factor	0.92	0.77	0.77	0.92	0.77	0.77	0.92	0.77	0.77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	91	1	0	62	60	0	3	51
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	NB	SB	SW
Opposing Approach	SB	NB	
Opposing Lanes	1	1	0
Conflicting Approach Left		SW	NB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	SW		SB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.6	7.9	7.1
HCM LOS	A	A	A

Lane	NBLn1	SBLn1	SWLn1
Vol Left, %	0%	51%	5%
Vol Thru, %	99%	49%	0%
Vol Right, %	1%	0%	95%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	71	94	41
LT Vol	0	48	2
Through Vol	70	46	0
RT Vol	1	0	39
Lane Flow Rate	92	122	53
Geometry Grp	1	1	1
Degree of Util (X)	0.105	0.142	0.057
Departure Headway (Hd)	4.111	4.199	3.843
Convergence, Y/N	Yes	Yes	Yes
Cap	867	851	938
Service Time	2.16	2.239	1.843
HCM Lane V/C Ratio	0.106	0.143	0.057
HCM Control Delay	7.6	7.9	7.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.4	0.5	0.2

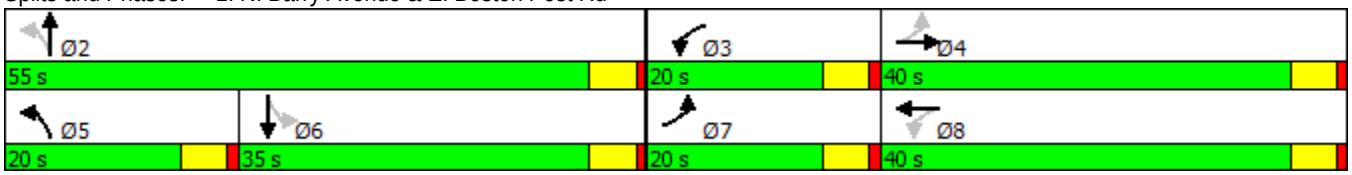


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	496	43	17	462	108	72	65	20	153	39	56
Future Volume (vph)	77	496	43	17	462	108	72	65	20	153	39	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	60		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.97			0.99			0.98	
Frt		0.989			0.972			0.965			0.969	
Flt Protected		0.994			0.999		0.950				0.970	
Satd. Flow (prot)	0	3471	0	0	3347	0	1770	1782	0	0	1732	0
Flt Permitted		0.672			0.925		0.600				0.758	
Satd. Flow (perm)	0	2332	0	0	3099	0	1118	1782	0	0	1335	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			30			17			12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		175			494			370			154	
Travel Time (s)		4.0			11.2			8.4			3.5	
Confl. Peds. (#/hr)	39		4	4		39	19		13	13		19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	84	539	47	18	502	117	78	71	22	166	42	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	670	0	0	637	0	78	93	0	0	269	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			0	
Link Offset(ft)		0			0			0			-5	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	15.0	35.0		15.0	35.0		15.0	15.0		35.0	35.0	
Total Split (s)	20.0	40.0		20.0	40.0		20.0	55.0		35.0	35.0	
Total Split (%)	17.4%	34.8%		17.4%	34.8%		17.4%	47.8%		30.4%	30.4%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	50.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Walk Time (s)		7.0			7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0			0		0	0	
Act Effct Green (s)		27.1			27.1		50.2	50.2			40.1	
Actuated g/C Ratio		0.31			0.31		0.58	0.58			0.46	
v/c Ratio		0.92			0.65		0.11	0.09			0.43	
Control Delay		47.2			27.8		10.2	8.4			20.8	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		47.2			27.8		10.2	8.4			20.8	
LOS		D			C		B	A			C	
Approach Delay		47.2			27.8			9.2			20.8	
Approach LOS		D			C			A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 87.3			
Natural Cycle: 100			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 32.3		Intersection LOS: C	
Intersection Capacity Utilization 68.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: N. Barry Avenue & E. Boston Post Rd



Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	0	236	238	0
Future Vol, veh/h	0	1	0	236	238	0
Conflicting Peds, #/hr	0	2	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	0	265	267	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	539	276	274	0	-	0
Stage 1	274	-	-	-	-	-
Stage 2	265	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	503	763	1289	-	-	-
Stage 1	772	-	-	-	-	-
Stage 2	779	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	496	756	1287	-	-	-
Mov Cap-2 Maneuver	496	-	-	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	774	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1287	-	756	-	-
HCM Lane V/C Ratio	-	-	0.001	-	-
HCM Control Delay (s)	0	-	9.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	604	716	21	1	69
Future Vol, veh/h	8	604	716	21	1	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	657	778	23	1	75

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	801	0	-	0	1136	401
Stage 1	-	-	-	-	790	-
Stage 2	-	-	-	-	346	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	818	-	-	-	196	599
Stage 1	-	-	-	-	408	-
Stage 2	-	-	-	-	688	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	818	-	-	-	193	599
Mov Cap-2 Maneuver	-	-	-	-	193	-
Stage 1	-	-	-	-	408	-
Stage 2	-	-	-	-	676	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	818	-	-	-	582
HCM Lane V/C Ratio	0.011	-	-	-	0.131
HCM Control Delay (s)	9.4	0.1	-	-	12.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	197	407	454	0	0	283
Future Vol, veh/h	197	407	454	0	0	283
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	214	442	493	0	0	308

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	493	0	-	0	-	247
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	1067	-	-	-	0	753
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1067	-	-	-	-	753
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SW
HCM Control Delay, s	3.4	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
Capacity (veh/h)	1067	-	-	-	753
HCM Lane V/C Ratio	0.201	-	-	-	0.409
HCM Control Delay (s)	9.2	0.6	-	-	13
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.7	-	-	-	2

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	45	38	52	0	73	0	210	89	65	176	0
Future Vol, veh/h	0	45	38	52	0	73	0	210	89	65	176	0
Conflicting Peds, #/hr	101	0	9	9	0	101	0	0	0	0	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	30	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	60	51	69	0	97	0	280	119	87	235	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	848	807	244	811	-	440	-	0	0	399	0	0
Stage 1	408	408	-	339	-	-	-	-	-	-	-	-
Stage 2	440	399	-	472	-	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	-	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	-	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	281	315	795	298	0	617	0	-	-	1160	-	0
Stage 1	620	597	-	676	0	-	0	-	-	-	-	0
Stage 2	596	602	-	573	0	-	0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	194	285	788	215	-	558	-	-	-	1048	-	-
Mov Cap-2 Maneuver	194	285	-	215	-	-	-	-	-	-	-	-
Stage 1	620	540	-	676	-	-	-	-	-	-	-	-
Stage 2	445	602	-	428	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.3	19.7	0	2.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	403	215	558	1048	-
HCM Lane V/C Ratio	-	-	0.275	0.322	0.174	0.083	-
HCM Control Delay (s)	-	-	17.3	29.5	12.8	8.7	0
HCM Lane LOS	-	-	C	D	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	1.3	0.6	0.3	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	3	0	0	5	3	233	0	0	235	2
Future Vol, veh/h	1	0	3	0	0	5	3	233	0	0	235	2
Conflicting Peds, #/hr	0	0	0	0	0	0	6	0	37	37	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	3	0	0	6	3	262	0	0	264	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	542	577	271	573	578	299	272	0	0	299	0	0
Stage 1	271	271	-	306	306	-	-	-	-	-	-	-
Stage 2	271	306	-	267	272	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	451	427	768	430	427	741	1291	-	-	1262	-	-
Stage 1	735	685	-	704	662	-	-	-	-	-	-	-
Stage 2	735	662	-	738	685	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	444	408	764	412	408	715	1291	-	-	1262	-	-
Mov Cap-2 Maneuver	444	408	-	412	408	-	-	-	-	-	-	-
Stage 1	729	681	-	677	637	-	-	-	-	-	-	-
Stage 2	727	637	-	735	681	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.6	10.1	0.1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1291	-	-	647	715	1262	-	-
HCM Lane V/C Ratio	0.003	-	-	0.007	0.008	-	-	-
HCM Control Delay (s)	7.8	0	-	10.6	10.1	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	0	3	235	237	11
Future Vol, veh/h	6	0	3	235	237	11
Conflicting Peds, #/hr	4	0	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	0	3	264	266	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	553	278	285	0	-	0
Stage 1	278	-	-	-	-	-
Stage 2	275	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	494	761	1277	-	-	-
Stage 1	769	-	-	-	-	-
Stage 2	771	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	487	757	1277	-	-	-
Mov Cap-2 Maneuver	487	-	-	-	-	-
Stage 1	765	-	-	-	-	-
Stage 2	764	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1277	-	487	-	-
HCM Lane V/C Ratio	0.003	-	0.014	-	-
HCM Control Delay (s)	7.8	0	12.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Vol, veh/h	0	299	266	0	0	43
Future Vol, veh/h	0	299	266	0	0	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	399	355	0	0	57

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	355
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	0	0	689
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	689
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	689
HCM Lane V/C Ratio	-	-	0.083
HCM Control Delay (s)	-	-	10.7
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.3

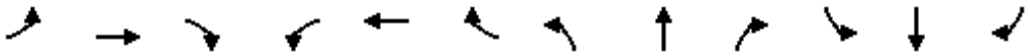
Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	234	208	52	53	28
Future Vol, veh/h	17	234	208	52	53	28
Conflicting Peds, #/hr	160	0	0	160	7	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	72	72	72	72	72	72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	325	289	72	74	39

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	521	0	-	0	864	488
Stage 1	-	-	-	-	485	-
Stage 2	-	-	-	-	379	-
Critical Hdwy	4.12	-	-	-	7.12	6.22
Critical Hdwy Stg 1	-	-	-	-	6.12	-
Critical Hdwy Stg 2	-	-	-	-	6.12	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1045	-	-	-	274	580
Stage 1	-	-	-	-	563	-
Stage 2	-	-	-	-	643	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1042	-	-	-	226	490
Mov Cap-2 Maneuver	-	-	-	-	226	-
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	621	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	26.5
HCM LOS			D

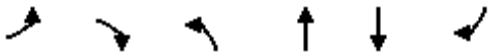
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1042	-	-	-	278
HCM Lane V/C Ratio	0.023	-	-	-	0.405
HCM Control Delay (s)	8.5	0	-	-	26.5
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	1.9



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	0	64	3	121	20	7	30	0	0	43	12
Future Volume (vph)	15	0	64	3	121	20	7	30	0	0	43	12
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	17	0	72	3	136	22	8	34	0	0	48	13

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	89	161	42	61
Volume Left (vph)	17	3	8	0
Volume Right (vph)	72	22	0	13
Hadj (s)	-0.41	-0.04	0.07	-0.09
Departure Headway (s)	3.9	4.2	4.6	4.4
Degree Utilization, x	0.10	0.19	0.05	0.07
Capacity (veh/h)	889	837	736	763
Control Delay (s)	7.3	8.1	7.8	7.7
Approach Delay (s)	7.3	8.1	7.8	7.7
Approach LOS	A	A	A	A

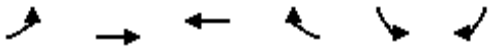
Intersection Summary			
Delay	7.8		
Level of Service	A		
Intersection Capacity Utilization	28.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1	0	236	238	0
Future Volume (Veh/h)	0	1	0	236	238	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	1	0	265	267	0
Pedestrians	7			2		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	3.5			3.5		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				154		
pX, platoon unblocked	1.00					
vC, conflicting volume	539	276	274			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	539	276	274			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	500	756	1281			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	1	265	267
Volume Left	0	0	0
Volume Right	1	0	0
cSH	756	1281	1700
Volume to Capacity	0.00	0.00	0.16
Queue Length 95th (ft)	0	0	0
Control Delay (s)	9.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.8	0.0	0.0
Approach LOS	A		

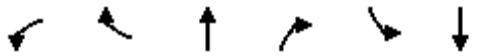
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	23.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	627	601	172	0	0
Future Volume (Veh/h)	40	627	601	172	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	45	713	683	195	0	0
Pedestrians					57	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		494				
pX, platoon unblocked					0.87	
vC, conflicting volume	935				1284	496
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	935				1019	496
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				100	100
cM capacity (veh/h)	728				189	519

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	283	475	455	423
Volume Left	45	0	0	0
Volume Right	0	0	0	195
cSH	728	1700	1700	1700
Volume to Capacity	0.06	0.28	0.27	0.25
Queue Length 95th (ft)	5	0	0	0
Control Delay (s)	2.3	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.8		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

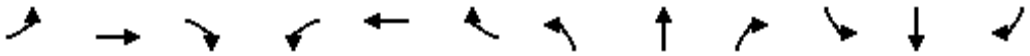


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	0	6	94	110	26	0
Future Volume (vph)	0	6	94	110	26	0
Peak Hour Factor	0.61	0.61	0.61	0.61	0.61	0.61
Hourly flow rate (vph)	0	10	154	180	43	0

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	10	334	43
Volume Left (vph)	0	0	43
Volume Right (vph)	10	180	0
Hadj (s)	-0.57	-0.29	0.23
Departure Headway (s)	4.1	3.7	4.4
Degree Utilization, x	0.01	0.34	0.05
Capacity (veh/h)	797	966	795
Control Delay (s)	7.1	8.6	7.7
Approach Delay (s)	7.1	8.6	7.7
Approach LOS	A	A	A

Intersection Summary			
Delay	8.4		
Level of Service	A		
Intersection Capacity Utilization	29.5%	ICU Level of Service	A
Analysis Period (min)	15		

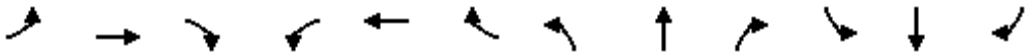
Intersection Sign configuration not allowed in HCM analysis.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	31	80	31	0	1	0	1	36	4	8	45	3
Future Volume (vph)	31	80	31	0	1	0	1	36	4	8	45	3
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Hourly flow rate (vph)	55	143	55	0	2	0	2	64	7	14	80	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	253	2	73	99
Volume Left (vph)	55	0	2	14
Volume Right (vph)	55	0	7	5
Hadj (s)	-0.05	0.03	-0.02	0.03
Departure Headway (s)	4.3	4.6	4.6	4.6
Degree Utilization, x	0.30	0.00	0.09	0.13
Capacity (veh/h)	817	725	736	731
Control Delay (s)	9.1	7.6	8.1	8.3
Approach Delay (s)	9.1	7.6	8.1	8.3
Approach LOS	A	A	A	A

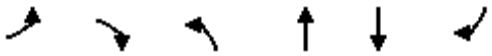
Intersection Summary				
Delay	8.7			
Level of Service	A			
Intersection Capacity Utilization	30.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	186	0	4	279	17	0	12	5	73	74	8
Future Volume (vph)	5	186	0	4	279	17	0	12	5	73	74	8
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	6	235	0	5	353	22	0	15	6	92	94	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	241	380	21	196
Volume Left (vph)	6	5	0	92
Volume Right (vph)	0	22	6	10
Hadj (s)	0.04	0.00	-0.14	0.10
Departure Headway (s)	5.1	4.9	5.7	5.6
Degree Utilization, x	0.34	0.52	0.03	0.30
Capacity (veh/h)	666	710	527	589
Control Delay (s)	10.7	12.9	8.9	11.0
Approach Delay (s)	10.7	12.9	8.9	11.0
Approach LOS	B	B	A	B

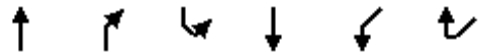
Intersection Summary				
Delay	11.7			
Level of Service	B			
Intersection Capacity Utilization	39.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	3	91	0	37	51	1
Future Volume (vph)	3	91	0	37	51	1
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	4	120	0	49	67	1

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	124	49	68
Volume Left (vph)	4	0	0
Volume Right (vph)	120	0	1
Hadj (s)	-0.54	0.03	0.03
Departure Headway (s)	3.6	4.2	4.2
Degree Utilization, x	0.12	0.06	0.08
Capacity (veh/h)	962	813	825
Control Delay (s)	7.1	7.5	7.6
Approach Delay (s)	7.1	7.5	7.6
Approach LOS	A	A	A

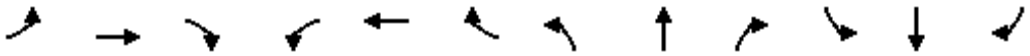
Intersection Summary			
Delay	7.3		
Level of Service	A		
Intersection Capacity Utilization	16.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	70	1	48	46	2	39
Future Volume (vph)	70	1	48	46	2	39
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	91	1	62	60	3	51

Direction, Lane #	NB 1	SB 1	SW 1
Volume Total (vph)	92	122	54
Volume Left (vph)	0	62	3
Volume Right (vph)	1	0	51
Hadj (s)	0.03	0.14	-0.52
Departure Headway (s)	4.2	4.2	3.8
Degree Utilization, x	0.11	0.14	0.06
Capacity (veh/h)	840	833	884
Control Delay (s)	7.7	7.9	7.1
Approach Delay (s)	7.7	7.9	7.1
Approach LOS	A	A	A

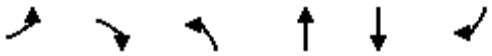
Intersection Summary			
Delay	7.7		
Level of Service	A		
Intersection Capacity Utilization	21.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	45	38	52	0	73	0	210	89	65	176	0
Future Volume (Veh/h)	0	45	38	52	0	73	0	210	89	65	176	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	60	51	69	0	97	0	280	119	87	235	0
Pedestrians		13						9			101	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		1						1			10	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	960	821	257	838	762	440	248			399		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	960	821	257	838	762	440	248			399		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	79	93	67	100	83	100			92		
cM capacity (veh/h)	163	283	765	207	306	557	1301			1160		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	111	69	97	399	322
Volume Left	0	69	0	0	87
Volume Right	51	0	97	119	0
cSH	398	207	557	1700	1160
Volume to Capacity	0.28	0.33	0.17	0.23	0.08
Queue Length 95th (ft)	28	35	16	0	6
Control Delay (s)	17.5	30.9	12.8	0.0	2.8
Lane LOS	C	D	B		A
Approach Delay (s)	17.5	20.3		0.0	2.8
Approach LOS	C	C			

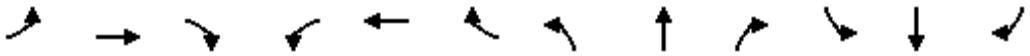
Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	52.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	12	276	248	128
Future Volume (Veh/h)	0	0	12	276	248	128
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	0	0	16	363	326	168
Pedestrians	71					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	876	481	565			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	876	481	565			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	98			
cM capacity (veh/h)	314	585	1007			

Direction, Lane #	NB 1	SB 1
Volume Total	379	494
Volume Left	16	0
Volume Right	0	168
cSH	1007	1700
Volume to Capacity	0.02	0.29
Queue Length 95th (ft)	1	0
Control Delay (s)	0.5	0.0
Lane LOS	A	
Approach Delay (s)	0.5	0.0
Approach LOS		

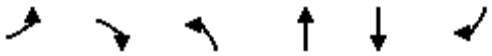
Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	27.6%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	3	0	0	5	3	233	0	0	235	2
Future Volume (Veh/h)	1	0	3	0	0	5	3	233	0	0	235	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	1	0	3	0	0	6	3	262	0	0	264	2
Pedestrians		6			37							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		1			4							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								236				
pX, platoon unblocked												
vC, conflicting volume	545	576	271	573	577	299	272			299		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	545	576	271	573	577	299	272			299		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	99	100			100		
cM capacity (veh/h)	428	410	763	400	409	714	1284			1218		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	6	265	266
Volume Left	1	0	3	0
Volume Right	3	6	0	2
cSH	638	714	1284	1218
Volume to Capacity	0.01	0.01	0.00	0.00
Queue Length 95th (ft)	0	1	0	0
Control Delay (s)	10.7	10.1	0.1	0.0
Lane LOS	B	B	A	
Approach Delay (s)	10.7	10.1	0.1	0.0
Approach LOS	B	B		

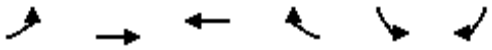
Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	24.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	0	3	235	237	11
Future Volume (Veh/h)	6	0	3	235	237	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	7	0	3	264	266	12
Pedestrians	6				4	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	1				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				299		
pX, platoon unblocked						
vC, conflicting volume	552	278	284			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	552	278	284			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	489	756	1271			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	7	267	278
Volume Left	7	3	0
Volume Right	0	0	12
cSH	489	1271	1700
Volume to Capacity	0.01	0.00	0.16
Queue Length 95th (ft)	1	0	0
Control Delay (s)	12.5	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	12.5	0.1	0.0
Approach LOS	B		

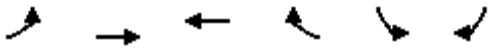
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	24.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Volume (veh/h)	0	299	266	0	0	43
Future Volume (Veh/h)	0	299	266	0	0	43
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	399	355	0	0	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	355				754	355
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	355				754	355
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	92
cM capacity (veh/h)	1204				377	689

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	399	355	57
Volume Left	0	0	0
Volume Right	0	0	57
cSH	1700	1700	689
Volume to Capacity	0.23	0.21	0.08
Queue Length 95th (ft)	0	0	7
Control Delay (s)	0.0	0.0	10.7
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.7
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	234	208	52	53	28
Future Volume (Veh/h)	17	234	208	52	53	28
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	24	325	289	72	74	39
Pedestrians		3	7		160	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		0	1		15	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	521				865	488
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	521				865	488
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				72	92
cM capacity (veh/h)	886				266	490

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	349	361	113
Volume Left	24	0	74
Volume Right	0	72	39
cSH	886	1700	315
Volume to Capacity	0.03	0.21	0.36
Queue Length 95th (ft)	2	0	39
Control Delay (s)	0.9	0.0	22.7
Lane LOS	A		C
Approach Delay (s)	0.9	0.0	22.7
Approach LOS			C

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	31	0	69	0	4	119	32	0	20	24	0
Future Vol, veh/h	0	31	0	69	0	4	119	32	0	20	24	0
Peak Hour Factor	0.92	0.79	0.79	0.79	0.92	0.79	0.79	0.79	0.92	0.79	0.79	0.79
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	39	0	87	0	5	151	41	0	25	30	0
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.7	8.5	8.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	45%	31%	3%	0%
Vol Thru, %	55%	0%	77%	85%
Vol Right, %	0%	69%	21%	15%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	44	100	155	39
LT Vol	20	31	4	0
Through Vol	24	0	119	33
RT Vol	0	69	32	6
Lane Flow Rate	56	127	196	49
Geometry Grp	1	1	1	1
Degree of Util (X)	0.074	0.142	0.229	0.063
Departure Headway (Hd)	4.774	4.036	4.208	4.6
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	751	891	859	780
Service Time	2.795	2.051	2.208	2.622
HCM Lane V/C Ratio	0.075	0.143	0.228	0.063
HCM Control Delay	8.2	7.7	8.5	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.5	0.9	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	33	6
Future Vol, veh/h	0	0	33	6
Peak Hour Factor	0.92	0.79	0.79	0.79
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	0	42	8
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.9
HCM LOS	A

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations									
Traffic Vol, veh/h	0	0	13	0	62	71	0	25	0
Future Vol, veh/h	0	0	13	0	62	71	0	25	0
Peak Hour Factor	0.92	0.45	0.45	0.92	0.45	0.45	0.92	0.45	0.45
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	29	0	138	158	0	56	0
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.2	8.4	7.8
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	100%
Vol Thru, %	47%	0%	0%
Vol Right, %	53%	100%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	133	13	25
LT Vol	0	0	25
Through Vol	62	0	0
RT Vol	71	13	0
Lane Flow Rate	296	29	56
Geometry Grp	1	1	1
Degree of Util (X)	0.304	0.032	0.068
Departure Headway (Hd)	3.706	4.043	4.408
Convergence, Y/N	Yes	Yes	Yes
Cap	969	891	809
Service Time	1.734	2.043	2.455
HCM Lane V/C Ratio	0.305	0.033	0.069
HCM Control Delay	8.4	7.2	7.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1.3	0.1	0.2

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	21	42	32	0	2	2	3	0	6	27	7
Future Vol, veh/h	0	21	42	32	0	2	2	3	0	6	27	7
Peak Hour Factor	0.92	0.69	0.69	0.69	0.92	0.69	0.69	0.69	0.92	0.69	0.69	0.69
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	30	61	46	0	3	3	4	0	9	39	10
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.8	7.2	7.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	22%	29%	19%
Vol Thru, %	68%	44%	29%	63%
Vol Right, %	17%	34%	43%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	95	7	43
LT Vol	6	21	2	8
Through Vol	27	42	2	27
RT Vol	7	32	3	8
Lane Flow Rate	58	138	10	62
Geometry Grp	1	1	1	1
Degree of Util (X)	0.067	0.153	0.011	0.072
Departure Headway (Hd)	4.164	3.992	4.049	4.162
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	849	889	870	850
Service Time	2.244	2.055	2.14	2.24
HCM Lane V/C Ratio	0.068	0.155	0.011	0.073
HCM Control Delay	7.5	7.8	7.2	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.5	0	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	8	27	8
Future Vol, veh/h	0	8	27	8
Peak Hour Factor	0.92	0.69	0.69	0.69
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	12	39	12
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.6
HCM LOS	A

Intersection	
Intersection Delay, s/veh	9.3
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	4	191	0	0	4	199	26	0	3	18	26
Future Vol, veh/h	0	4	191	0	0	4	199	26	0	3	18	26
Peak Hour Factor	0.92	0.96	0.96	0.96	0.92	0.96	0.96	0.96	0.92	0.96	0.96	0.96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	199	0	0	4	207	27	0	3	19	27
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	9.3	9.5	8.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	2%	2%	50%
Vol Thru, %	38%	98%	87%	41%
Vol Right, %	55%	0%	11%	9%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	47	195	229	111
LT Vol	3	4	4	56
Through Vol	18	191	199	45
RT Vol	26	0	26	10
Lane Flow Rate	49	203	239	116
Geometry Grp	1	1	1	1
Degree of Util (X)	0.065	0.261	0.299	0.162
Departure Headway (Hd)	4.785	4.619	4.515	5.05
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	744	776	794	708
Service Time	2.842	2.658	2.553	3.1
HCM Lane V/C Ratio	0.066	0.262	0.301	0.164
HCM Control Delay	8.2	9.3	9.5	9.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	1	1.3	0.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	56	45	10
Future Vol, veh/h	0	56	45	10
Peak Hour Factor	0.92	0.96	0.96	0.96
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	58	47	10
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	9.1
HCM LOS	A

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBU	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations									
Traffic Vol, veh/h	0	1	57	0	5	33	0	47	1
Future Vol, veh/h	0	1	57	0	5	33	0	47	1
Peak Hour Factor	0.92	0.75	0.75	0.92	0.75	0.75	0.92	0.75	0.75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	76	0	7	44	0	63	1
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.9	7.4	7.4
HCM LOS	A	A	A

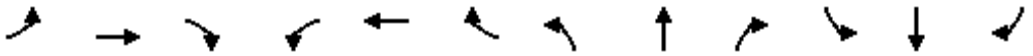
Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	13%	2%	0%
Vol Thru, %	87%	0%	98%
Vol Right, %	0%	98%	2%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	38	58	48
LT Vol	5	1	0
Through Vol	33	0	47
RT Vol	0	57	1
Lane Flow Rate	51	77	64
Geometry Grp	1	1	1
Degree of Util (X)	0.058	0.076	0.073
Departure Headway (Hd)	4.146	3.544	4.096
Convergence, Y/N	Yes	Yes	Yes
Cap	863	1001	874
Service Time	2.173	1.6	2.122
HCM Lane V/C Ratio	0.059	0.077	0.073
HCM Control Delay	7.4	6.9	7.4
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0.2	0.2

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	NBU	NBT	NBR	SBU	SBL	SBT	SWU	SWL	SWR
Lane Configurations									
Traffic Vol, veh/h	0	44	3	0	43	39	0	1	28
Future Vol, veh/h	0	44	3	0	43	39	0	1	28
Peak Hour Factor	0.92	0.86	0.86	0.92	0.86	0.86	0.92	0.86	0.86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	51	3	0	50	45	0	1	33
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	NB	SB	SW
Opposing Approach	SB	NB	
Opposing Lanes	1	1	0
Conflicting Approach Left		SW	NB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	SW		SB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.3	7.7	6.8
HCM LOS	A	A	A

Lane	NBLn1	SBLn1	SWLn1
Vol Left, %	0%	52%	3%
Vol Thru, %	94%	48%	0%
Vol Right, %	6%	0%	97%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	47	82	29
LT Vol	0	43	1
Through Vol	44	39	0
RT Vol	3	0	28
Lane Flow Rate	55	95	34
Geometry Grp	1	1	1
Degree of Util (X)	0.061	0.11	0.034
Departure Headway (Hd)	4.027	4.14	3.619
Convergence, Y/N	Yes	Yes	Yes
Cap	889	868	976
Service Time	2.056	2.158	1.69
HCM Lane V/C Ratio	0.062	0.109	0.035
HCM Control Delay	7.3	7.7	6.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0.4	0.1

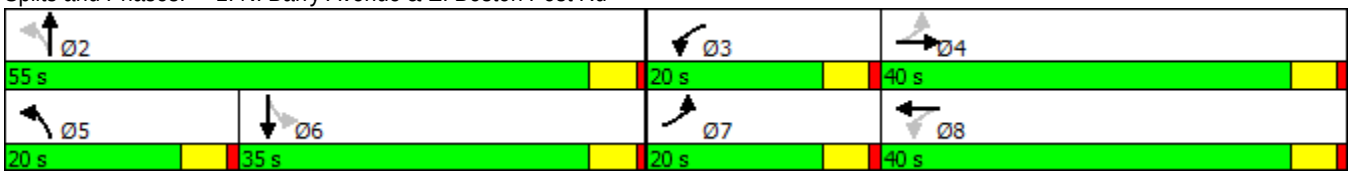


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	507	61	11	471	106	46	41	14	114	30	78
Future Volume (vph)	82	507	61	11	471	106	46	41	14	114	30	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	60		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.97		0.99	0.99			0.97	
Frt		0.986			0.973			0.961			0.953	
Flt Protected		0.994			0.999		0.950				0.975	
Satd. Flow (prot)	0	3458	0	0	3352	0	1770	1773	0	0	1702	0
Flt Permitted		0.675			0.937		0.597				0.820	
Satd. Flow (perm)	0	2333	0	0	3144	0	1096	1773	0	0	1414	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			29			15			23	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		175			494			370			154	
Travel Time (s)		4.0			11.2			8.4			3.5	
Confl. Peds. (#/hr)	39		4	4		39	19		13	13		19
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	86	534	64	12	496	112	48	43	15	120	32	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	684	0	0	620	0	48	58	0	0	234	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	15.0	35.0		15.0	35.0		15.0	15.0		35.0	35.0	
Total Split (s)	20.0	40.0		20.0	40.0		20.0	55.0		35.0	35.0	
Total Split (%)	17.4%	34.8%		17.4%	34.8%		17.4%	47.8%		30.4%	30.4%	
Maximum Green (s)	15.0	35.0		15.0	35.0		15.0	50.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		Max	Max	
Walk Time (s)		7.0			7.0			7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0			0		0	0	
Act Effct Green (s)		27.5			27.5		50.2	50.2			43.1	
Actuated g/C Ratio		0.31			0.31		0.57	0.57			0.49	
v/c Ratio		0.92			0.62		0.07	0.06			0.33	
Control Delay		47.8			27.0		10.1	8.0			16.8	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		47.8			27.0		10.1	8.0			16.8	
LOS		D			C		B	A			B	
Approach Delay		47.8			27.0			9.0			16.8	
Approach LOS		D			C			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 87.7			
Natural Cycle: 100			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 33.0		Intersection LOS: C	
Intersection Capacity Utilization 68.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: N. Barry Avenue & E. Boston Post Rd



Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	11	12	201	185	0
Future Vol, veh/h	3	11	12	201	185	0
Conflicting Peds, #/hr	0	0	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	12	13	218	201	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	451	206	206	0	-	0
Stage 1	206	-	-	-	-	-
Stage 2	245	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	566	835	1365	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	796	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	554	831	1365	-	-	-
Mov Cap-2 Maneuver	554	-	-	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	783	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1365	-	751	-	-
HCM Lane V/C Ratio	0.01	-	0.02	-	-
HCM Control Delay (s)	7.7	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	592	623	25	3	56
Future Vol, veh/h	10	592	623	25	3	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	643	677	27	3	61

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	704	0	-	0	1034	352
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	343	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	890	-	-	-	228	644
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	690	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	890	-	-	-	224	644
Mov Cap-2 Maneuver	-	-	-	-	224	-
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	677	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	890	-	-	-	588
HCM Lane V/C Ratio	0.012	-	-	-	0.109
HCM Control Delay (s)	9.1	0.1	-	-	11.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	193	402	444	0	0	204
Future Vol, veh/h	193	402	444	0	0	204
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	210	437	483	0	0	222

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	483	0	-	0	-	241
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	1076	-	-	-	0	760
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1076	-	-	-	-	760
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	3.4	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1076	-	-	-	760
HCM Lane V/C Ratio	0.195	-	-	-	0.292
HCM Control Delay (s)	9.2	0.6	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.7	-	-	-	1.2

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	22	28	45	0	81	0	189	80	90	164	0
Future Vol, veh/h	0	22	28	45	0	81	0	189	80	90	164	0
Conflicting Peds, #/hr	101	0	3	3	0	101	0	0	3	3	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	30	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	26	33	52	0	94	0	220	93	105	191	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	767	716	194	701	-	370	-	0	0	316	0	0
Stage 1	400	400	-	269	-	-	-	-	-	-	-	-
Stage 2	367	316	-	432	-	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	-	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	-	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	319	356	847	353	0	676	0	-	-	1244	-	0
Stage 1	626	602	-	737	0	-	0	-	-	-	-	0
Stage 2	653	655	-	602	0	-	0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	224	318	845	292	-	609	-	-	-	1124	-	-
Mov Cap-2 Maneuver	224	318	-	292	-	-	-	-	-	-	-	-
Stage 1	626	539	-	737	-	-	-	-	-	-	-	-
Stage 2	499	653	-	493	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.4	14.9	0	3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	489	292	609	1124	-
HCM Lane V/C Ratio	-	-	0.119	0.179	0.155	0.093	-
HCM Control Delay (s)	-	-	13.4	20	12	8.5	0
HCM Lane LOS	-	-	B	C	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.6	0.5	0.3	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	0	9	0	0	3	6	198	0	0	176	2
Future Vol, veh/h	2	0	9	0	0	3	6	198	0	0	176	2
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	44	44	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	10	0	0	3	7	215	0	0	191	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	426	468	196	469	469	259	197	0	0	259	0	0
Stage 1	196	196	-	272	272	-	-	-	-	-	-	-
Stage 2	230	272	-	197	197	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	539	493	845	505	492	780	1376	-	-	1306	-	-
Stage 1	806	739	-	734	685	-	-	-	-	-	-	-
Stage 2	773	685	-	805	738	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	532	468	842	476	467	747	1376	-	-	1306	-	-
Mov Cap-2 Maneuver	532	468	-	476	467	-	-	-	-	-	-	-
Stage 1	798	736	-	699	652	-	-	-	-	-	-	-
Stage 2	765	652	-	796	735	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	9.8	0.2	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1376	-	-	761	747	1306	-	-
HCM Lane V/C Ratio	0.005	-	-	0.016	0.004	-	-	-
HCM Control Delay (s)	7.6	0	-	9.8	9.8	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	8	3	203	170	18
Future Vol, veh/h	8	8	3	203	170	18
Conflicting Peds, #/hr	10	0	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	9	3	221	185	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	438	201	210	0	-	0
Stage 1	201	-	-	-	-	-
Stage 2	237	-	-	-	-	-
Critical Hdwy	7.12	6.22	4.12	-	-	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	529	840	1361	-	-	-
Stage 1	801	-	-	-	-	-
Stage 2	766	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	520	835	1361	-	-	-
Mov Cap-2 Maneuver	520	-	-	-	-	-
Stage 1	794	-	-	-	-	-
Stage 2	756	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1361	-	641	-	-
HCM Lane V/C Ratio	0.002	-	0.027	-	-
HCM Control Delay (s)	7.7	0	10.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Vol, veh/h	0	269	237	0	0	31
Future Vol, veh/h	0	269	237	0	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	313	276	0	0	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	276
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	0	0	763
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	763
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	763
HCM Lane V/C Ratio	-	-	0.047
HCM Control Delay (s)	-	-	10
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.1

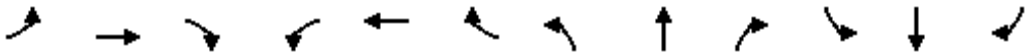
Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	199	199	44	32	23
Future Vol, veh/h	18	199	199	44	32	23
Conflicting Peds, #/hr	161	0	0	161	6	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	234	234	52	38	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	447	0	-	0	703	421
Stage 1	-	-	-	-	421	-
Stage 2	-	-	-	-	282	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1113	-	-	-	404	632
Stage 1	-	-	-	-	662	-
Stage 2	-	-	-	-	766	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1113	-	-	-	283	535
Mov Cap-2 Maneuver	-	-	-	-	283	-
Stage 1	-	-	-	-	560	-
Stage 2	-	-	-	-	634	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	17.5
HCM LOS			C

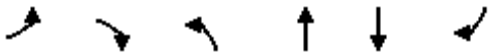
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1113	-	-	-	352
HCM Lane V/C Ratio	0.019	-	-	-	0.184
HCM Control Delay (s)	8.3	0	-	-	17.5
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	31	0	69	4	119	32	20	24	0	0	33	6
Future Volume (vph)	31	0	69	4	119	32	20	24	0	0	33	6
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	39	0	87	5	151	41	25	30	0	0	42	8

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	126	197	55	50
Volume Left (vph)	39	5	25	0
Volume Right (vph)	87	41	0	8
Hadj (s)	-0.32	-0.09	0.12	-0.06
Departure Headway (s)	4.0	4.2	4.8	4.6
Degree Utilization, x	0.14	0.23	0.07	0.06
Capacity (veh/h)	856	823	698	718
Control Delay (s)	7.7	8.5	8.2	7.9
Approach Delay (s)	7.7	8.5	8.2	7.9
Approach LOS	A	A	A	A

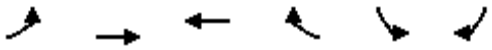
Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	11	12	201	185	0
Future Volume (Veh/h)	3	11	12	201	185	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	12	13	218	201	0
Pedestrians	5					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				154		
pX, platoon unblocked						
vC, conflicting volume	450	206	206			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	450	206	206			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	559	831	1359			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	15	231	201
Volume Left	3	13	0
Volume Right	12	0	0
cSH	757	1359	1700
Volume to Capacity	0.02	0.01	0.12
Queue Length 95th (ft)	2	1	0
Control Delay (s)	9.9	0.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.9	0.5	0.0
Approach LOS	A		

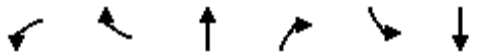
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	33	612	591	81	0	0
Future Volume (Veh/h)	33	612	591	81	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	35	644	622	85	0	0
Pedestrians					57	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		494				
pX, platoon unblocked					0.87	
vC, conflicting volume	764				1114	410
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	764				820	410
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	100
cM capacity (veh/h)	845				260	590

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	250	429	415	292
Volume Left	35	0	0	0
Volume Right	0	0	0	85
cSH	845	1700	1700	1700
Volume to Capacity	0.04	0.25	0.24	0.17
Queue Length 95th (ft)	3	0	0	0
Control Delay (s)	1.7	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.6		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

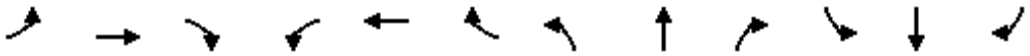


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	0	13	62	71	25	0
Future Volume (vph)	0	13	62	71	25	0
Peak Hour Factor	0.45	0.45	0.45	0.45	0.45	0.45
Hourly flow rate (vph)	0	29	138	158	56	0

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	29	296	56
Volume Left (vph)	0	0	56
Volume Right (vph)	29	158	0
Hadj (s)	-0.57	-0.29	0.23
Departure Headway (s)	4.0	3.7	4.5
Degree Utilization, x	0.03	0.31	0.07
Capacity (veh/h)	809	947	790
Control Delay (s)	7.2	8.4	7.8
Approach Delay (s)	7.2	8.4	7.8
Approach LOS	A	A	A

Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	26.0%	ICU Level of Service	A
Analysis Period (min)	15		

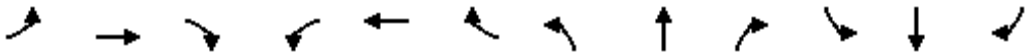
Intersection has too many legs for HCM analysis.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	42	32	2	2	3	6	27	7	8	27	8
Future Volume (vph)	21	42	32	2	2	3	6	27	7	8	27	8
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	30	61	46	3	3	4	9	39	10	12	39	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	137	10	58	63
Volume Left (vph)	30	3	9	12
Volume Right (vph)	46	4	10	12
Hadj (s)	-0.12	-0.15	-0.04	-0.04
Departure Headway (s)	4.1	4.2	4.2	4.2
Degree Utilization, x	0.15	0.01	0.07	0.07
Capacity (veh/h)	860	829	809	816
Control Delay (s)	7.8	7.2	7.6	7.6
Approach Delay (s)	7.8	7.2	7.6	7.6
Approach LOS	A	A	A	A

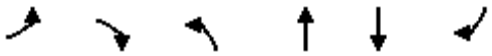
Intersection Summary				
Delay	7.7			
Level of Service	A			
Intersection Capacity Utilization	23.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	191	0	4	199	26	3	18	26	56	45	10
Future Volume (vph)	4	191	0	4	199	26	3	18	26	56	45	10
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	4	199	0	4	207	27	3	19	27	58	47	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	203	238	49	115
Volume Left (vph)	4	4	3	58
Volume Right (vph)	0	27	27	10
Hadj (s)	0.04	-0.03	-0.28	0.08
Departure Headway (s)	4.6	4.5	4.8	5.1
Degree Utilization, x	0.26	0.30	0.07	0.16
Capacity (veh/h)	732	755	666	645
Control Delay (s)	9.3	9.5	8.2	9.1
Approach Delay (s)	9.3	9.5	8.2	9.1
Approach LOS	A	A	A	A

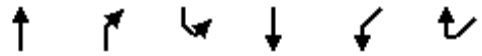
Intersection Summary			
Delay	9.2		
Level of Service	A		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	1	57	5	33	47	1
Future Volume (vph)	1	57	5	33	47	1
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	1	76	7	44	63	1

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	77	51	64
Volume Left (vph)	1	7	0
Volume Right (vph)	76	0	1
Hadj (s)	-0.56	0.06	0.02
Departure Headway (s)	3.6	4.2	4.1
Degree Utilization, x	0.08	0.06	0.07
Capacity (veh/h)	967	835	851
Control Delay (s)	6.9	7.4	7.4
Approach Delay (s)	6.9	7.4	7.4
Approach LOS	A	A	A

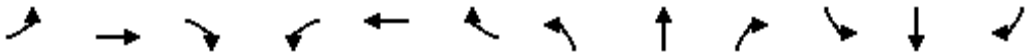
Intersection Summary			
Delay	7.2		
Level of Service	A		
Intersection Capacity Utilization	19.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	44	3	43	39	1	28
Future Volume (vph)	44	3	43	39	1	28
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	51	3	50	45	1	33

Direction, Lane #	NB 1	SB 1	SW 1
Volume Total (vph)	54	95	34
Volume Left (vph)	0	50	1
Volume Right (vph)	3	0	33
Hadj (s)	0.00	0.14	-0.54
Departure Headway (s)	4.1	4.2	3.7
Degree Utilization, x	0.06	0.11	0.03
Capacity (veh/h)	864	853	936
Control Delay (s)	7.3	7.7	6.8
Approach Delay (s)	7.3	7.7	6.8
Approach LOS	A	A	A

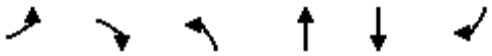
Intersection Summary			
Delay	7.4		
Level of Service	A		
Intersection Capacity Utilization	21.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	22	28	45	0	81	0	189	80	90	164	0
Future Volume (Veh/h)	0	22	28	45	0	81	0	189	80	90	164	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	26	33	52	0	94	0	220	93	105	191	0
Pedestrians					3			3			101	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			0			10	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	862	717	194	720	670	370	191			316		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	862	717	194	720	670	370	191			316		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	92	96	82	100	85	100			92		
cM capacity (veh/h)	196	324	845	288	345	609	1383			1241		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	59	52	94	313	296
Volume Left	0	52	0	0	105
Volume Right	33	0	94	93	0
cSH	495	288	609	1700	1241
Volume to Capacity	0.12	0.18	0.15	0.18	0.08
Queue Length 95th (ft)	10	16	14	0	7
Control Delay (s)	13.3	20.3	12.0	0.0	3.4
Lane LOS	B	C	B		A
Approach Delay (s)	13.3	14.9		0.0	3.4
Approach LOS	B	B			

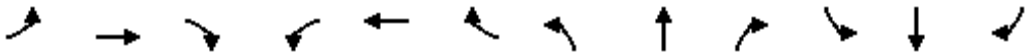
Intersection Summary				
Average Delay	4.9			
Intersection Capacity Utilization	51.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	2	268	254	63
Future Volume (Veh/h)	0	0	2	268	254	63
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	0	2	319	302	75
Pedestrians	71					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	734	410	448			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	734	410	448			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	387	641	1112			

Direction, Lane #	NB 1	SB 1
Volume Total	321	377
Volume Left	2	0
Volume Right	0	75
cSH	1112	1700
Volume to Capacity	0.00	0.22
Queue Length 95th (ft)	0	0
Control Delay (s)	0.1	0.0
Lane LOS	A	
Approach Delay (s)	0.1	0.0
Approach LOS		

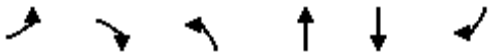
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	21.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	9	0	0	3	6	198	0	0	176	2
Future Volume (Veh/h)	2	0	9	0	0	3	6	198	0	0	176	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	0	10	0	0	3	7	215	0	0	191	2
Pedestrians		4			44							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			4							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								236				
pX, platoon unblocked												
vC, conflicting volume	428	469	196	475	470	259	197			259		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	428	469	196	475	470	259	197			259		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	99			100		
cM capacity (veh/h)	512	467	842	455	467	747	1370			1251		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	12	3	222	193
Volume Left	2	0	7	0
Volume Right	10	3	0	2
cSH	760	747	1370	1251
Volume to Capacity	0.02	0.00	0.01	0.00
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	9.8	9.8	0.3	0.0
Lane LOS	A	A	A	
Approach Delay (s)	9.8	9.8	0.3	0.0
Approach LOS	A	A		

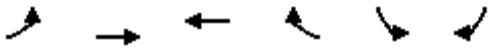
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	25.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	8	3	203	170	18
Future Volume (Veh/h)	8	8	3	203	170	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	9	3	221	185	20
Pedestrians	6				10	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	1				1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				299		
pX, platoon unblocked						
vC, conflicting volume	438	201	211			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	438	201	211			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	566	835	1352			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	18	224	205
Volume Left	9	3	0
Volume Right	9	0	20
cSH	675	1352	1700
Volume to Capacity	0.03	0.00	0.12
Queue Length 95th (ft)	2	0	0
Control Delay (s)	10.5	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	10.5	0.1	0.0
Approach LOS	B		

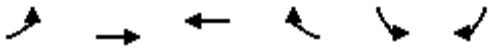
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Volume (veh/h)	0	269	237	0	0	31
Future Volume (Veh/h)	0	269	237	0	0	31
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	313	276	0	0	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	276				589	276
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	276				589	276
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	95
cM capacity (veh/h)	1287				471	763

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	313	276	36
Volume Left	0	0	0
Volume Right	0	0	36
cSH	1700	1700	763
Volume to Capacity	0.18	0.16	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	10.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	10.0
Approach LOS			A

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	22.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	199	199	44	32	23
Future Volume (Veh/h)	18	199	199	44	32	23
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	21	234	234	52	38	27
Pedestrians			6		161	
Lane Width (ft)			12.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			1		15	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	447				703	421
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	447				703	421
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				89	95
cM capacity (veh/h)	943				332	536

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	255	286	65
Volume Left	21	0	38
Volume Right	0	52	27
cSH	943	1700	395
Volume to Capacity	0.02	0.17	0.16
Queue Length 95th (ft)	2	0	15
Control Delay (s)	0.9	0.0	15.9
Lane LOS	A		C
Approach Delay (s)	0.9	0.0	15.9
Approach LOS			C

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		