

# TRAFFIC IMPACT STUDY

*For*

**176 Riverside, LLC  
Proposed Mixed Use Building**

*Property Located at:*

**176 Riverside Avenue  
Block 3 – Lots 2.01, 4.01, 6, & 9.01  
Borough of Red Bank, Monmouth County, NJ**

Prepared by:



1904 Main Street | 245 Main Street, Suite #110  
Lake Como, NJ 07719 | Chester, NJ 07930  
(732) 681-0760

Nick Verderese, PE  
NJ PE License #38991

John McCormack, PE, PTOE  
NJ PE License #41701

April 15, 2019

2561-99-001TE

## INTRODUCTION

It is proposed to construct a five story mixed use building, consisting of 210 residential units (113 one-bedroom units, 91 two-bedroom units, and 6 three-bedroom units), 9,000 SF of co-working space, along with accessory retail/food space. The subject property is currently developed with a vacant three-story (35,600 SF) office building (recently vacated by the Visiting Nurse Association) located in the northeast quadrant of the intersection of Route 35 (Riverside Avenue) and Bridge Avenue and Rector Place in Red Bank Borough, Monmouth County, New Jersey, see Figure 1 in Appendix A. The site is designated as Block 3 – Lots 2.01, 4.01, 6, and 9.01 on the Borough of Red Bank Tax Maps. The site is located within the WD – Waterfront Development zone and is the subject of the Borough's Redevelopment Plan dated December 12, 2018. Access to the site is currently provided via two full movement driveways along Bodman Place. It is proposed to close the existing driveways and construct two new full movement driveways along Bodman Place. It should be noted that a pick up/drop off circulation area will be provided at each driveway.

Dynamic Traffic LLC has been retained to prepare this study to assess the traffic impact associated with the construction of The Project on the adjacent roadway network. This study documents the methodology, analyses, findings and conclusions of our study and includes:

- A detailed field inspection was conducted to obtain an inventory of existing roadway geometry, traffic control, and location and geometry of existing driveways and intersections.
- Existing traffic data was collected via manual turning movement (MTM) counts during the weekday AM and weekday PM peak periods at the following intersections:
  - Route 35 (Riverside Avenue) & Bridge Avenue & Rector Place
  - Route 35 (Riverside Avenue) & Bodman Place
- Automatic traffic recorder (ATR) counts were performed along Route 35 and Bodman Place for a period of seven (7) days.
- Projections of traffic to be generated by the proposed development were prepared utilizing trip generation data as published by the Institute of Transportation Engineers. Site traffic was then assigned to the adjacent street system based upon the anticipated directional distribution.
- Capacity analyses were conducted for the Existing, No Build, and Build conditions for the study intersections.
- The proposed points of ingress and egress were inspected for adequacy of geometric design, spacing and/or alignment to streets and driveways on the opposite side of the street, relationship to other driveways adjacent to the development, and conformance with accepted design standards.
- The site plan as designed was reviewed for sufficiency in accommodating large wheel base vehicles such as delivery trucks, refuse trucks, and emergency vehicles.
- The parking layout and supply was assessed based on the standards set forth in the Borough's Redevelopment Plan, accepted design standards and demand experienced at similar developments.

## **EXISTING CONDITIONS**

A review of the existing roadway conditions in the vicinity of the proposed site was conducted to provide the basis for assessing the traffic impact of the development. This included field investigations of the surrounding roadways and intersections, collection of traffic volume data, and extensive analyses.

### **Existing Roadway Conditions**

The following are descriptions of the roadways in the study area:

Route 35 is an Urban Principal Arterial roadway under New Jersey Department of Transportation (NJDOT) jurisdiction with a general north/south orientation. It should be noted that Route 35 travels through the Borough's street system, primarily along Riverside Avenue and Maple Avenue. In the vicinity of the site the posted speed limit is 30 MPH, the roadway provides two travel lanes in each direction, and on-street parking is prohibited. Curb and sidewalk are provided along both sides of the roadway. Route 35 provides a curved horizontal alignment and a relatively flat vertical alignment. The land uses along Route 35 in the vicinity of The Project are a mix of commercial (restaurant, hotel, funeral home) and residential apartment buildings.

Rector Place (CR 13) is an Urban Minor Arterial roadway under Monmouth County jurisdiction with a general north/south orientation. In the vicinity of the site the posted speed limit is 30 MPH and the roadway provides one travel lane in each direction. Curb and sidewalk are provided along both sides of the roadway. Rector Place provides a curved horizontal alignment and a relatively flat vertical alignment (somewhat downhill to the south). The land uses along Rector Place in the vicinity of The Project are commercial near Route 35 and residential beyond the intersection.

Bridge Avenue is an Urban Local roadway under municipal jurisdiction with a general north/south orientation. In the vicinity of the site the posted speed limit is 30 MPH and the roadway provides one travel lane in each direction. Curb and sidewalk are provided along both sides of the roadway. Bridge Avenue provides a straight horizontal alignment and a relatively flat vertical alignment. The land uses along Bridge Avenue in the vicinity of The Project are mixed commercial and residential.

Bodman Place is an Urban Local (dead end) roadway under municipal jurisdiction with a general north/south orientation. The speed limit is unposted and the roadway provides one travel lane in each direction. On-street parking is allowed along the eastern side of the roadway (2 hour parking 8 AM – 6 PM except Sunday). Curb is provided along both sides of the roadway and sidewalk is provided along the east side of the road. Bodman Place provides a slightly curved horizontal alignment and a downgrade to the north approaching the river. The land uses along Bodman Place in the vicinity of The Project include an office building, hotel and several apartment/condo developments.

## Existing Traffic Volumes

Manual turning movement (MTM) counts were conducted on Tuesday, June 12, 2018 from 7:00 to 9:00 AM and from 3:30 to 6:30 PM at the following intersections:

- Route 35 (Riverside Avenue) & Bridge Avenue & Rector Place
- Route 35 (Riverside Avenue) & Bodman Place

In addition, automatic traffic recorder (ATR) counts were conducted along Route 35 and Bodman Place from Wednesday, December 5, 2018 to Tuesday, December 11, 2018. Review of the collected traffic data reveals that the weekday morning peak street hour (PSH) occurs between 8:00 - 9:00 AM and the weekday evening PSH occurs between 4:15 - 5:15 PM. Figure 2, located in Appendix A, shows the existing peak hour traffic volumes at the study intersections. All MTM counts are contained in Appendix B.

It should be noted that we have reviewed the historical traffic count data collected for an adjacent development and found the traffic volumes to be very consistent over the past few years. Below is a table showing the traffic volume data history at the intersection of Route 35 (Riverside Avenue) and Bridge Avenue and Rector Place.

**Table I  
Total Evening Peak Hour Entering Volume**

Year	Intersection Total
August 2009	3,028
June 2013	2,967
December 2016	3,054
June 2018	3,040

As can be seen by a review of the above collected data, the traffic volumes recorded by this firm in June 2018 are consistent with historical data collected at this intersection.

## Existing Capacity Analysis

The methodology utilized in the capacity analyses is described in the *Highway Capacity Manual*, published by the Transportation Research Board. In general, the term Level of Service (LOS) is used to provide a “qualitative” evaluation of capacity based upon certain “quantitative” calculations related to empirical values, such as traffic volume and intersection control.

At the signalized intersections, factors that affect the various approach capacities include width of approach, number of lanes, signal “green time”, turning percentages, truck volumes, etc. However, delays cannot be related to capacity in a simple one-to-one fashion. For example, it is possible to have delays in the Level of Service “F” range without exceeding roadway capacity. Substantial delays can exist without exceeding capacity if one or more of the following conditions exist: long signal cycle lengths; a particular traffic movement experiences a long red time; or progressive movement for a particular lane group is poor. Table II describes the level of service ranges for signalized intersections.

**Table II**  
**Level of Service Criteria**  
**For Signalized Intersections**

Level of Service	Average Control Delay (seconds per vehicle)
A	0.0 to 10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	greater than 80.0

An unsignalized (STOP sign controlled) driveway or side street along a through route is seldom critical from an overall capacity standpoint, however, it may be of great significance to the capacity of the minor cross-route, and it may influence the quality of traffic flow on both. When analyzing an unsignalized intersection, it is assumed that both the major street through and right turn movements are unimpeded and have the right-of-way over all side street traffic and left turns from the major street. All other turning movements in the intersection cross, merge with, or are otherwise impeded by major street movements. Traffic delays at unsignalized intersections are determined by sequentially processing these impeded movements. Table III describes the level of service ranges for unsignalized (stop controlled) intersections.

**Table III**  
**Level of Service Criteria**  
**For Unsignalized Intersections**

Level of Service	Average Control Delay (seconds per vehicle)
a	0.0 to 10.0
b	10.1 to 15.0
c	15.1 to 25.0
d	25.1 to 35.0
e	35.1 to 50.0
f	greater than 50.0

It should be noted that the analyses within the *Highway Capacity Manual* assume a random arrival for all the movements, which is not the case due to the traffic signal at Route 35 and Bridge Avenue and Rector Place, which platoons vehicles. Therefore, the actual operation of the study intersections could be better than is calculated.

All capacity analyses were performed utilizing Synchro 10. Table IV summarizes the existing levels of service (LOS) and delays. All capacity analysis calculation worksheets are contained in Appendix C.

**Table IV**  
**Existing Levels of Service**

Intersection	Direction/ Movement		AM PSH	PM PSH
Route 35 (Riverside Avenue) & Bridge Avenue & Rector Place	WB	R	B (13)	C (22)
	NB	TR	D (54)	E (69)
	SB	L	C (23)	C (21)
		LT	C (23)	C (21)
		R	B (18)	B (20)
	NEB	LR	D (51)	D (48)
	<b>Overall</b>		<b>C (26)</b>	<b>C (31)</b>
Route 35 (Riverside Avenue) & Bodman Place	EB	L	a (9)	a (10)
	SB	LR	c (24)	d (33)

a (#) - Unsignalized Intersection Level of Service (seconds of delay per vehicle)

A (#) - Signalized Intersection Level of Service (seconds of delay per vehicle)

The following are discussions pertaining to each of the existing intersections analyzed. It should be noted that the actual (as counted) percentage of trucks and peak hour factors were used in the existing analysis.

#### **Route 35 (Riverside Avenue) & Bridge Avenue & Rector Place**

Bridge Avenue and Rector Place intersect Route 35 to form a four-leg intersection controlled by a three-phase traffic signal operating with multiple background cycle lengths. To note is that Route 35 turns between the north and east (Riverside Avenue) at the study intersection, thereby providing the southbound and westbound approaches. The traffic signal provides a mainline Route 35 phase (southbound and westbound approaches) and exclusive phases for Rector Place (northbound) and Bridge Avenue (northeastbound).

The westbound approach of Route 35 provides two dedicated right turn lanes, while the southbound approach provides a dedicated left turn lane, a shared left turn/through lane, and a dedicated right turn lane. The northbound approach of Bridge Avenue provides a dedicated through lane and a shared through/right turn lane. The northeastbound approach of Rector Place provides a dedicated through lane and a shared through/right turn lane. Note that vehicles traveling from Rector Place onto Route 35 northbound are considered through movements.

A review of the existing analysis reveals that all movements operate at levels of service “E” or better and the intersection operates with an overall level of service “C” during the analyzed peak periods. See Table IV for the individual movement levels of service and delays.

**Route 35 (Riverside Avenue) & Bodman Place**

Bodman Place intersects Route 35 to form a T-intersection with the southbound approach of Bodman Place operating under stop control. The eastbound approach of Route 35 provides a dedicated left turn lane and two dedicated through lanes, while the westbound approach provides a dedicated through lane and a shared through/right turn lane. The southbound approach of Bodman Place provides a very wide shared left turn/right turn lane.

A review of the existing analysis reveals that all movements operate at levels of service “D” or better during the analyzed peak periods. See Table IV for the individual movement levels of service and delays.



## FUTURE CONDITIONS

Traffic volumes and operational analyses were developed for both the 2021 No Build and Build conditions. The No Build conditions provide a baseline for assessing the impact of the site development traffic on the roadway system. The process of developing the No Build and Build traffic volumes and the subsequent analyses is outlined below.

Regardless of whether the subject site is developed or not, traffic volumes on the surrounding roadways are expected to increase as a result of developments throughout the region. A growth rate for roadways within the study area was obtained from the NJDOT Annual Background Growth Rate Table, which indicates a growth rate of 1.5% per year.

Through consultation with the Red Bank Borough Planning Board staff, there are a few developments in the vicinity of the site that have been approved but not yet constructed that are identified as potential significant traffic generators, shown below. The Adjacent Development Traffic Volumes passing the site are shown on Figures 3 through 5. It was assumed that the background growth rate was adequate to account for the traffic associated with all developments not listed hereafter.

- A Hampton Inn & Suites development consisting of 76 hotel rooms, located at Block 1 – Lot 1, has been approved. Projections of the associated traffic volumes were gathered from the *Traffic Impact Analysis*, dated June 27, 2011 prepared by Dolan & Dean Consulting Engineers, LLC. (Figure 3)
- The Anderson Building consisting of 11,500 SF of retail space and 31,205 SF of office space located at 200 Monmouth Street, has been approved. Projections of the associated traffic volumes were developed using Institute of Transportation Engineers (ITE) Publication *Trip Generation, 10<sup>th</sup> Edition* for Land Use Code (LUC) 710 – General Office Building and LUC 820 – Shopping Center. (Figure 4)
- The Gold building is currently partially occupied and has an available 8,383 SF of office space located at 10 Route 35 just north of the Route 35 bridge. Projections of the associated traffic volumes of the potential occupancy of the available office space were developed using LUC 710 – General Office Building. (Figure 5)
- Additionally, a gas station located in the southeast quadrant of the intersection of Route 35 (Riverside Avenue) and Bridge Avenue and Rector Place is currently vacant. Should the site be redeveloped with another gas station, the majority of the anticipated traffic would be passby already on the adjacent street system. Consequently, the site would not contribute a significant amount of new traffic through either of the two study intersections.

Future 2021 No Build traffic volumes were developed by applying the background growth rate of 1.5% for three (3) years to the study area roadways existing traffic volumes and by adding the site generated traffic associated with the above listed adjacent developments. Figure 6, in Appendix A, shows the 2021 No Build traffic volumes.



### ***Potential Re-occupancy of Existing Site***

In the future, if the subject project was not constructed, the existing vacant building could be re-occupied by the Visiting Nurse Association of Central Jersey (VNA) or another medical/office type use, therefore projections of traffic volumes associated of the recently vacant building, approximately 30,000 SF of office space and 5,600 SF of medical office space, were developed utilizing ITE methodology for LUC 710 – General Office Building and LUC 720 – Medical- Dental Office Building. Note that an additional No Build condition with the VNA re-occupied was also prepared to assess the impact of the proposed site development traffic versus the approved and permitted traffic volumes of the VNA site. Table V summarizes the anticipated trip generation if the VNA building were to be reoccupied.

**Table V**  
**Trip Generation of Re-Occupancy of VNA Building**

Land Use	AM PSH			PM PSH		
	In	Out	Total	In	Out	Total
30,000 SF Office	30	5	35	6	29	35
5,600 SF Medical Office	13	4	17	6	15	21
<b>Total</b>	<b>43</b>	<b>9</b>	<b>52</b>	<b>12</b>	<b>44</b>	<b>56</b>

Figure 7, in Appendix A, shows the anticipated site generated volumes considering the re-occupancy of the VNA building. The potential site generated volumes were added to the No Build traffic volumes to generate the 2021 No Build traffic volumes considering the re-occupancy of the VNA building.

### **Traffic Generation**

Trip generation projections for The Project were prepared utilizing trip generation research data as published under LUC 221 – Multifamily Housing (Mid-Rise) and LUC 710 – General Office Building. It should be noted that the ITE publication *Trip Generation Handbook, 3<sup>rd</sup> Edition*, recognizes that when land uses are proximate to each other, individual land uses tend to interact, reducing the overall trip generation of the site. However, in order to provide a conservative projection of site generated traffic, no credit was taken for this effect. It should be further noted that the proposed accessory retail/food space is anticipated to service primarily the residents of the building, therefore there is no additional trip generation associated with it. Additionally, it is anticipated that the walkability of Red Bank will further reduce the necessity to utilize a car, however conservatively this credit was not applied. Table VI details the traffic volumes associated with the Project.

**Table VI**  
**Trip Generation**

Land Use	AM PSH			PM PSH		
	In	Out	Total	In	Out	Total
210 Multifamily (Mid-Rise) Units	18	53	71	55	35	90
9,000 SF Office	9	1	10	2	8	10
<b>Total</b>	<b>27</b>	<b>54</b>	<b>81</b>	<b>57</b>	<b>43</b>	<b>100</b>

Once the magnitude of traffic to be generated by the site is known, it is necessary to assign that traffic to the adjacent street system. The distribution of new traffic to the surrounding roadways is based on the location of primary arterial roadways, major signalized intersections and existing traffic patterns. Table VI summarizes the anticipated trip distribution for The Project.

**Table VII**  
**Trip Distribution**

To/From	Percentage	
	Entering	Exiting
Riverside Avenue – East	25%	65%
Rector Place – West	20%	-
Route 35 – North	35%	35%
Bridge Avenue – South	20%	-
<b>Total</b>	<b>100%</b>	<b>100%</b>

Located in Appendix A, Figure 7 illustrates the site generated volumes assigned to the study area network. The site generated volumes were added to the No Build traffic volumes to generate the Build traffic volumes, which are shown in Figure 8.

### Future Capacity Analysis

Operational conditions at the study intersections were analyzed under the No Build (with and without the re-occupancy of the VNA building) and Build conditions and are summarized in Table VIII below.

**Table VIII**  
**Future Levels of Service**

Intersection	Direction/ Movement		AM PSH			PM PSH			
			No Build	No Build w/ VNA	Build	No Build	No Build w/ VNA	Build	Build w/ Mit.
Route 35 (Riverside Avenue) & Bridge Avenue & Rector Place	WB	R	B (14)	B (14)	B (14)	C (23)	C (23)	C (23)	C (25)
	NB	TR	E (56)	E (58)	E (57)	F (82)	F (83)	F (90)	E (68)
	SB	L	C (25)	C (25)	C (25)	C (23)	C (23)	C (23)	C (24)
		LT	C (25)	C (26)	C (26)	C (23)	C (23)	C (23)	C (24)
		R	B (19)	B (20)	B (19)	C (21)	C (21)	C (21)	C (22)
	NEB	LR	D (53)	D (54)	D (54)	D (52)	D (52)	D (53)	D (53)
	<b>Overall</b>		<b>C (27)</b>	<b>C (28)</b>	<b>C (28)</b>	<b>C (34)</b>	<b>C (35)</b>	<b>D (36)</b>	<b>C (34)</b>
Route 35 (Riverside Avenue & Bodman Place	EB	L	a (9)	a (9)	a (9)	b (10)	b (10)	b (11)	-
	SB	LR	d (27)	d (33)	e (39)	e (37)	f (56)	f (74)	-

a (#) - Unsignalized Intersection Level of Service (seconds of delay per vehicle)

A (#) - Signalized Intersection Level of Service (seconds of delay per vehicle)

### **Route 35 (Riverside Avenue) & Bridge Avenue & Rector Place**

With the addition of site generated traffic, all movements are anticipated to operate at levels of service similar to the No Build condition. The critical approaches of Route 35 are projected to operate at levels of service “C” or better and the overall intersection is projected to operate at levels of service “D” or better. Note that the Bridge Avenue approach which operates at level of service “F” during the evening peak hour in both the No Build and Build conditions, only provides 7-10 seconds of green time in order to prioritize traffic on the critical approaches at the intersection. Additionally, the increase of traffic on that approach from the Project is anticipated to be just 11 vehicles during the evening peak hour (roughly one vehicle every 5/6 minutes). The Build with Mitigation analysis shows that a reallocation of as little as one second of green time from Route 35 to Bridge Avenue would reduce delays on that approach to less than No Build conditions while maintaining good levels of service on all other approaches. It should be noted that the intersection is under NJDOT jurisdiction, therefore any timing modification would require the Department’s approval. The applicant will coordinate with NJDOT to determine the optimal signal timing adjustment. See Table VIII for the individual movement levels of service and delays.

### **Route 35 (Riverside Avenue) & Bodman Place**

With the addition of site generated traffic, all movements from Route 35 are anticipated to operate at levels of service “B” or better with the Bodman Place approach operating at level of service “E” during the morning peak hour and level of service “F” during the evening peak hour. Note, the Bodman Place approach would operate at similar level of service “F” conditions if the VNA building was reoccupied. In fact, the traffic volumes exiting Bodman Place during the critical evening peak hour if the Project is constructed will be nearly identical to those associated with the already approved and permitted VNA facility (43 Project vehicles vs. 44 VNA vehicles). See Table VIII for the individual movement levels of service and delays.

It is also worth mentioning that egress from Bodman Place is anticipated to operate better than theoretically calculated due to the presence of the adjacent traffic signal at the intersection of Route 35 (Riverside Avenue) and Bridge Avenue and Rector Place. The signal at Bridge Avenue platoons traffic along Riverside Avenue, thereby providing clear and definable gaps in which left turning vehicles can exit Bodman Place.

Lastly, it should be noted that the intersection is under NJDOT jurisdiction; therefore, any potential improvements to the intersection would require the Department’s approval. It is our understanding that the Department has historically been opposed to the installation of a traffic signal at this intersection due to its proximity to the existing traffic signal at Route 35 and Bridge Avenue/Rector Place intersection. At the direction of the Borough, the Applicant is prepared to submit an application to the NJDOT for a traffic signal at the intersection and diligently seek approval of such traffic signal.

### **Transit Availability & Walkability**

The Redevelopment Plan envisions that residents of this development will take advantage of the transit availability and walkability of the Borough. The development will provide a shuttle that will transport residents to and from the Red Bank Train Station during peak commuting hours. To note is that the Red Bank train station is less than ½ mile walk straight down Bridge Avenue. The walkability of the Borough will allow residents an alternative method of travel besides automobile. As such, it is anticipated that the actual trip generation of the Project will be lower than projected and that the future levels of service analyses indicated earlier in this report provide a conservative forecast of conditions for the site.

Additionally, we have referenced [www.walkscore.com](http://www.walkscore.com) which is a walkability evaluation tool for cities and towns which was developed by urban planning, environmental and technical experts. The mission of Walk Score is to promote walkable neighborhoods by making it easy for people to evaluate walkability and transportation when choosing where to live. To note is that Bodman Place has a walk score of 71 out of 100 and Riverside Avenue has a walk score of 84 out of 100 (both defined as “Very Walkable”) meaning that most errands can be accomplished on foot thus reducing automobile dependency.

## SITE PLAN

### Site Access and Circulation

The site plan was reviewed with respect to the site access and on-site circulation design. As noted previously, access to The Project will be provided via two new full movement driveways along Bodman Place, with a pick up/drop off area at each driveway. The proposed driveways were designed to provide adequate alignment and spacing with respect to the neighboring developments along Bodman Place. It should be noted that the parking garage is proposed to have three levels. The northern driveway is designed to be the entrance to the lower level of the garage and the southern driveway is designed to be the entrance to the two upper levels of the garage.

The proposed parking garage will be serviced by parking aisles with minimum widths of 24', which satisfy the Ordinance's minimum requirement of 24'. These aisles will allow for safe and efficient two-way circulation and 90 degree parking.

### Parking

The Redevelopment Plan sets forth the following parking requirements for the proposed mixed use building.

**Table IX**  
**Proposed Mixed Use Building**

Unit Type	Requirement / Unit	Number of Units	Required Parking Spaces
1-Bedroom	1.0 / Unit	113 Units	113
2-Bedroom	1.7 / Unit	91 Units	155
3-Bedroom	2 / Unit	6 Units	12
Non-Residential	1 / 350 SF	9,000 SF	26
Retail/Food	1 / 4 Seats	40 Seats	10
Total Parking Spaces Required			316
Proposed Parking Supply			326
Exceeds Redevelopment Requirement			+10

As shown in the table above, the proposed parking supply of 326 spaces exceeds the Redevelopment Plan requirement of 316 spaces. Note that the proliferation of Transportation Network Companies (TNC's) and the provision of Zipcar type services in the parking garage will reduce the parking demand on-site. It should be further noted that no credit was taken for on-street parking which currently exists along Bodman Place and is proposed to be maintained.

It is proposed to provide parking stalls with standard dimensions of 9'x18', which satisfy the Ordinance minimum requirement of 9'x18'. Additionally, it is proposed to provide compact parking stalls with minimum dimensions of 8'x18', which satisfy the Ordinance minimum requirement for compact parking stall requirement 7'-4"x16'. Further, drop off/pick up/loading zone areas are located outside each lobby for use by the shuttle to the Red Bank train station, TNC's, and delivery services (Fed-Ex, UPS, food, etc.).

## **FINDINGS & CONCLUSIONS**

### **Findings**

Based upon the detailed analyses as documented herein, the following findings are noted:

- The recently vacated 35,600 SF office/medical office building on the subject site was previously occupied by the Visiting Nurse Association of Central Jersey (VNA). If re-occupied this building would generate 43 entering trips and 9 exiting trips during the weekday morning peak hour and 12 entering trips and 44 exiting trips during weekday evening peak hour.
- The proposed mixed use building, will generate 27 entering trips and 54 exiting trips during the weekday morning peak hour and 57 entering trips and 43 exiting trips during the evening peak hour. This estimate is conservative considering that the building will provide a shuttle to/from the Red Bank train station during the peak commuting hours and that there is the opportunity for internal trips between the proposed residential units and co-working space.
- The existing access driveways to the VNA will be removed and access to the site is proposed to be provided via two new full movement driveways along Bodman Place with a pick up/drop off area at each driveway. The on-street parking along Bodman will be maintained as it currently exists.
- With the addition of site generated traffic, the intersection of Route 35 (Riverside Avenue) with Bridge Avenue and Rector Place is anticipated to operate at levels of service similar to the No Build condition. The critical approaches of Route 35 are projected to operate at levels of service “C” or better and the overall intersection is projected to operate at levels of service “D”. The Applicant will coordinate with NJDOT to determine the optimal signal timing adjustment.
- With the addition of site generated traffic, the intersection of Riverside Avenue (Route 35) and Bodman Place is anticipated to operate at levels of service “B” or better with the Bodman Place approach operating at level of service “F” during the evening peak hour similar to if the VNA building were re-occupied. It is anticipated that the gaps created by the adjacent signalized intersection of Route 35 (Riverside Avenue) and Bridge Avenue and Rector Place will result in operation that is better than calculated. It should be noted that the intersection is under NJDOT jurisdiction, therefore any potential improvements to the intersection would require the Department’s approval. The Applicant is willing to discuss the intersection with NJDOT to identify what, if any, improvements are appropriate to and to pay for their fair share of the cost of those improvements.
- As proposed, The Project’s site driveways and internal circulation have been designed to provide for safe and efficient movement. Large wheel base vehicles such as delivery trucks and refuse trucks will be accommodated via external loading areas.

- The proposed parking supply and design is sufficient to support the projected demand and satisfies/exceeds the Redevelopment Plan requirements.
- The provision of a shuttle to the Red Bank train station and the walkability of the Borough will reduce the automobile dependence of residents, thereby potentially reducing the traffic generation of The Project.
- The proliferation of Transportation Network Companies and the provision of Zipcar type services in the parking garage will reduce the parking demand on-site.

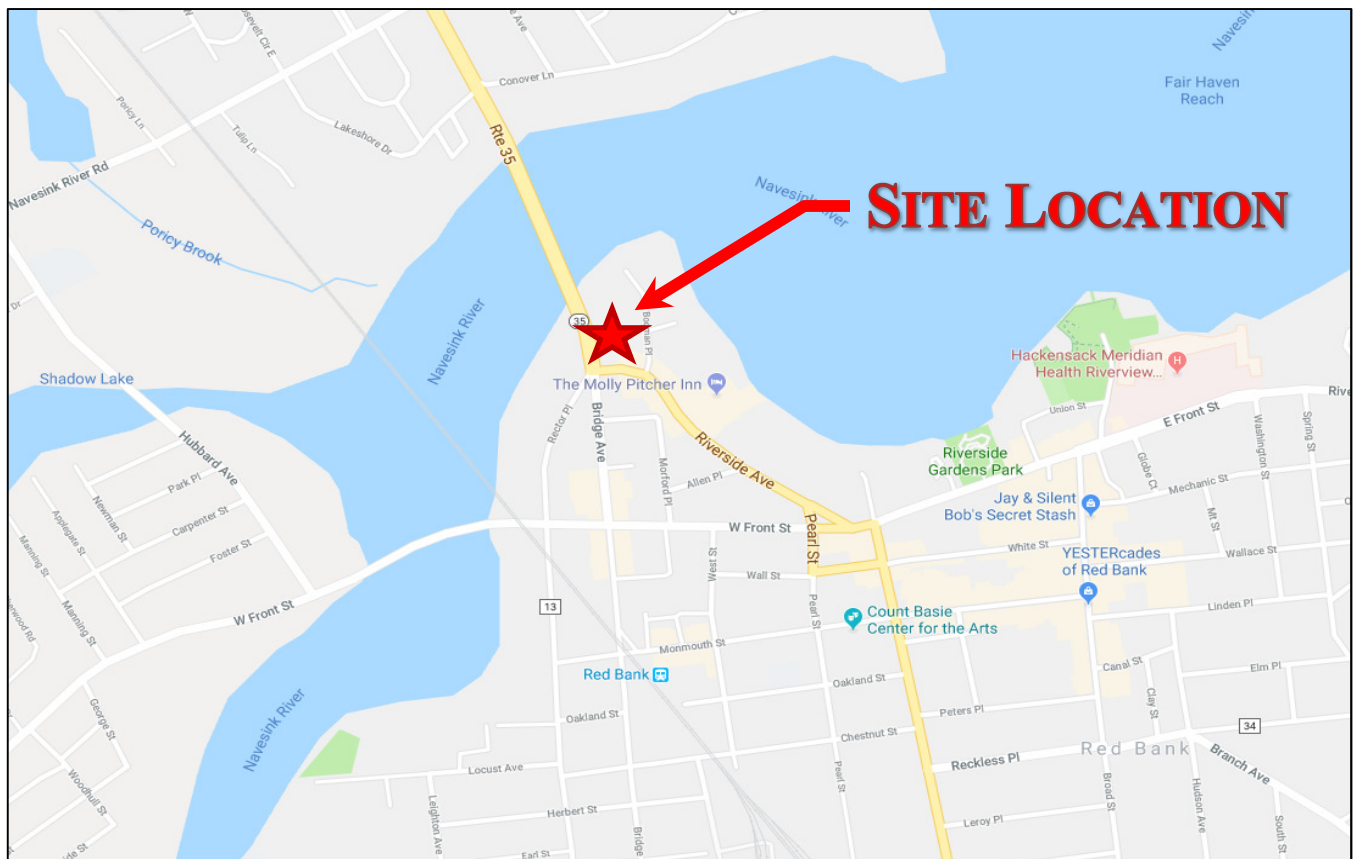
## **Conclusions**

Based upon our Traffic Impact Study as detailed in the body of this report, it is the professional opinion of Dynamic Traffic LLC that the adjacent street system will not experience any significant degradation in operating conditions with the construction of The Project. The operating conditions will be substantially similar to those when the VNA building was occupied. The site driveways are located to provide safe and efficient access. The site plan as proposed provides for good circulation throughout the site and provides adequate parking to accommodate The Project's needs.



## **Appendix A**

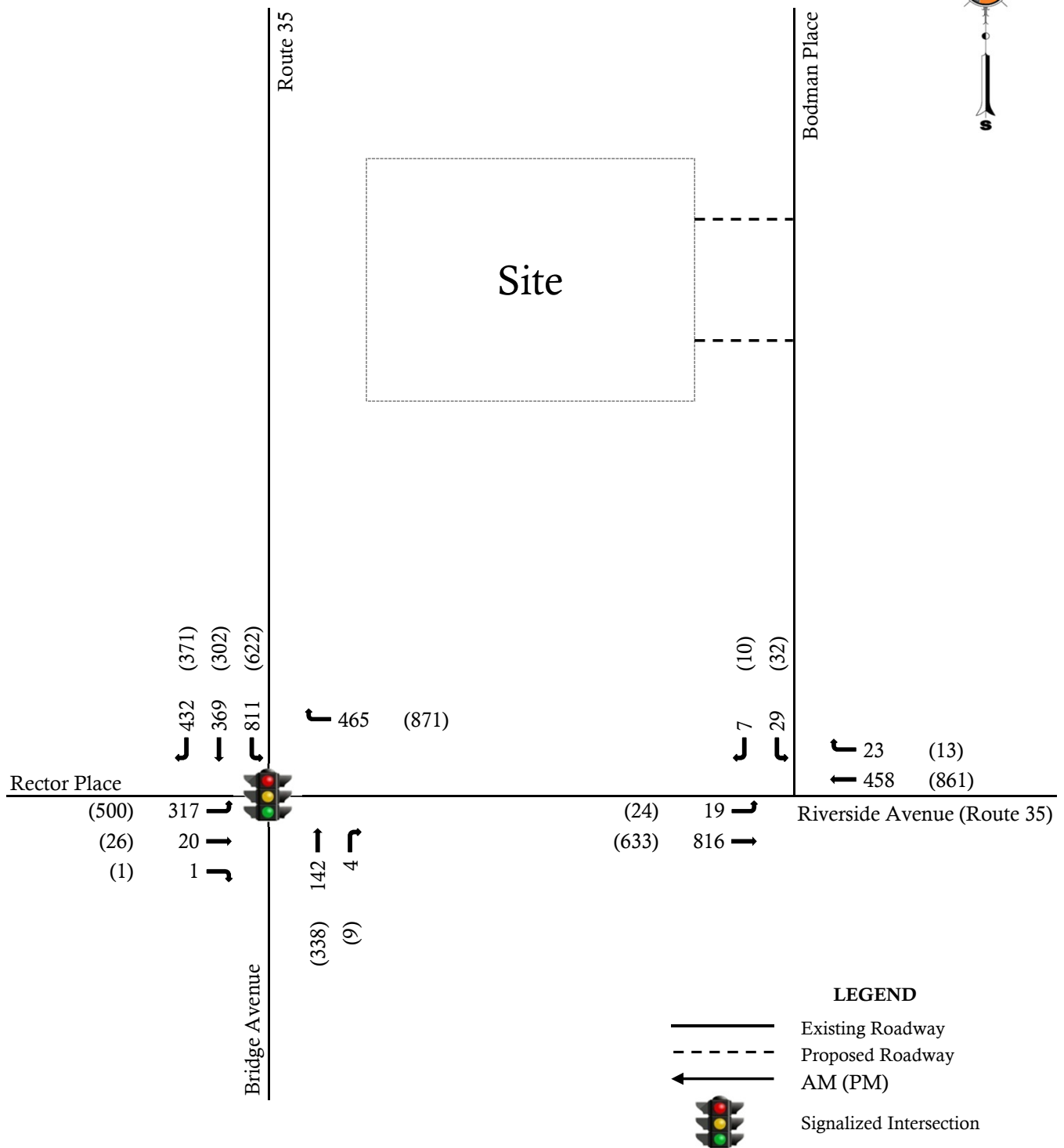
### **Traffic Volume Figures**

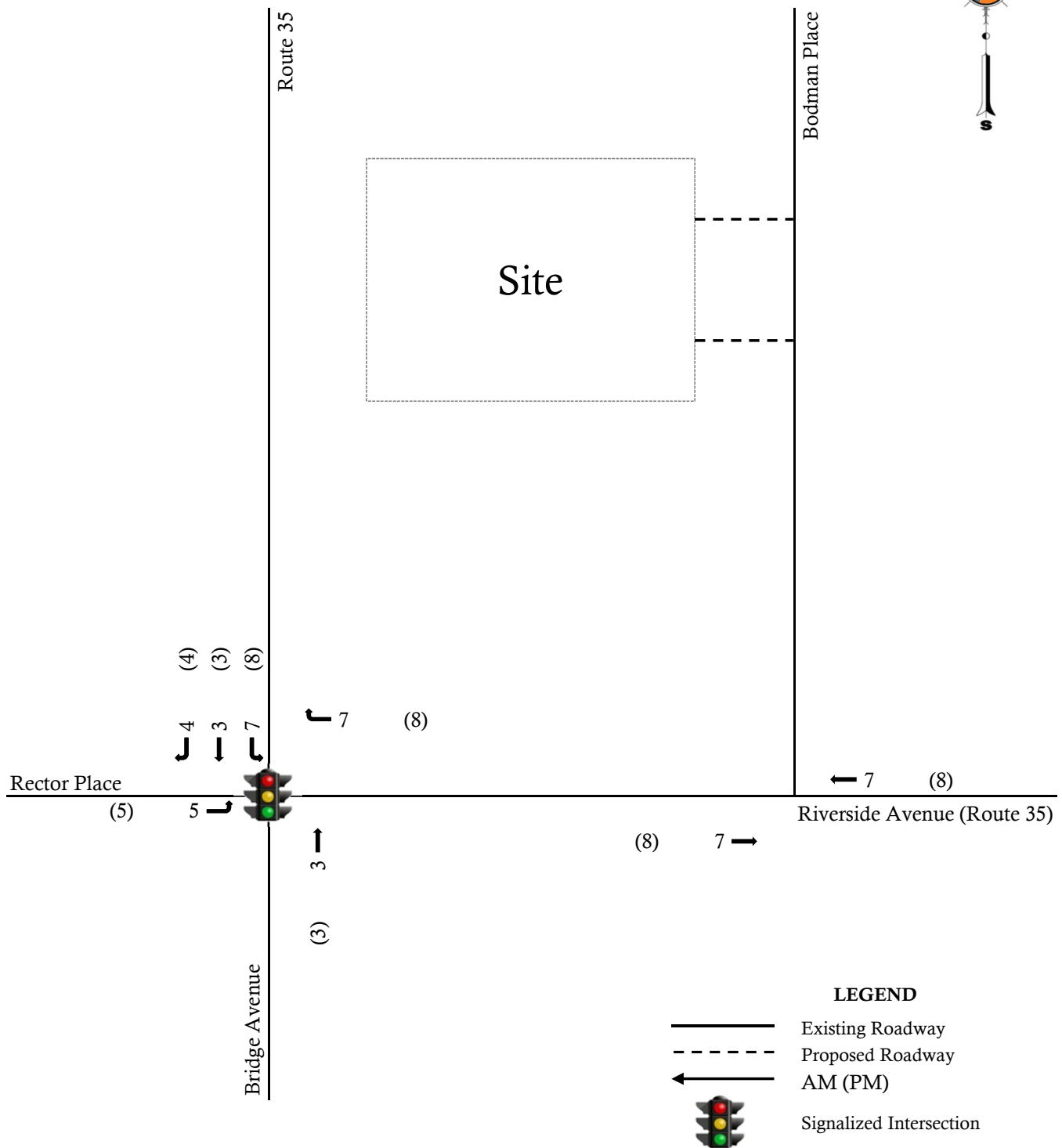


Proposed Mixed Use Building  
 Traffic Impact Study  
 2561-99-001TE  
 4/15/2019

**Figure 1**

**Site Location Map**

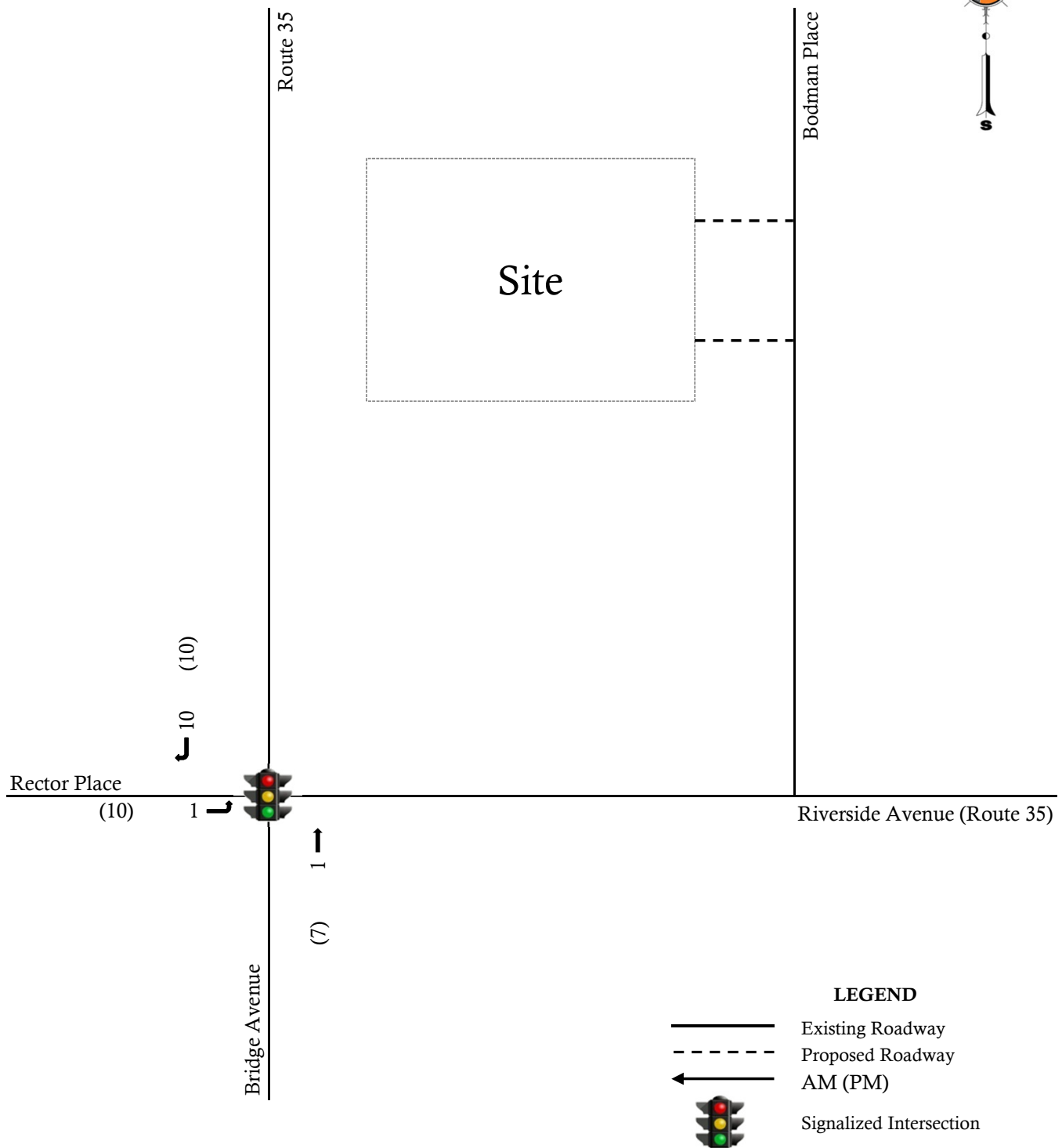




Proposed Mixed Use Building  
Traffic Impact Study  
2561-99-001TE  
4/15/2019

**Figure 3**

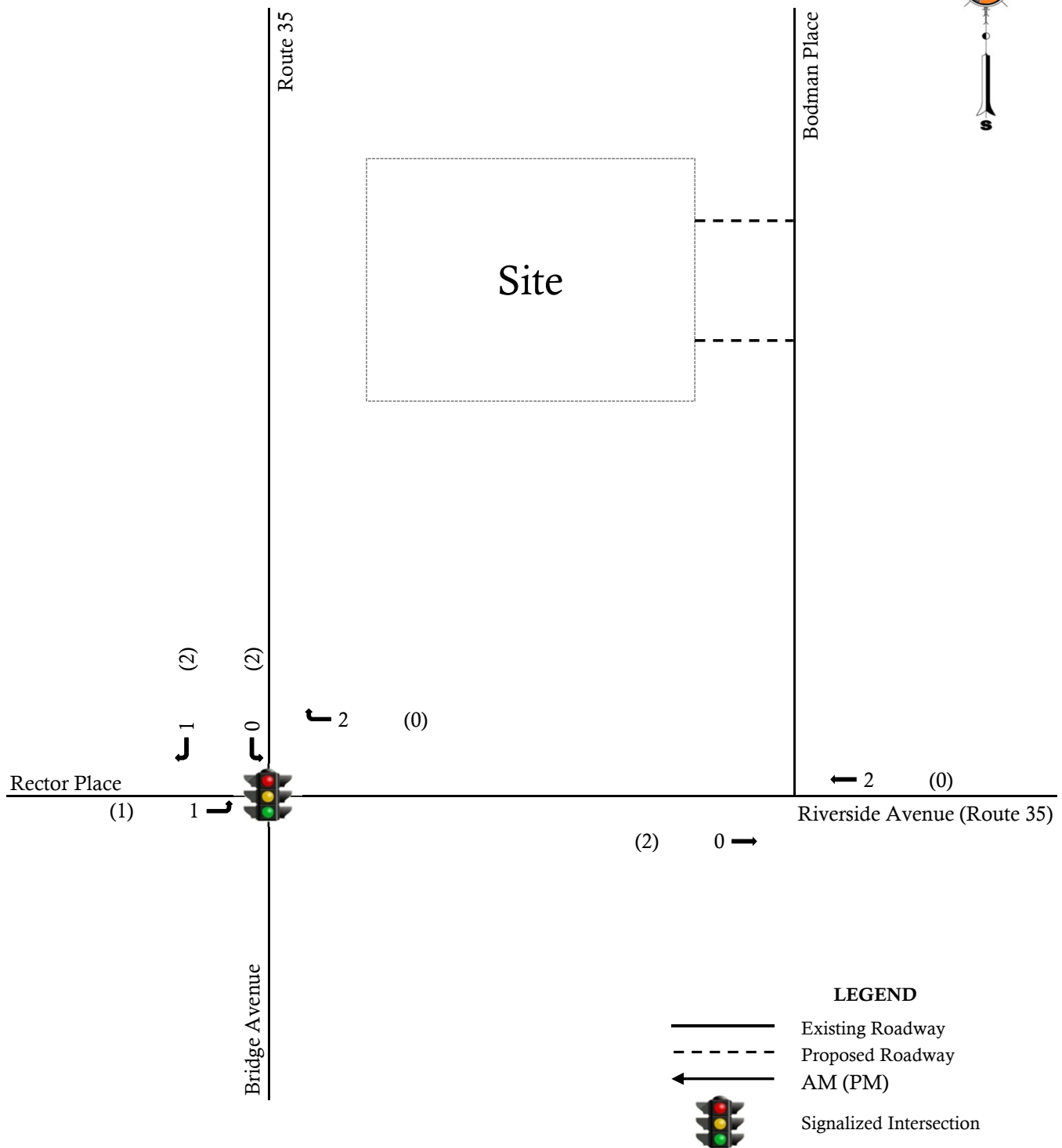
**Adjacent Development Traffic Volumes  
[Hampton Inn & Suites]**



Proposed Mixed Use Building  
Traffic Impact Study  
2561-99-001TE  
4/15/2019

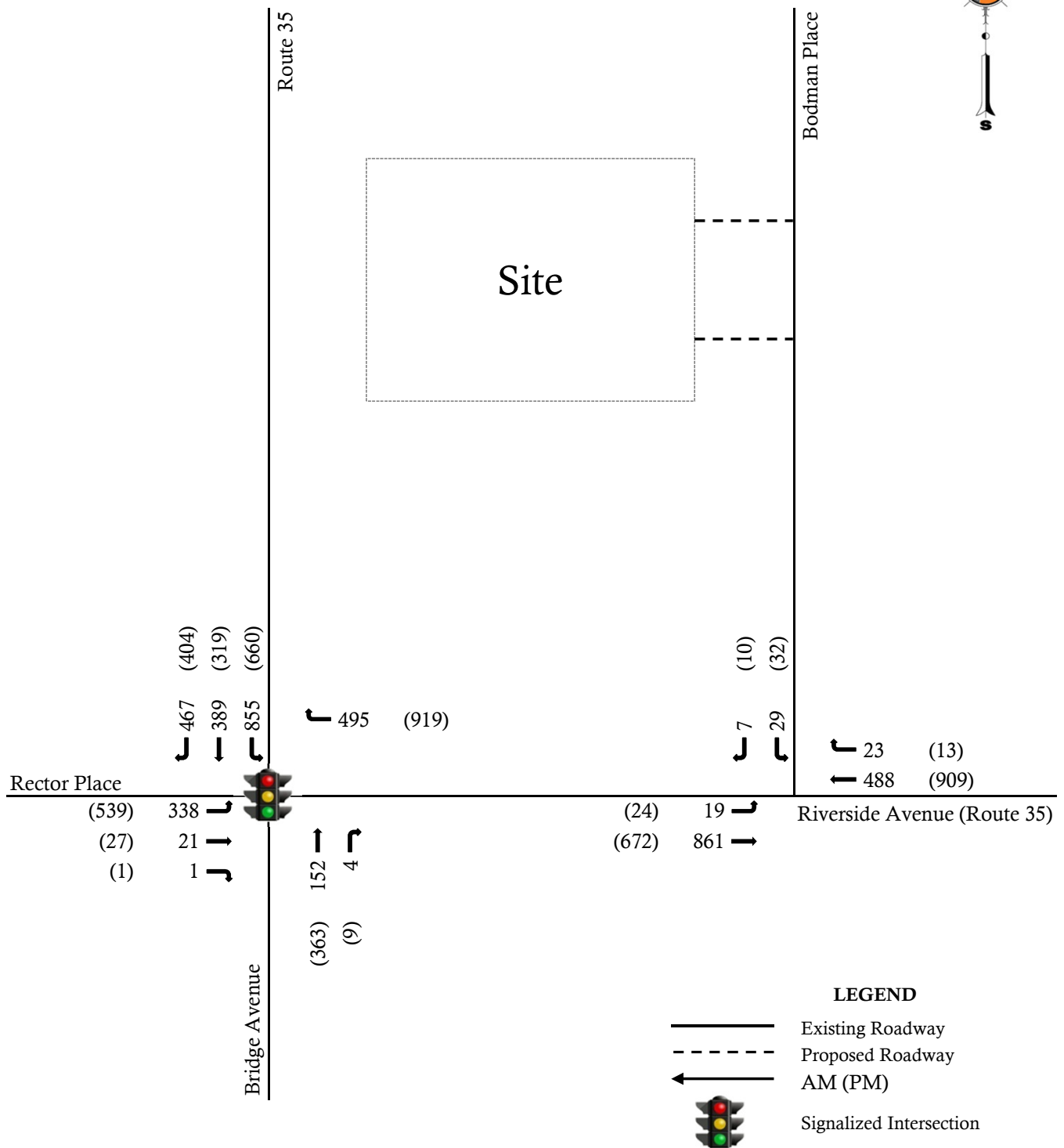
**Figure 4**

**Adjacent Development Traffic Volumes  
[The Anderson Building]**



Proposed Mixed Use Building  
Traffic Impact Study  
2561-99-001TE  
4/15/2019

**Figure 5**  
**Adjacent Development Traffic Volumes**  
**[Gold Building]**

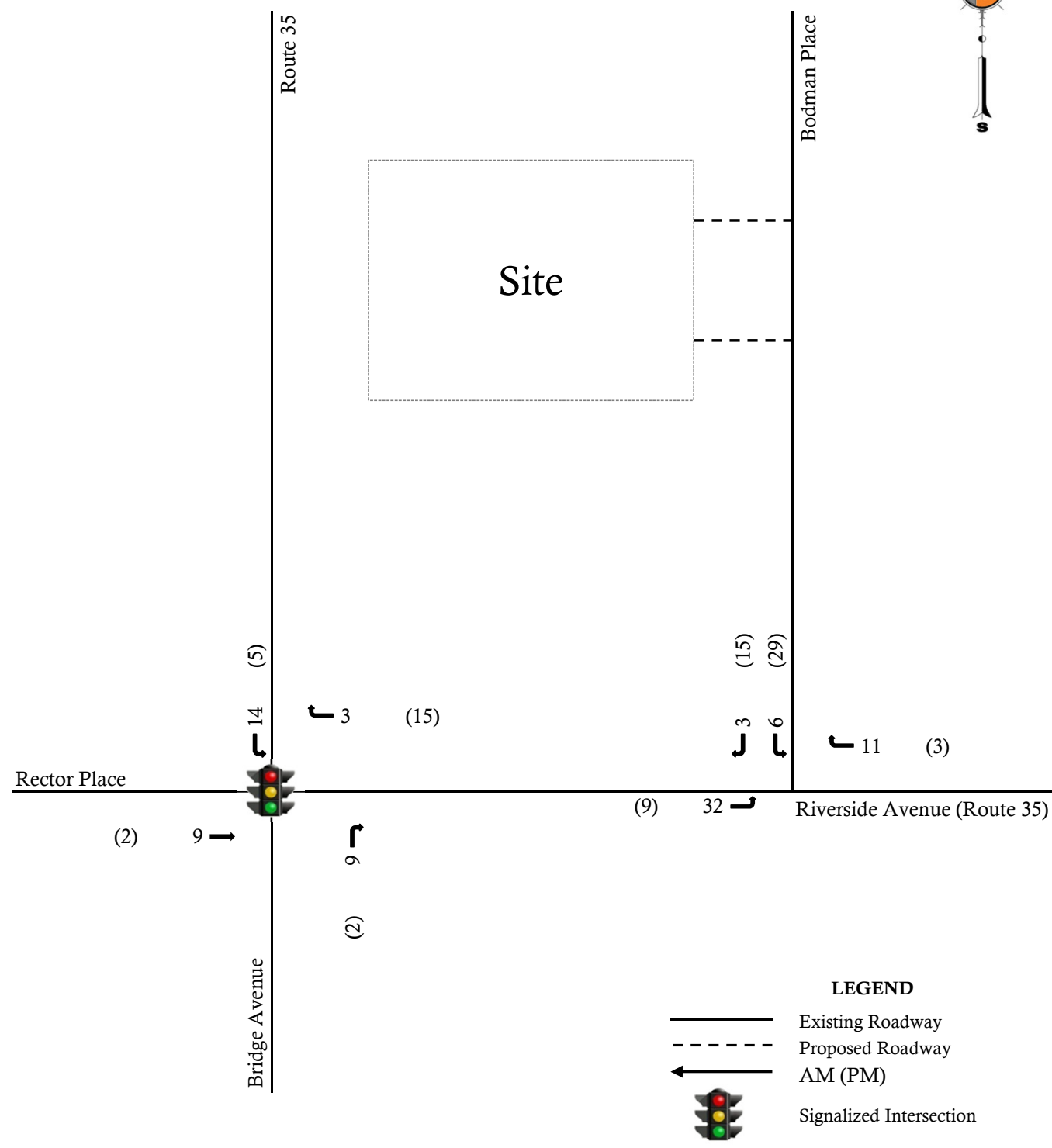


Proposed Mixed Use Building  
Traffic Impact Study  
2561-99-001TE  
4/15/2019

**Figure 6**

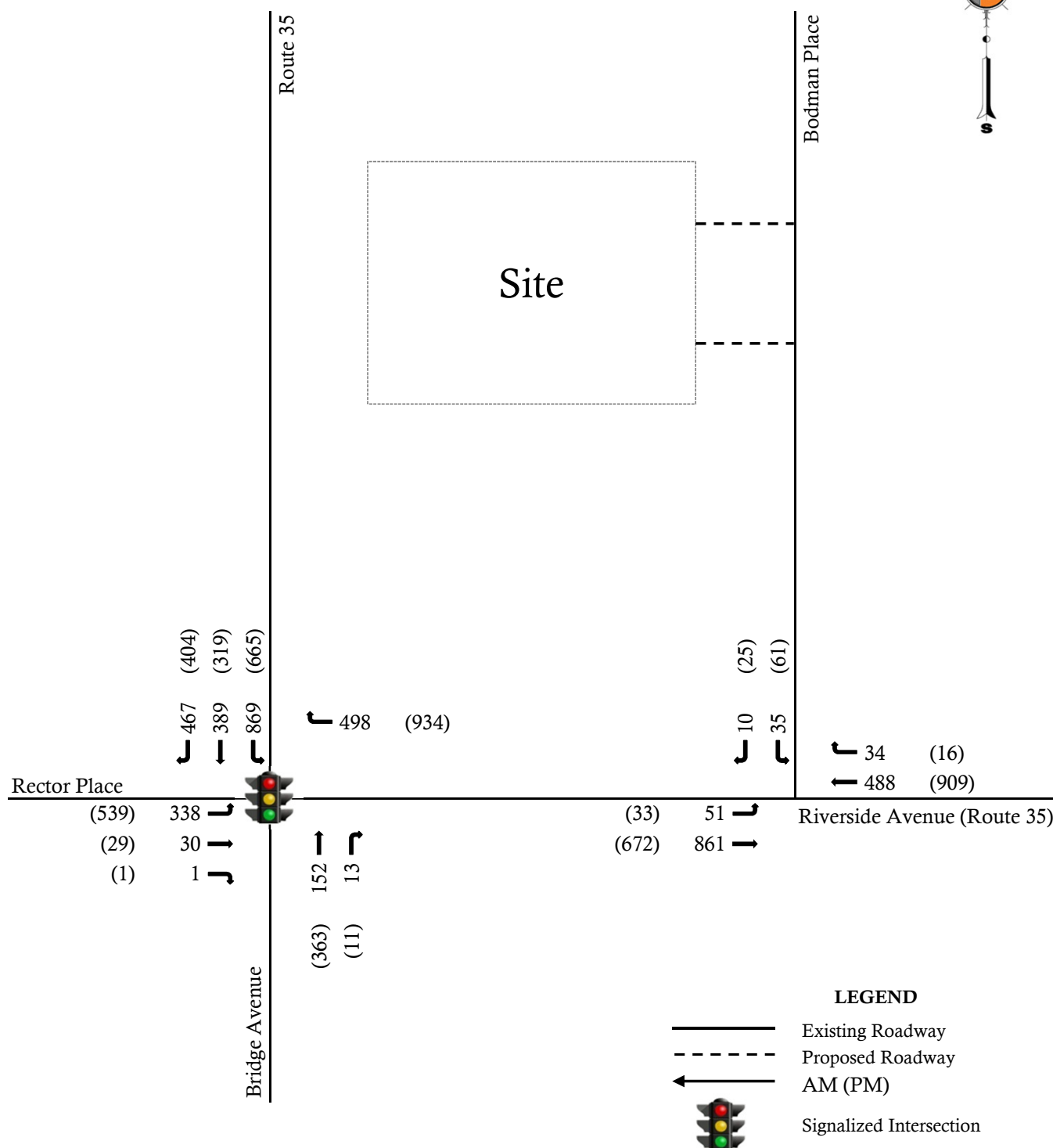
**No Build Traffic Volumes**

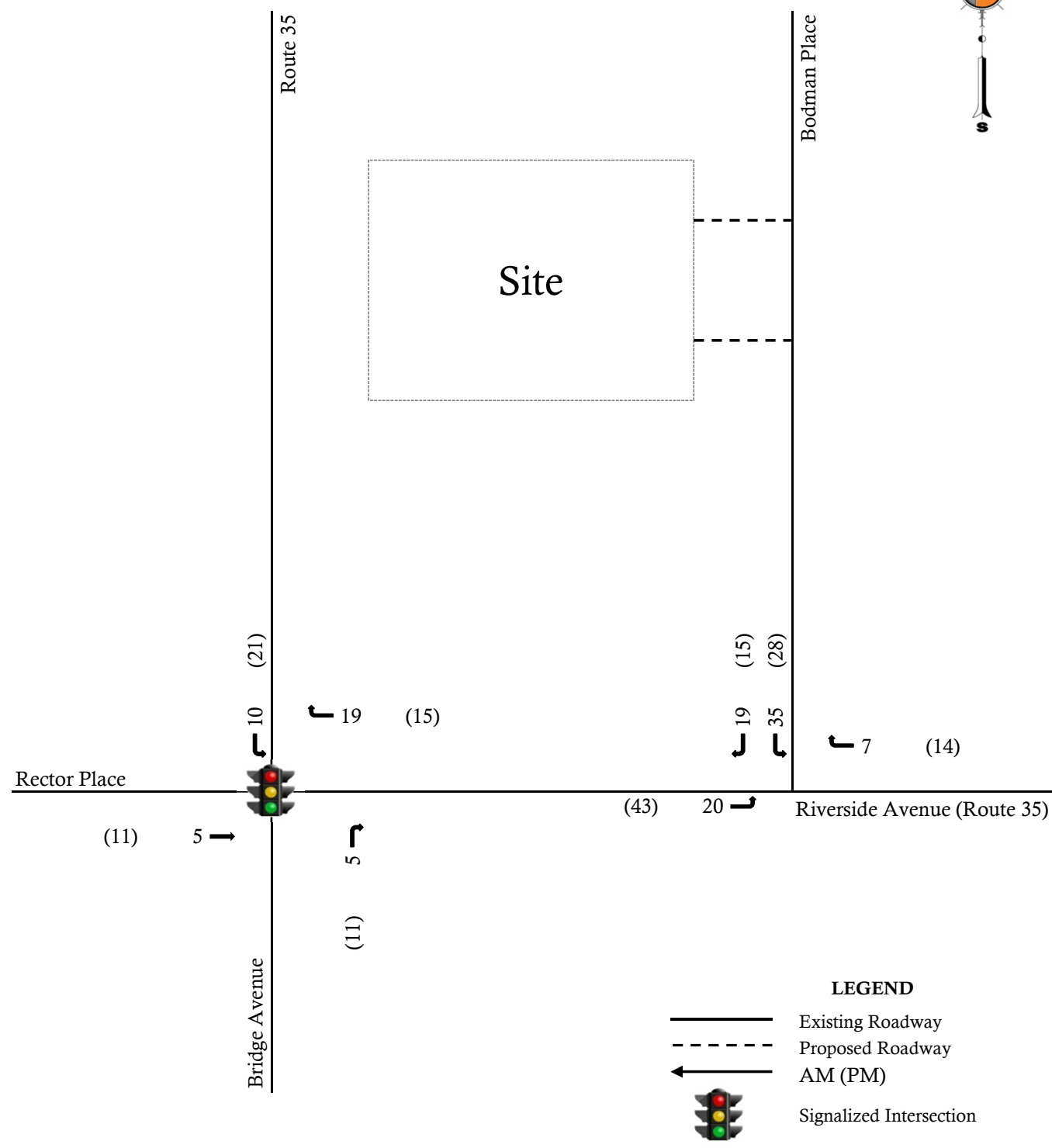




**Figure 7**

**Re-occupancy of the VNA Building Site Generated Trips**

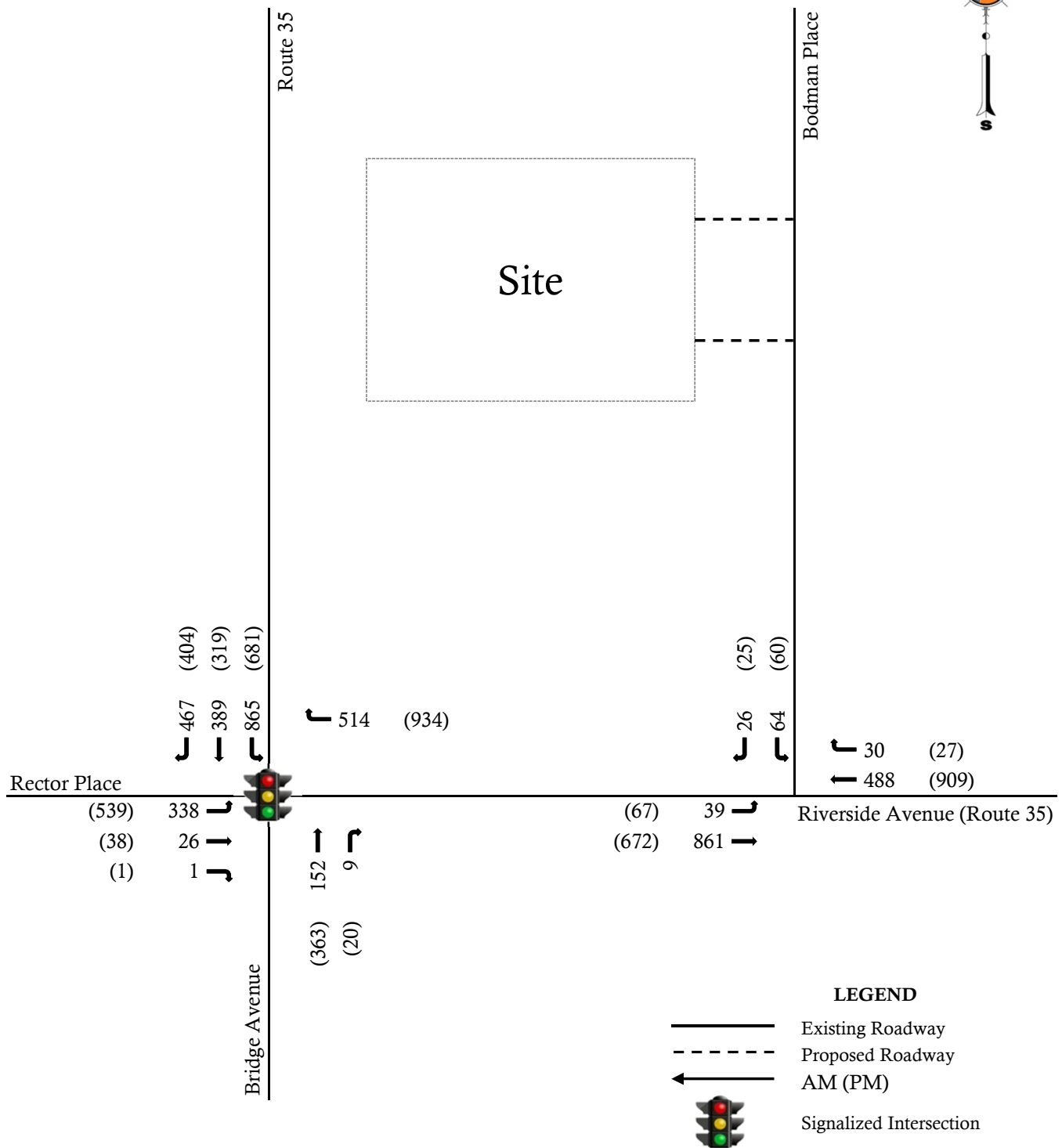




Proposed Mixed Use Building  
Traffic Impact Study  
2561-99-001TE  
4/15/2019

**Figure 9**

**Site Generated Trips**



## **Appendix B**

### **Traffic Counts**

1904 Main Street, Lake Como, NJ 07719  
245 Main Street - Suite #110, Chester, NJ 07930  
732-681-0760

E/W: Rector Pl/Rvierside Ave  
N/S: Bridge Ave/Rt 35  
Town/County: Red Bank/Monmouth  
Job #: 2561-99-001T

File Name : Rt 35, Riverside Ave & Rector PI - AM&PM  
Site Code : 00000000  
Start Date : 6/12/2018  
Page No : 1

Groups Printed- Cars - Trucks (SU) - Tucks (TT)

	Rector PI Eastbound					Riverside Ave Westbound					Bridge Ave Northbound					Route 35 Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	96	5	2	0	103	0	0	0	0	0	0	37	2	0	39	106	61	72	0	239	381
07:15 AM	79	4	0	0	83	0	0	0	2	2	0	24	4	0	28	140	85	85	1	311	424
07:30 AM	82	4	0	0	86	0	0	0	2	2	0	33	0	0	33	178	106	89	0	373	494
07:45 AM	61	8	0	0	69	0	0	0	2	2	0	42	1	0	43	185	127	121	0	433	547
Total	318	21	2	0	341	0	0	0	6	6	0	136	7	0	143	609	379	367	1	1356	1846
08:00 AM	66	5	1	0	72	0	0	0	0	0	0	36	1	0	37	179	84	106	0	369	478
08:15 AM	69	4	0	0	73	0	0	0	0	0	0	39	1	0	40	196	92	108	1	397	510
08:30 AM	93	4	0	0	97	0	0	0	0	0	0	31	1	0	32	199	89	104	0	392	521
08:45 AM	89	7	0	0	96	0	0	0	0	0	0	36	1	0	37	237	104	114	1	456	589
Total	317	20	1	0	338	0	0	0	0	0	0	142	4	0	146	811	369	432	2	1614	2098

\*\*\* BREAK \*\*\*

[illegible]

# Dynamic Traffic, LLC

1904 Main Street, Lake Como, NJ 07719  
245 Main Street - Suite 110, Chester, NJ 07930  
732-681-0760

E/W: Riverside Avenue (Rt. 35)  
N/S: Bodman Place  
Town/County: Red Bank/Monmouth  
Job #: 2561-99-001TE

File Name : Riverside Ave (Rt 35) & Bodman Pl AM & PM  
Site Code : 00000000  
Start Date : 6/12/2018  
Page No : 1


## Groups Printed- Cars - Single Unit Trucks - Tractor Trailers

	Riverside Avenue (Rt. 35) Eastbound					Riverside Avenue (Rt. 35) Westbound					Bodman Place Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	2	0	0	0	2	0	106	6	0	112	5	0	1	0	6	120
07:15 AM	4	0	0	0	4	0	104	1	0	105	9	0	2	2	13	122
07:30 AM	6	0	0	0	6	0	111	3	2	116	4	0	0	1	5	127
07:45 AM	5	0	0	0	5	0	117	5	0	122	4	0	1	1	6	133
Total	17	0	0	0	17	0	438	15	2	455	22	0	4	4	30	502
08:00 AM	5	0	0	0	5	0	97	4	1	102	5	0	2	0	7	114
08:15 AM	4	0	0	0	4	0	120	9	0	129	4	0	3	0	7	140
08:30 AM	3	0	0	0	3	0	128	4	2	134	11	0	0	0	11	148
08:45 AM	7	0	0	1	8	0	113	6	0	119	9	0	2	0	11	138
Total	19	0	0	1	20	0	458	23	3	484	29	0	7	0	36	540
*** BREAK ***																
03:30 PM	3	147	0	1	151	0	219	0	2	221	4	0	3	2	9	381
03:45 PM	8	159	0	1	168	0	215	1	1	217	4	0	6	1	11	396
Total	11	306	0	2	319	0	434	1	3	438	8	0	9	3	20	777
04:00 PM	1	137	0	0	138	0	216	3	2	221	7	0	6	0	13	372
04:15 PM	5	162	0	0	167	0	203	2	2	207	6	0	2	1	9	383
04:30 PM	3	165	0	0	168	0	214	1	1	216	9	0	3	0	12	396
04:45 PM	11	150	0	0	161	0	226	3	1	230	10	0	2	0	12	403
Total	20	614	0	0	634	0	859	9	6	874	32	0	13	1	46	1554
05:00 PM	5	156	0	0	161	0	218	7	0	225	7	0	3	0	10	396
05:15 PM	10	188	0	0	198	0	250	2	0	252	4	0	3	0	7	457
05:30 PM	7	190	0	0	197	0	206	5	6	217	11	0	3	0	14	428
05:45 PM	7	157	0	0	164	0	229	2	0	231	5	0	0	0	5	400
Total	29	691	0	0	720	0	903	16	6	925	27	0	9	0	36	1681
06:00 PM	4	183	0	0	187	0	191	5	0	196	8	0	2	0	10	393
06:15 PM	5	167	0	0	172	0	195	3	0	198	8	0	3	1	12	382
Grand Total	105	1961	0	3	2069	0	3478	72	20	3570	134	0	47	9	190	5829
Apprch %	5.1	94.8	0	0.1		0	97.4	2	0.6		70.5	0	24.7	4.7		
Total %	1.8	33.6	0	0.1	35.5	0	59.7	1.2	0.3	61.2	2.3	0	0.8	0.2	3.3	
Cars	104	1946	0	3	2053	0	3387	69	20	3476	130	0	46	9	185	5714
% Cars	99	99.2	0	100	99.2	0	97.4	95.8	100	97.4	97	0	97.9	100	97.4	98
Single Unit Trucks	1	11	0	0	12	0	77	3	0	80	3	0	1	0	4	96
% Single Unit Trucks	1	0.6	0	0	0.6	0	2.2	4.2	0	2.2	2.2	0	2.1	0	2.1	1.6
Tractor Trailers	0	4	0	0	4	0	14	0	0	14	1	0	0	0	1	19
% Tractor Trailers	0	0.2	0	0	0.2	0	0.4	0	0	0.4	0.7	0	0	0	0.5	0.3



## **Appendix C**

### **Capacity Analysis**

											
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Lane Configurations		↗↗		↖↖		↘	↙	↘	↗↗		
Traffic Volume (vph)	0	465	0	142	4	811	369	432	317	20	1
Future Volume (vph)	0	465	0	142	4	811	369	432	317	20	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	13	10	10	12
Grade (%)	-4%			0%			2%		0%		
Storage Length (ft)	0	0	50		0	135		0	100	0	
Storage Lanes	0	2	1		0	1		1	1	0	
Taper Length (ft)	25		50			100			50		
Right Turn on Red		No			No			No			No
Link Speed (mph)	30			25			30		30		
Link Distance (ft)	304			197			329		233		
Travel Time (s)	6.9			5.4			7.5		5.3		
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
Heavy Vehicles (%)	0%	0%	0%	14%	0%	4%	6%	6%	9%	5%	0%
Shared Lane Traffic (%)						28%					
Lane Group Flow (vph)	0	522	0	164	0	656	670	485	379	0	0
Turn Type		Over		NA		Split	NA	Prot	Prot		
Protected Phases		6		4		6	6	6	3		
Permitted Phases											
Detector Phase		6		4		6	6	6	3		
Switch Phase											
Minimum Initial (s)		54.0		7.0		54.0	54.0	54.0	7.0		
Minimum Split (s)		61.0		13.0		61.0	61.0	61.0	14.0		
Total Split (s)		61.0		15.0		61.0	61.0	61.0	24.0		
Total Split (%)		61.0%		15.0%		61.0%	61.0%	61.0%	24.0%		
Yellow Time (s)		4.0		4.0		4.0	4.0	4.0	4.0		
All-Red Time (s)		3.0		2.0		3.0	3.0	3.0	3.0		
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)		7.0		6.0		7.0	7.0	7.0	7.0		
Lead/Lag				Lag					Lead		
Lead-Lag Optimize?				Yes					Yes		
Recall Mode		C-Max		None		C-Max	C-Max	C-Max	None		
Act Effect Green (s)		55.7		8.5		55.7	55.7	55.7	15.8		
Actuated g/C Ratio		0.56		0.08		0.56	0.56	0.56	0.16		
v/c Ratio		0.33		0.61		0.72	0.72	0.56	0.77		
Control Delay		13.2		54.2		22.7	22.6	17.9	51.2		
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0		
Total Delay		13.2		54.2		22.7	22.6	17.9	51.2		
LOS		B		D		C	C	B	D		
Approach Delay	13.2			54.2			21.4		51.2		
Approach LOS	B			D			C		D		
Queue Length 50th (ft)		101		53		321	328	196	119		
Queue Length 95th (ft)		138		87		469	475	290	167		
Internal Link Dist (ft)	224			117			249		153		
Turn Bay Length (ft)						135			100		
Base Capacity (vph)		1561		284		909	927	868	532		
Starvation Cap Reductn		0		0		0	0	0	0		
Spillback Cap Reductn		0		0		0	0	0	0		



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Storage Cap Reductn		0		0		0	0	0	0		
Reduced v/c Ratio		0.33		0.58		0.72	0.72	0.56	0.71		

**Intersection Summary**

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 29 (29%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 25.7

Intersection LOS: C


Intersection Capacity Utilization 77.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 10: Rector Place (CR 13) &amp; Bridge Avenue/Route 35 &amp; Riverside Avenue (Route 35)



											
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Lane Configurations		↔↔		↕↕		↗	↖	↗	↗↗		
Traffic Volume (vph)	0	871	0	338	9	622	302	371	500	26	1
Future Volume (vph)	0	871	0	338	9	622	302	371	500	26	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	13	10	10	12
Grade (%)	-4%			0%			2%		0%		
Storage Length (ft)	0	0	50		0	135		0	100	0	
Storage Lanes	0	2	1		0	1		1	1	0	
Taper Length (ft)	25		50			100			50		
Right Turn on Red		No			No			No			No
Link Speed (mph)	30			25			30		30		
Link Distance (ft)	304			197			329		233		
Travel Time (s)	6.9			5.4			7.5		5.3		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	3%	0%	2%	4%	4%	2%	0%	0%
Shared Lane Traffic (%)						27%					
Lane Group Flow (vph)	0	889	0	354	0	464	479	379	538	0	0
Turn Type		Over		NA		Split	NA	Prot	Prot		
Protected Phases		6		4		6	6	6	3		
Permitted Phases											
Detector Phase		6		4		6	6	6	3		
Switch Phase											
Minimum Initial (s)		42.0		7.0		42.0	42.0	42.0	7.0		
Minimum Split (s)		49.0		13.0		49.0	49.0	49.0	14.0		
Total Split (s)		49.0		16.0		49.0	49.0	49.0	25.0		
Total Split (%)		54.4%		17.8%		54.4%	54.4%	54.4%	27.8%		
Yellow Time (s)		4.0		4.0		4.0	4.0	4.0	4.0		
All-Red Time (s)		3.0		2.0		3.0	3.0	3.0	3.0		
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)		7.0		6.0		7.0	7.0	7.0	7.0		
Lead/Lag				Lag					Lead		
Lead-Lag Optimize?				Yes					Yes		
Recall Mode		C-Max		None		C-Max	C-Max	C-Max	None		
Act Effct Green (s)		42.6		10.0		42.6	42.6	42.6	17.4		
Actuated g/C Ratio		0.47		0.11		0.47	0.47	0.47	0.19		
v/c Ratio		0.67		0.91		0.59	0.60	0.50	0.83		
Control Delay		21.6		69.3		21.3	21.4	19.5	47.5		
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0		
Total Delay		21.6		69.3		21.3	21.4	19.5	47.5		
LOS		C		E		C	C	B	D		
Approach Delay	21.6			69.3			20.9		47.5		
Approach LOS	C			E			C		D		
Queue Length 50th (ft)		215		106		197	205	145	151		
Queue Length 95th (ft)		290		#189		303	312	228	#225		
Internal Link Dist (ft)	224			117			249		153		
Turn Bay Length (ft)						135			100		
Base Capacity (vph)		1328		388		788	804	752	669		
Starvation Cap Reductn		0		0		0	0	0	0		
Spillback Cap Reductn		0		0		0	0	0	0		



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Storage Cap Reductn		0		0		0	0	0	0		
Reduced v/c Ratio		0.67		0.91		0.59	0.60	0.50	0.80		

**Intersection Summary**

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 33 (37%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 31.2

Intersection LOS: C

Intersection Capacity Utilization 76.4%

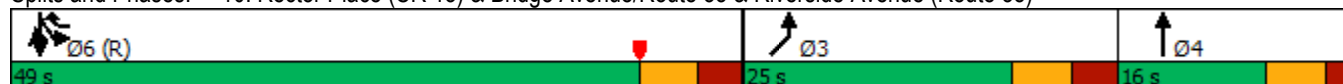
ICU Level of Service D


















Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 10: Rector Place (CR 13) &amp; Bridge Avenue/Route 35 &amp; Riverside Avenue (Route 35)



											
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Lane Configurations											
Traffic Volume (vph)	0	495	0	152	4	855	389	467	338	21	1
Future Volume (vph)	0	495	0	152	4	855	389	467	338	21	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	13	10	10	12
Grade (%)	-4%			0%			2%		0%		
Storage Length (ft)	0	0	50		0	135		0	100	0	
Storage Lanes	0	2	1		0	1		1	1	0	
Taper Length (ft)	25		50			100			50		
Right Turn on Red		No			No			No			No
Link Speed (mph)	30			25			30		30		
Link Distance (ft)	304			197			329		233		
Travel Time (s)	6.9			5.4			7.5		5.3		
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
Heavy Vehicles (%)	0%	0%	0%	14%	0%	4%	6%	6%	9%	5%	0%
Shared Lane Traffic (%)						28%					
Lane Group Flow (vph)	0	556	0	175	0	692	706	525	405	0	0
Turn Type		Over		NA		Split	NA	Prot	Prot		
Protected Phases		6		4		6	6	6	3		
Permitted Phases											
Detector Phase		6		4		6	6	6	3		
Switch Phase											
Minimum Initial (s)		54.0		7.0		54.0	54.0	54.0	7.0		
Minimum Split (s)		61.0		13.0		61.0	61.0	61.0	14.0		
Total Split (s)		61.0		15.0		61.0	61.0	61.0	24.0		
Total Split (%)		61.0%		15.0%		61.0%	61.0%	61.0%	24.0%		
Yellow Time (s)		4.0		4.0		4.0	4.0	4.0	4.0		
All-Red Time (s)		3.0		2.0		3.0	3.0	3.0	3.0		
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)		7.0		6.0		7.0	7.0	7.0	7.0		
Lead/Lag				Lag					Lead		
Lead-Lag Optimize?				Yes					Yes		
Recall Mode		C-Max		None		C-Max	C-Max	C-Max	None		
Act Effct Green (s)		55.3		8.6		55.3	55.3	55.3	16.1		
Actuated g/C Ratio		0.55		0.09		0.55	0.55	0.55	0.16		
v/c Ratio		0.36		0.65		0.77	0.77	0.61	0.80		
Control Delay		13.6		55.7		25.0	24.8	19.3	53.2		
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0		
Total Delay		13.6		55.7		25.0	24.8	19.3	53.2		
LOS		B		E		C	C	B	D		
Approach Delay	13.6			55.7			23.4		53.2		
Approach LOS	B			E			C		D		
Queue Length 50th (ft)		109		57		351	358	220	128		
Queue Length 95th (ft)		147		92		515	523	324	#180		
Internal Link Dist (ft)	224			117			249		153		
Turn Bay Length (ft)						135			100		
Base Capacity (vph)		1549		284		902	920	861	532		
Starvation Cap Reductn		0		0		0	0	0	0		
Spillback Cap Reductn		0		0		0	0	0	0		



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Storage Cap Reductn		0		0		0	0	0	0		
Reduced v/c Ratio		0.36		0.62		0.77	0.77	0.61	0.76		

**Intersection Summary**

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 29 (29%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 27.4

Intersection LOS: C

Intersection Capacity Utilization 77.8%

ICU Level of Service D

Analysis Period (min) 15


















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

Queue shown is maximum after two cycles.

Splits and Phases: 10: Rector Place (CR 13) &amp; Bridge Avenue/Route 35 &amp; Riverside Avenue (Route 35)





											
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Lane Configurations											
Traffic Volume (vph)	0	919	0	363	9	660	319	404	539	27	1
Future Volume (vph)	0	919	0	363	9	660	319	404	539	27	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	13	10	10	12
Grade (%)	-4%			0%			2%		0%		
Storage Length (ft)	0	0	50		0	135		0	100	0	
Storage Lanes	0	2	1		0	1		1	1	0	
Taper Length (ft)	25		50			100			50		
Right Turn on Red		No			No			No			No
Link Speed (mph)	30			25			30		30		
Link Distance (ft)	304			197			329		233		
Travel Time (s)	6.9			5.4			7.5		5.3		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	3%	0%	2%	4%	4%	2%	0%	0%
Shared Lane Traffic (%)						27%					
Lane Group Flow (vph)	0	938	0	379	0	491	508	412	579	0	0
Turn Type		Over		NA		Split	NA	Prot	Prot		
Protected Phases		6		4		6	6	6	3		
Permitted Phases											
Detector Phase		6		4		6	6	6	3		
Switch Phase											
Minimum Initial (s)		42.0		7.0		42.0	42.0	42.0	7.0		
Minimum Split (s)		49.0		13.0		49.0	49.0	49.0	14.0		
Total Split (s)		49.0		16.0		49.0	49.0	49.0	25.0		
Total Split (%)		54.4%		17.8%		54.4%	54.4%	54.4%	27.8%		
Yellow Time (s)		4.0		4.0		4.0	4.0	4.0	4.0		
All-Red Time (s)		3.0		2.0		3.0	3.0	3.0	3.0		
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)		7.0		6.0		7.0	7.0	7.0	7.0		
Lead/Lag				Lag					Lead		
Lead-Lag Optimize?				Yes					Yes		
Recall Mode		C-Max		None		C-Max	C-Max	C-Max	None		
Act Effect Green (s)		42.3		10.0		42.3	42.3	42.3	17.7		
Actuated g/C Ratio		0.47		0.11		0.47	0.47	0.47	0.20		
v/c Ratio		0.71		0.98		0.63	0.64	0.55	0.88		
Control Delay		22.8		82.0		22.5	22.6	20.7	51.8		
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0		
Total Delay		22.8		82.0		22.5	22.6	20.7	51.8		
LOS		C		F		C	C	C	D		
Approach Delay	22.8			82.0			22.0		51.8		
Approach LOS	C			F			C		D		
Queue Length 50th (ft)		233		115		213	223	162	165		
Queue Length 95th (ft)		314		#207		327	337	253	#253		
Internal Link Dist (ft)	224			117			249		153		
Turn Bay Length (ft)						135			100		
Base Capacity (vph)		1319		388		782	798	747	669		
Starvation Cap Reductn		0		0		0	0	0	0		
Spillback Cap Reductn		0		0		0	0	0	0		



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Storage Cap Reductn		0		0		0	0	0	0		
Reduced v/c Ratio		0.71		0.98		0.63	0.64	0.55	0.87		

**Intersection Summary**

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 33 (37%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 34.3

Intersection LOS: C

Intersection Capacity Utilization 78.2%

ICU Level of Service D


















Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 10: Rector Place (CR 13) &amp; Bridge Avenue/Route 35 &amp; Riverside Avenue (Route 35)



											
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Lane Configurations											
Traffic Volume (vph)	0	498	0	152	13	869	389	467	338	30	1
Future Volume (vph)	0	498	0	152	13	869	389	467	338	30	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	13	10	10	12
Grade (%)	-4%			0%			2%		0%		
Storage Length (ft)	0	0	50		0	135		0	100	0	
Storage Lanes	0	2	1		0	1		1	1	0	
Taper Length (ft)	25		50			100			50		
Right Turn on Red		No			No			No			No
Link Speed (mph)	30			25			30		30		
Link Distance (ft)	304			197			329		233		
Travel Time (s)	6.9			5.4			7.5		5.3		
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
Heavy Vehicles (%)	0%	0%	0%	14%	0%	4%	6%	6%	9%	5%	0%
Shared Lane Traffic (%)						29%					
Lane Group Flow (vph)	0	560	0	186	0	693	720	525	415	0	0
Turn Type		Over		NA		Split	NA	Prot	Prot		
Protected Phases		6		4		6	6	6	3		
Permitted Phases											
Detector Phase		6		4		6	6	6	3		
Switch Phase											
Minimum Initial (s)		54.0		7.0		54.0	54.0	54.0	7.0		
Minimum Split (s)		61.0		13.0		61.0	61.0	61.0	14.0		
Total Split (s)		61.0		15.0		61.0	61.0	61.0	24.0		
Total Split (%)		61.0%		15.0%		61.0%	61.0%	61.0%	24.0%		
Yellow Time (s)		4.0		4.0		4.0	4.0	4.0	4.0		
All-Red Time (s)		3.0		2.0		3.0	3.0	3.0	3.0		
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)		7.0		6.0		7.0	7.0	7.0	7.0		
Lead/Lag				Lag					Lead		
Lead-Lag Optimize?				Yes					Yes		
Recall Mode		C-Max		None		C-Max	C-Max	C-Max	None		
Act Effct Green (s)		55.0		8.7		55.0	55.0	55.0	16.3		
Actuated g/C Ratio		0.55		0.09		0.55	0.55	0.55	0.16		
v/c Ratio		0.36		0.68		0.77	0.79	0.61	0.82		
Control Delay		13.7		57.5		25.3	25.9	19.5	54.2		
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0		
Total Delay		13.7		57.5		25.3	25.9	19.5	54.2		
LOS		B		E		C	C	B	D		
Approach Delay	13.7			57.5			24.0		54.2		
Approach LOS	B			E			C		D		
Queue Length 50th (ft)		110		61		352	371	220	131		
Queue Length 95th (ft)		149		#98		516	542	324	#194		
Internal Link Dist (ft)	224			117			249		153		
Turn Bay Length (ft)						135			100		
Base Capacity (vph)		1542		284		898	916	857	531		
Starvation Cap Reductn		0		0		0	0	0	0		
Spillback Cap Reductn		0		0		0	0	0	0		



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Storage Cap Reductn		0		0		0	0	0	0		
Reduced v/c Ratio		0.36		0.65		0.77	0.79	0.61	0.78		

**Intersection Summary**

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 29 (29%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 28.2

Intersection LOS: C

Intersection Capacity Utilization 78.1%

ICU Level of Service D


















Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 10: Rector Place (CR 13) &amp; Bridge Avenue/Route 35 &amp; Riverside Avenue (Route 35)



											
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Lane Configurations											
Traffic Volume (vph)	0	934	0	363	11	665	319	404	539	29	1
Future Volume (vph)	0	934	0	363	11	665	319	404	539	29	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	13	10	10	12
Grade (%)	-4%			0%			2%		0%		
Storage Length (ft)	0	0	50		0	135		0	100	0	
Storage Lanes	0	2	1		0	1		1	1	0	
Taper Length (ft)	25		50			100			50		
Right Turn on Red		No			No			No			No
Link Speed (mph)	30			25			30		30		
Link Distance (ft)	304			197			329		233		
Travel Time (s)	6.9			5.4			7.5		5.3		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	3%	0%	2%	4%	4%	2%	0%	0%
Shared Lane Traffic (%)						27%					
Lane Group Flow (vph)	0	953	0	381	0	496	509	412	581	0	0
Turn Type		Over		NA		Split	NA	Prot	Prot		
Protected Phases		6		4		6	6	6	3		
Permitted Phases											
Detector Phase		6		4		6	6	6	3		
Switch Phase											
Minimum Initial (s)		42.0		7.0		42.0	42.0	42.0	7.0		
Minimum Split (s)		49.0		13.0		49.0	49.0	49.0	14.0		
Total Split (s)		49.0		16.0		49.0	49.0	49.0	25.0		
Total Split (%)		54.4%		17.8%		54.4%	54.4%	54.4%	27.8%		
Yellow Time (s)		4.0		4.0		4.0	4.0	4.0	4.0		
All-Red Time (s)		3.0		2.0		3.0	3.0	3.0	3.0		
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)		7.0		6.0		7.0	7.0	7.0	7.0		
Lead/Lag				Lag					Lead		
Lead-Lag Optimize?				Yes					Yes		
Recall Mode		C-Max		None		C-Max	C-Max	C-Max	None		
Act Effect Green (s)		42.3		10.0		42.3	42.3	42.3	17.7		
Actuated g/C Ratio		0.47		0.11		0.47	0.47	0.47	0.20		
v/c Ratio		0.72		0.98		0.63	0.64	0.55	0.88		
Control Delay		23.2		83.2		22.7	22.7	20.7	52.0		
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0		
Total Delay		23.2		83.2		22.7	22.7	20.7	52.0		
LOS		C		F		C	C	C	D		
Approach Delay	23.2			83.2			22.1		52.0		
Approach LOS	C			F			C		D		
Queue Length 50th (ft)		239		115		216	223	162	165		
Queue Length 95th (ft)		322		#208		331	340	253	#255		
Internal Link Dist (ft)	224			117			249		153		
Turn Bay Length (ft)						135			100		
Base Capacity (vph)		1318		388		782	798	747	669		
Starvation Cap Reductn		0		0		0	0	0	0		
Spillback Cap Reductn		0		0		0	0	0	0		



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Storage Cap Reductn		0		0		0	0	0	0		
Reduced v/c Ratio		0.72		0.98		0.63	0.64	0.55	0.87		

**Intersection Summary**

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 33 (37%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 34.6

Intersection LOS: C

Intersection Capacity Utilization 78.4%

ICU Level of Service D


Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 10: Rector Place (CR 13) &amp; Bridge Avenue/Route 35 &amp; Riverside Avenue (Route 35)



											
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Lane Configurations		↗↗		↖↖		↘	↙	↘	↗↗		
Traffic Volume (vph)	0	514	0	152	9	865	389	467	338	26	1
Future Volume (vph)	0	514	0	152	9	865	389	467	338	26	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	13	10	10	12
Grade (%)	-4%			0%			2%		0%		
Storage Length (ft)	0	0	50		0	135		0	100	0	
Storage Lanes	0	2	1		0	1		1	1	0	
Taper Length (ft)	25		50			100			50		
Right Turn on Red		No			No			No			No
Link Speed (mph)	30			25			30		30		
Link Distance (ft)	304			197			329		233		
Travel Time (s)	6.9			5.4			7.5		5.3		
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
Heavy Vehicles (%)	0%	0%	0%	14%	0%	4%	6%	6%	9%	5%	0%
Shared Lane Traffic (%)						29%					
Lane Group Flow (vph)	0	578	0	181	0	690	719	525	410	0	0
Turn Type		Over		NA		Split	NA	Prot	Prot		
Protected Phases		6		4		6	6	6	3		
Permitted Phases											
Detector Phase		6		4		6	6	6	3		
Switch Phase											
Minimum Initial (s)		54.0		7.0		54.0	54.0	54.0	7.0		
Minimum Split (s)		61.0		13.0		61.0	61.0	61.0	14.0		
Total Split (s)		61.0		15.0		61.0	61.0	61.0	24.0		
Total Split (%)		61.0%		15.0%		61.0%	61.0%	61.0%	24.0%		
Yellow Time (s)		4.0		4.0		4.0	4.0	4.0	4.0		
All-Red Time (s)		3.0		2.0		3.0	3.0	3.0	3.0		
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)		7.0		6.0		7.0	7.0	7.0	7.0		
Lead/Lag				Lag					Lead		
Lead-Lag Optimize?				Yes					Yes		
Recall Mode		C-Max		None		C-Max	C-Max	C-Max	None		
Act Effect Green (s)		55.1		8.6		55.1	55.1	55.1	16.2		
Actuated g/C Ratio		0.55		0.09		0.55	0.55	0.55	0.16		
v/c Ratio		0.37		0.66		0.77	0.78	0.61	0.81		
Control Delay		13.8		56.6		25.0	25.8	19.4	53.7		
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0		
Total Delay		13.8		56.6		25.0	25.8	19.4	53.7		
LOS		B		E		C	C	B	D		
Approach Delay	13.8			56.6			23.8		53.7		
Approach LOS	B			E			C		D		
Queue Length 50th (ft)		115		59		349	370	220	129		
Queue Length 95th (ft)		154		95		512	541	324	#185		
Internal Link Dist (ft)	224			117			249		153		
Turn Bay Length (ft)						135			100		
Base Capacity (vph)		1545		284		900	918	859	532		
Starvation Cap Reductn		0		0		0	0	0	0		
Spillback Cap Reductn		0		0		0	0	0	0		



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Storage Cap Reductn		0		0		0	0	0	0		
Reduced v/c Ratio		0.37		0.64		0.77	0.78	0.61	0.77		

**Intersection Summary**

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 29 (29%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 27.8

Intersection LOS: C

Intersection Capacity Utilization 78.0%

ICU Level of Service D

Analysis Period (min) 15


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

Queue shown is maximum after two cycles.

Splits and Phases: 10: Rector Place (CR 13) &amp; Bridge Avenue/Route 35 &amp; Riverside Avenue (Route 35)





											
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Lane Configurations		↗↗		↖↖		↘	↙	↘	↗↗		
Traffic Volume (vph)	0	934	0	363	20	681	319	404	539	38	1
Future Volume (vph)	0	934	0	363	20	681	319	404	539	38	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	13	10	10	12
Grade (%)	-4%			0%			2%		0%		
Storage Length (ft)	0	0	50		0	135		0	100	0	
Storage Lanes	0	2	1		0	1		1	1	0	
Taper Length (ft)	25		50			100			50		
Right Turn on Red		No			No			No			No
Link Speed (mph)	30			25			30		30		
Link Distance (ft)	304			197			329		233		
Travel Time (s)	6.9			5.4			7.5		5.3		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	3%	0%	2%	4%	4%	2%	0%	0%
Shared Lane Traffic (%)						28%					
Lane Group Flow (vph)	0	953	0	390	0	500	521	412	590	0	0
Turn Type		Over		NA		Split	NA	Prot	Prot		
Protected Phases		6		4		6	6	6	3		
Permitted Phases											
Detector Phase		6		4		6	6	6	3		
Switch Phase											
Minimum Initial (s)		42.0		7.0		42.0	42.0	42.0	7.0		
Minimum Split (s)		49.0		13.0		49.0	49.0	49.0	14.0		
Total Split (s)		49.0		16.0		49.0	49.0	49.0	25.0		
Total Split (%)		54.4%		17.8%		54.4%	54.4%	54.4%	27.8%		
Yellow Time (s)		4.0		4.0		4.0	4.0	4.0	4.0		
All-Red Time (s)		3.0		2.0		3.0	3.0	3.0	3.0		
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)		7.0		6.0		7.0	7.0	7.0	7.0		
Lead/Lag				Lag					Lead		
Lead-Lag Optimize?				Yes					Yes		
Recall Mode		C-Max		None		C-Max	C-Max	C-Max	None		
Act Effct Green (s)		42.2		10.0		42.2	42.2	42.2	17.8		
Actuated g/C Ratio		0.47		0.11		0.47	0.47	0.47	0.20		
v/c Ratio		0.72		1.01		0.64	0.65	0.55	0.90		
Control Delay		23.2		90.1		22.9	23.2	20.7	53.2		
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0		
Total Delay		23.2		90.1		22.9	23.2	20.7	53.2		
LOS		C		F		C	C	C	D		
Approach Delay	23.2			90.1			22.4		53.2		
Approach LOS	C			F			C		D		
Queue Length 50th (ft)		239		~120		220	230	162	169		
Queue Length 95th (ft)		322		#215		335	349	253	#261		
Internal Link Dist (ft)	224			117			249		153		
Turn Bay Length (ft)						135			100		
Base Capacity (vph)		1315		386		780	798	745	668		
Starvation Cap Reductn		0		0		0	0	0	0		
Spillback Cap Reductn		0		0		0	0	0	0		



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	NER2
Storage Cap Reductn		0		0		0	0	0	0		
Reduced v/c Ratio		0.72		1.01		0.64	0.65	0.55	0.88		

**Intersection Summary**

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 33 (37%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 35.9

Intersection LOS: D

Intersection Capacity Utilization 78.9%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.





Queue shown is maximum after two cycles.





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





Queue shown is maximum after two cycles.





Splits and Phases: 10: Rector Place (CR 13) &amp; Bridge Avenue/Route 35 &amp; Riverside Avenue (Route 35)











Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	816	458	23	29	7
Future Vol, veh/h	19	816	458	23	29	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	4	5	4	10	0
Mvmt Flow	21	907	509	26	32	8
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	535	0	-	0	1018	268
Stage 1	-	-	-	-	522	-
Stage 2	-	-	-	-	496	-
Critical Hdwy	4.1	-	-	-	7.4	7.1
Critical Hdwy Stg 1	-	-	-	-	6.4	-
Critical Hdwy Stg 2	-	-	-	-	6.4	-
Follow-up Hdwy	2.2	-	-	-	3.6	3.3
Pot Cap-1 Maneuver	1043	-	-	-	197	725
Stage 1	-	-	-	-	507	-
Stage 2	-	-	-	-	525	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1043	-	-	-	193	725
Mov Cap-2 Maneuver	-	-	-	-	193	-
Stage 1	-	-	-	-	497	-
Stage 2	-	-	-	-	525	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		24.4		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1043	-	-	-	225	
HCM Lane V/C Ratio	0.02	-	-	-	0.178	
HCM Control Delay (s)	8.5	-	-	-	24.4	
HCM Lane LOS	A	-	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6	

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	633	861	13	32	10
Future Vol, veh/h	24	633	861	13	32	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	2	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	24	646	879	13	33	10
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	892	0	-	0	1257	446
Stage 1	-	-	-	-	886	-
Stage 2	-	-	-	-	371	-
Critical Hdwy	4.1	-	-	-	7.2	7.1
Critical Hdwy Stg 1	-	-	-	-	6.2	-
Critical Hdwy Stg 2	-	-	-	-	6.2	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	769	-	-	-	144	551
Stage 1	-	-	-	-	334	-
Stage 2	-	-	-	-	647	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	769	-	-	-	140	551
Mov Cap-2 Maneuver	-	-	-	-	140	-
Stage 1	-	-	-	-	324	-
Stage 2	-	-	-	-	647	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.4	0		33.2		
HCM LOS	D					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	769	-	-	-	170	
HCM Lane V/C Ratio	0.032	-	-	-	0.252	
HCM Control Delay (s)	9.8	-	-	-	33.2	
HCM Lane LOS	A	-	-	-	D	
HCM 95th %tile Q(veh)	0.1	-	-	-	1	





Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	861	488	23	29	7
Future Vol, veh/h	19	861	488	23	29	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	4	5	4	10	0
Mvmt Flow	21	957	542	26	32	8
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	568	0	-	0	1076	284
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	521	-
Critical Hdwy	4.1	-	-	-	7.4	7.1
Critical Hdwy Stg 1	-	-	-	-	6.4	-
Critical Hdwy Stg 2	-	-	-	-	6.4	-
Follow-up Hdwy	2.2	-	-	-	3.6	3.3
Pot Cap-1 Maneuver	1014	-	-	-	179	708
Stage 1	-	-	-	-	486	-
Stage 2	-	-	-	-	508	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1014	-	-	-	175	708
Mov Cap-2 Maneuver	-	-	-	-	175	-
Stage 1	-	-	-	-	476	-
Stage 2	-	-	-	-	508	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		26.8		
HCM LOS				D		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1014	-	-	-	205	
HCM Lane V/C Ratio	0.021	-	-	-	0.195	
HCM Control Delay (s)	8.6	-	-	-	26.8	
HCM Lane LOS	A	-	-	-	D	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7	





Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	672	909	13	32	10
Future Vol, veh/h	24	672	909	13	32	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	2	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	24	686	928	13	33	10
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	941	0	-	0	1326	471
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	391	-
Critical Hdwy	4.1	-	-	-	7.2	7.1
Critical Hdwy Stg 1	-	-	-	-	6.2	-
Critical Hdwy Stg 2	-	-	-	-	6.2	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	737	-	-	-	129	531
Stage 1	-	-	-	-	313	-
Stage 2	-	-	-	-	631	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	737	-	-	-	125	531
Mov Cap-2 Maneuver	-	-	-	-	125	-
Stage 1	-	-	-	-	303	-
Stage 2	-	-	-	-	631	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		37.4		
HCM LOS				E		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	737	-	-	-	153	
HCM Lane V/C Ratio	0.033	-	-	-	0.28	
HCM Control Delay (s)	10.1	-	-	-	37.4	
HCM Lane LOS	B	-	-	-	E	
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1	

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	51	861	488	34	35	10
Future Vol, veh/h	51	861	488	34	35	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	4	5	4	10	0
Mvmt Flow	57	957	542	38	39	11
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	580	0	-	0	1154	290
Stage 1	-	-	-	-	561	-
Stage 2	-	-	-	-	593	-
Critical Hdwy	4.1	-	-	-	7.4	7.1
Critical Hdwy Stg 1	-	-	-	-	6.4	-
Critical Hdwy Stg 2	-	-	-	-	6.4	-
Follow-up Hdwy	2.2	-	-	-	3.6	3.3
Pot Cap-1 Maneuver	1004	-	-	-	157	701
Stage 1	-	-	-	-	482	-
Stage 2	-	-	-	-	462	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1004	-	-	-	148	701
Mov Cap-2 Maneuver	-	-	-	-	148	-
Stage 1	-	-	-	-	455	-
Stage 2	-	-	-	-	462	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.5	0		32.7		
HCM LOS				D		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1004	-	-	-	179	
HCM Lane V/C Ratio	0.056	-	-	-	0.279	
HCM Control Delay (s)	8.8	-	-	-	32.7	
HCM Lane LOS	A	-	-	-	D	
HCM 95th %tile Q(veh)	0.2	-	-	-	1.1	

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	33	672	909	16	61	25
Future Vol, veh/h	33	672	909	16	61	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	2	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	34	686	928	16	62	26
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	944	0	-	0	1347	472
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	411	-
Critical Hdwy	4.1	-	-	-	7.2	7.1
Critical Hdwy Stg 1	-	-	-	-	6.2	-
Critical Hdwy Stg 2	-	-	-	-	6.2	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	735	-	-	-	125	530
Stage 1	-	-	-	-	313	-
Stage 2	-	-	-	-	615	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	735	-	-	-	119	530
Mov Cap-2 Maneuver	-	-	-	-	119	-
Stage 1	-	-	-	-	299	-
Stage 2	-	-	-	-	615	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.5	0		55.5		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	735	-	-	-	154	
HCM Lane V/C Ratio	0.046	-	-	-	0.57	
HCM Control Delay (s)	10.1	-	-	-	55.5	
HCM Lane LOS	B	-	-	-	F	
HCM 95th %tile Q(veh)	0.1	-	-	-	2.9	



Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	39	861	488	30	64	26
Future Vol, veh/h	39	861	488	30	64	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	2	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	4	5	4	10	0
Mvmt Flow	43	957	542	33	71	29
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	575	0	-	0	1124	288
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	565	-
Critical Hdwy	4.1	-	-	-	7.4	7.1
Critical Hdwy Stg 1	-	-	-	-	6.4	-
Critical Hdwy Stg 2	-	-	-	-	6.4	-
Follow-up Hdwy	2.2	-	-	-	3.6	3.3
Pot Cap-1 Maneuver	1008	-	-	-	165	703
Stage 1	-	-	-	-	483	-
Stage 2	-	-	-	-	479	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1008	-	-	-	158	703
Mov Cap-2 Maneuver	-	-	-	-	158	-
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	479	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.4	0		38.5		
HCM LOS	E					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1008	-	-	-	204	
HCM Lane V/C Ratio	0.043	-	-	-	0.49	
HCM Control Delay (s)	8.7	-	-	-	38.5	
HCM Lane LOS	A	-	-	-	E	
HCM 95th %tile Q(veh)	0.1	-	-	-	2.4	

Intersection						
Int Delay, s/veh	3.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	67	672	909	27	60	25
Future Vol, veh/h	67	672	909	27	60	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	2	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	68	686	928	28	61	26
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	956	0	-	0	1421	478
Stage 1	-	-	-	-	942	-
Stage 2	-	-	-	-	479	-
Critical Hdwy	4.1	-	-	-	7.2	7.1
Critical Hdwy Stg 1	-	-	-	-	6.2	-
Critical Hdwy Stg 2	-	-	-	-	6.2	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	727	-	-	-	111	525
Stage 1	-	-	-	-	310	-
Stage 2	-	-	-	-	564	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	727	-	-	-	101	525
Mov Cap-2 Maneuver	-	-	-	-	101	-
Stage 1	-	-	-	-	281	-
Stage 2	-	-	-	-	564	-
Approach	EB		WB		SB	
HCM Control Delay, s	0.9		0		73.5	
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	727	-	-	-	132	
HCM Lane V/C Ratio	0.094	-	-	-	0.657	
HCM Control Delay (s)	10.5	-	-	-	73.5	
HCM Lane LOS	B	-	-	-	F	
HCM 95th %tile Q(veh)	0.3	-	-	-	3.5	