

TRAFFIC IMPACT STUDY

For

Proposed Mixed Use Development

Property Located at:

**420 Bloomfield Avenue
Block 701 – Lot 3
Township of Verona, Essex County, NJ**

Prepared by:



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DT# 2918 26-02660

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INTRODUCTION

It is proposed to redevelop a site bounded by Claremont Avenue to the north and Bloomfield Avenue (CR 506) to the south between Park Avenue and Cumberland Avenue in the Township of Verona, Essex County, New Jersey. The site is designated as Block 701 – Lot 3 on the Township of Verona Tax Maps. The site is currently developed with an approximately 21,000 SF banquet hall which provides approximately 475 seats. It is proposed to demolish the existing building and construct a mixed use development with 65 residential units above 1,400 SF of commercial space (The Project).

Access to the site is currently provided via one driveway along Bloomfield Avenue and four driveways along Claremont Avenue. It is proposed to close the existing access points and construct two (2) new driveways along Claremont Avenue that will provide access to separate parking areas. It is proposed to provide 76 parking spaces on the lower parking level and 42 parking spaces on the upper parking level for a total of 118 parking spaces.

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 morning, and evening peak periods, at the intersections of Bloomfield Avenue with Park Avenue, Bloomfield Avenue with Cumberland Avenue, Claremont Avenue with Cumberland Avenue and Claremont Avenue with Park Avenue.
- 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 intersection and the site driveways.
- The parking supply was assessed based on the jurisdictional requirements, as well as the anticipated demand in accordance with the Institute of Transportation Engineers.

EXISTING CONDITIONS

A review of the existing roadway conditions near the subject 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:

Bloomfield Avenue (CR 506) is an urban principal arterial roadway under the jurisdiction of Essex County. In the vicinity of the site the posted speed limit is 25 miles per hour and the roadway provides two travel lanes in each direction with a general east/west orientation. On-street parking, curb, and sidewalk is provided along both sides of the roadway. Bloomfield Avenue provides a straight horizontal alignment and a vertical alignment with upgrade from west to east. The land uses along Bloomfield Avenue are primarily commercial.

Claremont Avenue is an urban major collector roadway under the jurisdiction of the Township of Verona. In the vicinity of the site the posted speed limit is 25 miles per hour. To the east of Cumberland Avenue, the roadway provides one travel lane in each direction with a general east/west orientation. To the west of Cumberland Avenue, the roadway provides one travel lane for one-way travel in the westbound direction. On-street parking is permitted along the south side of the roadway in the vicinity of the site while curb and sidewalk is provided along both sides of the roadway. Claremont Avenue provides a straight horizontal alignment in the vicinity of the site and a vertical alignment with upgrade from west to east. The land uses along Claremont Avenue to the west of Park Avenue are commercial. To the east of Claremont Avenue, the street is primarily residential.

Park Avenue is a local roadway under the jurisdiction of the Township of Verona. In the vicinity of the site the speed limit is not posted and the roadway provides one travel lane in each direction with a general north/south orientation. On-street parking is not permitted along either side of the roadway to the north of its intersection with Bloomfield Avenue. On-street parking is permitted along the west side of the roadway to the south of Bloomfield Avenue. Curb and sidewalk is provided along the west side of the roadway and along portions of the east side of the roadway. Park Avenue provides a straight horizontal alignment and a vertical alignment with upgrade from south to north. The land uses along Park Avenue in the vicinity of the site are primarily residential.

Cumberland Avenue is a local roadway under the jurisdiction of the Township of Verona. In the vicinity of the site the posted speed limit is 25 miles per hour. The roadway provides one travel lane for one-way travel in the northbound direction between its intersections with Bloomfield Avenue and Claremont Avenue. To the north of Claremont Avenue, the roadway provides one travel lane in each direction with a general north/south orientation. On-street parking is permitted along the east side of the roadway while curb and sidewalk is provided along both sides of the roadway. Cumberland Avenue provides a straight horizontal alignment and a vertical alignment with slight upgrade from north to south. The land uses along Cumberland Avenue in the vicinity of the site are primarily residential.

Existing Traffic Volumes

Manual turning movement (MTM) counts were previously conducted by our office on Wednesday, September 12, 2018 between 7:00 – 9:00 AM and 2:30 – 6:00 PM at the following locations.

- Bloomfield Avenue and Park Avenue
- Bloomfield Avenue and Cumberland Avenue
- Claremont Avenue and Cumberland Avenue
- Claremont Avenue and Park Avenue

Updated “spot” counts were collected on Tuesday, June 16, 2026 and the 2026 traffic volumes were consistent with and, somewhat lower than the 2018 volumes. Therefore, conservatively, the higher 2018 traffic volumes were utilized as a baseline for analysis. Review of the collected traffic data reveals that the weekday morning peak street hour (PSH) of the network occurs between 7:30 – 8:30 AM, the weekday evening PSH occurs between 5:00 – 6:00 PM.

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 1 describes the level of service ranges for signalized intersections.

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 2 describes the level of service ranges for unsignalized (stop controlled) intersections.

Table 1
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

Table 2
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

All Capacity analyses were performed utilizing the Synchro software package. Table 3 summarizes the existing levels of service (LOS) and delay in seconds per vehicle. All Capacity analysis calculation worksheets are contained in Appendix C.

Table 3
Existing Levels of Service

Intersection	Direction/ Movement		AM PSH	PM PSH
Bloomfield Avenue and Park Avenue	EB	LT	B (10)	A (7)
	WB	LT	B (10)	A (6)
	NB	LTR	D (51)	D (42)
	SB	LTR	C (23)	C (30)
	Overall		B (14)	A (9)
Bloomfield Avenue and Cumberland Avenue	EB	LT	b (13)	b (12)
Claremont Avenue and Cumberland Avenue	NB	L	a (10)	a (10)
		TR	a (10)	b (10)
	SB	LR	b (12)	b (12)
Claremont Avenue and Park Avenue	WB	LT	a (8)	a (8)
	NB	LR	b (11)	a (10)

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

a (#) - Unsignalized 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 existing percentage of trucks and peak hour factors were used in the existing analysis.

Bloomfield Avenue and Park Avenue

Bloomfield Avenue intersects Park Avenue to form a four-leg signalized intersection with a 100 second cycle length. The eastbound and westbound approaches of Bloomfield Avenue each provide a shared left turn/through lane and a shared through/right turn lane. The northbound and southbound approaches of Park Avenue each provide a shared left turn/through/right turn lane.

A review of the existing analysis reveals that the intersection operates with overall level of service “B” or better during the analyzed peak periods. See Table 3 for the individual movement levels of service and delays.

Bloomfield Avenue and Cumberland Avenue

Bloomfield Avenue intersects Cumberland Avenue to form an unsignalized T-intersection. The eastbound approach of Bloomfield Avenue provides a shared left turn/through lane and a dedicated through lane. The westbound approach of Bloomfield Avenue provides a dedicated through lane and a shared through/right turn lane. Cumberland Avenue provides one lane for one-way travel in the northbound direction away from Bloomfield Avenue.

A review of the existing analysis reveals that the individual intersection movements operate with level of service “B” during the analyzed peak periods. See Table 3 for the individual movement levels of service and delays.

Claremont Avenue and Cumberland Avenue

Claremont Avenue intersects Cumberland Avenue to form a four-leg unsignalized intersection with Cumberland Avenue under stop control. The westbound approach of Claremont Avenue provides a shared through/right turn lane. The northbound approach of Cumberland Avenue provides a dedicated left turn lane and a shared through/right turn lane. The southbound approach of Cumberland Avenue provides a shared lane for left and right turns.

A review of the existing analysis reveals that the individual intersection movements operate with level of service “B” or better during the analyzed peak periods. See Table 3 for the individual movement levels of service and delays.

Claremont Avenue and Park Avenue

Claremont Avenue intersects Park Avenue to form an unsignalized T-intersection with Park Avenue under stop control. The eastbound approach of Claremont Avenue provides a shared through/right turn lane. The westbound approach of Claremont Avenue provides a shared left turn/through lane. The northbound approach of Park Avenue provides a shared lane for left and right turns.

A review of the existing analysis reveals that the individual intersection movements operate with level of service “B” or better during the analyzed peak periods. See Table 3 for the individual movement levels of service and delays.

FUTURE CONDITIONS

Traffic volumes and operational analyses were developed for both the Future 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. Growth rates for roadways within the study area were obtained from the NJDOT Annual Background Growth Rate Table, which indicates a growth rate of 2.0% per year.

Additionally, there is one development in the vicinity of the site that has been approved but not yet constructed that is identified as a potential significant traffic generator. The Adjacent Development Traffic Volumes passing the site are shown on Figure 3. It was assumed that the background growth rate was adequate to account for the traffic associated with all developments not listed hereafter.

- Redevelopment of the Hillcrest Farms site consisting of 33 residential apartment units and 4,050 SF of commercial space has been approved. Projections of the associated traffic volumes were developed based on a Traffic and Parking Assessment prepared by our office dated February 11, 2026. Note that conservatively, existing Hillcrest Farms traffic was not removed and this project was considered an increase over vacant land.

Future No Build traffic volumes were developed by applying the background growth rate of 2.0% per year for two (2) years to the study area roadways existing traffic volumes and by adding the site generated traffic associated with the adjacent development. Figure 4, in Appendix A of this report, shows the Future No Build traffic volumes.

Traffic Generation

Trip generation projections for the existing banquet hall and the proposed mixed use development were prepared utilizing trip generation data as published by the New Jersey Department Transportation (NJDOT) and in the Institute of Transportation Engineers' (ITE) publication, *Trip Generation, 12th Edition*, which sets forth trip generation rates based on traffic counts conducted at research sites throughout the country. Trip generation projections for the existing use were prepared utilizing Land Use Code (LUC) W09 - Banquet Hall from published NJDOT data and trip generation projections for the Project were prepared utilizing LUC 220 – Multi-Family Housing (Low-Rise) and LUC 822 – Strip Retail Plaza. The following table compares the anticipated site generated trips for the existing and proposed uses.

Table 4
Trip Generation Comparison

Land Use	AM PSH			PM PSH		
	In	Out	Total	In	Out	Total
475 Seat Banquet Hall	25	51	76	96	47	143
65 Residential Units	6	21	27	21	13	34
1,400 SF Commercial Space	3	3	6	5	4	9
Proposed Subtotal	9	24	33	26	17	43
Difference	-16	-27	-43	-70	-30	-100

As shown in the table above, the proposed use will generate considerably less trips compared to the existing use. Therefore, it is anticipated that the change in use will provide an overall positive benefit to the surrounding roadways due to significant reduction in trips compared to the existing use when the use is hosting events at approximate maximum capacity. Furthermore, the removal of direct access to the more heavily traveled Bloomfield Avenue, along with the reduction in trip generation potential, will result in a significant benefit from a Traffic Engineering perspective.

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. Figures 5 and 6, located in Appendix A, illustrate the Percent Distribution and Site Generated Volumes, respectively. The Site Generated Volumes assigned to the study area network were added to the No Build traffic volumes to generate the Build traffic volumes, which are shown in Figure 7.

Future Capacity Analysis

Operational conditions at the study intersections were analyzed under the No Build and Build conditions and are summarized in Table 5 below. Note that the site driveways were analyzed as a single access point which is a conservative assessment given that traffic will be divided between these two (2) locations resulting in fewer turning movements at each driveway than was assessed.

Table 5
Future Levels of Service

Intersection	Direction/ Movement		AM PSH		PM PSH	
			No Build	Build	No Build	Build
Bloomfield Avenue and Park Avenue	EB	LT	B (11)	B (11)	A (8)	A (8)
	WB	LT	B (11)	B (11)	A (7)	A (7)
	NB	LTR	D (54)	D (55)	D (43)	D (43)
	SB	LTR	C (22)	C (24)	C (28)	C (29)
	Overall		B (16)	B (16)	B (13)	B (11)
Bloomfield Avenue and Cumberland Avenue	EB	LT	b (13)	b (13)	b (12)	b (12)
Claremont Avenue and Cumberland Avenue	NB	L	a (10)	b (10)	a (10)	a (10)
		TR	a (10)	a (10)	b (10)	b (10)
	SB	LR	b (12)	b (13)	b (12)	b (13)
Claremont Avenue and Park Avenue	WB	LT	a (8)	a (8)	a (8)	a (8)
	NB	LR	b (11)	b (11)	b (10)	b (10)
Claremont Avenue and Site Driveways	WB	L	-	a (8)	-	a (8)
	NB	LR	-	a (10)	-	a (10)

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

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

Bloomfield Avenue and Park Avenue

With the addition of the site traffic the intersection will continue to operate at overall level of service “B” during the analyzed peak hours, maintaining the No Build level of service. See Table 5 for the individual movement levels of service and delays.

Bloomfield Avenue and Cumberland Avenue

With the addition of the site traffic the individual intersection movements will continue to operate at level of service “B” during the analyzed peak hours, maintaining the No Build level of service. See Table 5 for the individual movement levels of service and delays.

Claremont Avenue and Cumberland Avenue

With the addition of the site traffic the individual intersection movements will continue to operate at level of service “B” or better during the analyzed peak hours. See Table 5 for the individual movement levels of service and delays.

Claremont Avenue and Park Avenue

With the addition of the site traffic the individual intersection movements will continue to operate at level of service “B” or better during the analyzed peak hours, maintaining the No Build level of service. See Table 5 for the individual movement levels of service and delays.

Claremont Avenue and Site Driveways

Both site driveways are proposed to intersect Claremont Avenue from the south to form three-leg unsignalized intersections with the site driveways under stop control. One lane is provided on each approach for all turning movements.

With the addition of the site traffic the individual intersection movements will operate with minimal delay at favorable level of service “A” during the analyzed peak hours. See Table 5 for the individual movement levels of service and delays.

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 (2) full-movement driveways along Claremont Avenue. This is an improvement over the existing access configuration which has multiple access points along Claremont Avenue and direct access to the much more heavily traveled Bloomfield Avenue.

The parking lot will be serviced by two-way parking aisles with widths of 24 feet that provide access to 90-degree parking and an 18 foot one-way aisle serving angled parking spaces. These dimensions meet the Redevelopment Plan requirements and are consistent with accepted engineering design standards. A review of the site plan design indicates that the site can sufficiently accommodate the anticipated vehicle mix.

Parking

The Redevelopment Plan sets forth a parking requirement of 1.8 parking spaces per unit and 1 parking space per 250 SF for the ground floor commercial space. This equates to a parking requirement of 117 parking spaces for the proposed 65 units and 6 parking spaces for the 1,400 SF of commercial space for a total parking requirement of 123 spaces. The site as proposed provides 118 parking spaces.

Pursuant to New Jersey Senate Bill S3223, residential developments totaling more than 5 units require 15% of proposed parking spaces to be “make-ready” for electric vehicles and a parking space prepared as “make-ready” counts as 2 parking spaces for the purposes of complying with minimum parking space requirements, up to a 10% reduction in required spaces. This results in a requirement of 18 electric vehicle charging stations, whereas 18 electric vehicle spaces are proposed and 12 of which count towards the reduced requirement. As such, the Ordinance requirement of 123 spaces is reduced to 111 spaces, which is met as designed and no variance is required.

It should also be noted that national parking demand data has been collected by ITE within their publication *Parking Generation, 6th Edition*. This publication establishes peak parking demands for multiple land uses based upon different independent variables, such as GFA and employees. ITE identifies an average peak parking demand of 1.27 spaces per unit for the proposed residential use and 2.79 spaces per 1,000 SF for the ground floor commercial use. This equates to a total demand of 87 spaces for the 65 residential units and 1,400 SF of commercial space proposed, which is exceeded as designed. Therefore, it is anticipated that the proposed 118 parking spaces will adequately support the projected parking demands.

It is proposed to provide parking stalls with dimensions of 9'x18' and nine (9) compact parking stalls with dimensions of 8'x 18'. The proposed dimensions will adequately accommodate the anticipated site traffic and are generous for enclosed garage parking.

FINDINGS & CONCLUSIONS

Findings

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

- The proposed 65 residential units and ground floor commercial space will generate 9 entering trips and 24 exiting trips during the morning peak hour and 26 entering trips and 17 exiting trips during the evening peak hour. The proposed redevelopment will result in a significant reduction in peak hour traffic compared to the operation of the existing banquet hall during events.
- Access to the site will be provided via two (2) driveways along Claremont Avenue, which is an overall reduction in curb cuts to the property and elimination of direct access to Bloomfield Avenue.
- With the addition of the site generated traffic, the intersection of Bloomfield Avenue and Park Avenue will operate at overall level of service “B” during the studied peak hours.
- With the addition of the site generated traffic the individual intersection movements of Bloomfield Avenue and Cumberland Avenue will operate at level of service “B” during the studied peak hours.
- With the addition of the site generated traffic the individual intersection movements of Claremont Avenue and Cumberland Avenue will operate at level of service “B” or better during the studied peak hours.
- With the addition of the site generated traffic the individual intersection movements of Claremont Avenue and Park Avenue will operate at level of service “B” or better during the studied peak hours.
- With the addition of the site generated traffic the individual intersection movements of Claremont Avenue and the site driveways will operate at level of service “A” during the studied peak hours.
- The proposed parking supply is sufficient to support the projected demand per ITE, and meets the requirements of the Redevelopment Plan.

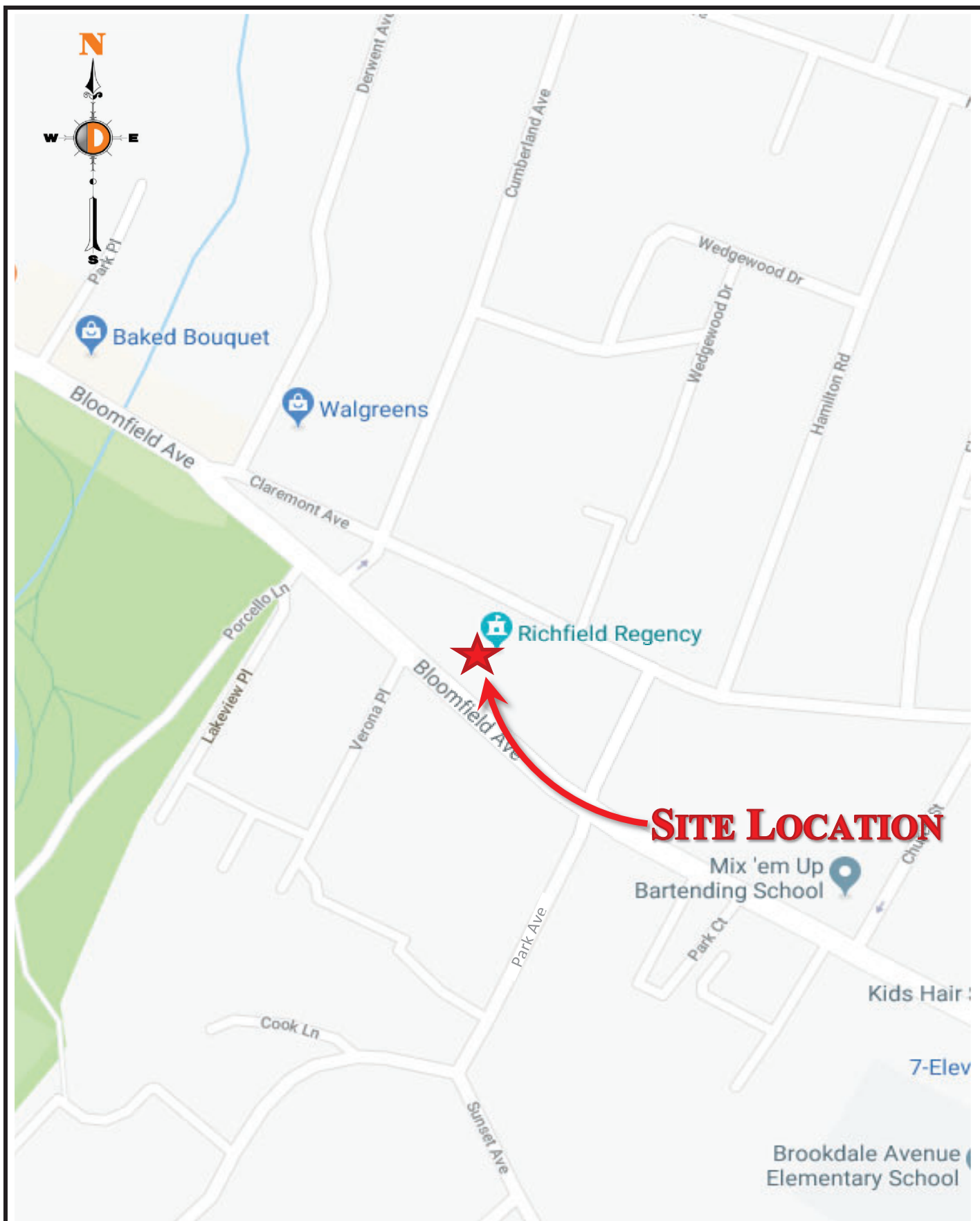
Conclusions

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 of the Township of Verona and Essex County will not experience any degradation in operating conditions with the construction of The Project. The site driveways are located to provide safe and efficient access to the adjacent roadway system. The site plan as proposed provides for effective circulation throughout the site and provides adequate parking to accommodate The Project’s needs

Technical Appendix

Appendix A

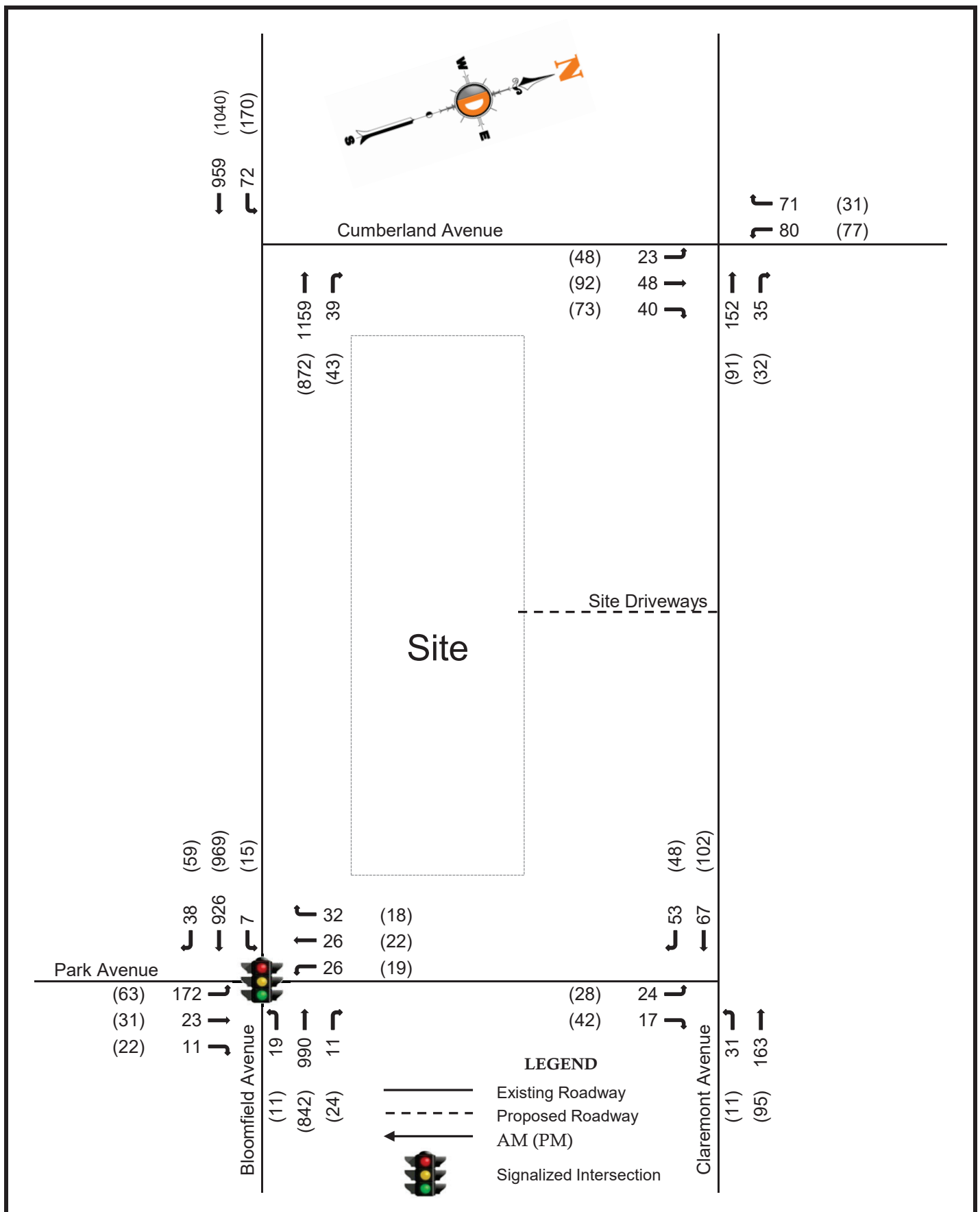
Traffic Volume Figures



Proposed Mixed Use Development
Traffic Impact Study
2918-26-02660
7/1/2026

Figure 1

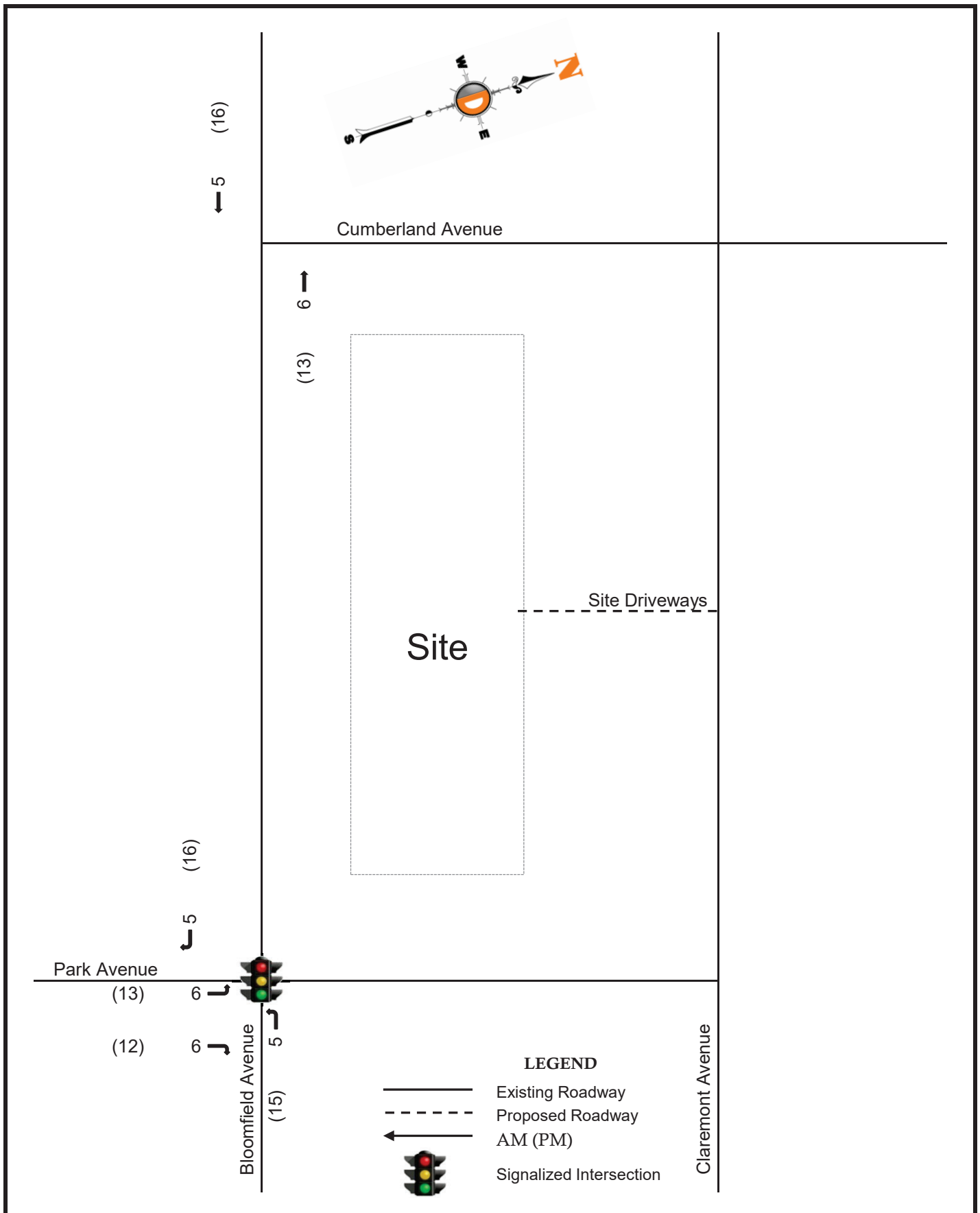
Site Location Map



Proposed Mixed Use Development
 Traffic Impact Study
 2918-26-02660
 7/1/2026

Figure 2

Existing Traffic Volumes



Proposed Mixed Use Development
 Traffic Impact Study
 2918-26-02660
 7/1/2026

Figure 3

Adjacent Development Traffic Volumes

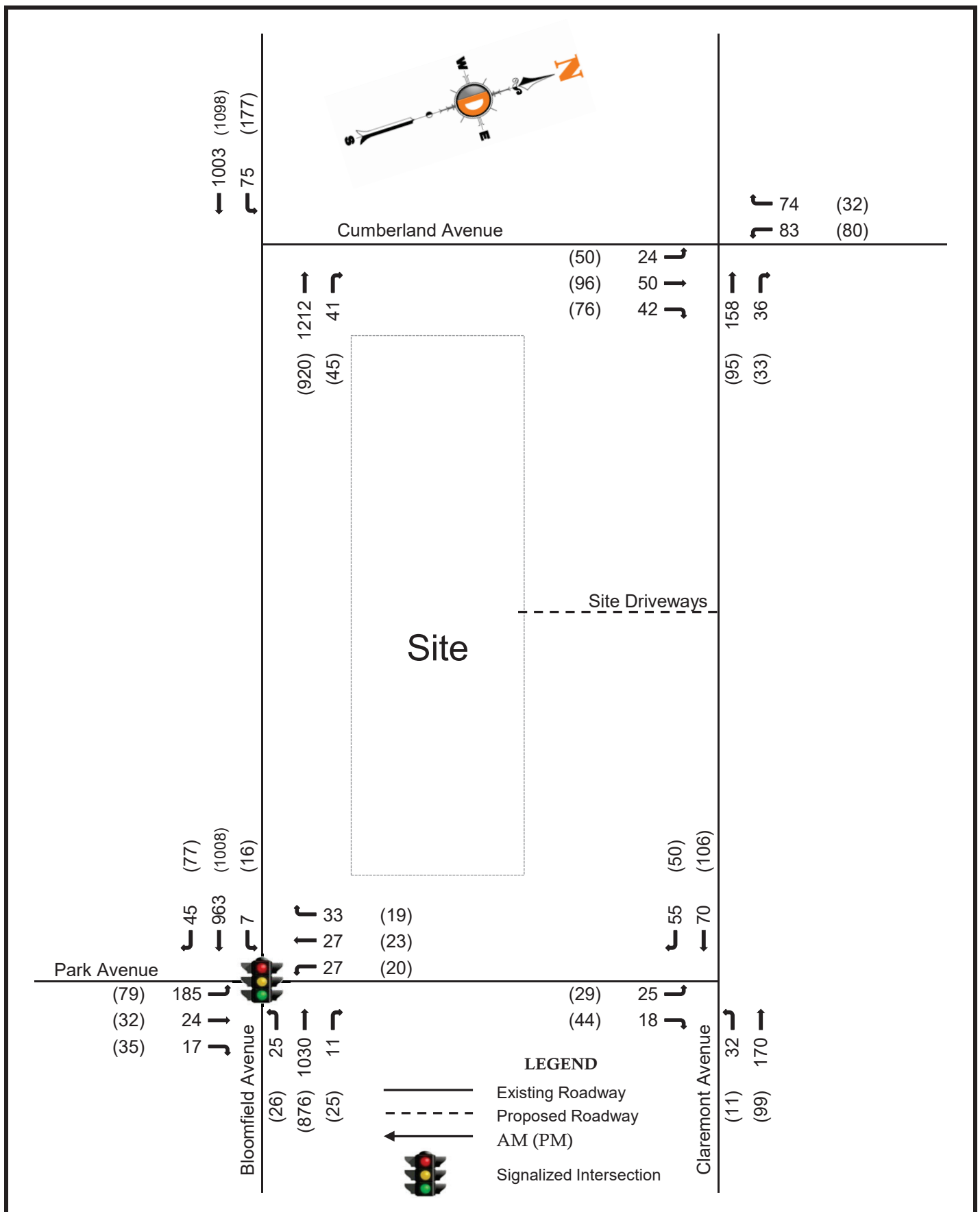
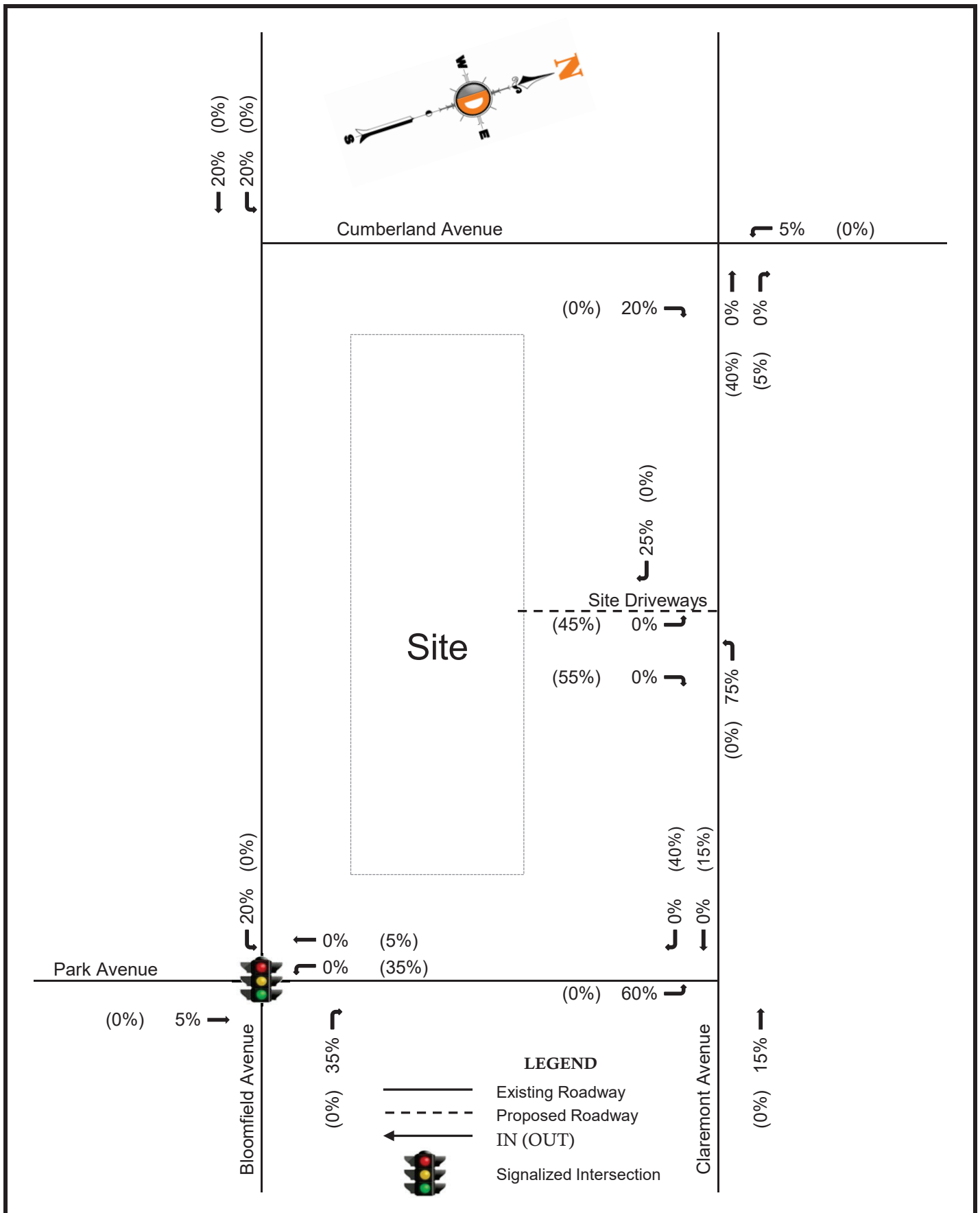


Figure 4

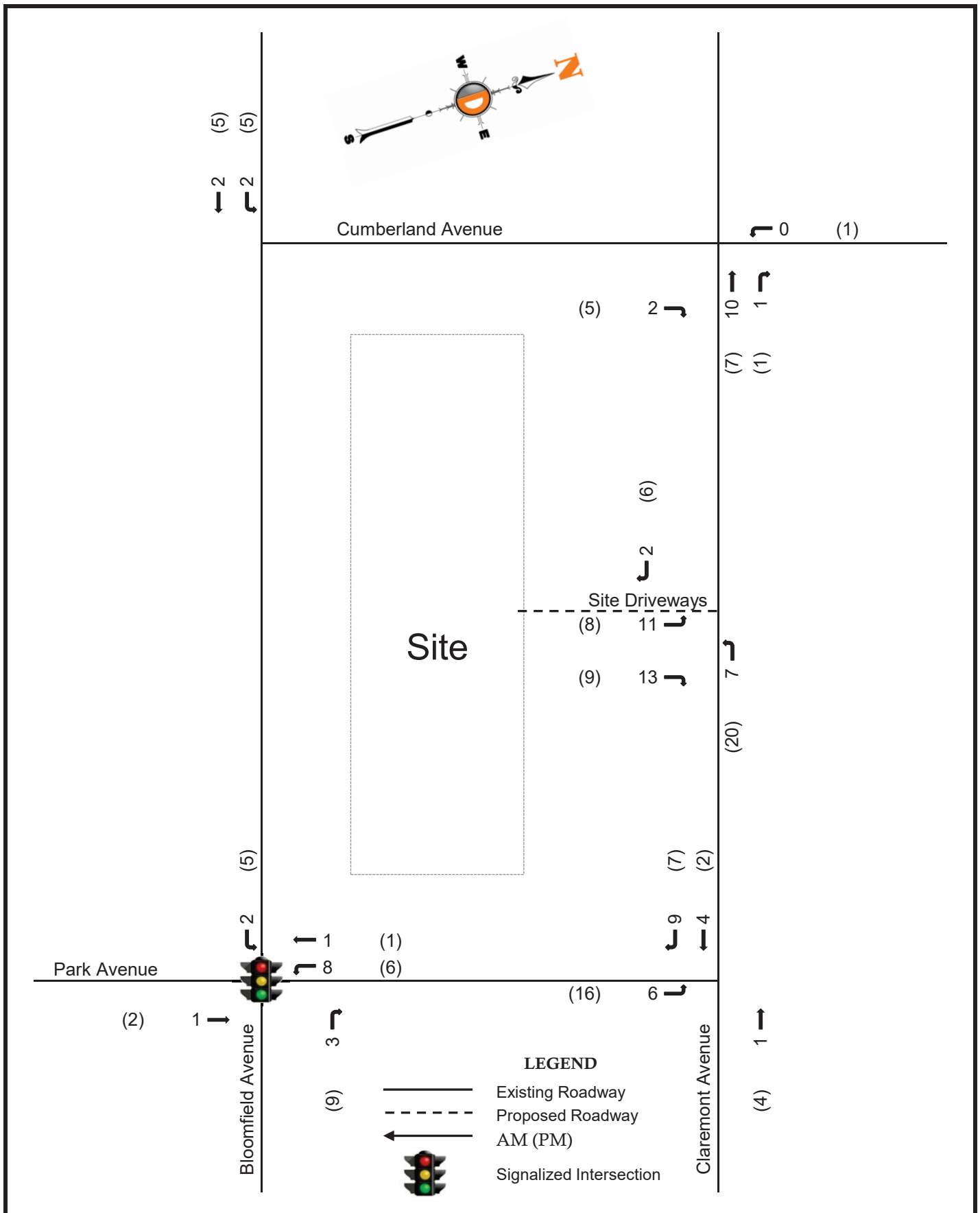
No Build Traffic Volumes



Proposed Mixed Use Development
 Traffic Impact Study
 2918-26-02660
 7/1/2026

Figure 5

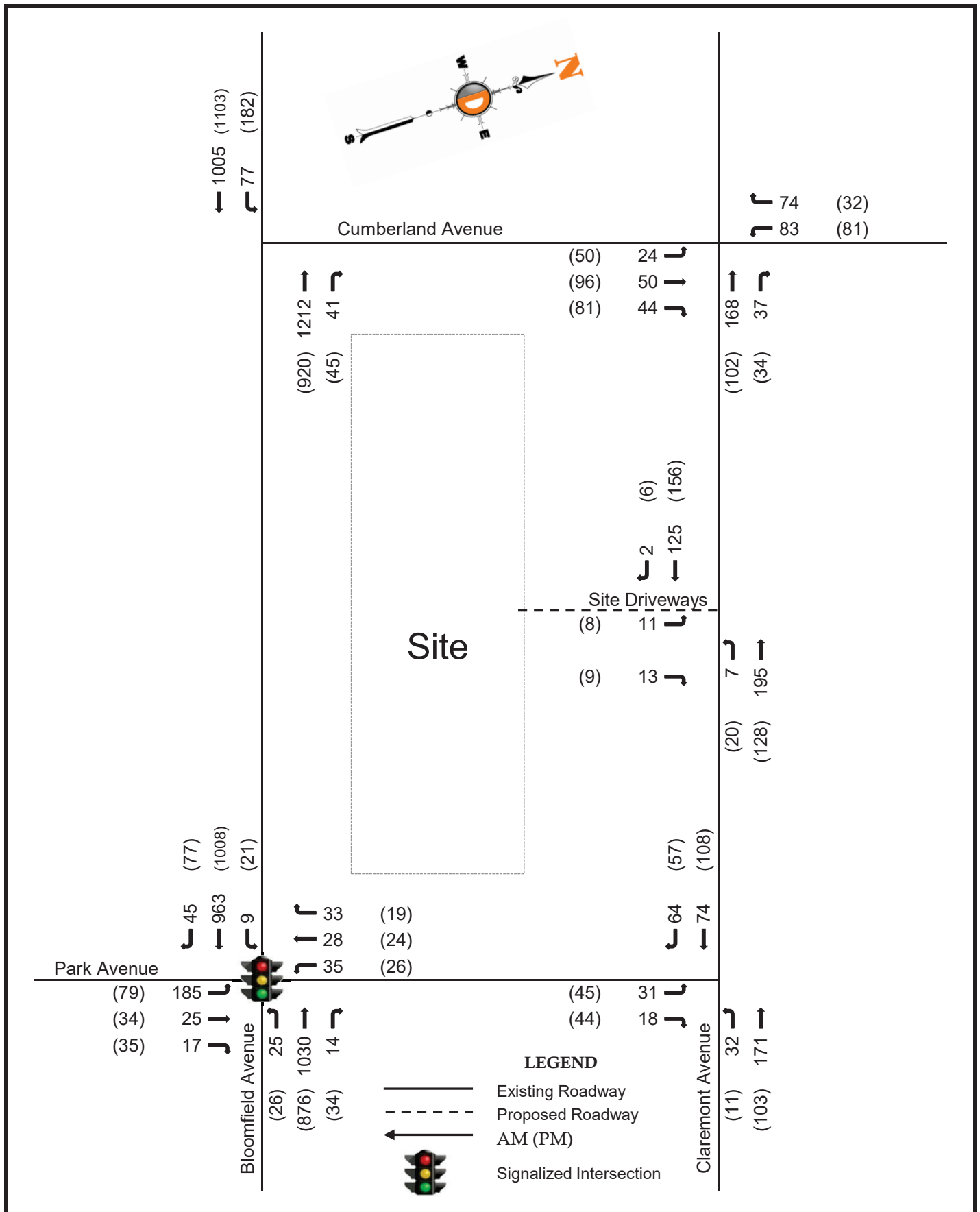
Percent Distribution



Proposed Mixed Use Development
 Traffic Impact Study
 2918-26-02660
 7/1/2026

Figure 6

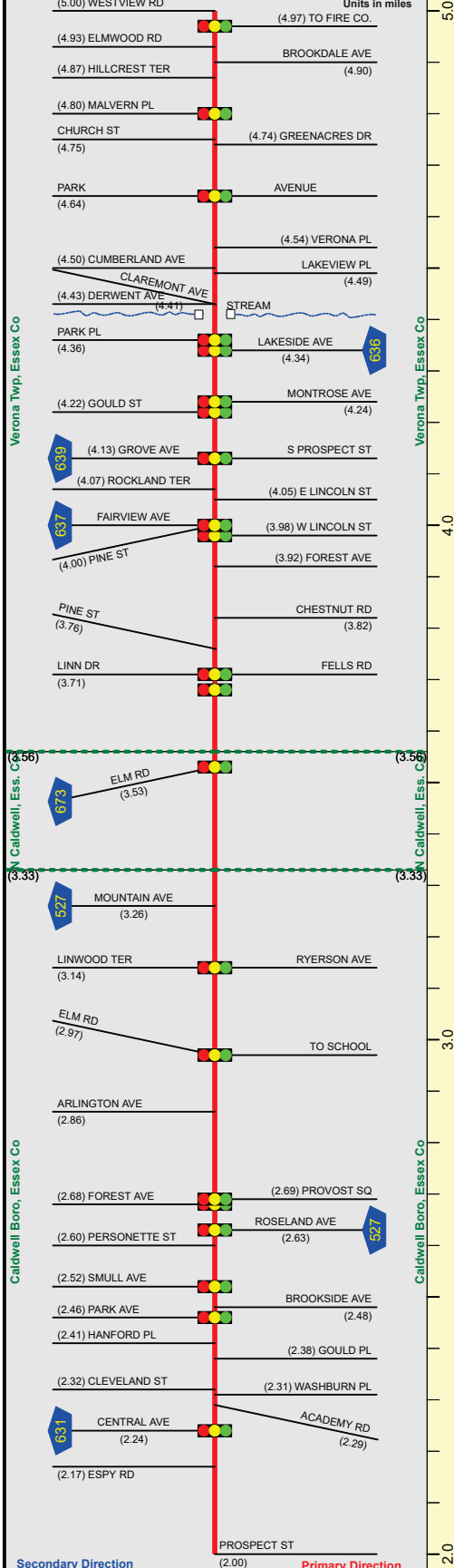
Site Generated Trips



Appendix B

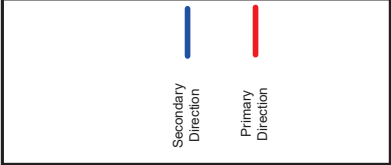
Project Information



Pavement										
Shoulder										
Number of Lanes										
Speed Limit										
Street Name										
Interstate Route										
Street Name	Bloomfield Avenue									
Jurisdiction	County									
Functional Class	Urban Principal Arterial									
Access Level										
Control Section										
Speed Limit	35									
Number of Lanes	4									
Med. Type	None									
Med. Width	72									
Pavement	60									
Shoulder										
Traffic Volume	19,722 (2023)									
Traffic Sta. ID	3-5414									
Structure No.	3-5415									
Enlarged Views	07/0012									

Mile Posts: 0.000 - 0.950

CLAREMONT AVE (East to West)



Pavement	
Shoulder	
Number of Lanes	
Speed Limit	
Street Name	
Interstate Route	
US Route	
NJ Route	
County Road	
Interchange Number	
Grade Separated Interchange	
Traffic Signal	
Traffic Monitoring Sites	
Road Underpass	
Road Overpass	
Dyn. Msg. Sign	
Street Name	Claremont Avenue
Jurisdiction	Municipal
Functional Class	Urban Major Collector
Access Level	
Control Section	
Speed Limit	25
Number of Lanes	2
Med. Type	None
Med. Width	28
Pavement	
Shoulder	
Traffic Volume	
Traffic Sta. ID	
Structure No.	
Enlarged Views	

Date last inventoried: August 2015

SRI = 07131001

Appendix C

Capacity Analysis

Existing AM Peak Hour
Lanes, Volumes, Timings

110: Park Avenue & Bloomfield Avenue

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	926	38	19	990	11	172	23	11	26	26	32
Future Volume (vph)	7	926	38	19	990	11	172	23	11	26	26	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	14	14	14	14	14	14
Grade (%)		7%			-5%			6%			-3%	
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		685			746			522			331	
Travel Time (s)		18.7			20.3			14.2			9.0	
Confl. Peds. (#/hr)	9		6	6		9	15		3	3		15
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	2%	3%	0%	2%	8%	1%	4%	0%	4%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1032	0	0	1085	0	0	219	0	0	90	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	60.0	60.0		60.0	60.0		14.0	14.0		14.0	14.0	
Minimum Split (s)	66.0	66.0		66.0	66.0		20.0	20.0		20.0	20.0	
Total Split (s)	66.0	66.0		66.0	66.0		34.0	34.0		34.0	34.0	
Total Split (%)	66.0%	66.0%		66.0%	66.0%		34.0%	34.0%		34.0%	34.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)		67.0			67.0			21.0			21.0	
Actuated g/C Ratio		0.67			0.67			0.21			0.21	
v/c Ratio		0.51			0.52			0.74			0.24	
Control Delay (s/veh)		10.1			10.2			51.1			22.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay (s/veh)		10.1			10.2			51.1			22.5	
LOS		B			B			D			C	
Approach Delay (s/veh)		10.1			10.2			51.1			22.5	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)		156			166			134			32	
Queue Length 95th (ft)		255			270			202			68	
Internal Link Dist (ft)		605			666			442			251	
Turn Bay Length (ft)												
Base Capacity (vph)		2011			2087			393			495	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.51			0.52			0.56			0.18	

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset: 14 (14%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay (s/veh): 14.3	Intersection LOS: B
Intersection Capacity Utilization 78.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 110: Park Avenue & Bloomfield Avenue



Existing AM Peak Hour
HCM 7th TWSC

130: Bloomfield Avenue & Cumberland Avenue

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	72	959	1159	39	0	0
Future Vol, veh/h	72	959	1159	39	0	0
Conflicting Peds, #/hr	9	0	0	9	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, %	-	6	-6	-	6	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	2	2	0	0	0
Mvmt Flow	76	1009	1220	41	0	0
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1270	0	-	0	1906	640
Stage 1	-	-	-	-	1250	-
Stage 2	-	-	-	-	656	-
Critical Hdwy	4.12	-	-	-	8	7.5
Critical Hdwy Stg 1	-	-	-	-	7	-
Critical Hdwy Stg 2	-	-	-	-	7	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	548	-	-	-	33	380
Stage 1	-	-	-	-	156	-
Stage 2	-	-	-	-	388	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	542	-	-	-	26	376
Mov Cap-2 Maneuver	-	-	-	-	26	-
Stage 1	-	-	-	-	125	-
Stage 2	-	-	-	-	388	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	2.89	0		0		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	251	-	-	-	-	
HCM Lane V/C Ratio	0.14	-	-	-	-	
HCM Ctrl Dly (s/v)	12.7	2.1	-	-	0	
HCM Lane LOS	B	A	-	-	A	
HCM 95th %tile Q(veh)	0.5	-	-	-	-	

Existing AM Peak Hour
HCM 7th TWSC

140: Cumberland Avenue & Claremont Avenue

Intersection													
Int Delay, s/veh	6.5												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↰		↱	↰			↱		
Traffic Vol, veh/h	0	0	0	0	152	35	23	48	40	80	0	71	
Future Vol, veh/h	0	0	0	0	152	35	23	48	40	80	0	71	
Conflicting Peds, #/hr	0	0	0	0	0	26	0	0	1	1	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	-8	-	-	-6	-	-	2	-	
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91	
Heavy Vehicles, %	0	0	0	0	0	3	0	2	0	3	0	1	
Mvmt Flow	0	0	0	0	167	38	25	53	44	88	0	78	
Major/Minor	Major1			Major2			Minor1			Minor2			
Conflicting Flow All	-	-	-	-	-	-	0	167	231	1	240	212	212
Stage 1	-	-	-	-	-	-	-	0	0	-	212	212	-
Stage 2	-	-	-	-	-	-	-	167	231	-	27	0	-
Critical Hdwy	-	-	-	-	-	-	5.9	5.32	5.6	7.53	6.9	6.41	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	6.53	5.9	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	4.9	4.32	-	-	-	-	
Follow-up Hdwy	-	-	-	-	-	-	3.5	4.018	3.3	3.527	4	3.309	
Pot Cap-1 Maneuver	0	0	0	0	-	-	847	722	1090	694	673	821	
Stage 1	0	0	0	0	-	-	-	-	-	769	713	-	
Stage 2	0	0	0	0	-	-	888	770	-	-	-	-	
Platoon blocked, %						-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	764	700	1088	596	652	795	
Mov Cap-2 Maneuver	-	-	-	-	-	-	764	700	-	596	652	-	
Stage 1	-	-	-	-	-	-	-	-	-	745	691	-	
Stage 2	-	-	-	-	-	-	801	746	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Ctrl Dly, s/v				0			9.87			12.06			
HCM LOS							A			B			
Minor Lane/Major Mvmt	NBLn1		NBLn2	WBT	WBR	SBLn1							
Capacity (veh/h)	764		835	-	-	675							
HCM Lane V/C Ratio	0.033		0.116	-	-	0.246							
HCM Ctrl Dly (s/v)	9.9		9.9	-	-	12.1							
HCM Lane LOS	A		A	-	-	B							
HCM 95th %tile Q(veh)	0.1		0.4	-	-	1							

Existing AM Peak Hour
HCM 7th TWSC

150: Park Avenue & Claremont Avenue

Intersection						
Int Delay, s/veh	1.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	67	53	31	163	24	17
Future Vol, veh/h	67	53	31	163	24	17
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, %	10	-	-	-7	3	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	2	0	0	8	0
Mvmt Flow	74	58	34	179	26	19
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	132	0	350	103
Stage 1	-	-	-	-	103	-
Stage 2	-	-	-	-	247	-
Critical Hdwy	-	-	4.1	-	7.08	6.5
Critical Hdwy Stg 1	-	-	-	-	6.08	-
Critical Hdwy Stg 2	-	-	-	-	6.08	-
Follow-up Hdwy	-	-	2.2	-	3.572	3.3
Pot Cap-1 Maneuver	-	-	1466	-	599	950
Stage 1	-	-	-	-	891	-
Stage 2	-	-	-	-	749	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1466	-	584	950
Mov Cap-2 Maneuver	-	-	-	-	584	-
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	749	-
Approach	EB		WB		NB	
HCM Ctrl Dly, s/v	0		1.2		10.54	
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	695	-	-	288	-	
HCM Lane V/C Ratio	0.065	-	-	0.023	-	
HCM Ctrl Dly (s/v)	10.5	-	-	7.5	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-	

Existing PM Peak Hour
Lanes, Volumes, Timings

110: Park Avenue & Bloomfield Avenue

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	969	59	11	842	24	63	31	22	19	22	18
Future Volume (vph)	15	969	59	11	842	24	63	31	22	19	22	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	14	14	14	14	14	14
Grade (%)		7%			-5%			6%			-3%	
Right Turn on Red		Yes				Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		685			746			522			331	
Travel Time (s)		18.7			20.3			14.2			9.0	
Confl. Peds. (#/hr)	6		3	3		6	4		1	1		4
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
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1098	0	0	923	0	0	122	0	0	62	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	60.0	60.0		60.0	60.0		14.0	14.0		14.0	14.0	
Minimum Split (s)	66.0	66.0		66.0	66.0		20.0	20.0		20.0	20.0	
Total Split (s)	66.0	66.0		66.0	66.0		34.0	34.0		34.0	34.0	
Total Split (%)	66.0%	66.0%		66.0%	66.0%		34.0%	34.0%		34.0%	34.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)		73.0			73.0			15.0			15.0	
Actuated g/C Ratio		0.73			0.73			0.15			0.15	
v/c Ratio		0.50			0.40			0.50			0.23	
Control Delay (s/veh)		6.8			5.9			42.3			29.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay (s/veh)		6.8			5.9			42.3			29.6	
LOS		A			A			D			C	
Approach Delay (s/veh)		6.8			5.9			42.3			29.6	
Approach LOS		A			A			D			C	
Queue Length 50th (ft)		126			96			66			25	
Queue Length 95th (ft)		198			151			119			62	
Internal Link Dist (ft)		605			666			442			251	
Turn Bay Length (ft)												
Base Capacity (vph)		2183			2306			446			496	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.50			0.40			0.27			0.13	

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset: 14 (14%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay (s/veh): 9.0	Intersection LOS: A
Intersection Capacity Utilization 71.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 110: Park Avenue & Bloomfield Avenue



Existing PM Peak Hour
HCM 7th TWSC

130: Bloomfield Avenue & Cumberland Avenue

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	170	1040	872	43	0	0
Future Vol, veh/h	170	1040	872	43	0	0
Conflicting Peds, #/hr	4	0	0	4	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, %	-	6	-6	-	6	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	1	2	0	0	0
Mvmt Flow	181	1106	928	46	0	0
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	977	0	-	0	1869	491
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	915	-
Critical Hdwy	4.1	-	-	-	8	7.5
Critical Hdwy Stg 1	-	-	-	-	7	-
Critical Hdwy Stg 2	-	-	-	-	7	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	714	-	-	-	35	487
Stage 1	-	-	-	-	247	-
Stage 2	-	-	-	-	262	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	710	-	-	-	22	485
Mov Cap-2 Maneuver	-	-	-	-	22	-
Stage 1	-	-	-	-	155	-
Stage 2	-	-	-	-	262	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	4.46	0		0		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	492	-	-	-	-	
HCM Lane V/C Ratio	0.255	-	-	-	-	
HCM Ctrl Dly (s/v)	11.8	3.3	-	-	0	
HCM Lane LOS	B	A	-	-	A	
HCM 95th %tile Q(veh)	1	-	-	-	-	

Existing PM Peak Hour
HCM 7th TWSC

140: Cumberland Avenue & Claremont Avenue

Intersection													
Int Delay, s/veh	7.8												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Vol, veh/h	0	0	0	0	91	32	48	92	73	77	0	31	
Future Vol, veh/h	0	0	0	0	91	32	48	92	73	77	0	31	
Conflicting Peds, #/hr	0	0	0	0	0	7	4	0	1	1	0	4	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	-8	-	-	-6	-	-	2	-	
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82	
Heavy Vehicles, %	0	0	0	0	0	0	2	1	2	0	0	7	
Mvmt Flow	0	0	0	0	111	39	59	112	89	94	0	38	
Major/Minor	Major1			Major2			Minor1			Minor2			
Conflicting Flow All	-	-	-	-	-	-	0	115	157	1	195	137	141
Stage 1	-	-	-	-	-	-	-	0	0	-	137	137	-
Stage 2	-	-	-	-	-	-	-	115	157	-	57	0	-
Critical Hdwy	-	-	-	-	-	-	5.92	5.31	5.62	7.5	6.9	6.47	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	6.5	5.9	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	4.92	4.31	-	-	-	-	
Follow-up Hdwy	-	-	-	-	-	-	3.518	4.009	3.318	3.5	4	3.363	
Pot Cap-1 Maneuver	0	0	0	0	-	-	895	776	1084	753	746	886	
Stage 1	0	0	0	0	-	-	-	-	-	857	775	-	
Stage 2	0	0	0	0	-	-	925	811	-	-	-	-	
Platoon blocked, %						-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	857	770	1083	585	739	879	
Mov Cap-2 Maneuver	-	-	-	-	-	-	857	770	-	585	739	-	
Stage 1	-	-	-	-	-	-	-	-	-	850	768	-	
Stage 2	-	-	-	-	-	-	885	804	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Ctrl Dly, s/v				0			10.1			11.99			
HCM LOS							B			B			
Minor Lane/Major Mvmt	NBLn1 NBLn2		WBT	WBR	SBLn1								
Capacity (veh/h)	857	883	-	-	647								
HCM Lane V/C Ratio	0.068	0.228	-	-	0.204								
HCM Ctrl Dly (s/v)	9.5	10.3	-	-	12								
HCM Lane LOS	A	B	-	-	B								
HCM 95th %tile Q(veh)	0.2	0.9	-	-	0.8								

Existing PM Peak Hour
HCM 7th TWSC

150: Park Avenue & Claremont Avenue

Intersection

Int Delay, s/veh 2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	102	48	11	95	28	42
Future Vol, veh/h	102	48	11	95	28	42
Conflicting Peds, #/hr	0	3	3	0	2	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, %	10	-	-	-7	3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	111	52	12	103	30	46

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	166
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	1424
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1420
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.78	9.98
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	799	-	-	187	-
HCM Lane V/C Ratio	0.095	-	-	0.008	-
HCM Ctrl Dly (s/v)	10	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

No Build AM Peak Hour
Lanes, Volumes, Timings

110: Park Avenue & Bloomfield Avenue

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	963	45	25	1030	11	185	24	17	27	27	33
Future Volume (vph)	7	963	45	25	1030	11	185	24	17	27	27	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	14	14	14	14	14	14
Grade (%)		7%			-5%			6%			-3%	
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		685			746			522			331	
Travel Time (s)		18.7			20.3			14.2			9.0	
Confl. Peds. (#/hr)	9		6	6		9	15		3	3		15
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	2%	3%	0%	2%	8%	1%	4%	0%	4%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1079	0	0	1135	0	0	241	0	0	93	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	60.0	60.0		60.0	60.0		14.0	14.0		14.0	14.0	
Minimum Split (s)	66.0	66.0		66.0	66.0		20.0	20.0		20.0	20.0	
Total Split (s)	66.0	66.0		66.0	66.0		34.0	34.0		34.0	34.0	
Total Split (%)	66.0%	66.0%		66.0%	66.0%		34.0%	34.0%		34.0%	34.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)		66.1			66.1			21.9			21.9	
Actuated g/C Ratio		0.66			0.66			0.22			0.22	
v/c Ratio		0.54			0.56			0.79			0.24	
Control Delay (s/veh)		11.0			11.3			53.5			22.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay (s/veh)		11.0			11.3			53.5			22.2	
LOS		B			B			D			C	
Approach Delay (s/veh)		11.0			11.3			53.5			22.2	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)		176			191			147			33	
Queue Length 95th (ft)		273			293			223			69	
Internal Link Dist (ft)		605			666			442			251	
Turn Bay Length (ft)												
Base Capacity (vph)		1983			2020			392			493	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.54			0.56			0.61			0.19	

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	14 (14%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.79
Intersection Signal Delay (s/veh):	15.6
Intersection LOS:	B
Intersection Capacity Utilization	79.2%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 110: Park Avenue & Bloomfield Avenue



No Build AM Peak Hour
HCM 7th TWSC

130: Bloomfield Avenue & Cumberland Avenue

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	75	1003	1212	41	0	0
Future Vol, veh/h	75	1003	1212	41	0	0
Conflicting Peds, #/hr	9	0	0	9	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, %	-	6	-6	-	6	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	2	2	0	0	0
Mvmt Flow	79	1056	1276	43	0	0
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1328	0	-	0	1992	668
Stage 1	-	-	-	-	1306	-
Stage 2	-	-	-	-	686	-
Critical Hdwy	4.12	-	-	-	8	7.5
Critical Hdwy Stg 1	-	-	-	-	7	-
Critical Hdwy Stg 2	-	-	-	-	7	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	521	-	-	-	28	362
Stage 1	-	-	-	-	143	-
Stage 2	-	-	-	-	371	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	515	-	-	-	22	358
Mov Cap-2 Maneuver	-	-	-	-	22	-
Stage 1	-	-	-	-	111	-
Stage 2	-	-	-	-	371	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	3.25	0		0		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	250	-	-	-	-	
HCM Lane V/C Ratio	0.153	-	-	-	-	
HCM Ctrl Dly (s/v)	13.2	2.5	-	-	0	
HCM Lane LOS	B	A	-	-	A	
HCM 95th %tile Q(veh)	0.5	-	-	-	-	

No Build AM Peak Hour
HCM 7th TWSC

140: Cumberland Avenue & Claremont Avenue

Intersection													
Int Delay, s/veh	6.6												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↶		↷	↶			↷		
Traffic Vol, veh/h	0	0	0	0	158	36	24	50	42	83	0	74	
Future Vol, veh/h	0	0	0	0	158	36	24	50	42	83	0	74	
Conflicting Peds, #/hr	0	0	0	0	0	26	0	0	1	1	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	-8	-	-	-6	-	-	2	-	
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91	
Heavy Vehicles, %	0	0	0	0	0	3	0	2	0	3	0	1	
Mvmt Flow	0	0	0	0	174	40	26	55	46	91	0	81	
Major/Minor	Major1			Major2			Minor1			Minor2			
Conflicting Flow All	-	-	-	-	-	-	0	174	239	1	248	219	219
Stage 1	-	-	-	-	-	-	-	0	0	-	219	219	-
Stage 2	-	-	-	-	-	-	-	174	239	-	28	0	-
Critical Hdwy	-	-	-	-	-	-	5.9	5.32	5.6	7.53	6.9	6.41	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	6.53	5.9	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	4.9	4.32	-	-	-	-	
Follow-up Hdwy	-	-	-	-	-	-	3.5	4.018	3.3	3.527	4	3.309	
Pot Cap-1 Maneuver	0	0	0	0	-	-	841	717	1090	685	666	813	
Stage 1	0	0	0	0	-	-	-	-	-	762	708	-	
Stage 2	0	0	0	0	-	-	883	766	-	-	-	-	
Platoon blocked, %						-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	754	695	1088	584	645	788	
Mov Cap-2 Maneuver	-	-	-	-	-	-	754	695	-	584	645	-	
Stage 1	-	-	-	-	-	-	-	-	-	738	686	-	
Stage 2	-	-	-	-	-	-	791	742	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Ctrl Dly, s/v				0			9.93			12.3			
HCM LOS							A			B			
Minor Lane/Major Mvmt	NBLn1 NBLn2		WBT	WBR	SBLn1								
Capacity (veh/h)	754	832	-	-	665								
HCM Lane V/C Ratio	0.035	0.121	-	-	0.259								
HCM Ctrl Dly (s/v)	9.9	9.9	-	-	12.3								
HCM Lane LOS	A	A	-	-	B								
HCM 95th %tile Q(veh)	0.1	0.4	-	-	1								

No Build AM Peak Hour
HCM 7th TWSC

150: Park Avenue & Claremont Avenue

Intersection

Int Delay, s/veh 1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	70	55	32	170	25	18
Future Vol, veh/h	70	55	32	170	25	18
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, %	10	-	-	-7	3	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	2	0	0	8	0
Mvmt Flow	77	60	35	187	27	20

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	137
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	1459
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1459
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	1.19	10.65
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	684	-	-	285	-
HCM Lane V/C Ratio	0.069	-	-	0.024	-
HCM Ctrl Dly (s/v)	10.7	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

No Build PM Peak Hour
Lanes, Volumes, Timings

110: Park Avenue & Bloomfield Avenue

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1008	77	26	876	25	79	32	35	20	23	19
Future Volume (vph)	16	1008	77	26	876	25	79	32	35	20	23	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	14	14	14	14	14	14
Grade (%)		7%			-5%			6%			-3%	
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		685			746			522			331	
Travel Time (s)		18.7			20.3			14.2			9.0	
Confl. Peds. (#/hr)	6		3	3		6	4		1	1		4
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
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1159	0	0	975	0	0	154	0	0	65	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	60.0	60.0		60.0	60.0		14.0	14.0		14.0	14.0	
Minimum Split (s)	66.0	66.0		66.0	66.0		20.0	20.0		20.0	20.0	
Total Split (s)	66.0	66.0		66.0	66.0		34.0	34.0		34.0	34.0	
Total Split (%)	66.0%	66.0%		66.0%	66.0%		34.0%	34.0%		34.0%	34.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)		71.8			71.8			16.2			16.2	
Actuated g/C Ratio		0.72			0.72			0.16			0.16	
v/c Ratio		0.54			0.45			0.58			0.22	
Control Delay (s/veh)		7.9			7.0			43.3			27.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay (s/veh)		7.9			7.0			43.3			27.9	
LOS		A			A			D			C	
Approach Delay (s/veh)		7.9			7.0			43.3			27.9	
Approach LOS		A			A			D			C	
Queue Length 50th (ft)		142			110			84			26	
Queue Length 95th (ft)		241			186			139			62	
Internal Link Dist (ft)		605			666			442			251	
Turn Bay Length (ft)												
Base Capacity (vph)		2140			2163			447			489	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.54			0.45			0.34			0.13	

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset: 14 (14%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay (s/veh): 10.4	Intersection LOS: B
Intersection Capacity Utilization 73.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 110: Park Avenue & Bloomfield Avenue



No Build PM Peak Hour
HCM 7th TWSC

130: Bloomfield Avenue & Cumberland Avenue

Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	177	1098	920	45	0	0
Future Vol, veh/h	177	1098	920	45	0	0
Conflicting Peds, #/hr	4	0	0	4	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, %	-	6	-6	-	6	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	1	2	0	0	0
Mvmt Flow	188	1168	979	48	0	0
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1031	0	-	0	1967	517
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	961	-
Critical Hdwy	4.1	-	-	-	8	7.5
Critical Hdwy Stg 1	-	-	-	-	7	-
Critical Hdwy Stg 2	-	-	-	-	7	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	682	-	-	-	29	466
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	244	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	678	-	-	-	17	464
Mov Cap-2 Maneuver	-	-	-	-	17	-
Stage 1	-	-	-	-	134	-
Stage 2	-	-	-	-	244	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	5.01	0		0		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	458	-	-	-	-	
HCM Lane V/C Ratio	0.278	-	-	-	-	
HCM Ctrl Dly (s/v)	12.3	3.8	-	-	0	
HCM Lane LOS	B	A	-	-	A	
HCM 95th %tile Q(veh)	1.1	-	-	-	-	

No Build PM Peak Hour
HCM 7th TWSC

140: Cumberland Avenue & Claremont Avenue

Intersection												
Int Delay, s/veh	7.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	95	33	50	96	76	80	0	32
Future Vol, veh/h	0	0	0	0	95	33	50	96	76	80	0	32
Conflicting Peds, #/hr	0	0	0	0	0	7	4	0	1	1	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-8	-	-	-6	-	-	2	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	2	1	2	0	0	7
Mvmt Flow	0	0	0	0	116	40	61	117	93	98	0	39
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	-	-	-	-	-	0	120	163	1	203	143
Stage 1	-	-	-	-	-	-	-	0	0	-	143	143
Stage 2	-	-	-	-	-	-	-	120	163	-	60	0
Critical Hdwy	-	-	-	-	-	-	5.92	5.31	5.62	7.5	6.9	6.47
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	6.5	5.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.92	4.31	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	3.518	4.009	3.318	3.5	4	3.363
Pot Cap-1 Maneuver	0	0	0	0	-	-	890	772	1084	743	740	880
Stage 1	0	0	0	0	-	-	-	-	-	851	770	-
Stage 2	0	0	0	0	-	-	921	808	-	-	-	-
Platoon blocked, %						-	-					
Mov Cap-1 Maneuver	-	-	-	-	-	-	851	766	1083	570	734	872
Mov Cap-2 Maneuver	-	-	-	-	-	-	851	766	-	570	734	-
Stage 1	-	-	-	-	-	-	-	-	-	844	764	-
Stage 2	-	-	-	-	-	-	879	801	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v				0			10.19			12.25		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1 NBLn2		WBT	WBR	SBLn1							
Capacity (veh/h)	851	879	-	-	633							
HCM Lane V/C Ratio	0.072	0.239	-	-	0.216							
HCM Ctrl Dly (s/v)	9.6	10.4	-	-	12.2							
HCM Lane LOS	A	B	-	-	B							
HCM 95th %tile Q(veh)	0.2	0.9	-	-	0.8							

No Build PM Peak Hour
HCM 7th TWSC

150: Park Avenue & Claremont Avenue

Intersection

Int Delay, s/veh 2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	106	50	11	99	29	44
Future Vol, veh/h	106	50	11	99	29	44
Conflicting Peds, #/hr	0	3	3	0	2	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, %	10	-	-	-7	3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	115	54	12	108	32	48

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	173
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	1417
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1412
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.76	10.06
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	791	-	-	180	-
HCM Lane V/C Ratio	0.1	-	-	0.008	-
HCM Ctrl Dly (s/v)	10.1	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Build AM Peak Hour

Lanes, Volumes, Timings

110: Park Avenue & Bloomfield Avenue

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	963	45	25	1030	14	185	25	17	35	28	33
Future Volume (vph)	9	963	45	25	1030	14	185	25	17	35	28	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	14	14	14	14	14	14
Grade (%)		7%			-5%			6%			-3%	
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		685			746			522			331	
Travel Time (s)		18.7			20.3			14.2			9.0	
Confl. Peds. (#/hr)	9		6	6		9	15		3	3		15
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	2%	3%	0%	2%	8%	1%	4%	0%	4%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1082	0	0	1138	0	0	242	0	0	102	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	60.0	60.0		60.0	60.0		14.0	14.0		14.0	14.0	
Minimum Split (s)	66.0	66.0		66.0	66.0		20.0	20.0		20.0	20.0	
Total Split (s)	66.0	66.0		66.0	66.0		34.0	34.0		34.0	34.0	
Total Split (%)	66.0%	66.0%		66.0%	66.0%		34.0%	34.0%		34.0%	34.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)		65.9			65.9			22.1			22.1	
Actuated g/C Ratio		0.66			0.66			0.22			0.22	
v/c Ratio		0.55			0.57			0.80			0.27	
Control Delay (s/veh)		11.2			11.4			54.6			24.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay (s/veh)		11.2			11.4			54.6			24.0	
LOS		B			B			D			C	
Approach Delay (s/veh)		11.2			11.4			54.6			24.0	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)		180			193			147			39	
Queue Length 95th (ft)		276			294			225			79	
Internal Link Dist (ft)		605			666			442			251	
Turn Bay Length (ft)												
Base Capacity (vph)		1965			2013			385			480	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.55			0.57			0.63			0.21	

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset: 14 (14%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay (s/veh): 15.9	Intersection LOS: B
Intersection Capacity Utilization 79.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 110: Park Avenue & Bloomfield Avenue



Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	125	2	7	195	11	13
Future Vol, veh/h	125	2	7	195	11	13
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, %	10	-	-	-8	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	136	2	8	212	12	14
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	138	0	364	137
Stage 1	-	-	-	-	137	-
Stage 2	-	-	-	-	227	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1458	-	639	917
Stage 1	-	-	-	-	895	-
Stage 2	-	-	-	-	815	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1458	-	636	917
Mov Cap-2 Maneuver	-	-	-	-	636	-
Stage 1	-	-	-	-	889	-
Stage 2	-	-	-	-	815	-
Approach	EB		WB		NB	
HCM Ctrl Dly, s/v	0		0.26		9.89	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	762	-	-	62	-	
HCM Lane V/C Ratio	0.034	-	-	0.005	-	
HCM Ctrl Dly (s/v)	9.9	-	-	7.5	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

Build AM Peak Hour
HCM 7th TWSC

130: Bloomfield Avenue & Cumberland Avenue

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕		↕↕	
Traffic Vol, veh/h	77	1005	1212	41	0	0
Future Vol, veh/h	77	1005	1212	41	0	0
Conflicting Peds, #/hr	9	0	0	9	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, %	-	6	-6	-	6	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	2	2	0	0	0
Mvmt Flow	81	1058	1276	43	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1328	0	0 1997 668
Stage 1	-	-	- 1306 -
Stage 2	-	-	- 691 -
Critical Hdwy	4.12	-	- 8 7.5
Critical Hdwy Stg 1	-	-	- 7 -
Critical Hdwy Stg 2	-	-	- 7 -
Follow-up Hdwy	2.21	-	- 3.5 3.3
Pot Cap-1 Maneuver	521	-	- 28 362
Stage 1	-	-	- 143 -
Stage 2	-	-	- 368 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	515	-	- 21 358
Mov Cap-2 Maneuver	-	-	- 21 -
Stage 1	-	-	- 110 -
Stage 2	-	-	- 368 -

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	3.33	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	256	-	-	-	-
HCM Lane V/C Ratio	0.157	-	-	-	-
HCM Ctrl Dly (s/v)	13.3	2.6	-	-	0
HCM Lane LOS	B	A	-	-	A
HCM 95th %tile Q(veh)	0.6	-	-	-	-

Build AM Peak Hour
HCM 7th TWSC

140: Cumberland Avenue & Claremont Avenue

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	168	37	24	50	44	83	0	74
Future Vol, veh/h	0	0	0	0	168	37	24	50	44	83	0	74
Conflicting Peds, #/hr	0	0	0	0	0	26	0	0	1	1	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-8	-	-	-6	-	-	2	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	3	0	2	0	3	0	1
Mvmt Flow	0	0	0	0	185	41	26	55	48	91	0	81
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	-	-	-	-	0	185	251	1	259	231	231
Stage 1	-	-	-	-	-	-	0	0	-	231	231	-
Stage 2	-	-	-	-	-	-	185	251	-	28	0	-
Critical Hdwy	-	-	-	-	-	-	5.9	5.32	5.6	7.53	6.9	6.41
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	6.53	5.9	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.9	4.32	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	3.5	4.018	3.3	3.527	4	3.309
Pot Cap-1 Maneuver	0	0	0	0	-	-	830	709	1090	672	655	800
Stage 1	0	0	0	0	-	-	-	-	-	750	699	-
Stage 2	0	0	0	0	-	-	874	760	-	-	-	-
Platoon blocked, %						-	-					
Mov Cap-1 Maneuver	-	-	-	-	-	-	743	687	1088	572	635	776
Mov Cap-2 Maneuver	-	-	-	-	-	-	743	687	-	572	635	-
Stage 1	-	-	-	-	-	-	-	-	-	727	677	-
Stage 2	-	-	-	-	-	-	782	736	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v				0			9.97			12.49		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1 NBLn2		WBT	WBR	SBLn1							
Capacity (veh/h)	743	830	-	-	653							
HCM Lane V/C Ratio	0.035	0.124	-	-	0.264							
HCM Ctrl Dly (s/v)	10	10	-	-	12.5							
HCM Lane LOS	B	A	-	-	B							
HCM 95th %tile Q(veh)	0.1	0.4	-	-	1.1							

Build AM Peak Hour
HCM 7th TWSC

150: Park Avenue & Claremont Avenue

Intersection						
Int Delay, s/veh	2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	74	64	32	171	31	18
Future Vol, veh/h	74	64	32	171	31	18
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, %	10	-	-	-7	3	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	2	0	0	8	0
Mvmt Flow	81	70	35	188	34	20
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	152	0	375	116
Stage 1	-	-	-	-	116	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	-	-	4.1	-	7.08	6.5
Critical Hdwy Stg 1	-	-	-	-	6.08	-
Critical Hdwy Stg 2	-	-	-	-	6.08	-
Follow-up Hdwy	-	-	2.2	-	3.572	3.3
Pot Cap-1 Maneuver	-	-	1442	-	578	932
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	739	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1442	-	562	932
Mov Cap-2 Maneuver	-	-	-	-	562	-
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	739	-
Approach	EB		WB		NB	
HCM Ctrl Dly, s/v	0		1.19		10.96	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	658	-	-	284	-	
HCM Lane V/C Ratio	0.082	-	-	0.024	-	
HCM Ctrl Dly (s/v)	11	-	-	7.6	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-	

Build PM Peak Hour
Lanes, Volumes, Timings

110: Park Avenue & Bloomfield Avenue

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1008	77	26	876	34	79	34	35	26	24	19
Future Volume (vph)	21	1008	77	26	876	34	79	34	35	26	24	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	14	14	14	14	14	14
Grade (%)		7%			-5%			6%			-3%	
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		685			746			522			331	
Travel Time (s)		18.7			20.3			14.2			9.0	
Confl. Peds. (#/hr)	6		3	3		6	4		1	1		4
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
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1164	0	0	985	0	0	156	0	0	72	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	60.0	60.0		60.0	60.0		14.0	14.0		14.0	14.0	
Minimum Split (s)	66.0	66.0		66.0	66.0		20.0	20.0		20.0	20.0	
Total Split (s)	66.0	66.0		66.0	66.0		34.0	34.0		34.0	34.0	
Total Split (%)	66.0%	66.0%		66.0%	66.0%		34.0%	34.0%		34.0%	34.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)		71.7			71.7			16.3			16.3	
Actuated g/C Ratio		0.72			0.72			0.16			0.16	
v/c Ratio		0.55			0.46			0.58			0.26	
Control Delay (s/veh)		8.1			7.1			43.1			29.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay (s/veh)		8.1			7.1			43.1			29.3	
LOS		A			A			D			C	
Approach Delay (s/veh)		8.1			7.1			43.1			29.3	
Approach LOS		A			A			D			C	
Queue Length 50th (ft)		146			113			85			31	
Queue Length 95th (ft)		247			191			141			68	
Internal Link Dist (ft)		605			666			442			251	
Turn Bay Length (ft)												
Base Capacity (vph)		2111			2157			450			471	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.55			0.46			0.35			0.15	

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	14 (14%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.58
Intersection Signal Delay (s/veh):	10.6
Intersection LOS:	B
Intersection Capacity Utilization	72.6%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 110: Park Avenue & Bloomfield Avenue



Build PM Peak Hour
HCM 7th TWSC

130: Bloomfield Avenue & Cumberland Avenue

Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	182	1103	920	45	0	0
Future Vol, veh/h	182	1103	920	45	0	0
Conflicting Peds, #/hr	4	0	0	4	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, %	-	6	-6	-	6	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	1	2	0	0	0
Mvmt Flow	194	1173	979	48	0	0
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1031	0	-	0	1981	517
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	974	-
Critical Hdwy	4.1	-	-	-	8	7.5
Critical Hdwy Stg 1	-	-	-	-	7	-
Critical Hdwy Stg 2	-	-	-	-	7	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	682	-	-	-	28	466
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	239	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	678	-	-	-	16	464
Mov Cap-2 Maneuver	-	-	-	-	16	-
Stage 1	-	-	-	-	131	-
Stage 2	-	-	-	-	239	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	5.15	0		0		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	457	-	-	-	-	
HCM Lane V/C Ratio	0.285	-	-	-	-	
HCM Ctrl Dly (s/v)	12.4	4	-	-	0	
HCM Lane LOS	B	A	-	-	A	
HCM 95th %tile Q(veh)	1.2	-	-	-	-	

Build PM Peak Hour
HCM 7th TWSC

140: Cumberland Avenue & Claremont Avenue

Intersection													
Int Delay, s/veh	7.8												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↰		↱	↰			↱		
Traffic Vol, veh/h	0	0	0	0	102	34	50	96	81	81	0	32	
Future Vol, veh/h	0	0	0	0	102	34	50	96	81	81	0	32	
Conflicting Peds, #/hr	0	0	0	0	0	7	4	0	1	1	0	4	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	-8	-	-	-6	-	-	2	-	
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82	
Heavy Vehicles, %	0	0	0	0	0	0	2	1	2	0	0	7	
Mvmt Flow	0	0	0	0	124	41	61	117	99	99	0	39	
Major/Minor	Major1			Major2			Minor1			Minor2			
Conflicting Flow All	-	-	-	-	-	-	0	128	173	1	212	152	156
Stage 1	-	-	-	-	-	-	-	0	0	-	152	152	-
Stage 2	-	-	-	-	-	-	-	128	173	-	60	0	-
Critical Hdwy	-	-	-	-	-	-	5.92	5.31	5.62	7.5	6.9	6.47	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	6.5	5.9	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	4.92	4.31	-	-	-	-	
Follow-up Hdwy	-	-	-	-	-	-	3.518	4.009	3.318	3.5	4	3.363	
Pot Cap-1 Maneuver	0	0	0	0	-	-	882	765	1084	732	731	869	
Stage 1	0	0	0	0	-	-	-	-	-	841	762	-	
Stage 2	0	0	0	0	-	-	914	803	-	-	-	-	
Platoon blocked, %						-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	842	759	1083	557	725	862	
Mov Cap-2 Maneuver	-	-	-	-	-	-	842	759	-	557	725	-	
Stage 1	-	-	-	-	-	-	-	-	-	834	756	-	
Stage 2	-	-	-	-	-	-	872	796	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Ctrl Dly, s/v				0			10.24			12.47			
HCM LOS							B			B			
Minor Lane/Major Mvmt	NBLn1 NBLn2		WBT	WBR	SBLn1								
Capacity (veh/h)	842	879	-	-	619								
HCM Lane V/C Ratio	0.072	0.246	-	-	0.223								
HCM Ctrl Dly (s/v)	9.6	10.4	-	-	12.5								
HCM Lane LOS	A	B	-	-	B								
HCM 95th %tile Q(veh)	0.2	1	-	-	0.8								

Build PM Peak Hour
HCM 7th TWSC

150: Park Avenue & Claremont Avenue

Intersection

Int Delay, s/veh 2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	108	57	11	103	45	44
Future Vol, veh/h	108	57	11	103	45	44
Conflicting Peds, #/hr	0	3	3	0	2	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, %	10	-	-	-7	3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	117	62	12	112	49	48

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	182
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	1405
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1401
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.73	10.45
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	757	-	-	174	-
HCM Lane V/C Ratio	0.128	-	-	0.009	-
HCM Ctrl Dly (s/v)	10.4	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Build PM Peak Hour
HCM 7th TWSC

1: Site Driveways & Claremont Avenue

Intersection

Int Delay, s/veh 1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	156	6	20	128	8	9
Future Vol, veh/h	156	6	20	128	8	9
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, %	10	-	-	-8	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	170	7	22	139	9	10

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	176
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	1412
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1412
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	1.03	9.96
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	744	-	-	243	-
HCM Lane V/C Ratio	0.025	-	-	0.015	-
HCM Ctrl Dly (s/v)	10	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-