TRAFFIC IMPACT STUDY

PROPOSED STARBUCKS DRIVE-THRU ONLY FACILITY

Proposed Starbucks Drive-Thru Facility
Block 6 Lots 1 & 38
Township of Lyndhurst
Bergen County, New Jersey

Prepared For:
Manzo Doren Park Ave, LLC

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INTRODUCTION

This Traffic Impact Study was prepared to investigate the potential impacts of the proposed Starbucks on the adjacent roadway network. The subject property is located between Park Avenue and Stuyvesant Avenue at the five (5)-leg intersection of Rutherford Avenue, Park Avenue, and Stuyvesant Avenue in the Township of Lyndhurst, Bergen County, New Jersey. The site location is shown on appended **Figure 1**.

The subject property is designated as Block 6, Lots 1 and 38 as depicted on the Township of Lyndhurst Tax Map. The site has approximately 336 feet of frontage along Park Avenue and approximately 212 feet of frontage along Stuyvesant Avenue. The existing site was occupied previously by a Chase Bank. Access is presently provided via two (2) full-movement driveways along Park Avenue and one (1) full-movement driveway along Stuyvesant Avenue. Under the proposed development program, the existing structures would be razed and an 863-square-foot, drive-through only Starbucks would be constructed. Access is proposed via one (1) full-movement driveway along Park Avenue and one (1) egress-only driveway along Stuyvesant Avenue.

METHODOLOGY

Stonefield Engineering & Design, LLC has prepared this Traffic Impact Study in accordance with the recommended guidelines and practices outlined by the Institute of Transportation Engineers (ITE) within Transportation Impact Analyses for Site Development. A detailed field investigation was performed to assess the existing conditions of the adjacent roadway network. A data collection effort was completed to identify the existing traffic volumes at the study intersections to serve as a base for the traffic analyses. Capacity analysis, a procedure used to estimate the traffic-carrying ability of roadway facilities over a range of defined operating conditions, was performed using the Highway Capacity Manual, 6th Edition (HCM) and the Synchro 10 Software for all study conditions to assess the roadway operations.

For an unsignalized intersection, Level of Service (LOS) A indicates operations with delay of less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 50 seconds per vehicle. For a signalized intersection, LOS A indicates operations with delay of less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 80 seconds per vehicle. The Technical Appendix contains the Highway Capacity Analysis Detail Sheets for the study intersections analyzed in this assessment. The traffic signal timing utilized within the signalized analysis is based on timing directives provided by Bergen County.

2021 EXISTING CONDITION

2021 EXISTING ROADWAY CONDITIONS

The proposed Starbucks is located between Park Avenue and Stuyvesant Avenue at the five (5)-leg intersection of Rutherford Avenue, Park Avenue, and Stuyvesant Avenue in the Township of Lyndhurst, Bergen County, New Jersey. The subject property is designated as Block 6, Lots 1 and 38 as depicted on the Township of Lyndhurst Tax Map. The site has approximately 336 feet of frontage along Park Avenue and approximately 212 feet of frontage along Stuyvesant Avenue. Land uses in the area are a mix of commercial and residential uses.

Park Avenue (Bergen County Route 30) is classified as an Urban Minor Arterial with a general east-west orientation and is under the jurisdiction of Bergen County. Along the site frontage, the roadway provides one (1) lane of travel in each direction and has a posted speed limit of 35 mph. Curbs and sidewalks are provided along both sides of the roadway, shoulders are not provided, and on-street parking is permitted intermittently on both sides of the roadway. Park Avenue provides east-west mobility within the Township of Lyndhurst and surrounding municipalities for a mix of commercial and residential uses along its length.

Rutherford Avenue (Bergen County Route S30) is classified as an Urban Minor Arterial with a general east-west orientation and is under the jurisdiction of Bergen County. In the site vicinity, the roadway provides two (2) lanes of travel the eastbound direction and has a posted speed limit of 25 mph. Curbs are provided along both sides of the roadway, shoulders are not provided, sidewalks are provided along the southerly side of the roadway and on-street parking is not permitted. Rutherford Avenue provides east-west mobility within the Township of Lyndhurst for predominately residential uses along its length.

Stuyvesant Avenue is classified as an Urban Major Collector with a general north-south orientation and is under the jurisdiction of the Township of Lyndhurst. The roadway provides one (1) lane in each direction and has a posted speed limit of 25 mph. Curb and sidewalks are provided along both sides of the roadway, shoulders are not provided, and on-street parking is permitted along the easterly side of the roadway. Stuyvesant Avenue provides north-south mobility within the Township of Lyndhurst for predominately residential uses along its length. Due to the construction on the Ridge Road Bridge, Stuyvesant Avenue is anticipated to receive a higher number of trips than usual until construction on the bridge has concluded. Park Avenue intersects Rutherford Avenue and Stuyvesant Avenue to form a signalized five (5) leg-intersection operating on a fixed 90-second background cycle. The northbound approach of Park Avenue provides one (1) exclusive through lane and one (1) shared through/right-turn lane. The southbound approach of Park Avenue provides one (1) exclusive through lane and one (1) shared right-turn lane to facilitate turning movements to Stuyvesant Avenue and Rutherford Avenue. The eastbound approach of Rutherford Avenue provides one (1) shared left-turn/through

lane, one (1) exclusive through lane, and one (1) shared right-turn lane to facilitate turning movements to Stuyvesant Avenue and Park Avenue. The westbound approach of Rutherford Avenue provides one (1) shared left-turn lane to facilitate turning movements to Stuyvesant Avenue and Park Avenue and one (1) exclusive right-turn lane. The northbound approach of Stuyvesant Avenue provides one (1) shared left-turn/through lane and one exclusive right-turn lane. Crosswalks are provided along Rutherford Avenue, Stuyvesant Avenue, and the southerly approach of Park Avenue.

2021 EXISTING TRAFFIC VOLUMES

Manual turning movement counts were collected during the typical weekday morning and weekday evening time periods to evaluate existing traffic conditions and identify the specific hours when traffic activity on the adjacent roadways is at a maximum and could be potentially impacted by the development of the site. Turning movement counts were collected at the signalized intersection of Rutherford Avenue, Park Avenue, and Stuyvesant Avenue.

Specifically, manual turning movement counts were conducted on Thursday, July 11, 2019, from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 7:00 p.m.

The study time periods were chosen as they are representative of the peak periods of both the adjacent roadway network and the proposed development. The traffic volume data was collected and analyzed to identify the design peak hour in accordance with HCM and ITE guidelines. Based on the review of the count data the weekday morning peak hour occurred from 8:00 a.m. to 9:00 a.m. and the weekday evening peak hour occurred from 5:30 p.m. to 6:30 p.m. The Technical Appendix contains a summary of the turning movement count data.

It is noted that the 2019 original traffic volume data was grown to the current year 2021, in order to represent the existing traffic volumes. In accordance with industry guidelines, the original traffic volumes at the study intersections were increased by 1.50% annually for two (2) years. The 2021 Existing weekday morning, weekday evening, and Saturday midday peak-hour volumes are summarized on appended **Figure 2**. The 1.50% background growth rate was obtained from the New Jersey Department of Transportation (NJDOT) Annual Background Growth Rate Table.

2021 EXISTING LOS/CAPACITY ANALYSIS

A Level of Service and Volume/Capacity analysis was conducted for the 2021 Existing Condition during the weekday morning and weekday evening peak hours at the study intersections. Under the existing condition, the signalized intersection of Park Avenue, Rutherford Avenue, and Stuyvesant Avenue is calculated to operate at overall Level of Service E during the weekday morning peak hour and Level of Service C during the weekday evening peak hour. The eastbound through movement of Rutherford Avenue and the north westbound

approach of Stuyvesant Avenue is calculated to exceed capacity during weekday morning peak hour. The Ridge Road Bridge crossing of Route 3 was under construction at the time that counts were conducted. Due to the closure of the Ridge Road Bridge the observed volumes are expected to be higher than usual given that the Park Avenue, Ridge Road, and Orient Way bridges are the only bridges crossing Route 3 between Route 21 and Route 17.

2023 NO-BUILD CONDITION

BACKGROUND GROWTH

The 2021 Existing Condition traffic volume data was grown to a future horizon year of 2023, which is a conservative estimate for when the proposed development is expected to be fully constructed. In accordance with industry guidelines, the existing traffic volumes at the study intersections were increased by 1.50% annually for two (2) years. The 1.50% background growth rate was obtained from the NJDOT Annual Background Growth Rate Table.

OTHER PLANNED DEVELOPMENT PROJECTS

To evaluate the future traffic conditions, it is important to consider the potential site-generated traffic of other projects that could influence the traffic volume at the study intersections. Other planned development projects include those that are either in the entitlement process or have recently been approved for building permits in proximity to the proposed development. Based on consultations with the Building Department for the Township of Lyndhurst, and the Building Department for the Borough of Rutherford, there are no planned development projects within the area of the subject site. As such, the application of the background growth rate would be adequate to account for background traffic growth.

2023 NO-BUILD TRAFFIC VOLUMES

The background growth rate was applied to the 2021 Existing Traffic Volumes to calculate the 2023 No-Build Traffic Volumes for the weekday morning and weekday evening peak hours. These volumes are summarized on appended **Figure 3**.

2023 NO-BUILD LOS/CAPACITY ANALYSIS

A Level of Service and Volume/Capacity analysis was also conducted for the 2023 No-Build Condition during the weekday morning and weekday evening peak hours at the study intersection. The signalized intersection of Park Avenue, Rutherford Avenue, and Stuyvesant Avenue is calculated to operate generally consistent with the findings of the Existing Condition during the weekday morning and weekday evening peak hours.

2023 BUILD CONDITION

The site-generated traffic volume of the proposed Starbucks development was estimated to identify the potential impacts of the project. For the purpose of this analysis, a complete project "build out" is assumed within two (2) years of the preparation of this study.

TRIP GENERATION

Trip generation projections for the proposed drive-through only Starbucks were prepared utilizing count data from an existing drive-through only Starbucks located at 121 Franklin Avenue, Ridgewood, New Jersey. The study site was selected based on its similarity to the proposed development; size of the Starbucks building, configuration of drive-through service, and parking lot are generally consistent with the proposed development. Manual counts and observations were performed at the existing Starbucks site between 6:30 a.m. and 10:00 a.m. on the following four (4) days:

- Wednesday, October 4, 2017
- Thursday, October 5, 2017
- Tuesday, November 14, 2017
- Wednesday, November 29, 2017

The Technical Appendix contains a summary of the trip generation count data.

It should be noted that counts were only performed during the weekday morning peak hour. In order to establish weekday evening peak hour trip generation projections, data from ITE's Trip Generation Manual, 10th Edition was utilized. Weekday morning and weekday evening trip generation rates associated with Land Use 937 "Coffee/Donut Shop with Drive-Through Window" were compared, and it was found that the weekday evening trip generation rates are approximately 51% lower than the weekday morning trip generation rates. As such, the weekday evening peak hour trip generation was assumed to be 51% less than the observed weekday morning peak hour trip generation. **Table 1** provides the average observed weekday morning and weekday evening peak hour trip generation volumes at the existing site.

TABLE 1 – PRJECTED TRIP GENERATION

	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
Land Use	**Enter**	**Exit**	**Total**	**Enter**	**Exit**	**Total**
Starbucks w/ only DT *121 Franklin Ave, Ridgewood, NJ*	93	93	186	46	46	92

As stated within Chapter 10 of ITE's Trip Generation Handbook, 3rd Edition, there are instances when the total number of trips generated by a site is different from the amount of new traffic added to the street system by the generator. Coffee shops are specifically located on or adjacent to busy streets to attract motorists already on the roadway. Therefore, the proposed Starbucks development would be expected to attract a portion of its trips from the traffic passing the site on the way from an origin to an ultimate destination. These trips do not add new traffic to the adjacent roadway system and are referred to as pass-by trips.

Based upon the published NJDOT data for Land Use 937 "Coffee/Donut Shop with Drive-Through," 63% of the site-generated traffic during the weekday morning peak hour and 66% during the weekday evening peak hour is comprised of pass-by traffic. **Table 2** shows the additional site generated traffic for the proposed development.

TABLE 2 – PROPOSED TRIP GENERATION – NEW & PASS-BY TRIPS

	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
Land Use	**Enter**	**Exit**	**Total**	**Enter**	**Exit**	**Total**
"New" Trips	34	34	68	16	16	32
"Pass-By" Trips	59	59	118	30	30	60
Total	**93**	**93**	**186**	**46**	**46**	**92**

At the site driveways, the calculated number of pass-by trips is shown as a negative number at the through movement as the vehicles are temporarily diverted from the through travel stream into and out of the site access point.

TRIP ASSIGNMENT/DISTRIBUTION

The trips generated by the proposed development were distributed according to the existing travel pattern along the adjacent roadways and the access management plan of the site. The "New" Site-Generated Traffic Volumes are illustrated on **Figure 4** and the "Pass-By" Site-Generated Traffic Volumes expected to access the site are depicted on **Figure 5**.

2023 BUILD TRAFFIC VOLUMES

The site-generated trips were added to the 2023 No-Build Traffic Volumes to calculate the 2023 Build Traffic Volumes and are shown on appended **Figure 6**.

2023 BUILD LOS/CAPACITY ANALYSIS

A Level of Service and Volume/Capacity analysis was also conducted for the 2023 Build Condition during the weekday morning and weekday evening peak hours at the study intersection and proposed site driveways.

Tables 3 through **6** compare the Existing, No-Build, and Build Conditions Level of Service and delay values. The signalized intersection of Park Avenue, Rutherford Avenue, and Stuyvesant Avenue is calculated to operate generally consistent with the findings of the No-Build Condition during the weekday morning and weekday evening peak hours. The unsignalized intersection of Park Avenue and the proposed site driveway is calculated to operate at a Level of Service B or better during the study periods. The unsignalized intersection of Stuyvesant Avenue and the proposed site driveway is calculated to operate at a Level of Service B during the study periods. It is again noted the Ridge Road Bridge crossing of Route 3 was under construction at the time that counts were conducted. Due to the closure of the Ridge Road Bridge the observed volumes are expected to be higher than usual given that the Park Avenue, Ridge Road, and Orient Way bridges are the only bridges crossing Route 3 between Route 21 and Route 17.

COMPARATIVE LEVEL OF SERVICE (DELAY) TABLES

PARK AVENUE AND RUTHERFORD AVENUE AND STUYVESANT AVENUE
EB (Eastbound) and WB (Westbound) approaches are the Rutherford Avenue approaches
NB (Northbound) and SB (Southbound) approaches are the Park Avenue approaches
NWB (North Westbound) approach is the Stuyvesant Avenue approach
X (n) = Level of Service (seconds of delay)

TABLE 3 – WEEKDAY MORNING PEAK HOUR

Lane Group	2021 Existing	2023 No-Build	2023 Build
EB Left	C (25.9)	C (26.1)	C (26.1)
EB Through	F (105.5)	F (118.0)	F (108.7)
EB Right	C (25.7)	C (26.0)	C (27.2)
WB Left	D (43.1)	D (45.1)	E (55.8)
WB Right	C (31.4)	C (31.5)	C (31.5)
NB Through/Right	C (22.0)	C (22.2)	C (22.5)
SB Left	C (28.0)	C (29.5)	C (30.8)
SB Through	B (18.6)	B (18.7)	B (18.7)
NWB Right	F (209.1)	F (225.0)	F (241.3)
NWB Hard Right	D (46.1)	D (47.4)	D (52.4)
Intersection	**E (61.5)**	**E (66.4)**	**E (65.0)**

TABLE 4 – WEEKDAY EVENING PEAK HOUR

Lane Group	2021 Existing	2023 No-Build	2023 Build
EB Left	C (26.4)	C (26.0)	C (25.4)
EB Through	C (23.9)	C (23.5)	C (22.9)
EB Right	C (32.5)	C (32.2)	C (32.1)
WB Left	C (29.3)	C (28.8)	C (28.3)
WB Right	C (33.0)	C (32.4)	C (31.4)
NB Through/Right	C (30.8)	C (32.0)	C (32.8)
SB Left	D (43.8)	D (49.3)	D (52.7)
SB Through	C (31.9)	C (33.4)	C (34.2)
NWB Left	C (31.8)	C (31.7)	D (31.1)
NWB Right	C (28.8)	C (28.5)	C (28.5)
Intersection	**C (30.6)**	**C (30.9)**	**C (30.9)**

PARK AVENUE & SITE DRIVEWAY

NB (Northbound) and SB (Southbound) approaches are the Park Avenue approaches
WB (Westbound) approach is the site driveway approach
X (n) = Level of Service (seconds of delay)

TABLE 5 – 2023 BUILD CONDITION

Lane Group	Weekday Morning Peak Hour	Weekday Evening Peak Hour
WB Left/Right	B (14.5)	B (11.3)
SB Left	A (2.5)	A (1.0)

STUYVESANT AVENUE & SITE DRIVEWAY

EB (Eastbound) and WB (Westbound) approaches are the Stuyvesant Avenue approaches
NB (Northbound) approach is the site driveway approach
X (n) = Level of Service (seconds of delay)

TABLE 6 – 2023 BUILD CONDITION

Lane Group	Weekday Morning Peak Hour	Weekday Evening Peak Hour
NB Left/Right	B (11.1)	B (12.7)

SITE CIRCULATION/PARKING SUPPLY

A review was conducted of the proposed drive-through only Starbucks using the Site Plan prepared by Stonefield, dated February 24, 2021. In completing this review, particular attention was focused on the site access, circulation, and parking supply.

Access is proposed via one (1) full-movement driveway along Park Avenue and one (1) egress-only driveway along Stuyvesant Avenue. The proposed Starbucks would be located in the central western portion of the site. A patio area would be located to the east of the building and would provide outdoor seating.

The drive-through lane would begin in the southwesterly portion of the development, along Stuyvesant Avenue and circulate counterclockwise around the site. The queue for the drive-through lane would provide storage for 10 vehicles on site. It should be noted that queue length data was also collected at the existing drive through only Starbucks located at 121 Franklin Avenue, Ridgewood, New Jersey. Queue length data was collected on the same days and during the same times as the trip generation data. The Technical Appendix contains a summary of the queue length data. It was found that the average queue length was approximately three (3) vehicles and the 95th percentile queue length across all the days of collection was nine (9) vehicles. As such, the proposed queue with storage for 11 vehicles would be sufficient.

Additionally, based on ITE's Transportation Land Development, 2nd Edition, the vehicle stacking length of a drive-through facility should be adequate to support an average of four (4) vehicles prior to the order point and four (4) vehicles between the order point and the pickup window. The proposed drive-through would provide stacking for five (5) vehicles prior to the order menu and five (5) vehicles between the order menus and pick-up window. As such, the proposed stacking length and drive-through have been designed in accordance with industry standards and would be sufficient to support the anticipated demand.

Regarding the parking requirements for the proposed development, the Township of Lyndhurst requires one (1) space per three (3) seats. For the proposed development with 24 outdoor seats, this equates to eight (8) required spaces. The site would provide 11 total parking spaces, inclusive of one (1) ADA-accessible parking spaces, which meets the parking requirement and would be sufficient to support this project's parking demand. The spaces would be nine (9) feet wide by 18 feet deep in accordance with industry standards.

CONCLUSIONS

This report was prepared to examine the potential traffic impact of the proposed drive-through only Starbucks. The analysis findings, which have been based on industry-standard guidelines, indicate that the proposed development would not have a significant impact on the traffic operations of the adjacent roadway network. The site driveways and on-site layout have been designed to provide for effective access to and from the subject property. The queue length for the drive-through would be sufficient to accommodate the anticipated demand. Based on the site being a drive-through only facility, the parking supply would be sufficient to support this project.

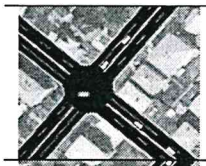
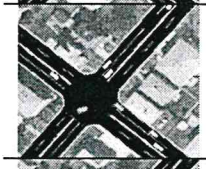
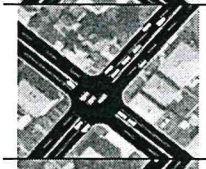
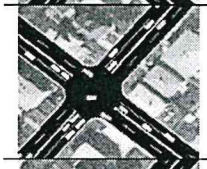
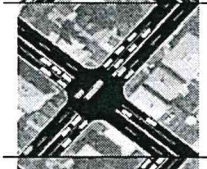
TECHNICAL APPENDIX

LEVEL OF SERVICE/AVERAGE CONTROL DELAY CRITERIA

LEVEL OF SERVICE /AVERAGE CONTROL DELAY CRITERIA

The ability of a roadway to effectively accommodate traffic demand is determined through an assessment of the volume-to-capacity ratio, delay and Level of Service of the lane group and/or intersection. The volume-to-capacity ratio is the ratio of traffic flow rate to capacity for a given transportation facility. As defined within the Highway Capacity Manual, 6th Edition (HCM), intersection delay is the total additional travel time experienced by drivers, passengers, or pedestrians as a result of control measures and interaction with other users of the facility, divided by the volume departing from the corresponding cross section of the facility. Level of service is a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience.

For an unsignalized intersection, LOS A indicates operations with delay less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 50 seconds per vehicle. For a signalized intersection, LOS A indicates operations with delay less than 10 seconds per vehicle and LOS F denotes operations with delay in excess of 80 seconds per vehicle.

	Level Of Service (LOS)	Signalized Delay Range (average control delay in sec/veh)	Unsignalized Delay Range (average control delay in sec/veh)
	A	<=10	<=10
	B	>10 and <=20	>10 and <=15
	C	>20 and <=35	>15 and <=25
	D	>35 and <=55	>25 and <=35
	E	>55 and <=80	>35 and <=50
	F	>80	>50

Source: Highway Capacity Manual, 6th Edition

TURNING MOVEMENT COUNT DATA

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Intersection of Rutherford Avenue(E/W)
and Park Avenue (N/S) and Stuyvesant Ave
Lyndhurst, Bergen, New Jersey
Thursday, July 11, 2019

File Name : S-19128.01
Site Code : 00019128
Start Date : 7/11/2019
Page No : 1

Groups Printed- Auto - HV - B/SB

	Rutherford Avenue Eastbound					Rutherford Avenue Westbound					Park Avenue Northbound					Park Avenue Southbound					Stuyvesant Avenue Northwestbound					
Start Time	Left 2	Thru	Right	Right 2	App. Total	Left 2	Left	Thru	Right	App. Total	Left	Thru	Right	Right 2	App. Total	Left 2	Left	Thru	Right	App. Total	Left 2	Thru	Right	Right 2	App. Total	Int. Total
07:00 AM	33	71	39	14	157	2	6	0	31	39	1	30	70	0	101	10	11	10	0	31	0	42	21	0	63	391
07:15 AM	42	112	33	10	197	2	3	0	34	39	0	40	74	0	114	15	14	15	0	44	0	41	26	0	67	461
07:30 AM	58	150	41	10	259	4	5	0	29	38	0	18	94	0	112	20	9	5	0	34	0	32	28	0	60	503
07:45 AM	71	156	38	11	276	4	8	0	31	43	0	43	103	0	146	19	3	15	0	37	0	34	23	0	57	559
Total	204	489	151	45	889	12	22	0	125	159	1	131	341	0	473	64	37	45	0	146	0	149	98	0	247	1914
08:00 AM	62	173	41	12	288	2	7	0	41	50	0	29	99	0	128	21	9	20	0	50	0	44	18	0	62	578
08:15 AM	58	144	47	16	265	2	8	0	42	52	0	44	95	0	139	18	9	14	0	41	1	48	27	0	76	573
08:30 AM	73	145	42	10	270	1	14	0	33	48	0	31	74	0	105	22	18	21	0	61	1	52	25	0	78	562
08:45 AM	69	142	54	21	286	4	9	0	27	40	0	52	82	0	134	25	22	26	0	73	0	35	17	0	52	585
Total	262	604	184	59	1109	9	38	0	143	190	0	156	350	0	506	86	58	81	0	225	2	179	87	0	268	2298
04:00 PM	63	60	54	17	194	6	11	0	43	60	0	32	31	0	63	14	25	29	0	68	0	30	14	0	44	429
04:15 PM	70	63	63	22	218	1	4	0	58	63	0	25	25	0	50	10	30	26	0	66	0	38	14	0	52	449
04:30 PM	57	88	71	25	241	1	16	0	66	83	0	34	21	0	55	12	19	40	0	71	0	27	10	0	37	487
04:45 PM	63	70	98	10	241	5	15	0	49	69	1	32	32	0	65	16	26	29	1	72	0	45	11	0	56	503
Total	253	281	286	74	894	13	46	0	216	275	1	123	109	0	233	52	100	124	1	277	0	140	49	0	189	1868
05:00 PM	71	72	56	25	224	0	21	0	51	72	0	29	26	0	55	12	24	32	1	69	0	40	15	0	55	475
05:15 PM	67	63	91	24	245	1	16	0	46	63	0	36	35	0	71	9	24	34	0	67	0	38	15	0	53	499
05:30 PM	96	85	75	16	272	6	20	0	68	94	0	31	24	0	55	13	22	29	0	64	0	50	12	0	62	547
05:45 PM	92	73	75	25	265	7	28	0	71	106	0	23	29	0	52	13	18	36	0	67	0	44	10	0	54	544
Total	326	293	297	90	1006	14	85	0	236	335	0	119	114	0	233	47	88	131	1	267	0	172	52	0	224	2065
06:00 PM	89	78	68	29	264	4	20	0	49	73	0	21	21	0	42	16	21	29	0	66	0	44	18	0	62	507
06:15 PM	95	72	92	25	284	6	15	0	51	72	0	32	17	0	49	17	31	25	0	73	0	54	13	0	67	545
06:30 PM	111	97	72	29	309	1	16	0	61	78	0	18	25	0	43	15	18	21	0	54	0	33	6	0	39	523
06:45 PM	58	69	49	28	204	3	18	0	57	78	0	28	27	0	55	14	22	26	0	62	0	40	12	0	52	451
Total	353	316	281	111	1061	14	69	0	218	301	0	99	90	0	189	62	92	101	0	255	0	171	49	0	220	2026
Grand Total	1398	1983	1199	379	4959	62	260	0	938	1260	2	628	1004	0	1634	311	375	482	2	1170	2	811	335	0	1148	10171
Apprch %	28.2	40	24.2	7.6		4.9	20.6	0	74.4		0.1	38.4	61.4	0		26.6	32.1	41.2	0.2		0.2	70.6	29.2	0		
Total %	13.7	19.5	11.8	3.7	48.8	0.6	2.6	0	9.2	12.4	0	6.2	9.9	0	16.1	3.1	3.7	4.7	0	11.5	0	8	3.3	0	11.3	
Auto	1398	1913	1199	379	4889	62	239	0	919	1220	0	622	977	0	1599	311	374	473	0	1158	2	811	335	0	1148	10014
% Auto	100	96.5	100	100	98.6	100	91.9	0	98	96.8	0	99	97.3	0	97.9	100	99.7	98.1	0	99	100	100	100	0	100	98.5
HV	0	55	0	0	55	0	3	0	16	19	2	6	7	0	15	0	0	9	2	11	0	0	0	0	0	100
% HV	0	2.8	0	0	1.1	0	1.2	0	1.7	1.5	100	1	0.7	0	0.9	0	0	1.9	100	0.9	0	0	0	0	0	1
B/SB	0	15	0	0	15	0	18	0	3	21	0	0	20	0	20	0	1	0	0	1	0	0	0	0	0	57
% B/SB	0	0.8	0	0	0.3	0	6.9	0	0.3	1.7	0	0	2	0	1.2	0	0.3	0	0	0.1	0	0	0	0	0	0.6

Stonefield Engineering & Design, LLC

92 Park Avenue, Rutherford, NJ 07070

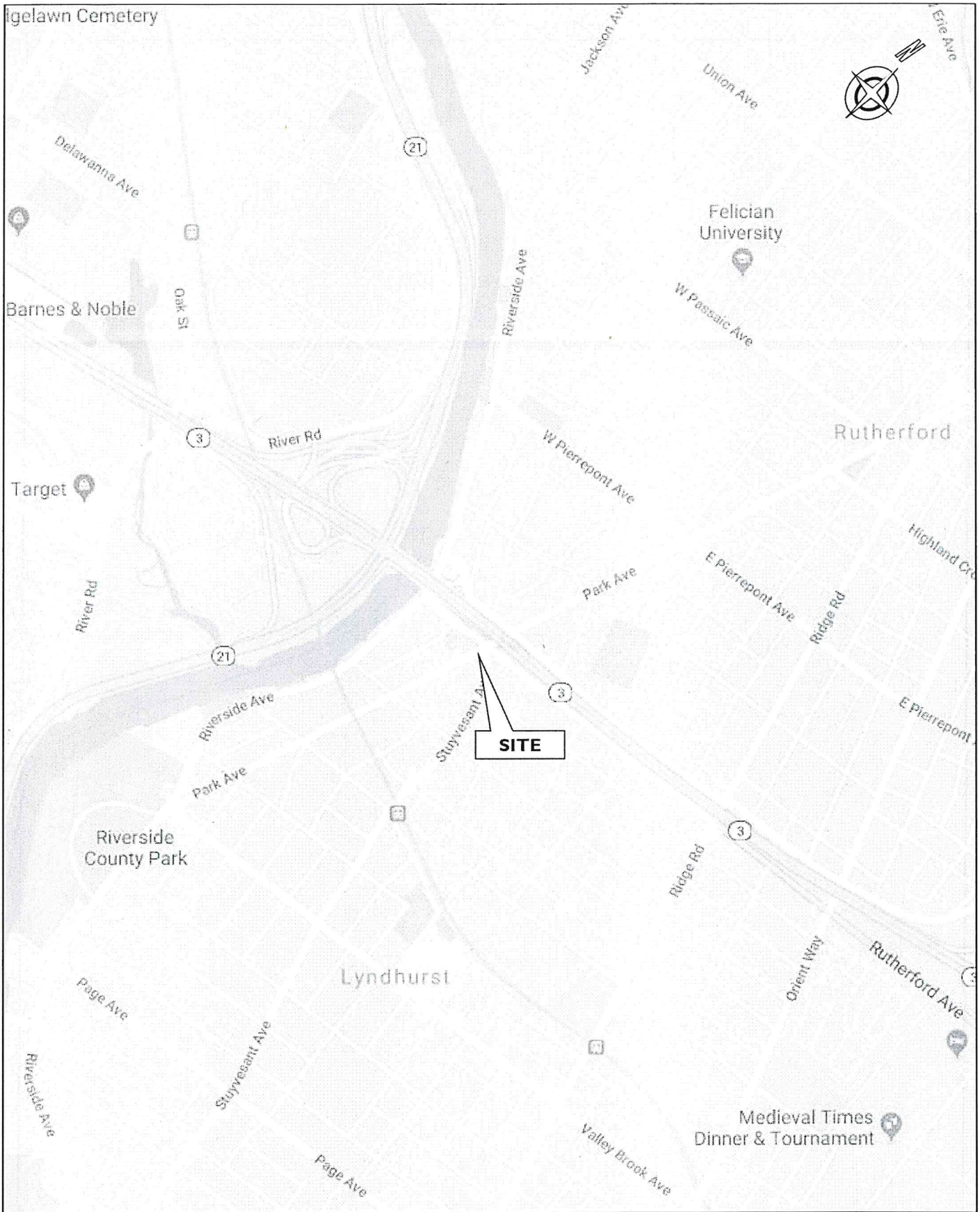
201.340.4468 t. 201.340.4472 f.

Intersection of Rutherford Avenue(E/W)
and Park Avenue (N/S) and Stuyvesant Ave
Lyndhurst, Bergen, New Jersey
Thursday, July 11, 2019

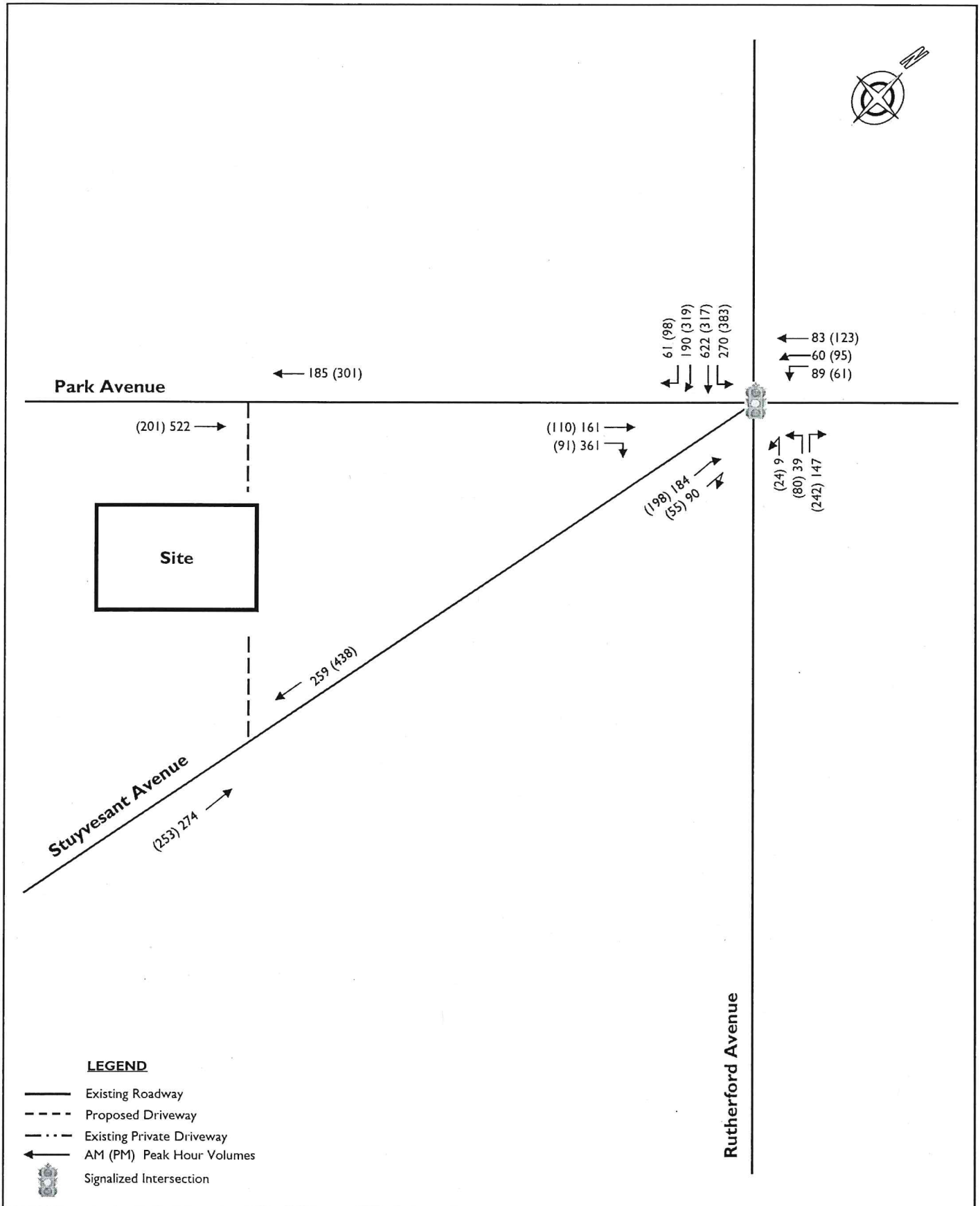
File Name : S-19128.01
Site Code : 00019128
Start Date : 7/11/2019
Page No : 2

	Rutherford Avenue Eastbound					Rutherford Avenue Westbound					Park Avenue Northbound					Park Avenue Southbound					Stuyvesant Avenue Northwestbound					
Start Time	Left 2	Thru	Right	Right 2	App. Total	Left 2	Left	Thru	Right	App. Total	Left	Thru	Right	Right 2	App. Total	Left 2	Left	Thru	Right	App. Total	Left 2	Thru	Right	Right 2	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 08:00 AM																										
08:00 AM	62	173	41	12	288	2	7	0	41	50	0	29	99	0	128	21	9	20	0	50	0	44	18	0	62	578
08:15 AM	58	144	47	16	265	2	8	0	42	52	0	44	95	0	139	18	9	14	0	41	1	48	27	0	76	573
08:30 AM	73	145	42	10	270	1	14	0	33	48	0	31	74	0	105	22	18	21	0	61	1	52	25	0	78	562
08:45 AM	69	142	54	21	286	4	9	0	27	40	0	52	82	0	134	25	22	26	0	73	0	35	17	0	52	585
Total Volume	262	604	184	59	1109	9	38	0	143	190	0	156	350	0	506	86	58	81	0	225	2	179	87	0	268	2298
% App. Total	23.6	54.5	16.6	5.3		4.7	20	0	75.3		0	30.8	69.2	0		38.2	25.8	36	0		0.7	66.8	32.5	0		
PHF	.897	.873	.852	.702	.963	.563	.679	.000	.851	.913	.000	.750	.884	.000	.910	.860	.659	.779	.000	.771	.500	.861	.806	.000	.859	.982
Auto	262	579	184	59	1084	9	34	0	137	180	0	155	344	0	499	86	58	80	0	224	2	179	87	0	268	2255
% Auto	100	95.9	100	100	97.7	100	89.5	0	95.8	94.7	0	99.4	98.3	0	98.6	100	100	98.8	0	99.6	100	100	100	0	100	98.1
HV	0	23	0	0	23	0	0	0	6	6	0	1	1	0	2	0	0	1	0	1	0	0	0	0	0	32
% HV	0	3.8	0	0	2.1	0	0	0	4.2	3.2	0	0.6	0.3	0	0.4	0	0	1.2	0	0.4	0	0	0	0	0	1.4
B/SB	0	2	0	0	2	0	4	0	0	4	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	11
% B/SB	0	0.3	0	0	0.2	0	10.5	0	0	2.1	0	0	1.4	0	1.0	0	0	0	0	0	0	0	0	0	0	0.5
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 05:30 PM																										
05:30 PM	96	85	75	16	272	6	20	0	68	94	0	31	24	0	55	13	22	29	0	64	0	50	12	0	62	547
05:45 PM	92	73	75	25	265	7	28	0	71	106	0	23	29	0	52	13	18	36	0	67	0	44	10	0	54	544
06:00 PM	89	78	68	29	264	4	20	0	49	73	0	21	21	0	42	16	21	29	0	66	0	44	18	0	62	507
06:15 PM	95	72	92	25	284	6	15	0	51	72	0	32	17	0	49	17	31	25	0	73	0	54	13	0	67	545
Total Volume	372	308	310	95	1085	23	83	0	239	345	0	107	91	0	198	59	92	119	0	270	0	192	53	0	245	2143
% App. Total	34.3	28.4	28.6	8.8		6.7	24.1	0	69.3		0	54	46	0		21.9	34.1	44.1	0		0	78.4	21.6	0		
PHF	.969	.906	.842	.819	.955	.821	.741	.000	.842	.814	.000	.836	.784	.000	.900	.868	.742	.826	.000	.925	.000	.889	.736	.000	.914	.979
Auto	372	299	310	95	1076	23	78	0	235	336	0	107	88	0	195	59	92	119	0	270	0	192	53	0	245	2122
% Auto	100	97.1	100	100	99.2	100	94.0	0	98.3	97.4	0	100	96.7	0	98.5	100	100	100	0	100	0	100	100	0	100	99.0
HV	0	7	0	0	7	0	0	0	3	3	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	11
% HV	0	2.3	0	0	0.6	0	0	0	1.3	0.9	0	0	1.1	0	0.5	0	0	0	0	0	0	0	0	0	0	0.5
B/SB	0	2	0	0	2	0	5	0	1	6	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	10
% B/SB	0	0.6	0	0	0.2	0	6.0	0	0.4	1.7	0	0	2.2	0	1.0	0	0	0	0	0	0	0	0	0	0	0.5

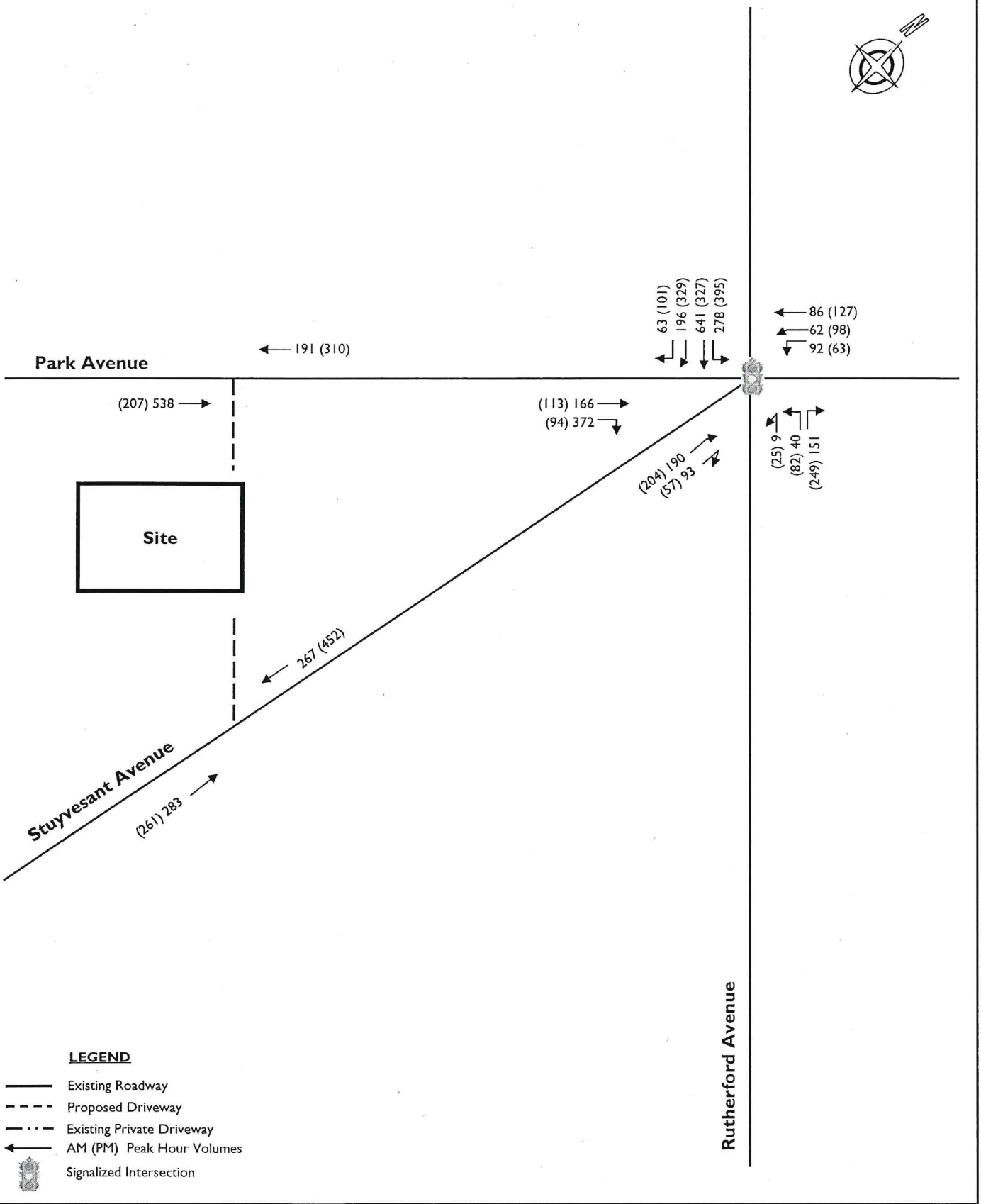
FIGURES



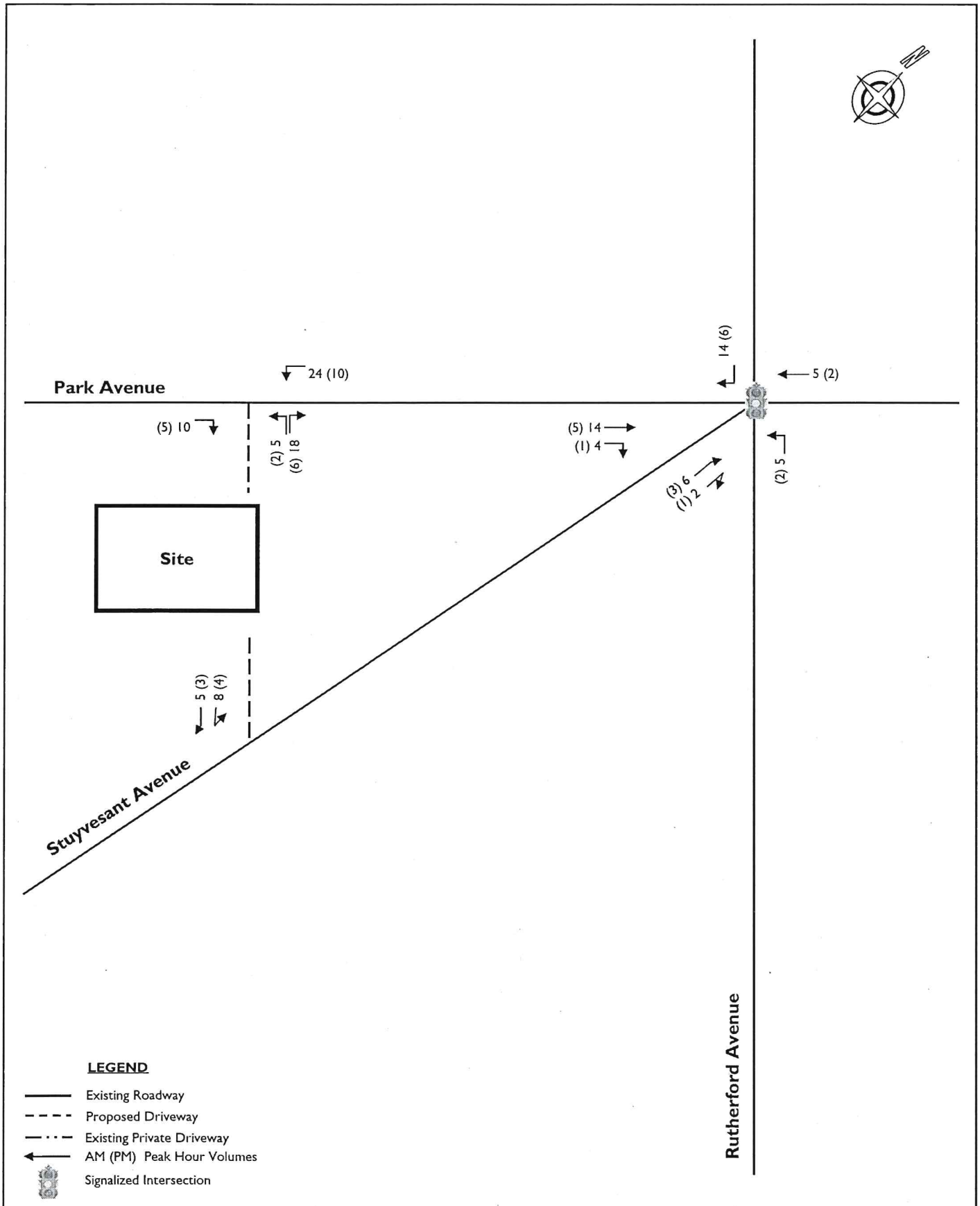
STONEFIELD	**Proposed Starbucks Drive-Thru Only Facility** **1 Stuyvesant Avenue** **Township of Lyndhurst, Bergen County, New Jersey** **Traffic Impact Study**	**FIGURE 1** **Site Location Map**



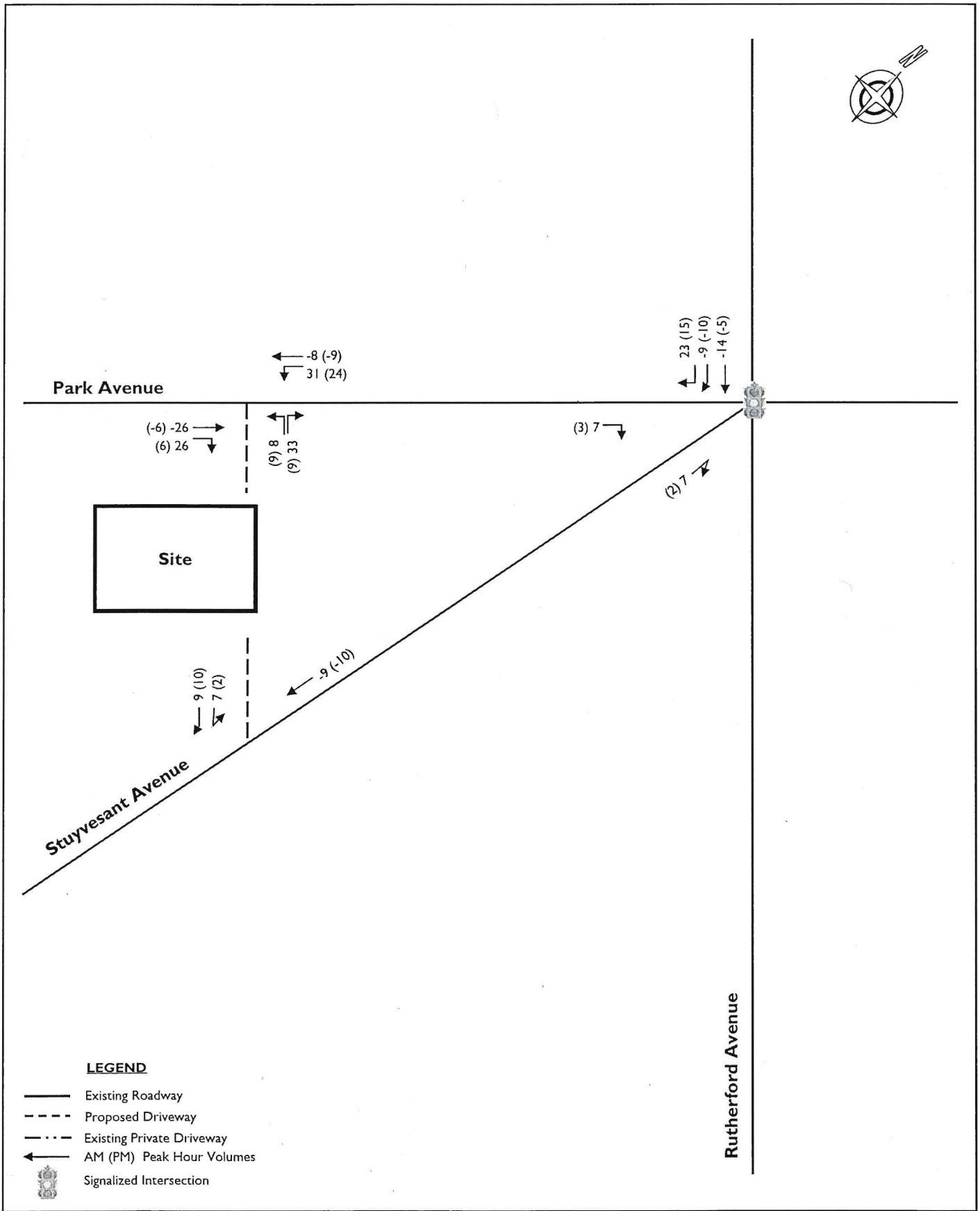
STONEFIELD	Proposed Starbucks Drive-Thru Only Facility 1 Stuyvesant Avenue Township of Lyndhurst, Bergen County, New Jersey Traffic Impact Study	FIGURE 2 2021 Existing Traffic Volumes



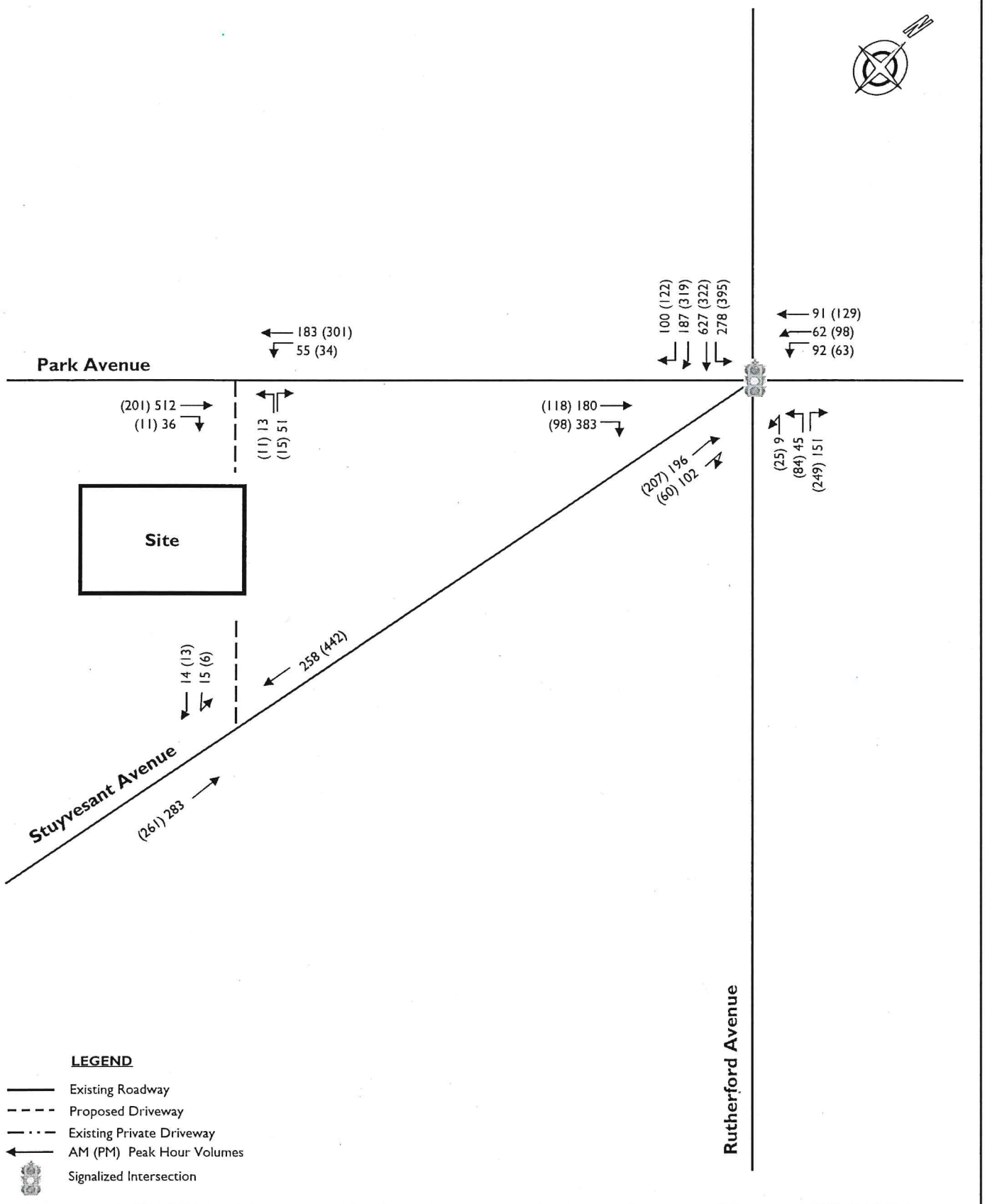
STONEFIELD	Proposed Starbucks Drive-Thru Only Facility 1 Stuyvesant Avenue Township of Lyndhurst, Bergen County, New Jersey Traffic Impact Study	FIGURE 3 2023 No-Build Traffic Volumes



STONEFIELD	Proposed Starbucks Drive-Thru Only Facility 1 Stuyvesant Avenue Township of Lyndhurst, Bergen County, New Jersey Traffic Impact Study	FIGURE 4 "New" Site-Generated Traffic Volumes



STONEFIELD	Proposed Starbucks Drive-Thru Only Facility 1 Stuyvesant Avenue Township of Lyndhurst, Bergen County, New Jersey Traffic Impact Study	FIGURE 5 "Pass-By" Site-Generated Traffic Volumes



STONEFIELD	Proposed Starbucks Drive-Thru Only Facility 1 Stuyvesant Avenue Township of Lyndhurst, Bergen County, New Jersey Traffic Impact Study	FIGURE 6 2023 Build Traffic Volumes

TRIP GENERATION COUNT DATA

STONEFIELD

Trip Generation
121 Franklin Avenue, Ridgewood, NJ

Wed, 10/4/2017

Time	Cars Through	Peak Hour Trip Generation
6:30 AM	--	33
6:35 AM	3	37
6:40 AM	3	38
6:45 AM	0	37
6:50 AM	4	38
6:55 AM	4	39
7:00 AM	3	38
7:05 AM	3	40
7:10 AM	2	40
7:15 AM	6	44
7:20 AM	3	50
7:25 AM	2	52
7:30 AM	4	57
7:35 AM	4	57
7:40 AM	2	59
7:45 AM	1	66
7:50 AM	5	74
7:55 AM	3	77
8:00 AM	5	78
8:05 AM	3	80
8:10 AM	6	89
8:15 AM	12	94
8:20 AM	5	90
8:25 AM	7	90
8:30 AM	4	92
8:35 AM	6	96
8:40 AM	9	92
8:45 AM	9	92
8:50 AM	8	89
8:55 AM	4	83
9:00 AM	7	83
9:05 AM	12	81
9:10 AM	11	--
9:15 AM	8	--
9:20 AM	5	--
9:25 AM	9	--
9:30 AM	8	--
9:35 AM	2	--
9:40 AM	9	--
9:45 AM	6	--
9:50 AM	2	--
9:55 AM	4	--
10:00 AM	5	--
Total	218	
Peak Hour Total	8:35 AM	96

Thurs, 10/5/2017

Time	Cars Through	Peak Hour Trip Generation
6:30 AM	--	31
6:35 AM	0	36
6:40 AM	2	40
6:45 AM	3	43
6:50 AM	4	46
6:55 AM	2	54
7:00 AM	3	56
7:05 AM	3	57
7:10 AM	4	59
7:15 AM	4	70
7:20 AM	3	69
7:25 AM	3	67
7:30 AM	5	71
7:35 AM	4	73
7:40 AM	5	74
7:45 AM	6	74
7:50 AM	12	76
7:55 AM	4	72
8:00 AM	4	75
8:05 AM	5	78
8:10 AM	15	78
8:15 AM	3	71
8:20 AM	1	73
8:25 AM	7	78
8:30 AM	7	75
8:35 AM	5	76
8:40 AM	5	78
8:45 AM	8	77
8:50 AM	8	73
8:55 AM	7	70
9:00 AM	7	69
9:05 AM	5	69
9:10 AM	8	--
9:15 AM	5	--
9:20 AM	6	--
9:25 AM	4	--
9:30 AM	8	--
9:35 AM	7	--
9:40 AM	4	--
9:45 AM	4	--
9:50 AM	5	--
9:55 AM	6	--
10:00 AM	2	--
Total	213	
Peak Hour Total	8:10 AM	78

STONEFIELD

Trip Generation
121 Franklin Avenue, Ridgewood, NJ

Tues, 11/14/17

Time	Cars Through	Peak Hour Trip Generation
6:30 AM	--	35
6:35 AM	2	39
6:40 AM	2	42
6:45 AM	1	43
6:50 AM	7	48
6:55 AM	2	49
7:00 AM	1	56
7:05 AM	5	61
7:10 AM	2	61
7:15 AM	3	69
7:20 AM	5	74
7:25 AM	5	74
7:30 AM	4	73
7:35 AM	5	73
7:40 AM	3	73
7:45 AM	6	80
7:50 AM	8	83
7:55 AM	9	85
8:00 AM	6	83
8:05 AM	5	81
8:10 AM	10	83
8:15 AM	8	80
8:20 AM	5	77
8:25 AM	4	81
8:30 AM	4	82
8:35 AM	5	81
8:40 AM	10	80
8:45 AM	9	73
8:50 AM	10	66
8:55 AM	7	59
9:00 AM	4	57
9:05 AM	7	58
9:10 AM	7	--
9:15 AM	5	--
9:20 AM	9	--
9:25 AM	5	--
9:30 AM	3	--
9:35 AM	4	--
9:40 AM	3	--
9:45 AM	2	--
9:50 AM	3	--
9:55 AM	5	--
10:00 AM	5	--
Total	215	
Peak Hour Total	7:55 AM	85

Wed, 11/29/17

Time	Cars Through	Peak Hour Trip Generation
6:30 AM	--	31
6:35 AM	3	36
6:40 AM	4	40
6:45 AM	2	42
6:50 AM	3	46
6:55 AM	0	49
7:00 AM	3	53
7:05 AM	3	61
7:10 AM	6	65
7:15 AM	3	68
7:20 AM	3	75
7:25 AM	1	79
7:30 AM	5	87
7:35 AM	7	88
7:40 AM	6	89
7:45 AM	6	90
7:50 AM	6	98
7:55 AM	4	98
8:00 AM	11	106
8:05 AM	7	106
8:10 AM	9	110
8:15 AM	10	110
8:20 AM	7	109
8:25 AM	9	112
8:30 AM	6	108
8:35 AM	8	108
8:40 AM	7	105
8:45 AM	14	99
8:50 AM	6	92
8:55 AM	12	92
9:00 AM	11	85
9:05 AM	11	78
9:10 AM	9	--
9:15 AM	9	--
9:20 AM	10	--
9:25 AM	5	--
9:30 AM	6	--
9:35 AM	5	--
9:40 AM	1	--
9:45 AM	7	--
9:50 AM	6	--
9:55 AM	5	--
10:00 AM	4	--
Total	260	
Peak Hour Total	8:25 AM	112

QUEUE LENGTH DATA

STONEFIELD

Queue Lengths
121 Franklin Avenue, Ridgewood, NJ

Wed, 10/4/2017

Time	Stack
6:30 AM	0
6:35 AM	0
6:40 AM	1
6:45 AM	0
6:50 AM	2
6:55 AM	2
7:00 AM	2
7:05 AM	1
7:10 AM	1
7:15 AM	4
7:20 AM	0
7:25 AM	0
7:30 AM	2
7:35 AM	2
7:40 AM	0
7:45 AM	0
7:50 AM	2
7:55 AM	3
8:00 AM	4
8:05 AM	1
8:10 AM	3
8:15 AM	9
8:20 AM	9
8:25 AM	6
8:30 AM	9
8:35 AM	5
8:40 AM	5
8:45 AM	10
8:50 AM	11
8:55 AM	5
9:00 AM	7
9:05 AM	9
9:10 AM	8
9:15 AM	9
9:20 AM	6
9:25 AM	9
9:30 AM	11
9:35 AM	4
9:40 AM	5
9:45 AM	4
9:50 AM	2
9:55 AM	1
10:00 AM	0
Average	4
95th percentile	9.9

Thurs, 10/5/2017

Time	Stack
6:30 AM	0
6:35 AM	0
6:40 AM	0
6:45 AM	0
6:50 AM	2
6:55 AM	0
7:00 AM	0
7:05 AM	0
7:10 AM	0
7:15 AM	0
7:20 AM	1
7:25 AM	1
7:30 AM	2
7:35 AM	0
7:40 AM	1
7:45 AM	0
7:50 AM	7
7:55 AM	2
8:00 AM	0
8:05 AM	2
8:10 AM	9
8:15 AM	6
8:20 AM	0
8:25 AM	3
8:30 AM	1
8:35 AM	2
8:40 AM	1
8:45 AM	4
8:50 AM	4
8:55 AM	3
9:00 AM	3
9:05 AM	2
9:10 AM	3
9:15 AM	2
9:20 AM	3
9:25 AM	2
9:30 AM	6
9:35 AM	7
9:40 AM	4
9:45 AM	0
9:50 AM	1
9:55 AM	5
10:00 AM	1
Average	2
95th percentile	6.9

Tues, 11/14/17

Time	Stack
6:30 AM	0
6:35 AM	0
6:40 AM	0
6:45 AM	0
6:50 AM	2
6:55 AM	0
7:00 AM	0
7:05 AM	2
7:10 AM	0
7:15 AM	1
7:20 AM	0
7:25 AM	1
7:30 AM	0
7:35 AM	3
7:40 AM	2
7:45 AM	2
7:50 AM	5
7:55 AM	4
8:00 AM	6
8:05 AM	2
8:10 AM	4
8:15 AM	2
8:20 AM	1
8:25 AM	1
8:30 AM	0
8:35 AM	0
8:40 AM	5
8:45 AM	5
8:50 AM	8
8:55 AM	8
9:00 AM	3
9:05 AM	3
9:10 AM	6
9:15 AM	2
9:20 AM	5
9:25 AM	2
9:30 AM	1
9:35 AM	2
9:40 AM	1
9:45 AM	0
9:50 AM	0
9:55 AM	2
10:00 AM	3
Average	2
95th percentile	6

Wed, 11/29/17

Time	Stack
6:30 AM	0
6:35 AM	1
6:40 AM	1
6:45 AM	0
6:50 AM	0
6:55 AM	0
7:00 AM	0
7:05 AM	0
7:10 AM	4
7:15 AM	2
7:20 AM	1
7:25 AM	0
7:30 AM	2
7:35 AM	4
7:40 AM	2
7:45 AM	0
7:50 AM	1
7:55 AM	0
8:00 AM	4
8:05 AM	3
8:10 AM	2
8:15 AM	6
8:20 AM	3
8:25 AM	4
8:30 AM	4
8:35 AM	3
8:40 AM	3
8:45 AM	8
8:50 AM	4
8:55 AM	5
9:00 AM	10
9:05 AM	10
9:10 AM	9
9:15 AM	10
9:20 AM	10
9:25 AM	5
9:30 AM	3
9:35 AM	1
9:40 AM	0
9:45 AM	3
9:50 AM	4
9:55 AM	1
10:00 AM	1
Average	3
95th percentile	10

Overall Average	**2.9**
Overal 95th Percentile	**9**

CAPACITY ANALYSIS DETAIL SHEETS

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBR	NBT	NBR	SBL2	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	270	622	190	61	9	39	147	161	361	89	60	83
Future Volume (vph)	270	622	190	61	9	39	147	161	361	89	60	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0			7.0	7.0	7.0			7.0	7.0
Lane Util. Factor	1.00	1.00	1.00			1.00	1.00	0.95			1.00	1.00
Frt	1.00	1.00	0.85			1.00	0.85	0.90			1.00	1.00
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1805	1827	1615			1669	1553	3225			1805	1863
Flt Permitted	0.95	1.00	1.00			0.21	1.00	1.00			0.41	1.00
Satd. Flow (perm)	1805	1827	1615			370	1553	3225			779	1863
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	276	635	194	62	9	40	150	164	368	91	61	85
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	276	635	256	0	0	49	150	532	0	0	152	85
Heavy Vehicles (%)	0%	4%	0%	0%	0%	10%	4%	1%	0%	0%	0%	2%
Turn Type	pm+pt	NA	Perm		Perm	Perm	Perm	NA		Perm	Perm	NA
Protected Phases	7	3						2				6
Permitted Phases	3		3		8	8	8			6	6	
Actuated Green, G (s)	28.0	28.0	28.0			19.0	19.0	34.0			34.0	34.0
Effective Green, g (s)	28.0	28.0	28.0			19.0	19.0	34.0			34.0	34.0
Actuated g/C Ratio	0.31	0.31	0.31			0.21	0.21	0.38			0.38	0.38
Clearance Time (s)	4.0	7.0	7.0			7.0	7.0	7.0			7.0	7.0
Vehicle Extension (s)	3.0	2.0	2.0			2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	561	568	502			78	327	1218			294	703
v/s Ratio Prot	0.03	c0.35						0.16				0.05
v/s Ratio Perm	0.13		0.16			0.13	0.10				c0.20	
v/c Ratio	0.49	1.12	0.51			0.63	0.46	0.44			0.52	0.12
Uniform Delay, d1	25.2	31.0	25.4			32.3	31.0	20.9			21.7	18.3
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.7	74.5	0.3			10.8	0.4	1.1			6.4	0.4
Delay (s)	25.9	105.5	25.7			43.1	31.4	22.0			28.0	18.6
Level of Service	C	F	C			D	C	C			C	B
Approach Delay (s)		69.2						22.0				24.6
Approach LOS		E						C				C

Intersection Summary			
HCM 2000 Control Delay	61.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	128.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWR	NWR2
Lane Configurations		
Traffic Volume (vph)	184	90
Future Volume (vph)	184	90
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	7.0	7.0
Lane Util. Factor	1.00	1.00
Frt	1.00	1.00
Flt Protected	1.00	1.00
Satd. Flow (prot)	1900	1900
Flt Permitted	1.00	1.00
Satd. Flow (perm)	1900	1900
Peak-hour factor, PHF	0.98	0.98
Adj. Flow (vph)	188	92
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	188	92
Heavy Vehicles (%)	0%	0%
Turn Type	Perm	Prot
Protected Phases		9
Permitted Phases	9	9
Actuated Green, G (s)	7.0	7.0
Effective Green, g (s)	7.0	7.0
Actuated g/C Ratio	0.08	0.08
Clearance Time (s)	7.0	7.0
Vehicle Extension (s)	2.0	2.0
Lane Grp Cap (vph)	147	147
v/s Ratio Prot		0.05
v/s Ratio Perm	c0.10	
v/c Ratio	1.28	0.63
Uniform Delay, d1	41.5	40.2
Progression Factor	1.00	1.00
Incremental Delay, d2	167.6	5.9
Delay (s)	209.1	46.1
Level of Service	F	D
Approach Delay (s)		
Approach LOS		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBR	NBT	NBR	SBL2	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	383	317	319	98	24	80	242	110	91	61	95	123
Future Volume (vph)	383	317	319	98	24	80	242	110	91	61	95	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0			7.0	7.0	7.0			7.0	7.0
Lane Util. Factor	1.00	1.00	1.00			1.00	1.00	0.95			1.00	1.00
Frt	1.00	1.00	0.85			1.00	0.85	0.93			1.00	1.00
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1805	1845	1615			1725	1615	3319			1805	1900
Flt Permitted	0.95	1.00	1.00			0.57	1.00	1.00			0.62	1.00
Satd. Flow (perm)	1805	1845	1615			1026	1615	3319			1184	1900
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	391	323	326	100	24	82	247	112	93	62	97	126
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	391	323	426	0	0	106	247	205	0	0	159	126
Heavy Vehicles (%)	0%	3%	0%	0%	0%	6%	0%	0%	3%	0%	0%	0%
Turn Type	pm+pt	NA	Perm		Perm	Perm	Perm	NA		Perm	Perm	NA
Protected Phases	7	3						2				6
Permitted Phases	3		3		8	8	8			6	6	
Actuated Green, G (s)	30.8	30.8	30.8			21.8	21.8	19.1			19.1	19.1
Effective Green, g (s)	30.8	30.8	30.8			21.8	21.8	19.1			19.1	19.1
Actuated g/C Ratio	0.34	0.34	0.34			0.24	0.24	0.21			0.21	0.21
Clearance Time (s)	4.0	7.0	7.0			7.0	7.0	7.0			7.0	7.0
Vehicle Extension (s)	2.0	2.0	2.0			2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	617	631	552			248	391	704			251	403
v/s Ratio Prot	0.04	0.18						0.06				0.07
v/s Ratio Perm	0.18		c0.26			0.10	0.15				c0.13	
v/c Ratio	0.63	0.51	0.77			0.43	0.63	0.29			0.63	0.31
Uniform Delay, d1	24.9	23.6	26.5			28.8	30.5	29.8			32.3	29.9
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	1.6	0.3	6.0			0.4	2.4	1.0			11.6	2.0
Delay (s)	26.4	23.9	32.5			29.3	33.0	30.8			43.8	31.9
Level of Service	C	C	C			C	C	C			D	C
Approach Delay (s)		28.0						30.8				38.6
Approach LOS		C						C				D

Intersection Summary			
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NWR2
Lane Configurations			
Traffic Volume (vph)	0	198	55
Future Volume (vph)	0	198	55
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	7.0		7.0
Lane Util. Factor	1.00		0.95
Frt	1.00		1.00
Flt Protected	1.00		1.00
Satd. Flow (prot)	1900		1805
Flt Permitted	1.00		1.00
Satd. Flow (perm)	1900		1805
Peak-hour factor, PHF	0.98	0.98	0.98
Adj. Flow (vph)	0	202	56
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	208	0	50
Heavy Vehicles (%)	0%	0%	0%
Turn Type	Prot		Prot
Protected Phases	9		9
Permitted Phases			
Actuated Green, G (s)	19.1		19.1
Effective Green, g (s)	19.1		19.1
Actuated g/C Ratio	0.21		0.21
Clearance Time (s)	7.0		7.0
Vehicle Extension (s)	2.0		2.0
Lane Grp Cap (vph)	403		383
v/s Ratio Prot	c0.11		0.03
v/s Ratio Perm			
v/c Ratio	0.52		0.13
Uniform Delay, d1	31.4		28.7
Progression Factor	1.00		1.00
Incremental Delay, d2	0.5		0.1
Delay (s)	31.8		28.8
Level of Service	C		C
Approach Delay (s)	31.2		
Approach LOS	C		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBR	NBT	NBR	SBL2	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	278	641	196	63	9	40	151	166	372	92	62	86
Future Volume (vph)	278	641	196	63	9	40	151	166	372	92	62	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0			7.0	7.0	7.0			7.0	7.0
Lane Util. Factor	1.00	1.00	1.00			1.00	1.00	0.95			1.00	1.00
Frt	1.00	1.00	0.85			1.00	0.85	0.90			1.00	1.00
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1805	1827	1615			1668	1553	3225			1805	1863
Flt Permitted	0.95	1.00	1.00			0.21	1.00	1.00			0.40	1.00
Satd. Flow (perm)	1805	1827	1615			370	1553	3225			756	1863
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	284	654	200	64	9	41	154	169	380	94	63	88
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	284	654	264	0	0	50	154	549	0	0	157	88
Heavy Vehicles (%)	0%	4%	0%	0%	0%	10%	4%	1%	0%	0%	0%	2%
Turn Type	pm+pt	NA	Perm		Perm	Perm	Perm	NA		Perm	Perm	NA
Protected Phases	7	3						2				6
Permitted Phases	3		3		8	8	8			6	6	
Actuated Green, G (s)	28.0	28.0	28.0			19.0	19.0	34.0			34.0	34.0
Effective Green, g (s)	28.0	28.0	28.0			19.0	19.0	34.0			34.0	34.0
Actuated g/C Ratio	0.31	0.31	0.31			0.21	0.21	0.38			0.38	0.38
Clearance Time (s)	4.0	7.0	7.0			7.0	7.0	7.0			7.0	7.0
Vehicle Extension (s)	3.0	2.0	2.0			2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	561	568	502			78	327	1218			285	703
v/s Ratio Prot	0.03	c0.36						0.17				0.05
v/s Ratio Perm	0.13		0.16			0.14	0.10				c0.21	
v/c Ratio	0.51	1.15	0.53			0.64	0.47	0.45			0.55	0.13
Uniform Delay, d1	25.3	31.0	25.5			32.4	31.1	21.0			22.0	18.3
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.7	87.0	0.5			12.7	0.4	1.2			7.5	0.4
Delay (s)	26.1	118.0	26.0			45.1	31.5	22.2			29.5	18.7
Level of Service	C	F	C			D	C	C			C	B
Approach Delay (s)		76.1						22.2				25.6
Approach LOS		E						C				C

Intersection Summary			
HCM 2000 Control Delay	66.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	130.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWR	NWR2
Lane Configurations		
Traffic Volume (vph)	190	93
Future Volume (vph)	190	93
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	7.0	7.0
Lane Util. Factor	1.00	1.00
Frt	1.00	1.00
Flt Protected	1.00	1.00
Satd. Flow (prot)	1900	1900
Flt Permitted	1.00	1.00
Satd. Flow (perm)	1900	1900
Peak-hour factor, PHF	0.98	0.98
Adj. Flow (vph)	194	95
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	194	95
Heavy Vehicles (%)	0%	0%
Turn Type	Perm	Prot
Protected Phases		9
Permitted Phases	9	9
Actuated Green, G (s)	7.0	7.0
Effective Green, g (s)	7.0	7.0
Actuated g/C Ratio	0.08	0.08
Clearance Time (s)	7.0	7.0
Vehicle Extension (s)	2.0	2.0
Lane Grp Cap (vph)	147	147
v/s Ratio Prot		0.05
v/s Ratio Perm	c0.10	
v/c Ratio	1.32	0.65
Uniform Delay, d1	41.5	40.3
Progression Factor	1.00	1.00
Incremental Delay, d2	183.5	7.1
Delay (s)	225.0	47.4
Level of Service	F	D
Approach Delay (s)		
Approach LOS		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBR	NBT	NBR	SBL2	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	395	327	329	101	25	82	249	113	94	63	98	127
Future Volume (vph)	395	327	329	101	25	82	249	113	94	63	98	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0			7.0	7.0	7.0			7.0	7.0
Lane Util. Factor	1.00	1.00	1.00			1.00	1.00	0.95			1.00	1.00
Frt	1.00	1.00	0.85			1.00	0.85	0.93			1.00	1.00
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1805	1845	1615			1726	1615	3318			1805	1900
Flt Permitted	0.95	1.00	1.00			0.56	1.00	1.00			0.62	1.00
Satd. Flow (perm)	1805	1845	1615			1016	1615	3318			1177	1900
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	403	334	336	103	26	84	254	115	96	64	100	130
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	403	334	439	0	0	110	254	211	0	0	164	130
Heavy Vehicles (%)	0%	3%	0%	0%	0%	6%	0%	0%	3%	0%	0%	0%
Turn Type	pm+pt	NA	Perm		Perm	Perm	Perm	NA		Perm	Perm	NA
Protected Phases	7	3						2				6
Permitted Phases	3		3		8	8	8			6	6	
Actuated Green, G (s)	31.5	31.5	31.5			22.5	22.5	18.0			18.0	18.0
Effective Green, g (s)	31.5	31.5	31.5			22.5	22.5	18.0			18.0	18.0
Actuated g/C Ratio	0.35	0.35	0.35			0.25	0.25	0.20			0.20	0.20
Clearance Time (s)	4.0	7.0	7.0			7.0	7.0	7.0			7.0	7.0
Vehicle Extension (s)	2.0	2.0	2.0			2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	631	645	565			254	403	663			235	380
v/s Ratio Prot	0.04	0.18						0.06				0.07
v/s Ratio Perm	0.19		c0.27			0.11	0.16				c0.14	
v/c Ratio	0.64	0.52	0.78			0.43	0.63	0.32			0.70	0.34
Uniform Delay, d1	24.5	23.2	26.1			28.4	30.0	30.8			33.5	30.9
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	1.6	0.3	6.1			0.4	2.4	1.3			15.8	2.4
Delay (s)	26.0	23.5	32.2			28.8	32.4	32.0			49.3	33.4
Level of Service	C	C	C			C	C	C			D	C
Approach Delay (s)		27.6						32.0				42.3
Approach LOS		C						C				D

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NWR2
Lane Configurations			
Traffic Volume (vph)	0	204	57
Future Volume (vph)	0	204	57
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	7.0		7.0
Lane Util. Factor	1.00		0.95
Frt	1.00		1.00
Flt Protected	1.00		1.00
Satd. Flow (prot)	1900		1805
Flt Permitted	1.00		1.00
Satd. Flow (perm)	1900		1805
Peak-hour factor, PHF	0.98	0.98	0.98
Adj. Flow (vph)	0	208	58
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	214	0	52
Heavy Vehicles (%)	0%	0%	0%
Turn Type	Prot		Prot
Protected Phases	9		9
Permitted Phases			
Actuated Green, G (s)	19.5		19.5
Effective Green, g (s)	19.5		19.5
Actuated g/C Ratio	0.22		0.22
Clearance Time (s)	7.0		7.0
Vehicle Extension (s)	2.0		2.0
Lane Grp Cap (vph)	411		391
v/s Ratio Prot	c0.11		0.03
v/s Ratio Perm			
v/c Ratio	0.52		0.13
Uniform Delay, d1	31.1		28.4
Progression Factor	1.00		1.00
Incremental Delay, d2	0.6		0.1
Delay (s)	31.7		28.5
Level of Service	C		C
Approach Delay (s)	31.1		
Approach LOS	C		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBR	NBT	NBR	SBL2	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	278	627	187	100	9	45	151	180	383	92	62	91
Future Volume (vph)	278	627	187	100	9	45	151	180	383	92	62	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0			7.0	7.0	7.0			7.0	7.0
Lane Util. Factor	1.00	1.00	1.00			1.00	1.00	0.95			1.00	1.00
Frt	1.00	1.00	0.85			1.00	0.85	0.90			1.00	1.00
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1805	1827	1615			1666	1553	3231			1805	1863
Flt Permitted	0.95	1.00	1.00			0.21	1.00	1.00			0.38	1.00
Satd. Flow (perm)	1805	1827	1615			369	1553	3231			723	1863
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	284	640	191	102	9	46	154	184	391	94	63	93
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	284	640	293	0	0	55	154	575	0	0	157	93
Heavy Vehicles (%)	0%	4%	0%	0%	0%	10%	4%	1%	0%	0%	0%	2%
Turn Type	pm+pt	NA	Perm		Perm	Perm	Perm	NA		Perm	Perm	NA
Protected Phases	7	3						2				6
Permitted Phases	3		3		8	8	8			6	6	
Actuated Green, G (s)	28.0	28.0	28.0			19.0	19.0	34.0			34.0	34.0
Effective Green, g (s)	28.0	28.0	28.0			19.0	19.0	34.0			34.0	34.0
Actuated g/C Ratio	0.31	0.31	0.31			0.21	0.21	0.38			0.38	0.38
Clearance Time (s)	4.0	7.0	7.0			7.0	7.0	7.0			7.0	7.0
Vehicle Extension (s)	3.0	2.0	2.0			2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	561	568	502			77	327	1220			273	703
v/s Ratio Prot	0.03	c0.35						0.18				0.05
v/s Ratio Perm	0.13		0.18			0.15	0.10				c0.22	
v/c Ratio	0.51	1.13	0.58			0.71	0.47	0.47			0.58	0.13
Uniform Delay, d1	25.3	31.0	26.1			33.0	31.1	21.2			22.3	18.3
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.7	77.7	1.1			22.8	0.4	1.3			8.5	0.4
Delay (s)	26.1	108.7	27.2			55.8	31.5	22.5			30.8	18.7
Level of Service	C	F	C			E	C	C			C	B
Approach Delay (s)		69.8						22.5				26.3
Approach LOS		E						C				C

Intersection Summary			
HCM 2000 Control Delay	65.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	131.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWR	NWR2
Lane Configurations		
Traffic Volume (vph)	196	102
Future Volume (vph)	196	102
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	7.0	7.0
Lane Util. Factor	1.00	1.00
Frt	1.00	1.00
Flt Protected	1.00	1.00
Satd. Flow (prot)	1900	1900
Flt Permitted	1.00	1.00
Satd. Flow (perm)	1900	1900
Peak-hour factor, PHF	0.98	0.98
Adj. Flow (vph)	200	104
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	200	104
Heavy Vehicles (%)	0%	0%
Turn Type	Perm	Prot
Protected Phases		9
Permitted Phases	9	9
Actuated Green, G (s)	7.0	7.0
Effective Green, g (s)	7.0	7.0
Actuated g/C Ratio	0.08	0.08
Clearance Time (s)	7.0	7.0
Vehicle Extension (s)	2.0	2.0
Lane Grp Cap (vph)	147	147
v/s Ratio Prot		0.05
v/s Ratio Perm	c0.11	
v/c Ratio	1.36	0.71
Uniform Delay, d1	41.5	40.5
Progression Factor	1.00	1.00
Incremental Delay, d2	199.8	11.9
Delay (s)	241.3	52.4
Level of Service	F	D
Approach Delay (s)		
Approach LOS		

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	13	51	512	36	55	183
Future Volume (Veh/h)	13	51	512	36	55	183
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	55	557	39	60	199
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			768			270
pX, platoon unblocked	0.98					
vC, conflicting volume	896	576			596	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	882	576			596	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	89			94	
cM capacity (veh/h)	291	517			980	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	69	596	259
Volume Left	14	0	60
Volume Right	55	39	0
cSH	446	1700	980
Volume to Capacity	0.15	0.35	0.06
Queue Length 95th (ft)	14	0	5
Control Delay (s)	14.5	0.0	2.5
Lane LOS	B		A
Approach Delay (s)	14.5	0.0	2.5
Approach LOS	B		

Intersection Summary			
Average Delay		1.8	
Intersection Capacity Utilization		55.7%	ICU Level of Service B
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	258	0	0	283	15	14
Future Volume (Veh/h)	258	0	0	283	15	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	280	0	0	308	16	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	249					
pX, platoon unblocked						
vC, conflicting volume			280		434	280
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			280		434	280
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	98
cM capacity (veh/h)			1280		550	717

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	280	154	154	31
Volume Left	0	0	0	16
Volume Right	0	0	0	15
cSH	1700	1700	1700	620
Volume to Capacity	0.16	0.09	0.09	0.05
Queue Length 95th (ft)	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	11.1
Lane LOS				B
Approach Delay (s)	0.0	0.0		11.1
Approach LOS				B

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	23.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBR	NBT	NBR	SBL2	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	395	322	319	122	25	84	249	118	98	63	98	129
Future Volume (vph)	395	322	319	122	25	84	249	118	98	63	98	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0			7.0	7.0	7.0			7.0	7.0
Lane Util. Factor	1.00	1.00	1.00			1.00	1.00	0.95			1.00	1.00
Frt	1.00	1.00	0.85			1.00	0.85	0.93			1.00	1.00
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00			0.95	1.00
Satd. Flow (prot)	1805	1845	1615			1726	1615	3319			1805	1900
Flt Permitted	0.95	1.00	1.00			0.56	1.00	1.00			0.61	1.00
Satd. Flow (perm)	1805	1845	1615			1021	1615	3319			1167	1900
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	403	329	326	124	26	86	254	120	100	64	100	132
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	403	329	450	0	0	112	254	220	0	0	164	132
Heavy Vehicles (%)	0%	3%	0%	0%	0%	6%	0%	0%	3%	0%	0%	0%
Turn Type	pm+pt	NA	Perm		Perm	Perm	Perm	NA		Perm	Perm	NA
Protected Phases	7	3						2				6
Permitted Phases	3		3		8	8	8			6	6	
Actuated Green, G (s)	32.1	32.1	32.1			23.1	23.1	17.4			17.4	17.4
Effective Green, g (s)	32.1	32.1	32.1			23.1	23.1	17.4			17.4	17.4
Actuated g/C Ratio	0.36	0.36	0.36			0.26	0.26	0.19			0.19	0.19
Clearance Time (s)	4.0	7.0	7.0			7.0	7.0	7.0			7.0	7.0
Vehicle Extension (s)	2.0	2.0	2.0			2.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	643	658	576			262	414	641			225	367
v/s Ratio Prot	0.03	0.18						0.07				0.07
v/s Ratio Perm	0.19		c0.28			0.11	0.16				c0.14	
v/c Ratio	0.63	0.50	0.78			0.43	0.61	0.34			0.73	0.36
Uniform Delay, d1	24.0	22.7	25.8			27.9	29.5	31.4			34.1	31.5
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	1.4	0.2	6.3			0.4	1.9	1.5			18.7	2.7
Delay (s)	25.4	22.9	32.1			28.3	31.4	32.8			52.7	34.2
Level of Service	C	C	C			C	C	C			D	C
Approach Delay (s)		27.2						32.8				44.5
Approach LOS		C						C				D

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NWR2
Lane Configurations			
Traffic Volume (vph)	0	207	60
Future Volume (vph)	0	207	60
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	7.0		7.0
Lane Util. Factor	1.00		0.95
Frt	1.00		1.00
Flt Protected	1.00		1.00
Satd. Flow (prot)	1900		1805
Flt Permitted	1.00		1.00
Satd. Flow (perm)	1900		1805
Peak-hour factor, PHF	0.98	0.98	0.98
Adj. Flow (vph)	0	211	61
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	217	0	55
Heavy Vehicles (%)	0%	0%	0%
Turn Type	Prot		Prot
Protected Phases	9		9
Permitted Phases			
Actuated Green, G (s)	19.5		19.5
Effective Green, g (s)	19.5		19.5
Actuated g/C Ratio	0.22		0.22
Clearance Time (s)	7.0		7.0
Vehicle Extension (s)	2.0		2.0
Lane Grp Cap (vph)	411		391
v/s Ratio Prot	c0.11		0.03
v/s Ratio Perm			
v/c Ratio	0.53		0.14
Uniform Delay, d1	31.2		28.5
Progression Factor	1.00		1.00
Incremental Delay, d2	0.6		0.1
Delay (s)	31.7		28.5
Level of Service	C		C
Approach Delay (s)	31.1		
Approach LOS	C		

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	15	201	11	34	301
Future Volume (Veh/h)	11	15	201	11	34	301
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	16	218	12	37	327
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			768			270
pX, platoon unblocked	0.92					
vC, conflicting volume	625	224			230	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	551	224			230	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	98			97	
cM capacity (veh/h)	444	815			1338	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	28	230	364
Volume Left	12	0	37
Volume Right	16	12	0
cSH	600	1700	1338
Volume to Capacity	0.05	0.14	0.03
Queue Length 95th (ft)	4	0	2
Control Delay (s)	11.3	0.0	1.0
Lane LOS	B		A
Approach Delay (s)	11.3	0.0	1.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	442	0	0	261	6	13
Future Volume (Veh/h)	442	0	0	261	6	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	480	0	0	284	7	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	249					
pX, platoon unblocked						
vC, conflicting volume			480		622	480
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			480		622	480
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	97
cM capacity (veh/h)			1079		419	532

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	480	142	142	21
Volume Left	0	0	0	7
Volume Right	0	0	0	14
cSH	1700	1700	1700	488
Volume to Capacity	0.28	0.08	0.08	0.04
Queue Length 95th (ft)	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	12.7
Lane LOS				B
Approach Delay (s)	0.0	0.0		12.7
Approach LOS				B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		