

STIMMEL ENGINEERING

William P. Stimmel, P.E., P.P., PTOE

Traffic Impact Analysis

for

Shameer Properties, LLC

212-216 Ernston Road – Block 444.04, Lots 23-25, 28

Borough of Sayreville, Middlesex County, New Jersey



William P. Stimmel

William P. Stimmel, P.E., P.P., PTOE

NJ PE Lic. # 45161

Revised October 2, 2024

September 28, 2022
Revised October 2, 2024

Borough of Sayreville – Planning Board
167 Main Street
Sayreville, NJ 08872

Re: Masjid Sadar & Community Center
212 – 216 Ernston Road – Block 444.04, Lots 23-25, 28
Borough of Sayreville, Middlesex County, New Jersey

Honorable Board Members:

This report has been prepared to address traffic impacts associated with the re-development of the referenced site. Specifically, this report will determine existing traffic volumes at the site driveways and nearest roadway intersection, project future traffic volumes based on the proposed use and provide a comparison of same. Site access, site circulation and parking concerns will also be discussed.

Existing Site Conditions

The site consists of Lots 23-25 and 28 in Block 444.04 and has an area of 2.49 acres. 212 and 214 Ernston Road are developed with existing single-family residential structures. 216 Ernston Road is developed with the existing Masjid Sadar. The site is located along the westbound side of Ernston Road, to the west of the intersection with Center Avenue, as shown on the attached **Figure 1**.

Vehicular access to the properties is provided four driveways along westbound Ernston Road.

Proposed Site Conditions

The applicant intends to remove all existing structures on the subject property and construct a new mosque with associated community space and offices. The proposed mosque will be centrally located on the subject property. Parking and circulation areas will be located to the south of the building. Portions of the site to the north, east and west of the principal structure will be landscaped.

A total of 166 parking spaces will be provided on site. 121 parking spaces will be located in a below-grade parking garage underneath the building with 57 of these 121 parking spaces being provided via lift mechanisms. The remaining 45 parking spaces will be located in the surface parking lot.

Access to the facility will be provided via two driveways along westbound Ernston Road. The centerlines of the proposed driveways will be separated by approximately 130 feet. Note that the location and design of the driveways is ultimately subject to review and approval by Middlesex County.

Schedule of Events

The client has provided a schedule of events which is attached to this report. A summary of the traffic and parking associated with regular events is as follows:

- Regular Prayers (Daily) – 30-45 people/30-45 vehicles/30-45 parking spaces
- Religious Education (Sunday afternoons) – 45-50 students/30 vehicles/0 parking
- Prayer for the Deceased (as needed) – 100-150 persons/50-75 vehicles/50-75 parking spaces
- Religious Wedding (as needed, typically Saturday afternoon) – 45-50 persons/20-25 vehicles/20-25 parking spaces
- Family Nights (once/month, Friday night) – 100-150 persons/30-40 vehicles/30-40 parking spaces

Attendance at Friday prayers will be addressed separately.

It is important to note that these are all scheduled events. There will not be a situation where two events are scheduled at the same time. The applicant has agreed to stipulate that no events will run at the same time as Friday prayer services.

Existing Roadway Network

Ernston Road, also known as County Route 673, is under the jurisdiction of Middlesex County. One lane is provided for each direction of travel in the eastbound and westbound directions. The speed limit along Ernston Road is posted as 35 miles per hour.

Bordentown Avenue, also known as County Route 615, is under the jurisdiction of Middlesex County. One lane is provided for each direction of travel in the northbound and southbound directions. The speed limit along Bordentown Avenue is posted as 40 miles per hour in the vicinity of the site.

There are four driveways which intersect Ernston Road along the site frontage. 212 and 214 Ernston Road have typical residential driveways. 216 Ernston Road has one residential driveway and one driveway with a width of approximately 40 feet which leads to a paved parking lot to the west of the principal structure.

The intersection of Ernston Road and Bordentown Avenue is a four-leg intersection controlled by a traffic signal. The northbound, southbound and eastbound approaches to the intersection each provide a left-turn lane, a through lane and a right-turn lane. The westbound approach to the intersection provides a left-turn lane, a through lane and a shared through/right-turn lane.

There are two minor intersections along Ernston Road between the site frontage and the intersection with Bordentown Avenue (Parkway Place, Rutgers Road). These are stop controlled intersections with the Ernston Road traffic having the right-of-way. Any site-generated traffic added to the intersection is expected to consist primarily of through traffic along Ernston Road and will have a minimal impact on operations at these locations. Therefore, these intersections were not included in the analysis.

Existing Traffic Volumes/Data Collection

Manual turning movement counts were conducted on Friday, April 29, 2022 from 12:00 p.m. until 4:00 p.m. at the two driveways for 216 Ernston Road. Given the existing development pattern and low volumes of traffic associated with 212 Ernston Road and 214 Ernston Road, these driveways were not included in the traffic count program. Note that at the time these traffic counts were performed, the mosque on the property was being used and experienced higher than typical driveway volumes due to holiday traffic.

These time periods were selected to capture the concurrent peaks of street traffic and site-generated traffic, as well as traffic associated with the nearby Samsel Upper Elementary School which typically has dismissal at 2:45 p.m. The existing peak hour traffic volumes at the mosque driveways were found to occur from 1:00 p.m. until 2:00 p.m. which reflects the peak times for Friday prayers.

At the request of the Board Engineer, additional traffic counts were conducted at the intersection of Ernston Road and Bordentown Avenue on Friday, June 16, 2023 from 12:00 p.m. until 4:00 p.m. and again on Sunday, June 18, 2023 from 9:30 a.m. until 1:30 p.m. This intersection was selected due the potential for site-generated traffic and turning movements impacting operations. The Sunday peak hour was included in the analysis due to the relatively high volume of street traffic during the Sunday peak hour.

Further updated traffic counts were performed at the intersection of Ernston Road and Bordentown Avenue on Friday, March 1, 2024 from 12:00 p.m. until 4:00 p.m. to include traffic associated with the nearby school.

The mosque is not currently operating at the subject property. At the request of the Board, traffic counts were conducted at the Madison Park Volunteer Fire House where the mosque is holding services on Friday, May 17, 2024 from 12:00 p.m. until 4:00 p.m.

24-hour Automatic Traffic Recorder (“ATR”) data was collected at the site frontage along Ernston Road from Friday, May 17 through Friday, May 24, 2024 as requested by the Board’s Traffic Consultant.

Peak hour traffic volumes for the intersection of Ernston Road and Bordentown Avenue are shown on the attached **Figure 2**, which provides a schematic representation of the study area. For the purposes of this analysis, the Friday Peak Hour is based on data collected on Friday, March 1, 2024 from 1:00 until 2:00 p.m. and the Sunday Peak hour is based on data collected on Sunday, June 18, 2023 from 12:30 p.m. until 1:30 p.m.

Other Nearby Mosques

At the request of the Board Engineer, traffic data was collected at existing mosques in the vicinity of the site to establish vehicle occupancy rates. Specifically traffic counts were conducted during Friday prayers at the Anjuman e Burhani Mosque in East Brunswick and Dawatul Islamia Mosque in Somerset. These counts showed average vehicle occupancies of 1.82 persons/vehicle and 1.88 persons/vehicle, respectively.

Analysis of Existing Traffic Volumes

Existing Traffic Volumes at the study intersection were analyzed utilizing Highway Capacity Software ("HCS"), which is based on methodologies contained in the Highway Capacity Manual. This software evaluates the operational efficiency of individual movements, approaches and for the intersection as a whole, based on average delay in seconds per vehicle. This average delay translates to a letter grade on an "A" through "F" scale, with "A" representing the best conditions and "F" being the worst. These letter grades are referred to as Levels of Service. The Level of Service and average delay for existing conditions are summarized in the appendix of this report.

Results of the analyses of existing traffic volumes for the study intersection are shown on attached **Figure 3**. As indicated, all movements at the intersection operate at Level of Service "C" or "D" under existing conditions.

Site Generated Traffic Volumes

Typically, site generated traffic for proposed developments is based on data presented by the Institute of Transportation Engineers ("ITE") in the publication Trip Generation, which is currently in its 11th Edition. In this case, the ITE has very limited data available for mosques (2 sample sites) and no data was available through NJDOT. Therefore, projections of future traffic volumes are based on a comparison of previously counted traffic volumes for the mosque at the site, traffic volumes at the Madison Park Volunteer Fire House where services are being held and information provided by the client.

There are currently two separate Friday prayer services at the Fire House during the Friday afternoon period. As noted above, data was collected at the Fire House on a typical Friday from 12:00 p.m. until 4:00 p.m. to capture all vehicular traffic associated with the services as well as the periods before and after.

During the four hour window, a total of 194 vehicles enter the site with roughly two-thirds of vehicles arriving for the earlier prayer service. Given the location of the property it is probably that some amount of this traffic is visiting the nearby park, but for the purposes of this report, all traffic at the Fire House is assumed to be there for prayer services.

Based on a schedule of events provided by the client, the Friday afternoon prayers are expected to be the main generator of traffic associated with the proposed mosque. The peak hour of driveway traffic at the Fire House has 132 vehicles entering and 110 vehicles exiting. In the hour from 12:45 p.m. until 1:45 p.m. This hour captures nearly all of the vehicles entering/exiting for the earlier service and a portion of vehicles entering for the alter service. To present a conservative estimate of future operations, these numbers were increased by 10% to 145 vehicles entering and 121 vehicles exiting.

The Board Engineer had also requested that the traffic associated with the religious instruction for children on Sundays be included in the analysis of traffic operations. It is expected that the religious instruction would generate 30 vehicles (60 trips) at the start of the session and 30 vehicles (60 trips) at the end of the session as parents would likely drop-off their children and return at the end of the session.

The projected site-generated traffic was routed to/from the site based on existing travel patterns and the distribution of site generated traffic counted at the site driveways during June 2022.

The projected site-generated traffic volumes are shown on attached **Figure 4**. These volumes reflect the existing distribution of traffic to/from the east and west, projected driveway volumes and the proposed driveway configuration at the site.

Comparison to Church

The ITE has published data for Churches based on 16 studies. Using the assemblage area of 6,835 s.f. 14,941 s.f., the traffic associated with a church would be 71 trips during the critical Sunday peak hour. This is significantly less than the projected traffic associated with the proposed mosque, although the church would experience its peak traffic generation on Sunday morning as opposed to Friday afternoon.

Future Traffic Volumes

The Borough of Sayreville and the Township of Old Bridge were contacted to determine if there were any other developments in the planning stages that should be incorporated into this traffic study. Sayreville and Old Bridge both advised that there were none.

In order to account for background traffic growth in the area, existing traffic volumes were increased by an annual 2.75% growth rate over a two year year build-out period ($2.75\% \wedge 2 = 5.58\%$), to develop the future "No-Build" Traffic volumes. The 2.75% growth rate was selected based on updated data published by NJDOT for minor arterial roadways in Middlesex County. Future "No-Build" traffic volumes are shown on attached **Figure 5**. Site-generated traffic volumes were added to the "No-Build" traffic volumes to develop the future "Build" traffic volumes, which are shown on attached **Figure 6**.

Analysis of Future Traffic Volumes

Future "No-Build" and "Build" traffic volumes were analyzed using HCS. Results of these analyses are shown on the attached **Figures 7 and 8**, for the "No-Build" and "Build" traffic volumes, respectively.

There is one change when comparing Levels of Service for movements under existing, "No-Build" and "Build" conditions at the study intersection. The eastbound through movement at the intersection of Ernston Road and Bordentown Road deteriorates from a Level of Service "D" to Level of Service "E" during the Friday peak hour when comparing "No-Build" and "Build" conditions. All other Levels of Service remain the same.

In addition, all movements at the site driveways are projected to operate at Level of Service "D" or better during both the Friday and Sunday peak periods. As with existing conditions, the Level of Service and average Delay for "No-Build" and "Build" analyses is summarized in the appendix of this report.

The applicant has also agreed to hire an off-duty officer from the Sayreville Police Department to control traffic at the site driveways during and after Friday prayer services as well as at periodic events which are expected to have higher than typical attendance.

Per the results of these analyses, the impact of site-generated traffic on Levels of Service is negligible.

Parking Supply

Based on a review of the site plan prepared by AWZ Engineering, last revised July 11, 2024, the applicant is required to provide 196 parking spaces for the combined place of worship, gymnasium, offices and classrooms. A total of 166 parking spaces are proposed. Accordingly a variance is required.

As noted above, no other events will be occurring on the site during the Friday prayer services. The parking requirement for the Place of Worship will be 151 parking spaces which is satisfied.

In addition, data collected at the existing fire house during Friday services shows a peak parking demand of 121 parking spaces, leaving a buffer of 45 parking spaces.

Based on the above, the proposed parking supply is adequate for the intended use of the property.

Site Layout/Circulation

The following site layout and circulation comments are based on the site plan prepared by AWZ Engineering, Inc.:

- The typical parking spaces on site measure nine feet wide by eighteen feet deep in accordance with accepted engineering standards.
- Six ADA accessible parking spaces are provided, including two van-accessible parking spaces, which satisfies accessibility requirements.
- Twenty-four foot wide circulation aisles are adequate for parking with two-way traffic.
- The provision of multiple access allows for safe and efficient access to the site.
- A total of 25 cars can be queued in two lanes for the valet operation which will load the vehicle lifts in the underground garage.
- Based on the volume of traffic at the existing Fire House and the distribution of traffic between the early and late services, it is unlikely that the lifts will be required for the late service.

Middlesex County Review

Note that application materials have been provided to Middlesex County for review. As noted above, the proposed driveways are subject to review and approval of the County, as Ernston Road is under County jurisdiction. At this point, the County has not granted final approval, but the substance of their comments has been addressed by the preparation of revised plans and documents.

Conclusion

The proposed development will have minimal impact on operations at the study intersection and site driveways. Adequate parking and circulation areas are provided on the site to accommodate the volume of traffic expected for the proposed use and the types of vehicles expected to access the facility on a regular basis.

Attachments

Figures 1-8

LOS/Delay Table

HCS Reports

Traffic Count Data

NJDOT Growth Rates

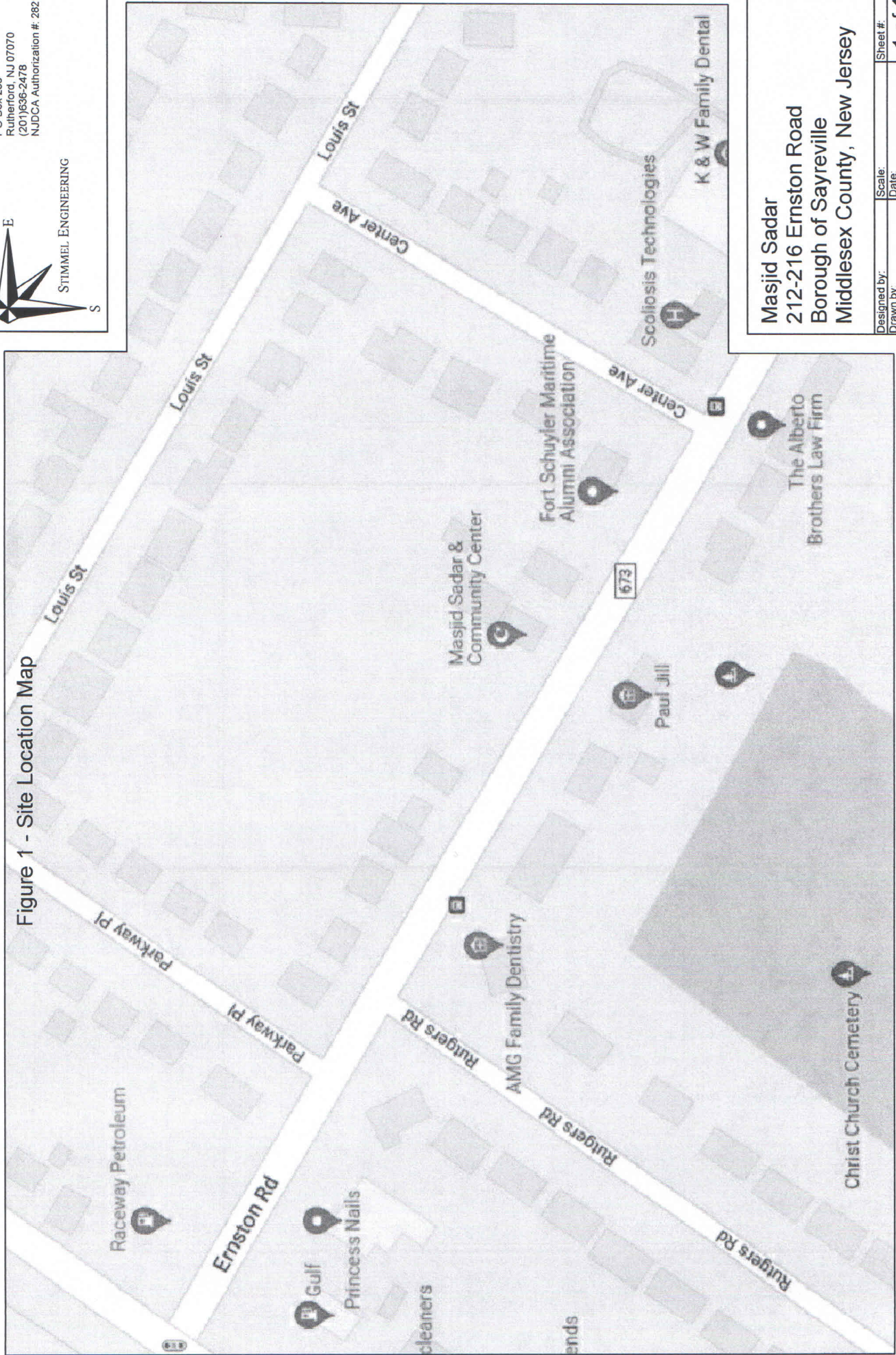
Weekly Schedule

Church Traffic Projections

PO Box 280
 Rutherford, NJ 07070
 (201)636-2478
 NJDCA Authorization #: 28215



Figure 1 - Site Location Map



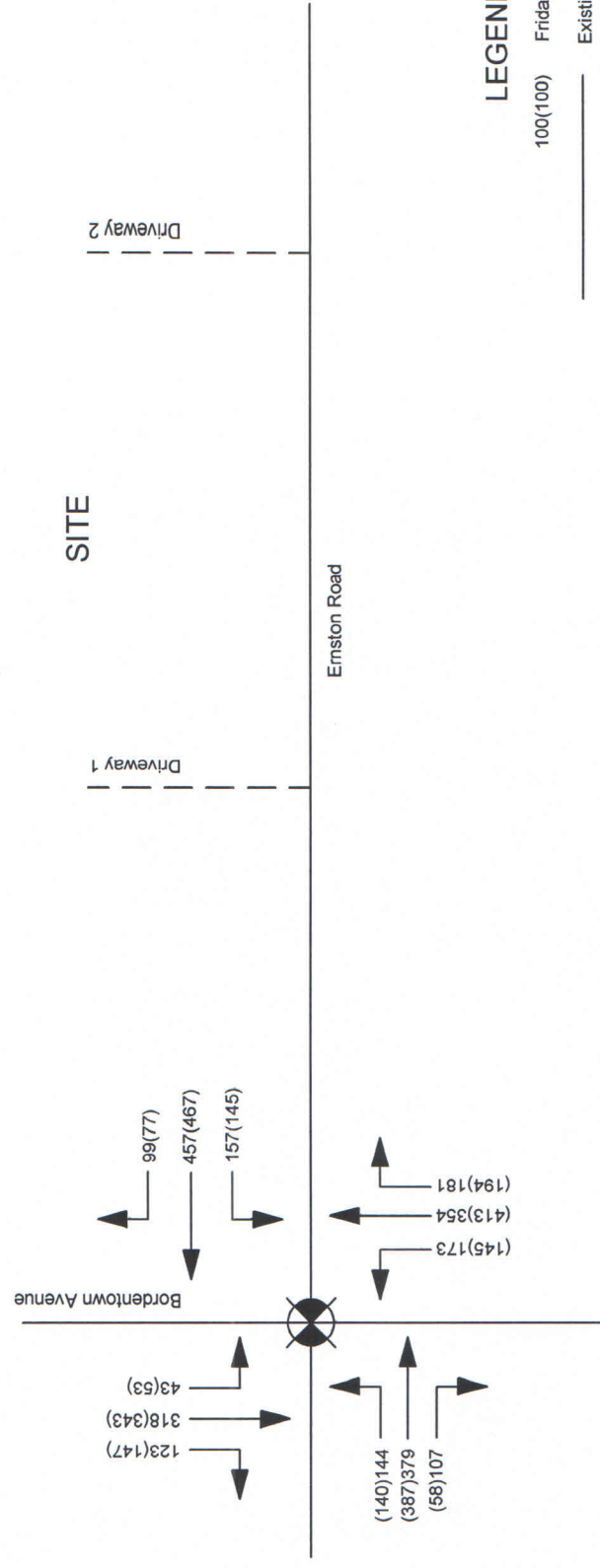
Masjid Sadaar
 212-216 Ernston Road
 Borough of Sayreville
 Middlesex County, New Jersey

Designed by:	Scale:	Sheet #:
Drawn by:	Date:	1 of 1
Checked by:	Project #:	

PO Box 280
 Rutherford, NJ 07070
 (201)636-2478
 NJDCA Authorization #: 28215



Figure 2
Existing Traffic Volumes
Friday (Sunday) Peak Hour



LEGEND

- 100(100) Friday(Sunday) Peak Hour
- Existing Roadway
- - - Proposed Driveway

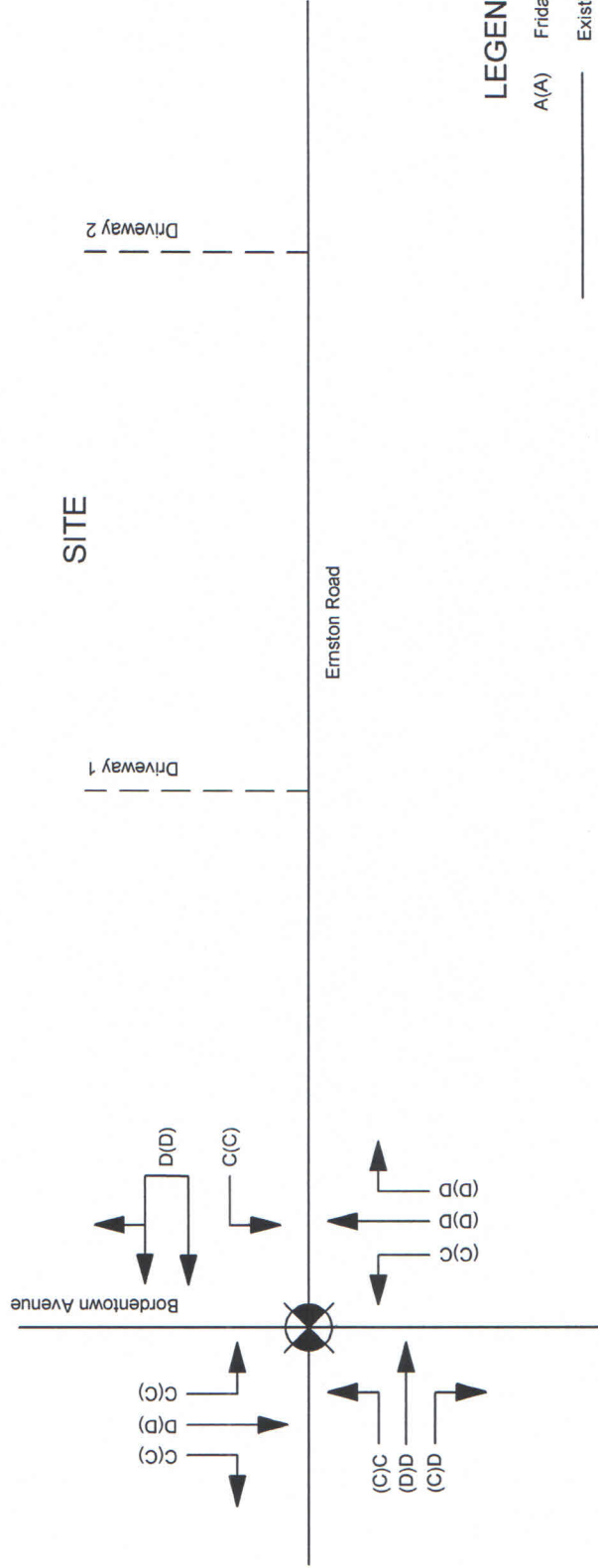
Masjid Sadar
 212-216 Ernston Road
 Borough of Sayreville
 Middlesex County, New Jersey

Designed by:	Scale:	Sheet #:
Drawn by:	Date:	1 of 1
Checked by:	Project #:	

PO Box 280
 Rutherford, NJ 07070
 (201)636-2478
 NJDCA Authorization #: 28215



Figure 3
Existing Levels of Service
Friday (Sunday) Peak Hour



LEGEND

- A(A) Friday(Sunday) Peak Hour
- Existing Roadway
- - - Proposed Driveway

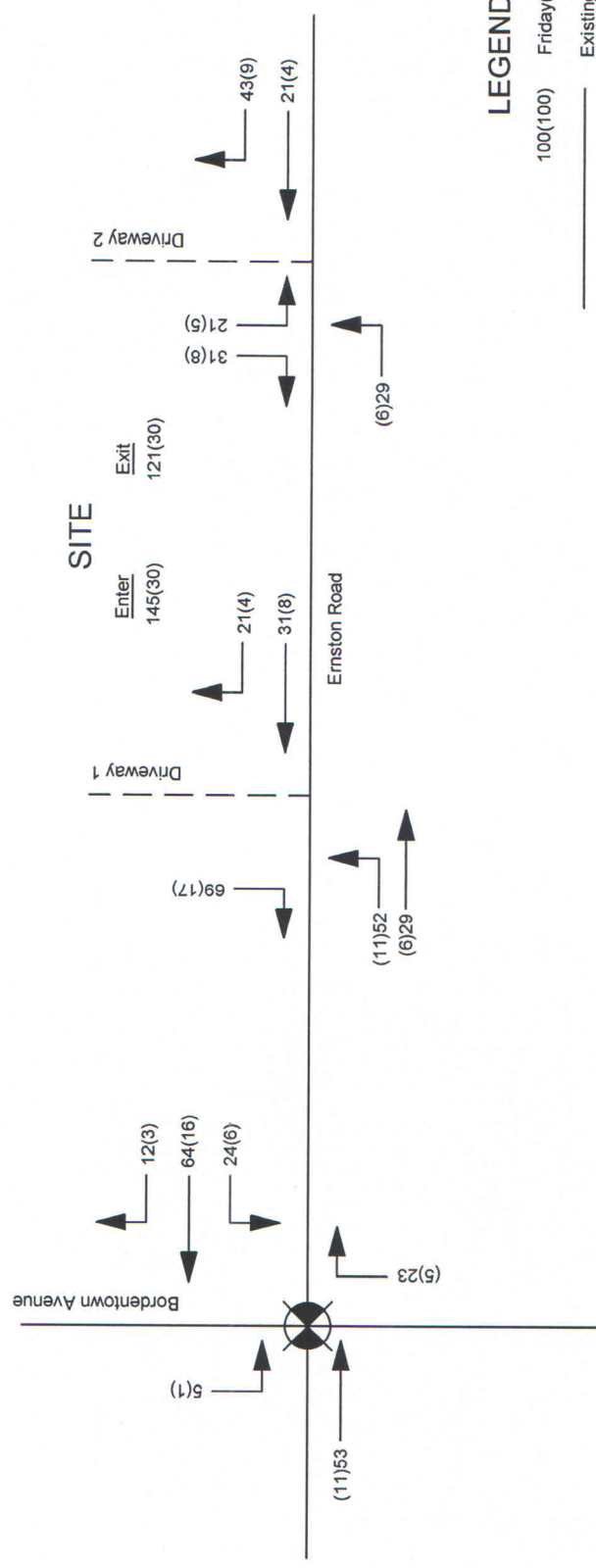
Masjid Sadar
212-216 Ernston Road
Borough of Sayreville
Middlesex County, New Jersey

Designed by:	Scale:	Sheet #:
Drawn by:	Date:	1 of 1
Checked by:	Project #:	



PO Box 280
 Rutherford, NJ 07070
 (201)636-2478
 NJDCA Authorization #: 28215

Figure 4
Site-Generated Traffic Volumes
Friday (Sunday) Peak Hour



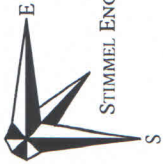
LEGEND

- 100(100) Friday(Sunday) Peak Hour
- Existing Roadway
- - - Proposed Driveway

Masjid Sadar
212-216 Ernoston Road
Borough of Sayreville
Middlesex County, New Jersey

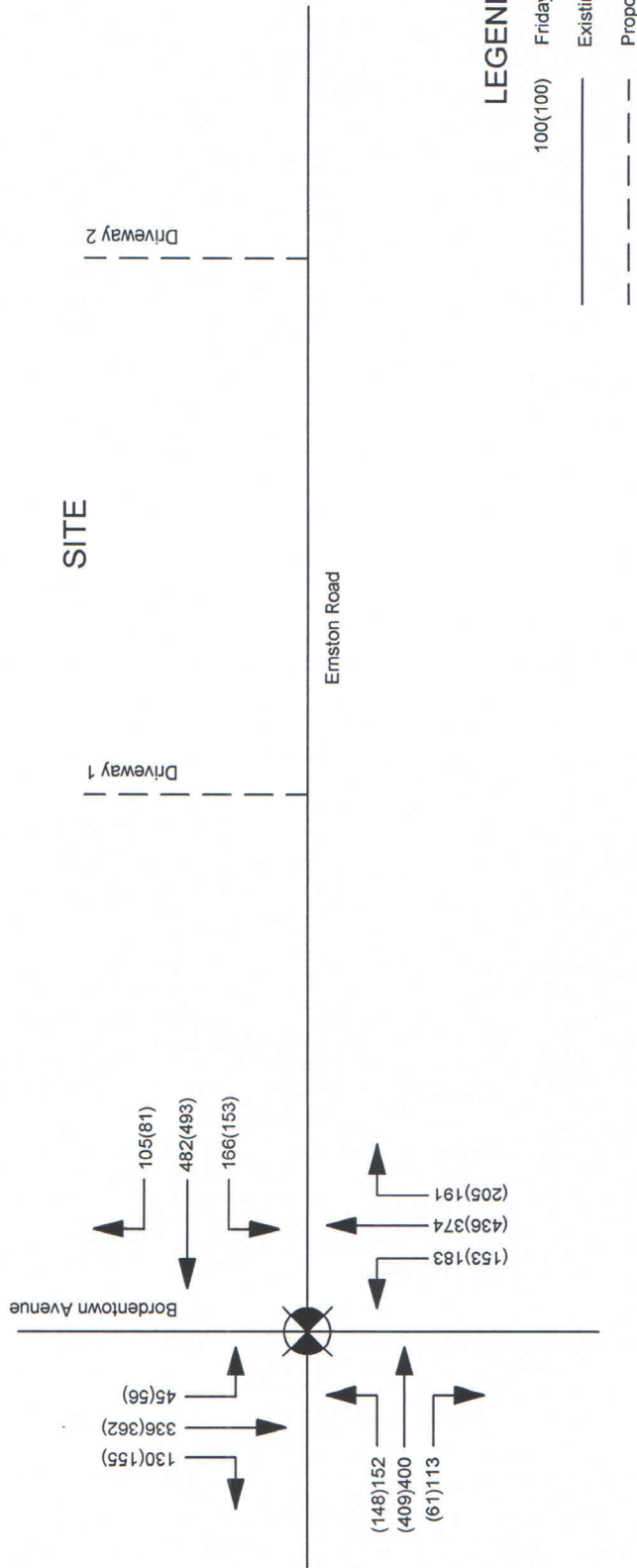
Designed by:	Scale:	Sheet #:
Drawn by:	Date:	1 of 1
Checked by:	Project #:	

Figure 5
"No-Build" Traffic Volumes
Friday (Sunday) Peak Hour



PO Box 280
 Rutherford, NJ 07070
 (201) 636-2478
 NJDCA Authorization #: 28215

STIMMEL ENGINEERING



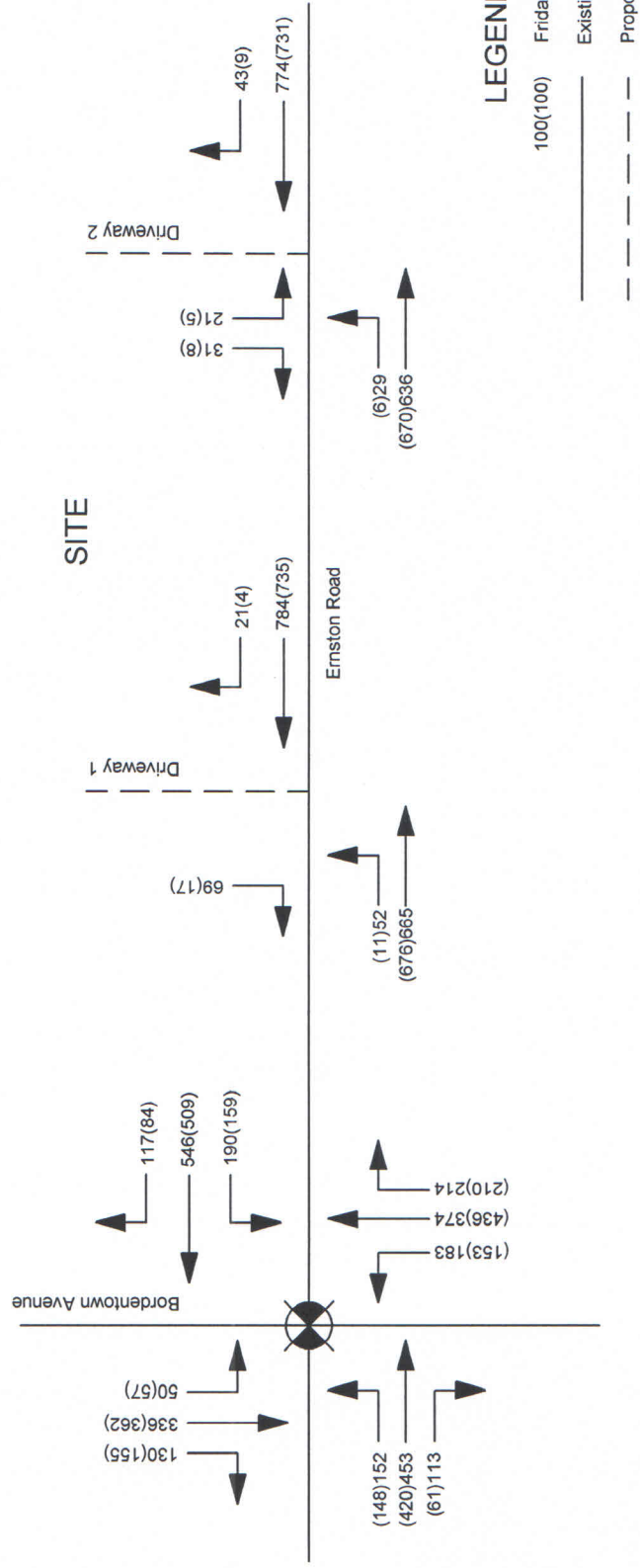
Masjid Sadar
212-216 Ernston Road
Borough of Sayreville
Middlesex County, New Jersey

Designed by:	Scale:	Sheet #:
Drawn by:	Date:	1 of 1
Checked by:	Project #:	



PO Box 280
 Rutherford, NJ 07070
 (201)636-2478
 NJUCA Authorization #: 28215

Figure 6
 "Build" Traffic Volumes
 Friday (Sunday) Peak Hour



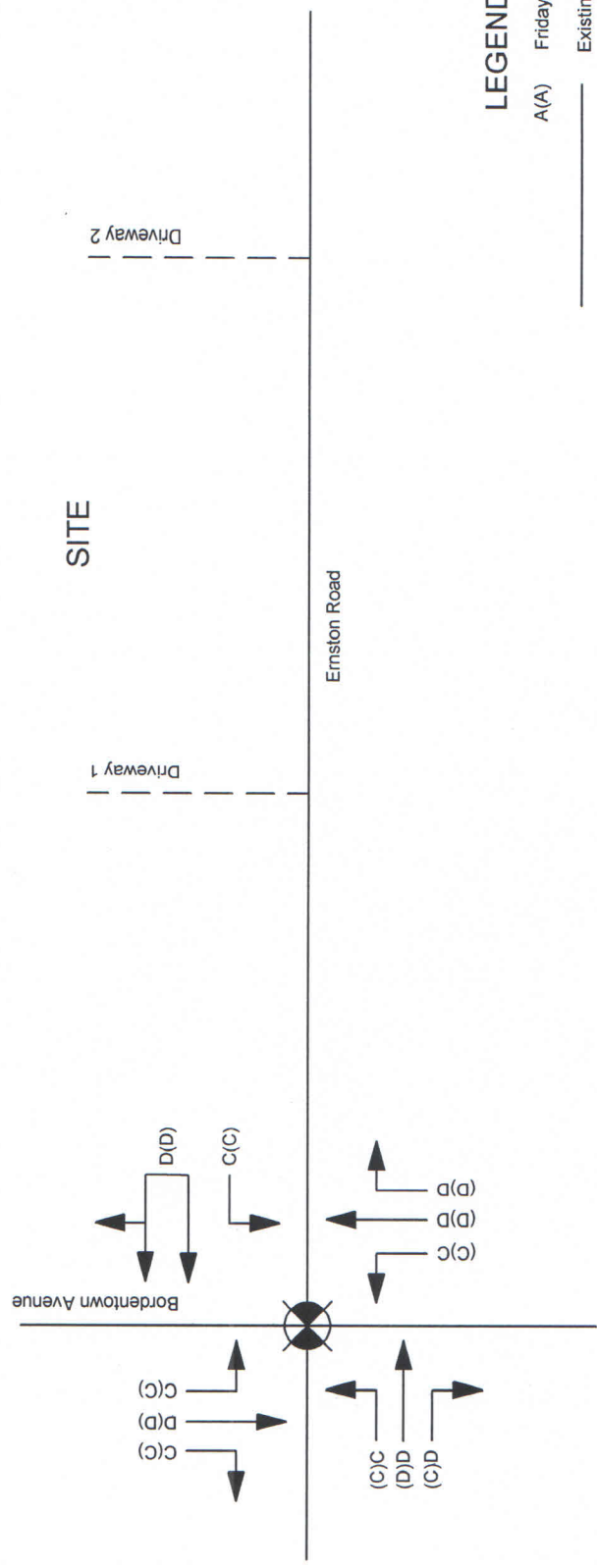
Masjid Sadar
 212-216 Ernston Road
 Borough of Sayreville
 Middlesex County, New Jersey

Designed by:	Scale:	Sheet #:
Drawn by:	Date:	1 of 1
Checked by:	Project #:	

PO Box 280
 Rutherford, NJ 07070
 (201)636-2478
 NJDCA Authorization #: 28215



Figure 7
"No-Build" Levels of Service
Friday (Sunday) Peak Hour



LEGEND

- A(A) Friday(Sunday) Peak Hour
- Existing Roadway
- - - Proposed Driveway

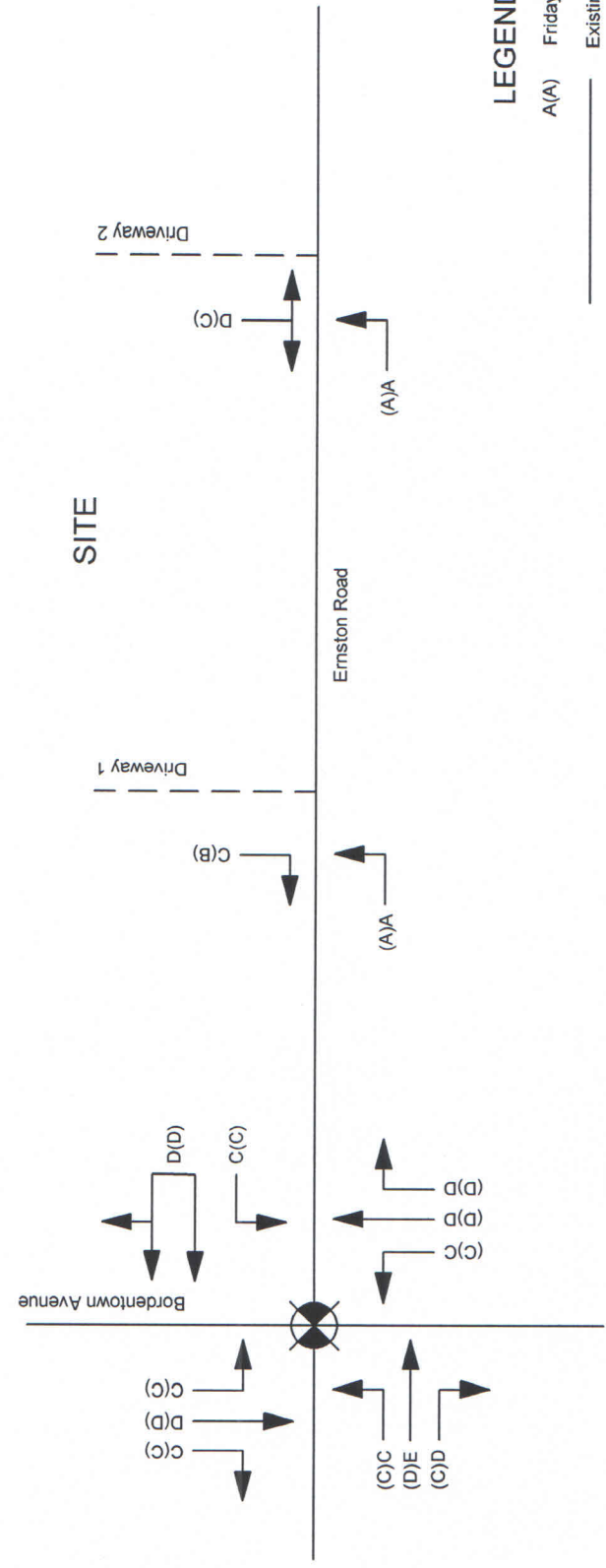
Masjid Sadar
212-216 Ernston Road
Borough of Sayreville
Middlesex County, New Jersey

Designed by:	Scale:	Sheet #:
Drawn by:	Date:	1 of 1
Checked by:	Project #:	



PO Box 280
 Rutherford, NJ 07070
 (201) 636-2478
 NJDCA Authorization #: 28215

Figure 8
"Build" Levels of Service
Friday (Sunday) Peak Hour



LEGEND

- A(A) Friday(Sunday) Peak Hour
- Existing Roadway
- - - Proposed Driveway

Masjid Sadar
212-216 Ernston Road
Borough of Sayreville
Middlesex County, New Jersey

Designed by:	Scale:	Sheet #:
Drawn by:	Date:	1 of 1
Checked by:	Project #:	

Levels of Service (Delay) – October 2, 2024
 Masjid Sadar
 216 Ernston Road
 Township of Sayreville, Middlesex County, New Jersey

		Friday		Sunday	
		Existing	No-Build	Existing	No-Build
Ernston Road / Bordentown Avenue	Northbound Left	C (24.3)	C (24.8)	C (23.6)	C (24.1)
	Through Right	D (41.3)	D (42.6)	D (43.1)	D (45.2)
	Southbound Left	D (36.0)	D (36.3)	D (35.0)	D (35.5)
	Through Right	C (22.7)	C (23.0)	C (23.3)	C (23.8)
	Eastbound Left	D (39.3)	D (40.2)	D (38.7)	D (39.7)
	Through Right	C (34.5)	C (34.7)	C (33.8)	C (34.0)
	Westbound Left	C (25.4)	C (25.8)	C (25.3)	C (25.8)
	Through Right	D (46.0)	D (48.3)	D (42.5)	D (45.4)
	Eastbound Left	D (35.9)	D (35.8)	C (32.4)	C (32.5)
	Through Right	C (27.2)	C (27.9)	C (27.0)	C (28.1)
	Westbound Left	D (39.9)	D (40.6)	D (37.0)	D (37.9)
	Through Right	D (40.1)	D (40.9)	D (37.1)	D (38.1)
			Build		Build

Ernston Road / West Driveway	Southbound Right	-	-	-	B (14.0)
	Eastbound Left	-	-	-	A (9.2)

Ernston Road / East Driveway	Southbound Left/Right	-	-	-	C (20.5)
	Eastbound Left	-	-	-	A (9.2)