

TRAFFIC IMPACT STUDY

For

**Artis Senior Living, LLC
Proposed Senior Living Facility**

Property Located at:

**700 Middlesex Avenue (CR 501)
Block 71 – Lot 37.01
Borough of Metuchen, Middlesex County, NJ**

Prepared by:



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

Craig W. Peregoy, PE
NJ PE License #45880

Corey M. Chase, PE
NJ PE License #47470

April 15, 2020

2621-99-003T

INTRODUCTION

It is proposed to construct a senior living facility with sixty-one (61) units and sixty-four (64) beds (The Project) on a parcel of land currently undeveloped located along the west side of Middlesex Avenue (CR 501) just north of its intersection with Factory Street, in the Borough of Metuchen, Middlesex County, New Jersey as shown on Figure 1 contained in Appendix A. The site is designated as Block 71 – Lot 37.01 on the Borough Tax Maps. Access to the proposed development will be provided via the existing full movement driveway along Middlesex Avenue which currently serves Fulton Bank as well as an interconnection to the SMG SportsPlex facility. Parking will be provided via twenty (20) on-site parking stalls as well as fifteen (15) public on-street spaces along the south side of the driveway in front of the site.

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, 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 obtained utilizing automatic traffic recorder (ATR) count data collected by the New Jersey Department of Transportation (NJDOT) as well as data as published by the Institute of Transportation Engineers.
- Projections of traffic to be generated by The Project were prepared utilizing trip generation data as published by the Institute of Transportation Engineers. Site traffic was then assigned to the adjacent street system based upon the anticipated directional distribution.
- Capacity analyses were conducted for the Existing, No Build, and Build conditions for the study intersections.
- The proposed site driveway was inspected for adequacy of geometric design, spacing and/or alignment to streets and driveways on the opposite side of the street, relationship to other driveways adjacent to the development, and conformance with accepted design standards.
- The parking layout and supply was assessed based on accepted design standards and demand experienced at similar developments.

EXISTING CONDITIONS

A review of the existing site and roadway conditions near the proposed site was conducted to provide the basis for assessing the traffic impact of the proposed residential 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:

Middlesex Avenue (CR 501) is an Urban Principal Arterial roadway under the jurisdiction of Middlesex County. In the vicinity of the site the posted speed limit is 25 MPH and the roadway provides one travel lane in each direction with a general north/south orientation. No on-street parking restrictions are posted in the vicinity of the site, while curb and sidewalk are provided along both sides of the roadway. Middlesex Avenue provides a straight horizontal alignment and a hilly vertical alignment with upgrade from north to south along the site frontage. The land uses along Middlesex Avenue in the vicinity of the site are primarily commercial.

Existing Traffic Volumes

Existing traffic volumes for the intersection of Middlesex Avenue with the site driveway were obtained utilizing counts available from NJDOT as well as data as published in the ITE publication *Trip Generation, 10th Edition* for Land Use Code (LUC) 912 – Drive-In Bank. Automatic Traffic Recorder (ATR) counts were conducted by NJDOT between Tuesday, August 28, 2018 and Thursday, August 31, 2018 between Factory Street and Central Avenue which were utilized to determine the 2018 volumes along Middlesex Avenue. The ITE data was utilized to establish the turning movements in and out of the existing driveway which serves Fulton Bank. It should be noted that there is a second driveway for the bank along Middlesex Avenue which accommodates right turn ingress movements, however conservatively it was assumed that all existing trips access the bank via the full movement driveway.

In order to calculate the current traffic volumes along Middlesex Avenue, the August 2018 data was first seasonally adjusted in order to reflect non-summer traffic volumes. The Project is located within an area designated as Region 1 by the NJDOT, which is defined as: “Traffic in urban Northeastern New Jersey-New York area that serve major industries, warehousing, trucking, logistics and through-truck movements”. In order to account for the fact that the traffic counts were conducted in August, the most recent NJDOT seasonal adjustment factors were utilized to increase the summer counts to the peak non-summer volumes based upon the Region 1 location and the Urban Principal Arterial roadway classification. The counts were then increased to better represent existing 2020 traffic volumes by applying a growth rate of 1% per year obtained from the NJDOT Annual Background Growth Rate Table for a period of two (2) years. Figure 2, located in Appendix A, shows the existing peak hour traffic volumes at the study intersections. The NJDOT ATR counts are contained in Appendix B.

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.

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 I describes the Level of Service ranges for unsignalized (stop controlled) intersections.

**Table I
Level of Service Criteria
for Unsignalized Intersections**

Level of Service	Average Control Delay (seconds per vehicle)
A	0.0 to 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	greater than 50.0

It should be noted that the analyses within the *Highway Capacity Manual* assume a random arrival for all the movements, which may not be the case if an adjacent traffic signal is present that platoons vehicles.

All capacity analyses were performed utilizing Highway Capacity Software (HCS 7). Table II summarizes the existing Levels of Service (LOS) and delays. All capacity analysis calculation worksheets are contained in Appendix C.

**Table II
Existing Levels of Service**

Intersection	Direction/ Movement		AM PSH	PM PSH
Middlesex Avenue and Site Driveway	EB	LR	C (18)	C (24)
	NB	LT	A (8)	A (9)

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.

Middlesex Avenue and Site Driveway

The site driveway intersects Middlesex Avenue to form an unsignalized T-intersection with the site driveway operating under stop control. The northbound and southbound approaches of Middlesex Avenue provide a shared left turn/through lane and a shared through/right turn lane, respectively. The eastbound approach of the site driveway provides a shared lane for left and right turns.

A review of the existing analysis reveals that the individual intersection movements operate at Level of Service “C” or better during the analyzed peak periods. See Table II for the individual movement Levels of Service and delays.

FUTURE CONDITIONS

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

Regardless of whether the subject site is developed or not, traffic volumes on the surrounding roadways are expected to increase as a result of developments throughout the region. A growth rate for roadways within the study area was obtained from the NJDOT Annual Background Growth Rate Table, which indicates a growth rate of 1% per year.

It should be noted that there are numerous developments in the vicinity of the site that were in various stages of development when the NJDOT counts were conducted that are identified as potential significant traffic generators, shown below. It was assumed that the background growth rate was adequate to account for the traffic associated with all developments not listed hereafter.

- A mixed-use development consisting of 79 residential units and 17,000 SF of retail space known as “The Hub at Metuchen”. Projections of the associated traffic volumes were developed utilizing ITE data for LUC 221 – Multifamily Housing (Mid-Rise) and LUC 820 – Shopping Center.
- A residential development consisting of 22 residential units located at 22 Center Street. Projections of the associated traffic volumes were developed utilizing ITE data for LUC 221 – Multifamily Housing (Mid-Rise).
- A residential development consisting of 19 residential units located at 23-27 Hillside Avenue. Projections of the associated traffic volumes were developed utilizing ITE data for LUC 221 – Multifamily Housing (Mid-Rise).

Future No Build traffic volumes were developed by applying the background growth rate of 1% for two (2) years to the study area roadways existing traffic volumes and adding the traffic volumes associated with the Adjacent Developments. Figure 3, in Appendix A, shows the Adjacent Development traffic volumes and Figure 4 shows the No Build traffic volumes.

Traffic Generation

Projections of future traffic volumes were developed utilizing data as published in the Institute of Transportation Engineers (ITE) publication *Trip Generation, 10th Edition* for Land Use Code (LUC) 254 – Assisted Living. Table III summarizes the projected trips generated by the proposed development utilizing the ITE data.

**Table III
Trip Generation**

Land Use	AM PSH			PM PSH		
	In	Out	Total	In	Out	Total
64 Bed Senior Living Facility	8	4	12	6	11	17

Since no appreciable increase in trip generation is projected to be generated by the site, the operational conditions of the surrounding roadway network is not anticipated to change. The minimal delays and queues in the area will remain as existing and it is likely that there will be no perceptible change in the traffic conditions with the construction of the proposed project. In fact, both ITE and the New Jersey Department of Transportation (NJDOT) define a “significant” increase in traffic as 100 or more peak hour trips. As shown in Table III, the subject property will generate less than 20% of this threshold.

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. Located in Appendix A, Figure 5 illustrates the site generated volumes assigned to the study area network. The site generated volumes were added to the No Build traffic volumes to generate the Build traffic volumes, which are shown in Figure 6.

Future Capacity Analysis

Operational conditions at the study intersections were analyzed under the No Build and Build conditions and are summarized in Table IV below.

**Table IV
Future Levels of Service**

Intersection	Direction/ Movement		AM PSH		PM PSH	
			No Build	Build	No Build	Build
Middlesex Avenue and Site Driveway	EB	LR	C (19)	C (21)	D (29)	D (32)
	NB	LT	A (9)	A (9)	A (9)	A (9)

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

Middlesex Avenue and the Site Driveway

With the addition of the site traffic, the individual intersection movements are anticipated to continue operating at Level of Service “D” or better during the studied peak hours, maintaining No Build Levels of Service. See Table IV 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 will be provided via the existing full movement driveway currently serving Fulton Bank as well as an interconnection to the SMG SportsPlex facility. This driveway layout offers sufficient geometry to allow safe and efficient access of the site.

The newly constructed parking area will be serviced by a single parking aisle with a width of 20', which is in compliance with accepted engineering design standards. This aisle will allow for one-way circulation in the westbound direction and angled parking. This access configuration is sufficient to accommodate the minimal, low-turnover traffic volumes anticipated for The Project.

Parking

As a residential development, the Residential Site Improvement Standards (RSIS) govern and were referenced. The RSIS sets forth a parking requirement of 0.5 parking spaces per unit for assisted living uses. With 61 units proposed this equates to a parking requirement of 31 spaces for The Project. It is proposed to provide 20 spaces, which does not meet the RSIS requirements and as such a variance is required.

It should be noted that the RSIS requirements are deemed to be conservative in that the *ITE Parking Generation, 5th Edition* provides an average peak parking rate of 0.4 spaces per unit for LUC 254 – Assisted Living. This equates to a parking demand of 24 spaces for the proposed 61 units based on the ITE data. Additionally, the proposed 15 public spaces along the driveway in front of the site will provide additional parking for visitors of the proposed development. Therefore, the proposed 20 on-site spaces and 15 public spaces are expected to be more than sufficient to accommodate the peak parking demand of the site.

It is proposed to provide parking stalls with dimensions of 9'x18', which exceed the minimum requirement of 9'x18' as dictated by RSIS. Therefore, it is expected that the proposed parking stall dimensions will adequately accommodate the site.

FINDINGS & CONCLUSIONS

Findings

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

- The proposed 64 bed senior living facility will generate 8 entering trips and 4 exiting trips during the morning peak hour and 6 entering trips and 11 exiting trips during the evening peak hour.
- Access to the site will be provided via the existing full movement driveway along Middlesex Avenue as well as an interconnection to the SMG SportsPlex facility.
- With the addition of the site traffic, the individual intersection movements of Middlesex Avenue and the site driveway are anticipated to operate at Level of Service “D” or better during the studied peak hours.
- As proposed, The Project’s site driveway and internal circulation have been designed to provide for safe and efficient movement of vehicles on-site.
- The proposed parking supply and design is sufficient to support the maximum anticipated demand and is consistent with past experience at similar developments, and meets the regulatory standards associated with the design and layout of the parking.

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 Borough of Metuchen and Middlesex County will not experience any significant degradation in operating conditions with the construction of The Project. The site driveway is located to provide safe and efficient access to the adjacent roadway system. The site plan as proposed provides for good circulation throughout the site and provides adequate parking to accommodate The Project’s needs.

Appendix A
Traffic Volume Figures

Appendix B
Traffic Counts

Appendix C
Capacity Analysis