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November 8, 2019

Mr. Michael Kulesza
Vice Chairman, Zoning Board of Appeals
Norfolk Town Hall
One Liberty Lane
Norfolk, MA 02056

**Subject: Residences at Norfolk Station, Norfolk, MA
Traffic Assessment**

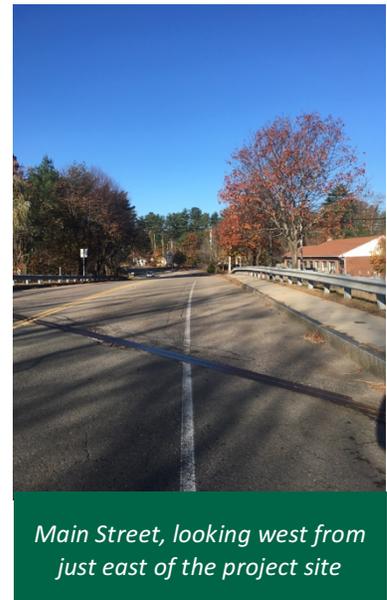
Dear Mr. Kulesza

On behalf of the applicant, Green International Affiliates, Inc. (Green) has conducted a limited traffic assessment of the proposed *Residences at Norfolk Station* residential development project located on the north side of Main Street in Norfolk, Massachusetts with an address of #194 Main Street. The scope of our study consisted of reviewing the section of Main Street in the immediate vicinity of the project site, estimate of expected vehicle trips generated by the proposed development project and an evaluation of the of sightlines at the site driveways. The project trip estimate also was compared to estimated trip characteristics of the current site uses to demonstrate minimal difference in hour traffic generating characteristics is likely to occur with the proposed project. With minimal differences in traffic generation, we would expect minimal changes to operating conditions at the nearby intersections with the project.

The site, currently occupied by a small commercial building, storage garage and one single family residence, is located approximately 625 feet east of Boardman Street and within 700 feet of the commuter rail station. The existing site includes two full access drives. The proposed project consists of a single three-story apartment buildings consisting of 60 residential rental units with a mix of 1, 2 and 3 bedroom units. The existing buildings on the site will be removed. Access is to be provided on Main Street via one driveway as the proposed project will retain the existing western drive with some minor modifications. Vehicular traffic will circulate to the rear of the building to access the site parking. In total, 108 spaces will be provided on the site with a portion within the building structure and a portion outside the building.

Main Street

Along the segment abutting the project, Main Street is a two-lane, two-way roadway providing 12-foot-wide travel lanes separated by a double yellow centerline and approximately four to six foot-wide striped shoulders. The street is owned and maintained by the Town of Norfolk. A five (5)-foot-wide cement concrete sidewalk exists in good condition along the north side of Main Street. Speed limits are posted at 30 miles per hour (mph) in this location which is in the center of the town. Historical studies¹ indicate that Main Street in this section carries approximately 11,615 vehicles over the course of the day.



*Main Street, looking west from
just east of the project site*

¹ VAI, Traffic Memorandum dated October 5, 2017.

Project Related Trip Generation

An estimate of expected trip generation related to the project was completed using the models and statistics published by the Institute of Transportation Engineers (ITE) in Trip Generation Manual² for similar land uses were examined. The ITE trip generation statistics represent compilations of data from studies/projects throughout the United States, collected over the past 50+ years on trip generation characteristics for different types of land uses. Land Use Code (LUC) 220-Multi-family was selected as the most similar to the project type. The total estimated new trips generated by the project is presented in Table 1.

**Table 1 – Summary of Site Trip Generation
Proposed 60 Unit Apartment Complex**

	ENTER	EXIT	TOTAL
Weekday 24 Hour	207	207	414
Weekday AM Peak Hour	7	22	29
Weekday PM Peak Hour	23	14	37

ITE LUC 220 Multi Unit Land Use

As shown in the table, the proposed development project is expected to generate a relatively small number of vehicle trips particularly during the peak hours with 29 vehicle trips projected for the AM peak hour and 37 vehicle trips during the PM peak hour. The majority of trips in the morning would be exiting the site while in the evening peak hour, the majority of project trips would be entering the site. Due to the project's location, it is likely that there would be a number of walk trips to the train station during the commuter times. Historical census work trip data indicates that approximately 8% of Norfolk residents commute by public transportation (i.e. commuter rail).

In addition to the work trip, it is likely that what would typically be a vehicle trip over the course of the day, could become a walking trip given the project's proximity to town hall, the library, banks and other commercial establishments located in Norfolk center. Consequently, the estimated volumes shown in the above table represent a conservatively high forecast as the likelihood of walk trips during the day including the commuter times would reduce the number of vehicle trips to and from the site. The total daily vehicle trip value could realistically be reduced by 15 to 20 percent while the peak hours could be reduced between 8 and 15 percent realistically due to proximity of train station and the commuter trips.

Assessment of Traffic Impact

To assess the potential traffic impact created by the new project, an estimate of trip generation for the current uses on the site was made and compared to the proposed trip generation characteristics. The current site houses a sit down casual restaurant that serves breakfast and lunch (approx. 50 seats) and a barber shop. A bank used to be located in the building. The rest of the building was assumed to be office space. There is also a single family residence on the site. In addition, there is a structure has been used to store vehicles. ITE was used to develop trip generation estimates for these current uses where models existed. Where models were limited (i.e. barbershop), assumptions were made for computing the potential traffic generation. Table 2 summarizes the estimated total site trip activity under current conditions and compares the weekday, AM peak hour and PM peak hour with the trip estimate for the proposed use.

² Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, Washington, D.C., 2017.

**Table 2 – Comparison of Site Trip Generation
Existing Land Uses vs. Proposed Project**

	CURRENT		PROPOSED
	TOTAL		TOTAL*
Weekday 24 Hour	450		414
Weekday AM Peak Hour	48		29
Weekday PM Peak Hour	39		37

* unadjusted for new use pedestrian related trips

As can be seen by the information contained in Table 2, the trip generation estimate for the proposed use over the course of the day will be similar but slightly lower than the combination of all the total uses that are on the existing site including the presumed re-occupancy of the vacant bank space. If one considered the likely reduction of project vehicle trips due to pedestrian and bicycle trips being made, the proposed use's impact would be that much less. Based upon the foregoing, it is reasonable to conclude that the current levels of service for Main Street and the proposed driveway intersection as well as the nearby intersections, including the roundabout at Rockwood Road, will not be substantively changed or negatively affected by the proposed development as a result of the estimated reduction in the number of trips from the project.

Sight Distances/Site Drive Visibility

Visibility in relation to the site drives is an important consideration for any development. Although the proposed project will utilize one of the existing drive connections to Main Street, a field review was completed to review the conditions. The minimum criteria for establishing adequate stopping and intersection sight distances are defined by the American Association of State Highway and Transportation Officials (AASHTO).³ Stopping sight distance (SSD) represents the distance required for a driver traveling at a specified speed to come to a complete stop and therefore relates specifically to safety. Intersection sight distance (ISD) relates to an exiting driver's view of approaching traffic and represents the distance an approaching vehicle travels during a specified time gap. As indicated by AASHTO, if the available ISD meets or exceeds the minimum SSD criteria, then there is adequate safe sight distance available for motorists to avoid collisions. ISD is more of a measure of convenience for approaching motorists and is not necessary for safe operations. Minimum required sight distances are calculated based on operating speeds of approaching drivers and the grade of the roadway.

For 30 mph speeds, the minimum stopping and intersection sight distance criterion would be 200 feet. The distances to and from the east could be increased slightly due to the downgrade from the MBTA overpass towards the site. Sight distances measured in relation to the proposed site drive location which is located on the western edge of the site frontage were more than 500 feet to and from the west and approximately 350 feet to and from the east. Based on this analysis, the site drive location is properly situated with respect to safe sight distances. The available sightlines are more than adequate to ensure safe traffic operations. The attached diagram illustrates the findings.

³ American Association of State Highway Transportation Officials (AASHTO), [A Policy on Geometric Design of Highways and Streets](#) (Green Book), Washington, D.C., 2011.

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Based on this assessment and review, it is our opinion that the proposed Residences at Norfolk Station development project at 194 Main Street will not significantly impact traffic operations along Main Street and that site traffic would be expected to be able to enter and exit the site in a safe manner. Furthermore, the location of this residential project in Norfolk center is likely to result in a significant number of walk and bicycle trips over the course of a typical day thereby resulting in a reduction in estimated vehicle trips.

While this assessment has shown minimal anticipated vehicle traffic impacts and the project can be safely accessed/egressed, several traffic safety and control related recommendations have been developed. These are as follows:

- That the project include a moderate capacity bicycle parking rack or cage within the garage for its residents to better encourage bicycle usage.
- A STOP sign should be placed facing the exit driveway to formalize a driver's requirement to stop prior to entering Main Street. All traffic control signage should conform to the MUTCD⁴.
- Small internal signs along the site driveway to the rear parking areas should be considered reminding motorists to drive slowly on site and be aware of potential pedestrians and bicyclists.
- Any new vegetation or site signage adjacent to the site driveway at Main Street should be kept low-lying (less than two feet tall) and/or set back sufficiently to maintain adequate sightlines.

If you have any questions, do not hesitate to contact me at 978-923-0400.

Very truly yours,
GREEN INTERNATIONAL AFFILIATES, INC.

William J Scully

William J. Scully, P.E.
Vice President
Municipal Transportation &
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WJS/-

Cc M. O'Shaughnessy

⁴ U.S. Department of Transportation, Federal Highway Administration, Manual on Uniform Traffic Control Devices (MUTCD), Washington, D.C., 2009.



FIGURE 1
194 MAIN STREET
SIGHT DISTANCE ANALYSIS