MEMORANDUM

TO: 489 Worcester LLC
c/o Mr. Victor Sheen
31 Concord Avenue, #9
Cambridge, MA 02138

FROM: Mr. Jeffrey S. Dirk, P.E., PTOE, FITE
Managing Partner
Vanasse & Associates, Inc.
35 New England Business Center Drive
Suite 140
Andover, MA 01810-1066
(978) 269-6830
jdirk@rdva.com
Professional Engineer in CT, MA, ME, NH, RI and VA

DATE: April 13, 2023

RE: 9668

SUBJECT: Preliminary Transportation Impact Assessment
8 Cliff Road
Wellesley, Massachusetts

Vanasse & Associates, Inc. (VAI) has conducted a Preliminary Transportation Impact Assessment (PTIA) in order to provide an initial assessment of the potential impacts on the transportation infrastructure associated with the proposed construction of a multifamily residential development to be located 8 Cliff Road in Wellesley, Massachusetts (hereafter referred to as the "Project"). This assessment: i) reviews the existing conditions context of the transportation infrastructure serving the Project site; ii) evaluates the access to the Project site and internal circulation; and iii) qualitatively evaluates the potential impact of the Project on the transportation infrastructure.

Based on this preliminary assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the Institute of Transportation Engineers (ITE)[1] and without adjustment to account for the use of alternative modes of transportation to single-occupancy vehicles (SOVs) or consideration that some portion of the Project will be occupied by "empty nesters", the Project is predicted to generate approximately 318 vehicle trips on an average weekday (two-way, 24-hour volume), with 19 vehicle trips expected during the weekday morning peak-hour and 28 vehicle trips expected during the weekday evening peak-hour. ***It is reasonable to assume that 20 to 25 percent of these trips will be made by means of public transportation, bicycling or walking, which will reduce the overall impact of the Project***;

2. The Project is located within walking distance of Wellesley Hills Commuter Rail Station, providing an opportunity to reduce the volume of traffic produced by the Project and encourage the use of alternative modes of transportation to SOVs;

3. No apparent safety deficiencies were noted with respect to the motor vehicle crash history in the vicinity of the Project site based on a review of information available through the Massachusetts Department of Transportation (MassDOT); and

[1] *Trip Generation,* 11th Edition; Institute of Transportation Engineers; Washington, DC; 2021.

4. A preliminary review of lines of sight at the Project site driveway intersections indicates that the available sight lines exceed the recommended minimum distances for the driveways to operate in a safe and efficient manner.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with implementation of the recommendations defined herein. These findings will be further evaluated as a part of the formal TIA that will be prepared in support of the local approval process.

The following details our preliminary assessment of the Project.

PROJECT DESCRIPTION

The Project will entail the construction of a multifamily residential development to be on an assemblage of parcels with addresses at 4 and 14 Cliff Road and 489 Worcester Street in Wellesley, Massachusetts. As proposed, the Project will include the construction of two (2) three-story multifamily residential buildings that will include a total of 70 multifamily residential units, with amenities and supporting parking. It is expected that a portion of the residents of the Project will be "empty nesters" that are looking to downsize their living area and remain within the Town.

Imagery ©2023 Google

The Project site encompasses approximately 3.75± acres of land that is bounded by residential properties to the north and west, Worcester Street (Route 9) to the south and Cliff Road to the east. The Project site currently contains three (3) single-family homes with associated driveways and appurtenances, all of which will be removed to accommodate the Project.

Access to the Project site will be provided by way of three (3) driveways configured as follows: a full access driveway that will intersect the west side of Cliff Road at the approximate location of the existing driveway that serves 14 Cliff Road and two (2) driveways that will intersect the north side of Route 9 with the east driveway to be situated at the approximate location of the existing driveway that serves

489 Worcester Street and will function as a one-way entrance and the west driveway located approximately 120 feet west of the existing driveway and will serve as the corresponding exit. The Project will require the issuance of a State Highway Access Permit from MassDOT for access to Route 9, a State Highway that is under MassDOT jurisdiction.

On-site parking will be provided for approximately 130 vehicles, or a parking ratio of 1.86 parking spaces per unit, with approximately 30 parking spaces to be provided in a surface parking lot that will be accessed from Route 9 and approximately 100 parking spaces that will be provided in a garage situated beneath the residential units and accessed from Cliff Road. The Project site is located within the *Single Residence 20* Zoning District, within which the development of multifamily housing is not allowed and, therefore, off-street parking requirements for multifamily residential buildings are not specified in the Zoning Bylaw. The parking ratio that is proposed (1.86 parking spaces per unit) exceeds the number of parking spaces that are necessary to accommodate the peak parking demands for a multifamily residential developed in a similar setting as documented by the ITE.[2]

EXISTING CONDITIONS CONTEXT

In order to establish the existing conditions context of the Project with respect to the transportation infrastructure, a review of existing roadway geometrics; pedestrian and bicycle facilities; posted speed limits; traffic volumes; and land use information was completed along Route 9 and Cliff Road in the vicinity of the Project site. The following provides a description of the transportation infrastructure serving the Project site.

Roadways

Worcester Street (Route 9)

- Four-lane urban principal arterial roadway under MassDOT jurisdiction;
- Traverses a general east-west alignment providing a full access interchange with I-95/Route 128 to the east of the Project site;
- Provides two (2) 11 to 12-foot wide travel lanes per direction that are separated by a raised median with guardrail with variable width marked shoulders;
- Average weekday traffic volume measured in 2018 was approximately 42,800 vehicle per day (vpd) in the vicinity of the I-95/Route 128 interchange, with weekday peak hourly traffic volumes of approximately 4,280 vehicles per hour (vph);
- The posted speed limit approaching the Project site is 40 miles per hour (mph), changing to 50 mph to the west;
- Sidewalks are provided along both sides of the roadway;
- Illumination is provided by way of street lights mounted on steel poles;
- Land use within the study area consists of the Project site, residential and commercial properties, the Wellesley Fire Department, Wellesley Municipal Light Department and Wellesley Department of Public Works.

[2] *Parking Generation*, 5th Edition; Institute of Transportation Engineers; Washington, D.C.; January 2019. The observed peak parking demand for a multifamily (mid-rise) residential building was identified to be 1.31 parking spaces per unit on average with an 85th percentile peak parking demand of 1.47 parking spaces per unit.

Cliff Road

- Two lane urban collector roadway under Town jurisdiction;
- Traverses a general northwest-southeast alignment between Glen Road and Washington Street (Route 16);
- Provides two (2) 11 to 12-foot wide travel lanes that are separated by a double-yellow centerline with approximately 1- to 2-foot wide marked shoulders;
- A posted speed limit is not provided and, as such, the statutory of "prima facie" speed limit pursuant to M.G.L. c. 90 § 17 is 30 mph;[3]
- A sidewalk is provided along both sides of the roadway;
- Illumination is provided by way of street lights mounted on wood poles;
- "Sharrow" pavement markings and "Share the Road" signs are provided in both directions of travel;
- Land use within the study area consists of the Project site, residential and commercial properties and Wellesley Hills Station on the Massachusetts Bay Transportation Authority (MBTA) Commuter Rail system (Framingham/Worcester Line).

Intersection

Table 1 summarize existing lane use, traffic control, and pedestrian and bicycle in the vicinity of the Project site.

Table 1
INTERSECTION DESCRIPTION

Intersection	Traffic Control Type[a]	No. of Travel Lanes Provided	Shoulder Provided? (Yes/No/Width)	Pedestrian Accommodations? (Yes/No/Description)	Bicycle Accommodations? (Yes/No/Description)
Washington St./ Cliff Rd./ Seaward Rd.	TS	1 general purpose travel lane on Washington St. southwestbound; 1 left-turn lane and 1 through travel lane on Washington St. northeastbound; 1 left-turn lane and 1 right-turn lane on Cliff Rd.; 1 general purpose travel lane on Seaward Rd.; on-street parking permitted along both sides of Washington St. and Seaward Rd., and along the north side of Cliff Rd. north of the intersection.	No	Yes; sidewalks along both sides of the intersecting roadways; crosswalks provided across all legs of the intersection; pedestrian traffic signal equipment and phasing provided	Yes; "sharrow" pavement markings provided on Washington St. accompanied by "Share the Road" signs

See notes at end of table.

[3]The statutory of "prima facie" speed is defined in M.G.L Chapter 90, Section 17, as the speed which would be deemed reasonable and proper to operate a motor vehicle.

Table 1 (Continued)
INTERSECTION DESCRIPTION

Intersection	Traffic Control Type[a]	No. of Travel Lanes Provided	Shoulder Provided? (Yes/No/Width)	Pedestrian Accommodations? (Yes/No/Description)	Bicycle Accommodations? (Yes/No/Description)
Cliff Rd./Rte. 9 WB Ramp	S	1 general purpose travel lane on all approaches	Yes; 1 to 2 feet on the intersecting roadways	Yes; sidewalks along both sides of the intersecting roadways	Yes; "sharrow" pavement markings provided on Cliff Rd. accompanied by "Share the Road" signs

[a]TS = traffic signal control; S = stop-sign control

Pedestrian And Bicycle Facilities

Sidewalks are provided along both sides of Cliff Road, Route 9 and Washington Street, with marked crosswalks provided for crossing all legs of the Washington Street/Cliff Road intersection that are incorporated into the traffic signal system at the intersection (i.e., pedestrian traffic signal equipment and phasing are provided). Bicycle lanes are not provided along the study area roadways; however, both Washington Street and Cliff Road include "sharrow" pavement markings with accompanying "Share the Road" signs.

Public Transportation

Public transportation services are provided within the area by the MBTA. The MBTA provides Commuter Rail service to South Station in Boston on the Framingham/Worcester Commuter Rail Line from Wellesley Hill Station, which is located at 341 Washington Street, an approximate 3-minute walking distance from the Project site along Cliff Road. The MBTA also operates The Ride paratransit services for eligible persons who cannot use fixed-route transit all or some of the time due to a physical, cognitive, or mental disability in accordance with ADA requirements.

The MetroWest Regional Transit Authority (MWRTA) provides fixed-route bus services along Route 9 and past the Project site by way of Route 1, which provides service between the MWRTA Blandin Hub in downtown Framingham and Woodland Station on the MBTA Green Line subway.

MOTOR VEHICLE CRASH DATA

A review of the MassDOT statewide high crash location list indicated that there are no locations proximate to the Project site along Route 9, Cliff Road or Washington Street that are defined as Highway Safety Improvement Program (HSIP) eligible crash locations.

PROJECT-GENERATED TRAFFIC

As proposed, the Project will entail the construction of a 70-unit multifamily residential community. In order to develop the traffic characteristics of the Project, trip-generation statistics published by the ITE[4] for a similar land use as that proposed was used. As discussed previously, it is expected that a portion of the residents of the Project will be "empty nesters" and may be retired, thereby reducing trips during the traditional commuter peak hours; however, for the purpose of this assessment, no adjustment was applied to account for reduced peak-hour trips. ITE Land Use Code (LUC) 221, *Multifamily Housing (Mid-Rise)*, was used to establish the trip-generation calculations for the Project, the results of which are summarized in Table 2.

Table 2
TRIP-GENERATION SUMMARY[a]

Time Period/Direction	Vehicle Trips Proposed Residential Development (70 units)
Average Weekday Daily:	
Entering	159
Exiting	159
Total	318
Weekday Morning Peak Hour:	
Entering	4
Exiting	15
Total	19
Weekday Evening Peak Hour:	
Entering	17
Exiting	11
Total	28

[a]Based on ITE LUC 221, *Multifamily Housing (Mid-Rise).*

Project-Generated Traffic-Volume Summary

As can be seen in Table 2, the Project is predicted to generate approximately 318 vehicle trips on an average weekday (two-way, 24-hour volume, or 159 vehicles entering and 159 exiting), with 19 vehicle trips (4 vehicles entering and 15 exiting) expected during the weekday morning peak-hour and 28 vehicle trips (17 vehicles entering and 11 exiting) expected during the weekday evening peak-hour.

Given the proximity of the Project site to the Wellesley Hills Commuter Rail station, as well as the interconnected network of sidewalks and on-road (shared) bicycle accommodations, it is expected that a portion of the residents of the Project will use public transportation, walk or bicycle as their primary mode of transportation. Disseminating the trips shown in Table 2 to these alternative modes of transportation to SOVs would be expected to reduce the number of automobile trips associated with the Project by between 20 and 25 percent.

[4]Ibid 1.

SIGHT LINE EVALUATION

Sight distance measurements were performed at the intersections of the Project site driveways with Cliff Road and Route 9 in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)[5] requirements. Both stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance required by a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. ISD or corner sight distance (CSD) is the sight distance required by a driver entering or crossing an intersecting roadway to perceive an oncoming vehicle and safely complete a turning or crossing maneuver with on-coming traffic. In accordance with AASHTO standards, if the measured ISD is at least equal to the required SSD value for the appropriate design speed, the intersection can operate in a safe manner. Table 3 presents the measured SSD and ISD at the subject intersections.

Table 3
SIGHT DISTANCE MEASUREMENTS[a]

Intersection/Sight Distance Measurement	Feet		
	Required Minimum (SSD)	Desirable (ISD)[b]	Measured
Route 9 at the Exit Project Site Driveway			
Stopping Sight Distance:			
Route 9 approaching from the east	495	--	650+
Intersection Sight Distance:			
Looking to the east from the Project Driveway	495	530	650+
Cliff Road at the Project Site Driveway			
Stopping Sight Distance:			
Cliff Road approaching from the north	250	--	538
Cliff Road approaching from the south	250	--	351
Intersection Sight Distance:			
Looking to the north from the Project Driveway	250	335	514
Looking to the south from the project Driveway	250	390	394

[a]Recommended minimum values obtained from *A Policy on Geometric Design of Highways and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018; and based on a 55 mph approach speed on Route 9 and a 35 mph approach speed on Cliff Road.
[b]Values shown are the intersection sight distance for a vehicle turning right or left exiting a roadway under STOP control such that motorists approaching the intersection on the major street should not need to adjust their travel speed to less than 70 percent of their initial approach speed.

As can be seen in Table 3, the available lines of sight to and from the Project site driveway intersections exceed the recommended minimum sight distances to function in a safe (SSD) and efficient (ISD) manner based on a 55 mph approach speed on Route 9 and a 35 mph approach speed on Cliff Road, which is 15 mph above the posted speed limit on Route 9 approaching the driveway and 5 mph above the posted speed limit on Cliff Road. These initial findings will be confirmed in conjunction with the formal TIA.

[5]*A Policy on Geometric Design of Highway and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.

ACCESS AND PROJECT-RELATED IMPACTS

Access

Access to the Project site will be provided by way of three (3) driveways configured as follows: a full access driveway that will intersect the west side of Cliff Road at the approximate location of the existing driveway that serves 14 Cliff Road and two (2) driveways that will intersect the north side of Route 9 with the east driveway to be situated at the approximate location of the existing driveway that serves 489 Worcester Street and will function as a one-way entrance and the west driveway located approximately 120 feet west of the existing driveway and will serve as the corresponding exit.

As identified in Table 3, the available lines of sight at the Project site driveway intersections exceed the recommended minimum distances for safe operation of the driveways, indicating that the driveways are appropriately located to function in a safe manner. Further, the Cliff Road driveway is positioned approximately 250 feet north of the Cliff Road/Route 9 westbound ramps intersection which affords sufficient separation for the intersections to operate independently.

Sidewalks are provided along both sides of Cliff Road that extend to Washington Street, where marked crosswalks and pedestrian traffic signal equipment are provided for crossing all legs of the intersections. A stairway is provided along the west side of the Cliff Road bridge over the MBTA Commuter Rail tracks that provides access to platform area for the Wellesley Hills Commuter Rail station, which is located within an approximate 3 minute walking distance of the Project site. ***The proximity of the Commuter Rail station and the connectivity to the station to the Project site by way of the existing sidewalk along Cliff Road will serve to afford opportunities to reduce the traffic and parking demands of the Project.***

Project-Related Impacts

Cliff Road, Washington Street and Route 9 provide sufficient capacity to accommodate the additional traffic that will be generated by the Project with consideration of: i) the use of alternative modes of transportation to SOVs by residents of the Project; and ii) the dispersal of trips over the respective peak hours and to the roadways serving the Project site. That being said, it is expected that the following improvements may be required to address existing conditions:

- Traffic signal timing improvements at the Washington Street/Cliff Road intersection
- Sign and pavement marking installation at the Cliff Road/Route 9 westbound ramps intersection
- Sidewalk improvements/upgrades along the Project site frontage
- Pedestrian crossing enhancements at the Cliff Road/Garden Road intersection

Roadway widening or major geometric improvements do not appear to be necessary to accommodate the Project. These preliminary findings will be refined in conjunction with the preparation of the formal TIA.

SUMMARY

VAI has conducted a PTIA in order to provide an initial assessment of the potential impacts on the transportation infrastructure associated with the proposed construction of a multifamily residential development to be located 8 Cliff Road in Wellesley, Massachusetts. This assessment has: i) reviewed the existing conditions context of the transportation infrastructure serving the Project site; ii) evaluated the access to the Project site and internal circulation; and iii) qualitatively evaluated the potential impact of the Project on the transportation infrastructure. The Project will require the issuance of a State Highway Access Permit from MassDOT for access to Route 9, a State Highway that is under MassDOT jurisdiction.

Based on this preliminary assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the ITE[6] without adjustment to account for the use of alternative modes of transportation to SOVs or consideration that some portion of the Project will be occupied by "empty nesters", the Project is predicted to generate approximately 318 vehicle trips on an average weekday (two-way, 24-hour volume), with 19 vehicle trips expected during the weekday morning peak-hour and 28 vehicle trips expected during the weekday evening peak-hour. ***It is reasonable to assume that 20 to 25 percent of these trips will be made by means of public transportation, bicycling or walking, which will reduce the overall impact of the Project***;

2. The Project is located within walking distance of Wellesley Hills Commuter Rail Station, providing an opportunity to reduce the volume of traffic produced by the Project and encourage the use of alternative modes of transportation to SOVs;

3. No apparent safety deficiencies were noted with respect to the motor vehicle crash history in the vicinity of the Project site based on a review of information available through MassDOT; and

4. A preliminary review of lines of sight at the Project site driveway intersections indicates that the available sight lines exceed the recommended minimum distances for the driveways to operate in a safe and efficient manner.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with the implementation of the recommendations that follow. These initial recommendations will be revisited and refined in conjunction with the formal TIA.

RECOMMENDATIONS

Project Access

The following recommendations are offered with respect to the design and operation of the Project site access and internal circulation:

- The Project site driveways should be a minimum of 20 feet in width and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle.

[6]Ibid 1.

- Vehicles exiting the Project site should be placed under stop control.
- "One Way" and "Do Not Enter" signs should be provided to regulate the follow of traffic for the one-way entrance and exit driveways along Route 9. In addition, a "One Way" and "No Left Turn" should be installed in the median along Route 9 facing traffic exiting the Project site.
- All signs and pavement markings to be installed within the Project site should conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[7]
- Where perpendicular parking is proposed, the drive aisle behind the parking should be a minimum of 23 feet in order to facilitate parking maneuvers.
- A sidewalk should be provided within the Project site that should extend to the sidewalks along both Route 9 and Cliff Road.
- Americans with Disabilities Act (ADA)-compliant wheelchair ramps should be provided at pedestrian crossings to be modified or constructed in conjunction with the Project, including for crossing the Project site driveways or the driveways should be designed so that the sidewalk crosses the driveways (i.e., pan-type driveway).
- Signs and landscaping to be installed as a part of the Project within the intersection sight triangle areas of the Project site driveways should be designed and maintained so as not to restrict lines of sight.
- Snow accumulations (windrows) within sight triangle areas should be promptly removed where such accumulations would impede sight lines.

Transportation Demand Management Program

The follow Transportation Demand Management (TDM) measures should be considered for implementation as part of the Project in an effort to encourage the use of alternative modes of transportation to single-occupant vehicles:

- A transportation coordinator should be assigned for the Project to coordinate the TDM program;
- Information regarding public transportation services, maps, schedules, and fare information should be posted in a central location and/or otherwise made available to residents;
- A "welcome packet" should be provided to new residents detailing available public transportation services, bicycle and walking alternatives, and other commuting options;
- Pedestrian accommodations should be incorporated within the Project site;
- A central maildrop should be provided; and
- Secure bicycle parking should be provided at appropriate locations within the Project site and include both exterior and interior (weather protected) bicycle parking.

[7] *Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.

With implementation of the aforementioned recommendations, safe and efficient access will be provided to the Project site and the Project can be accommodated within the confines of the existing and improved transportation system.

cc: File