

Ref: 7211

January 21, 2016

Ms. Jody Kablack
Director of Planning and Community Development
Town of Sudbury
278 Old Sudbury Road
Sudbury, MA 01776

Re: Traffic Engineering Peer Review
Meadow Walk Sudbury – 526 and 528 Boston Post Road
Sudbury, Massachusetts

Dear Jody:

Vanasse & Associates, Inc. (VAI) has completed a review of the materials submitted on behalf of BPR Sudbury Development, LLC (the “Applicant”) in support of the proposed Meadow Walk Sudbury mixed-use development to be located at 526 and 528 Boston Post Road (Route 20) in Sudbury, Massachusetts (hereafter referred to as the “Project”). Our review focused on the following areas as they relate to the Project: i) vehicle and pedestrian access and circulation; ii) Massachusetts Department of Transportation (MassDOT) design standards; iii) Town Zoning requirements as they relate to access, parking and circulation; and iv) accepted Traffic Engineering and Transportation Planning practices.

This review is limited to the January 6, 2016 *Traffic Impact and Access Study* (the “January 2016 TIAS”) that was prepared by Vanasse Hangen Brustlin, Inc./VHB in support of the Project as the Site Plans for the Project were not available at this time. In addition, we note that the comments that are offered herein are based on the full build-out of the Project, consistent with the presentation in the January 2016 TIAS.

Based on our review of the information submitted in support of the Project, we have determined that the materials were prepared in a professional manner and following the applicable standards of care. We have requested that the Applicant’s engineer review and revise the No-Build and Build condition traffic volumes and the associated analyses in order to provide a clear and concise representation of the potential impact of the Project on the transportation infrastructure. Further, given the phased nature of the Project and the need to obtain rights from other property owners to complete the proposed access improvements for the Project, the Applicant should present a phasing plan for both the Project and the associated improvements, along with all necessary supporting plans and analyses in order to ascertain which improvements are required to support each phase of the Project. In addition, we have provided guidance and recommendations that should be considered by the Applicant with respect to the development of the Site Plans for the Project.

The following summarizes our review of the materials submitted in support of the Project. Our comments are indicated in *italicized* text, with those requiring responses or additional information **bolded**.

PROJECT DESCRIPTION

As proposed, the Project will entail the redevelopment of the Raytheon campus located at 526-528 Boston Post Road (Route 20) in Sudbury, Massachusetts, to accommodate a mixed-use development to be known as Meadow Walk Sudbury. The Project will be constructed in phases and will include 80,000± square feet (sf) of mixed retail space including a 45,000± sf grocery store; a 250 unit residential apartment community; an age-restricted, active adult residential community with up to 60 dwelling units; and an assisted living/memory care facility with up to 54 beds. At present the Project site contains 563,300± sf of office, research and development (R&D), and manufacturing space in multiple buildings that are operated by Raytheon and supported by 2,040± parking spaces and associated appurtenances. These facilities, excepting approximately 15,000± sf of R&D space, will be removed to accommodate the Project. The Project site encompasses approximately 50 acres of land and is bounded by a railroad right-of-way to the north; Boston Post Road and a Town of Sudbury fire station to the south; commercial properties to the east; and commercial properties and areas of open and wooded space to the west.

Access to the Project site will be provided by way of the two (2) existing driveways that serve the Raytheon campus and are situated parallel to the east and west property lines; the existing center driveway (right-turn, exit only) will be closed in conjunction with the Project. The east Project site driveway will be placed under traffic signal control and aligned opposite a new driveway to the Sudbury Plaza that will be constructed as a part of the Project. The west Project site driveway will be reconstructed to improve the corner radii and facilitate turning movements at the intersection, and will be placed under STOP-sign control. In conjunction with the access improvements, left-turn lanes will be added to Boston Post Road at the east Project site driveway (signalized), and the driveways to the Sudbury Plaza will be modified to accommodate the proposed roadway geometry.

Boston Post Road (Route 20) is a State Highway under the jurisdiction of MassDOT and, as such, the Project will require the issuance of a State Highway Access Permit from MassDOT for access to Route 20 and to complete the associated roadway, intersection and traffic control improvements. In addition, based on information provided by the Applicant's engineer, the Project will require the filing of an Environmental Notification Form (ENF) with the Secretary of Energy and Environmental Affairs (EEA) pursuant to the provisions of the Massachusetts Environmental Policy Act (MEPA) due to the net increase in traffic that the Project represents over the current use of the site.

JANUARY 6, 2016 TRAFFIC IMPACT AND ACCESS STUDY

General

Comment: The January 2016 TIAS was prepared under the direction of Mr. Vinod Kalikiri, P.E., PTOE (MA P.E. No. 41442, Civil) and was completed in a professional manner and following the applicable standards of care.

Existing Conditions

Study Area

The study area evaluated for the Project was developed in consultation with and approved by MassDOT, and consisted of Boston Post Road (Route 20) and the following specific intersections:

- Route 20 at Horse Pond Road
- Route 20 at Dudley Road
- Route 20 at Highland Avenue and the Sudbury Plaza west driveway
- Route 20 at the Sudbury Plaza east driveway
- Route 20 at Nobscot Road
- Route 20 at Union Avenue
- Route 20 at Raymond Road
- Route 20 at Concord Road
- Route 20 at Landham Road

Comment: *This study area is generally sufficient to evaluate the potential impact of the Project on the transportation infrastructure based on the expected trip-distribution pattern for the Project, and encompasses all major intersections located proximate to the Project site where the Project is expected to result in an increase in peak-hour traffic volumes by: i) five (5) percent or more; or ii) by more than 100 vehicles per hour.*

Traffic Volumes and Data Collection

Traffic volumes were collected along Route 20 in the vicinity of the Project site over a continuous 72-hour period (Thursday through Saturday) in May 2015 means of an automatic traffic recorder, with manual turning movement counts and vehicle classification counts conducted at the study intersections during the weekday morning (7:00 to 9:00 AM), weekday evening (4:00 to 6:00 PM) and Saturday midday peak periods in May and November 2015. A review of seasonal adjustment data available from MassDOT indicated that traffic volume conditions during the months of May and November are representative of an “above average” condition and, as such, the Applicant’s engineer did not adjust the raw traffic count data in order to provide a conservative (above average) analysis condition.

In addition, vehicle travel speeds were also measured along Route 20 in the vicinity of the Project site in conjunction with the automatic traffic recorder counts. These measurements indicated that the average measured 85th percentile travel speed (the speed at which 85 percent of the observed vehicles travelled at or below) was approximately 38 miles per hour (mph) in the eastbound direction and 36 mph westbound, which is lightly above the posted speed limit in the vicinity of the Project site (35 mph).

Comment: *The data collection effort (traffic counts and vehicle travel speed measurements) and establishment of the seasonal adjustment were completed in accordance with standard Traffic Engineering and Transportation Planning practices, and we are in agreement with the resulting values.*

Pedestrian and Bicycle Facilities

An inventory of pedestrian and bicycle facilities within the study area was included in roadway and intersection descriptions presented in the January 2016 TIAS. As noted therein, a sidewalk is provided continuously along the north side of Route 20 within the study area, and along the south side between the Sudbury Plaza and the Sudbury Crossing retail center. Marked crosswalks are provided for crossing the study area intersections where a sidewalk is present, with a mid-block crossing of Route 20 provided between the Project site and the Sudbury Plaza. With the exception of the Route 20/Union Avenue intersection, the signalized intersections within the study area include pedestrian push buttons, signal indications and phasing where crosswalks are provided.

The January 2016 TIAS did not include a description of existing and future bicycle accommodations within the study area.

Comment: *The description of existing pedestrian facilities within the study area is consistent with field observations and indicates that the existing transportation system provides opportunities for pedestrian access to the Project site.*

An inventory of bicycle accommodations within the study area should be provided and summarized in graphical format, depicting the location of both existing and planned future bicycle accommodations and their relationship and connectivity to the Project site. This will allow for an understanding of opportunities to integrate the Project into available transportation resources with the goal of reducing the overall traffic and parking demands associated with the Project.

Public Transportation

A review of available public transportation resources serving the study area was undertaken and summarized in the January 2016 TIAS. Based on this review, it was identified that the study area is not currently served by regularly scheduled public transportation services; however, the Town of Sudbury is a member of the Metro West Regional Transit Authority (MWRTA). MWRTA bus service is currently provided along Route 20 in Marlborough and to the Nobscott Shopping Center in Framingham. A recently completed service assessment prepared by the MWRTA identifies extension of the Marlborough service route (Route 7C) to Sudbury and Wayland along Route 20 and the Framingham service routes (Route 2 and 3) into Sudbury as recommended future service plan expansions.

Motor Vehicle Crash Summary

Motor vehicle crash information was obtained for the study area intersections from MassDOT for the most recent 5-year period available (2009 through 2013, inclusive). Based on a review of this information, it was determined that the unsignalized intersections of Route 20 at Highland Avenue and the Sudbury Plaza west driveway (31 crashes total) and Route 20 at Landham Road (48 crashes total) experienced a frequency of occurrence of motor vehicle crashes that was found to be disproportionate to the number of vehicle travelling through these intersections, resulting in motor vehicle crash rates (average number of motor vehicle crashes reported per year per million vehicles travelling through an intersection) that were above the MassDOT average motor vehicle crash rate for a signalized or unsignalized intersection, as appropriate. In addition, a motor vehicle crash resulting in a fatality was



reported at the Route 20/Landham Road intersection in May 2011, and two (2) crashes involving a pedestrian or bicycle were reported at the Route 20/Highland Avenue/Sudbury Plaza west driveway intersection. The Applicant's engineer noted that MassDOT is currently designing improvements for the Route 20/Landham Road intersection that will include specific measures to reduce the frequency of occurrence of motor vehicle crashes at the intersection.

Comment: *The motor vehicle crash analysis was completed in accordance with MassDOT standards and following standard Traffic Engineering and Transportation Planning practices, and we are in agreement with the findings of the analysis. A review of the MassDOT statewide High Crash Location List indicates that the Route 20/Landham Road intersection was included on MassDOT's Highway Safety Improvement Program (HSIP) listing for funding to implement safety-related improvements. As indicated, MassDOT is currently designing improvements for this intersection to address both traffic operations and safety. In addition, the Applicant has proposed specific improvements along Route 20 and at the driveways to the Sudbury Plaza with the goal of improving both traffic operations and safety (discussion follows).*

Future Conditions

No-Build Conditions

Traffic volumes within the study area were projected to 2022, which represents a 7-year planning horizon from the existing conditions base year (2015). The future condition traffic volume projections were developed by applying a background traffic growth rate to the 2015 Existing traffic volumes and then adding traffic associated with specific development projects by others that may increase traffic volumes within the study area beyond that accounted for by the background traffic growth rate. A background traffic growth rate of 1.0 percent per year was established based on a review of historic traffic growth data available from MassDOT.

The Applicant's engineer consulted with the Sudbury Planning Department in order to determine if there were any specific development projects by others that would result in an increase in traffic volumes within the study area that would exceed the background traffic growth rate (1.0 percent per year). Based on these discussions, three (3) projects were identified for inclusion in the future condition traffic volume projections: Village at Sudbury Station (250 residential units); Concord Road retail plaza reoccupancy (8,040 sf retail/commercial space); and 275-290 Boston Post Road (72 residential units).

In addition, the Applicant's engineer reassigned existing trips associated with the uses that currently occupy the Project site to through movements along Route 20 in order to reflect the contemplated reassignment of Raytheon employees to their Marlborough facility which is located off Route 20 to the west of the Project site, and then projected traffic volumes that would be associated with the re-tenanting of the existing 563,300± sf of office, R&D and manufacturing space by similar uses assuming that Raytheon vacated the site.

Comment: *We are in general agreement with the methodology that was used to develop the future condition traffic volume projections for the Project, including the background traffic growth rate used in the base calculations and the inclusion of the identified specific development projects by others; however, we are not in agreement with the methodology*



that was used concerning the re-use of the Project site and would request that the Applicant's engineer revise the No-Build traffic volumes and the associated traffic operations analysis to reflect full-occupancy of the existing uses that occupy the Project site without consideration of the reassignment of the existing site traffic as such reassignment is speculative at this time, particularly with respect to travel routes for reassigned employees.

The Applicant's engineer should provide a detailed discussion concerning the scope of the improvements that are under design by MassDOT for the Route 20/Landham Road intersection and the timing of their implementation. A review of the MassDOT project listing for the Town of Sudbury indicates that the 25 Percent Design Plans for the intersection improvements have been received and are currently under review by MassDOT.

Build Conditions

Future Build condition (with the Project) traffic volume projections were developed by the Applicant's engineer following standard Traffic Engineering and Transportation Planning practices. In order to determine the traffic characteristics of the Project, trip-generation methodologies established by the Institute of Transportation Engineers (ITE)¹ were used. The ITE provides trip-generation information for various types of land uses developed as a result of scientific studies that have been conducted over the past 50 plus years. This data includes trip estimates for land uses similar to those that are to be located within the Project site. ITE Land Use Codes (LUCs) 220, *Apartment*; 252 *Senior Adult Housing – Attached*; 54, *Assisted Living*; and 820, *Shopping Center*; were determined by the Applicant's engineer to be the most appropriate ITE land use classifications to establish the traffic characteristics of the Project. In addition, the Applicant's engineer collected traffic volume data at four (4) retail plazas located in Sudbury, Acton and Ashland that include a grocery store/supermarket anchor, similar to the development program contemplated for the Project, and used this data to develop the peak-hour traffic characteristics for the retail/grocery store component of the Project.

Given the mix of uses that are to be located within the Project site, it is expected that there will be an interaction between the individual land uses, particularly between the residential and retail/grocery components. This interaction results in internal trips within the Project site that do not impact the adjacent roadway network. Internal trips vary by use and time of day, and were accounted for by the Applicant's engineer following a procedure established by the National Cooperative Highway Research Program (NCHRP). In addition, a portion of the trips that will be generated by the retail/grocery component of the Project will be derived from existing traffic that is travelling along Route 20 for other purposes. Such trips are known as "pass-by" trips and do not represent new traffic on Route 20 as a result of the Project. MassDOT guidelines limit the "pass-by" trip reduction to the lower of the values published by the ITE for the specific land use or 15 percent of the adjacent roadway traffic volume. The Applicant's engineer applied "pass-by" trip reductions of 37 percent to the weekday morning and Saturday midday peak-hour traffic volumes associated with the retail/grocery component of the Project, and a 42 percent reduction to the weekday evening peak-hour trip projections. The resulting reductions are generally consistent with or are below 15 percent of the volume of traffic on Route 20 during the respective peak hours.

¹*Trip Generation*, 9th Edition; Institute of Transportation Engineers; Washington, DC; 2012.

The traffic volumes associated with the Project were assigned onto the study area roadway network based on a review of existing travel patterns within the study area. Separate trip distribution patterns were developed for the residential and retail uses given the differing purpose of the trips associated with each use. Based on this review, the following trip assignments were developed by the Applicant's engineer for the Project:

TRIP-DISTRIBUTION SUMMARY

Roadway	Direction To/From	Trip Assignment (Percent)	
		Residential	Retail
Route 20	East	22	30
Route 20	West	23	18
Landham Road	South	15	16
Union Avenue	North	15	12
Local Roads	South	15	13
Local Roads	North	<u>10</u>	<u>11</u>
TOTAL		100	100

In order to develop the Build (with the Project) condition traffic volumes, the net increase/decrease in traffic that the Project represents over the re-tenanting of the existing uses that occupy the Project site were added/subtracted from the No-Build (without the Project) traffic volumes using the trip assignments described above.

Comment: *We are in general agreement with the methodology that was used to develop the anticipated traffic characteristics of the Project (ITE and empirical data) and the internal trip estimates; however, the Applicant's engineer should address the following comments:*

- 1. The trip-generation calculations for the retail/grocery store component of the Project should be reviewed and revised to reflect the use of the average of the calculated trip rates for the four (4) retail centers vs. applying the total trips of the observed sites to the total gross floor area of the (4) centers.**
- 2. The pass-by trip rates applied to the retail/grocery store component of the Project should be consistent with the average pass-by trip rates cited in the ITE Trip Generation Handbook² and limited to no more than 26 percent during the weekday morning peak-hour, 34 percent during the weekday evening peak-hour and 26 percent during the Saturday midday peak-hour.**
- 3. Internal captured trips should be reviewed and revised for the senior housing and apartment community components of the Project. The current projections indicate that approximately 45 percent of the trips generated by these uses during the**

²Trip Generation Handbook, 3rd Edition, An ITE Proposed Recommended Practice; Institute of Transportation Engineers; Washington, D.C.; August 2014



weekday evening and/or Saturday midday peak hours will remain internal to the Project site. We would also suggest that the internal trips associated with the retail/grocery component of the Project are also overstated, particularly given that any internal trips associated with this use(s) will be derived from the residential component of the Project and are already accounted for as indicated above.

- 4. The Build condition traffic volumes should be developed by removing the traffic volume projections that were associated with the re-tenanting of the Project site from the No-Build traffic volumes and then adding the revised traffic volume projections for the new uses. The Applicant's engineer can provide a table summarizing the net difference in trips for contextual purposes; however, the trip patterns for the former and proposed uses are expected to be different and, therefore, applying the net difference in trips before and after the Project may not result in an appropriate condition from which to assess the impact of the Project. Traffic volume networks showing the removal of the re-tenanted traffic volumes from the study area roadways and intersections should be provided along with revised site traffic assignment networks for the Project.*
- 5. The Applicant's engineer should reassess the trip-distribution for the residential component of the Project using Journey-to-Work data for the Town of Sudbury and the U.S. Census Tract in which the Project site is located. The resulting trip distribution should then be refined based on existing traffic patterns during the commuter peak hours and a review of the local and regional roadway network.*
- 6. A review of traffic patterns at the Sudbury Plaza driveways during the peak hours indicates that approximately 75 percent of trips are oriented to/from the east of the plaza and 25 percent are oriented to/from the west, which differs from the trip assignment for the retail component of the Project. The Applicant's engineer should review the trip distribution pattern for this component of the Project and revise the trip assignments as appropriate.*

Traffic Operations Analysis

In order to assess the potential impact of the Project on the transportation infrastructure, a detailed traffic operations analysis was performed for the study intersections under 2015 Existing, 2022 No-Build and 2022 Build (with the Project) conditions. In brief, traffic operations are described by six "levels of service" which are defined by letter grades from "A" through "F", with a level-of-service (LOS) "A" representing the best operating conditions (average motorist delays of less than 10 seconds and little or no apparent vehicle queuing) and a LOS "F" representing constrained operating conditions (average motorist delays of 50 to 60 seconds or more and often with apparent vehicle queuing). A LOS of "E" is representative of an intersection or traffic movement that is operating at its design capacity, with a LOS of "D" typically representing the limit of acceptable traffic operations.

The Applicant's engineer noted that for the purpose of the analysis, it was assumed that the primary Project site driveway (east drive) was assumed to be under traffic signal control under the Build

condition,³ and that the planned improvements that are under design by MassDOT for the Route 20/Landham Road intersection were complete within the 2022 horizon year.

With the installation of a traffic control signal at the primary Project site driveway intersection with Route 20 and the relocation of the access to the Sudbury Plaza to be situated opposite the Project site driveway, and assuming implementation of the MassDOT improvements at the Route 20/Landham Road intersection, all of the signalized intersections within the study area were shown to operate at an overall LOS “D” or better during the peak hours under all analysis conditions, with the exception of the Route 20/Union Avenue intersection which was shown to operate at an overall LOS “E” during the Saturday midday peak-hour independent of the Project.

Critical movements at the unsignalized study area intersections were shown to be operating at or over capacity (LOS “E” or “F”, respectively) during the peak hours independent of the Project as a result of the relatively large volume of conflicting traffic traveling along Route 20.

Comment: *The traffic operations analysis was completed using the appropriate methodologies and we are in agreement with the reported results and the overall conclusion that the addition of Project-related traffic to the study area roadways and intersections will not result in a significant impact (increase) on motorist delays or vehicle queuing over existing or anticipated future conditions without the Project (i.e., the “No-Build” condition). An initial review of traffic volumes at the unsignalized intersections within the study area does not indicate that the installation of a traffic control signal would be an appropriate improvement measure to reduce motorist delays at these intersections.*

The Applicant’s engineer should revise the traffic operations analysis to reflect the comments herein relating to the development of the No-Build and Build condition traffic volumes. In addition and as noted by the Applicant’s engineer, the traffic operations analysis indicates that extended vehicle queuing will occur along Route 20 at the signalized intersections within the study area. In order to ascertain the impact that this queuing will have on operating conditions at proximate driveways and intersections, and the ability of existing and proposed turning lanes to accommodate the projected vehicle queues, the Applicant’s engineer should provide vehicle queue diagrams (a graphical depiction of vehicle queueing on the roadway network) for both the average and 95th percentile vehicle queues at the study intersections.

Sight Distance

An evaluation of sight distances at the unsignalized Project site driveway (west driveway) intersection with Route 20 was conducted by the Applicant’s engineer in accordance with American Association of State Highway and Transportation Officials (AASHTO)⁴ standards. Based on these measurements, the Applicant’s engineer indicated that lines of sight to and from the west Project site driveway intersection exceed 445 feet, where a minimum sight line of 305 feet is required for safe operation of the Project site

³The Applicant’s engineer provided a Traffic Signal Warrants Analysis which indicated that the installation of a traffic control signal was warranted with the construction of the grocery store (45,000 sf) or at full build-out of the Project; if only the residential component were constructed, the installation of the traffic control signal would not be warranted.

⁴A *Policy on Geometric Design of Highway and Streets*, 6th Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2011.

driveway intersection based on an approach speed of between 40 mph, which is consistent with the travel speeds measured by the Applicant's engineer (36-38 mph) and is also in excess of the posted speed limit (35 mph). The Applicant's engineer noted that vegetation located behind sidewalk to the west of the west Project site driveway should be trimmed/removed in order to enhance sight lines looking to the right exiting the driveway.

Comment: *We are in agreement that sight lines at the west Project site driveway intersection exceed the requirements for safe operation based on a 40 mph approach speed along Route 20, which exceeds the posted speed limit and is consistent with the measured prevailing speed of traffic approaching the driveway.*

The Applicant's engineer should provide sight distance measurements at the primary (east) Project site driveway intersection with Route 20 that should also include measurements for the relocated Sudbury Plaza driveway. These measurements will allow for an understanding of how the intersection would function as an unsignalized intersection or during a period when the signal is not functional.

We recommend that any approvals that may be granted for the Project include a condition that that all signs and landscape features that are to be installed as a part of the Project along Route 20 and within the sight triangle areas of the Project site driveways be designed and located so as not to impede lines of sight. Such features should not exceed 2.5-feet in height as measured from the surface elevation of the Project site driveway. In addition, the Applicant should be required to selectively trim vegetation along the Project site frontage where necessary in order to enhance sight lines to and from the Project site driveways.

Recommendations

The January 2016 TIAS included a mitigation program for the Project that included the following elements:

Site Access

Primary Driveway – Placed under traffic signal control and aligned with a relocated Sudbury Plaza driveway, with left-turn lanes to be provided on the Route 20 approaches to the intersection, pedestrian accommodations for crossing Route 20 and the driveways to both the Sudbury Plaza and the Project site, and bicycle detection. The Applicant's engineer noted that if the apartment community proceeds first, the traffic signal would not be installed and the intersection would operate under STOP-sign control.

Secondary Driveway – Secondary access is proposed via the existing west driveway that serves the Project site which will be improved to accommodate truck turning maneuvers and will remain under STOP-sign control.

Off-Site

Fire Station Pre-Emption Signal – Design and install an emergency vehicle traffic control signal at the Sudbury Fire Department fire station that will be coordinated with the proposed traffic signal to be installed at the primary Project site driveway.

Traffic Signal Coordination – Design and install a time-based coordinated traffic signal system along Route 20 to include the following intersections: Primary Project site driveway; Nobscot Road; Union Street.

Transportation Demand Management (TDM)

- Assign a transportation coordinator for the Project
- Join the MetroWest/495 Transportation Management Association (TMA)
- Encourage participation in ridesharing programs
- Accommodate future expansion of MWRTA bus service to the Project site
- Bicycle and pedestrian facility enhancements

Comment: *We are in general agreement with the recommendations that have been provided by the Applicant’s engineer; however, given the phased nature of the Project, a better understanding of the elements of the Project that will be included in each phase and the associated timing of the recommended improvements should be provided. This is particularly important to determine the traffic control measures that will be in place at the primary access to the Project site.*

We offer the following additional recommendations for consideration by the Applicant and as guidance in the development of the Site Plans:

- 1. The Project site driveways should be a minimum of 24-feet in width with vehicles exiting the driveways placed under traffic signal or STOP-sign control with a marked STOP-line provided, as appropriate.***
- 2. Internal to the Project site, roadways and circulating aisles should be a minimum of 24-feet in width for two-way travel and a minimum of 16-feet in width for one-way travel or where two-way traffic is separated by a raised island (16-foot travel lanes on either side of a raised median or island).***
- 3. Where perpendicular parking is proposed, the travel isle adjacent to the parking shall be a minimum of 23-feet in width in order to accommodate parking maneuvers.***
- 4. Fire lanes and/or emergency vehicle access roads should be a minimum of 20-feet in width.***
- 5. All Signs and pavement markings to be installed within the Project site shall conform to the applicable specifications of the Manual on Uniform Traffic Control Devices (MUTCD).⁵***

⁵Manual on Uniform Traffic Control Devices (MUTCD); Federal Highway Administration; Washington, DC; 2009.



6. *Signs and landscape features to be installed along the Project site frontage within the sight triangle areas of the Project site driveways should not exceed 2.5 feet in height as measured from the surface elevation of the Project site driveways.*
7. *Snow windrows along the Project site frontage within the sight triangle areas of the Project site driveways shall be promptly removed where such accumulations would exceed 2.5 feet in height.*
8. *Sidewalks should be provided along one or both sides of the Project site driveways extending from Route 20 and linking the buildings and internal amenities within the Project.*
9. *Electric vehicle charging stations and dedicated parking for car/vanpools and alternatively fueled vehicles should be provided.*
10. *The TDM program should be coordinated with MassRides, MassDOT's rideshare coordinator.*
11. *A traffic monitoring program should be developed and proposed for the Project.*

In addition, the Applicant should provide documentation to indicate that the owner of the Sudbury Plaza has agreed to allow for the modifications to the plaza as proposed by the Applicant, as these modifications are required to ensure that safe and efficient access can be provided to the Project site and maintained to the Sudbury Plaza. We note that the current design of the improvements along Route 20 modifies the access to the Sudbury Plaza such that the west driveway will serve as a right-turn, entrance only drive, the center driveway (to be placed under traffic signal control) will provide full access to the plaza, and the east driveway will be reconfigured as a right in/out only driveway. We support these changes to the Sudbury Plaza access, particularly given the high crash incidence at the Route 20/Highland Avenue/Sudbury Plaza driveway intersection.

SITE PLANS

Site Plans for the Project were not available at the time of completion of this review. As such, the following initial comments are offered as guidance to the Applicant's engineer as the Site Plans are developed:

1. *A phasing plan should be included in the Site Plan submission that indicates the elements of the Project and the associated infrastructure (roadways, sidewalks/pathways, parking, etc.) that will be associated with each phase.*
2. *A truck turning analysis should be completed for the Project site using the following design parameters as guidance: i) the analysis should be completed using the AutoTurn® or similar analysis software for the following design vehicles: a WB-67 (large delivery vehicle), SU-30/40 (small delivery/moving vehicle and trash/recycling vehicle) and the Town of Sudbury Fire Department design vehicle; ii) the analysis should include the swept path for the front and rear tires of the design vehicles and any overhangs that may extend past the front and rear bumper of the vehicle (i.e., basket of the aerial ladder of the fire truck if so equipped); iii) the analysis should depict all maneuvers required to enter and exit the Project site by way of Route 20 (both*



left and right-turn movements entering and exiting), and all turning and maneuvering required within the Project site; iv) Back-up maneuvers, where required, should be clearly identified.

- 3. The grade of the Project site driveways should not exceed 2 percent within 50-feet (two (2) car lengths) of Route 20 in order to provide a leveling area for vehicles exiting the Project site.*
- 4. Sidewalks and pedestrian paths should be provided to link the buildings within the Project site and to the sidewalk infrastructure along Route 20.*
- 5. Bicycle parking should be provided throughout the Project site to include both bicycle racks and covered parking.*
- 6. The sidewalk along the Project site frontage should be reviewed for accessibility requirements and reconstructed as necessary.*
- 7. The sight triangle areas for the Project site driveways should be shown on the Site Plans along with a note to indicate: "Signs, landscaping and other features located within the sight triangle areas shall be designed, installed and maintained so as not to exceed 2.5 feet in height. Snow windrows located within the sight triangle areas that exceed 2.5 feet in height or that would otherwise inhibit sight lines shall be promptly removed."*
- 8. Parking calculations should be provided in order to demonstrate compliance with Town Zoning requirements for each use and phase (if the parking will be phased). If a waiver from Town Zoning requirements will be requested for parking, the Applicant should provide supporting documentation that is consistent with the methodology promulgated by the ITE⁶ and/or the Urban Land Institute (ULI)⁷ to demonstrate that adequate parking will be provided.*
- 9. A tenant move in/out management plan should be provided for the apartment community and reflected in the truck turning analysis for the Project.*

SUMMARY

VAI has completed a review of the materials submitted on behalf of BPR Sudbury Development, LLC in support of the proposed Meadow Walk Sudbury mixed-use development to be located at 526 and 528 Boston Post Road (Route 20) in Sudbury, Massachusetts. Our review focused on the following areas as they relate to the Project: i) vehicle and pedestrian access and circulation; ii) MassDOT design standards; iii) Town Zoning requirements as they relate to access, parking and circulation; and iv) accepted Traffic Engineering and Transportation Planning practices.

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⁶*Parking Generation*, 4th Edition; Institute of Transportation Engineers; Washington, D.C.; 2010.

⁷*Shared Parking*, Second Edition; Urban Land Institute; Washington, D.C.; 2005.



Ms. Jody Kablack
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Based on our review of the information submitted in support of the Project, we have determined that the materials were prepared in a professional manner and following the applicable standards of care. We have requested that the Applicant's engineer review and revise the No-Build and Build condition traffic volumes and the associated analyses in order to provide a clear and concise representation of the potential impact of the Project on the transportation infrastructure. Further, given the phased nature of the Project and the need to obtain rights from other property owners to complete the proposed access improvements for the Project, the Applicant should present a phasing plan for both the Project and the associated improvements, along with all necessary supporting plans and analyses in order to ascertain which improvements are required to support each phase of the Project. In addition, we have provided guidance and recommendations that should be considered by the Applicant with respect to the development of the Site Plans for the Project. Written responses to our comments should be provided so that we may continue our review of the Project on behalf of the Town.

This concludes our review of the materials that have been submitted to date in support of the Project. If you should have any questions regarding our review, please feel free to contact me.

Sincerely,

VANASSE & ASSOCIATES, INC.



Jeffrey S. Dirk, P.E., PTOE, FITE
Principal

JSD/jsd

cc: File

Ref: 7211

February 26, 2016

Ms. Jody Kablack
Director of Planning and Community Development
Town of Sudbury
278 Old Sudbury Road
Sudbury, MA 01776

Re: Supplemental Traffic Engineering Peer Review
Meadow Walk Sudbury – 526 and 528 Boston Post Road
Sudbury, Massachusetts

Dear Jody:

Vanasse & Associates, Inc. (VAI) has completed a review of the supplemental materials submitted on behalf of BPR Sudbury Development, LLC (the “Applicant”) in support of the proposed Meadow Walk Sudbury mixed-use development to be located at 526 and 528 Boston Post Road (Route 20) in Sudbury, Massachusetts (hereafter referred to as the “Project”). This information was prepared by Vanasse Hangen Brustlin Inc./VHB in response to the comments that were raised in VAI’s January 21, 2016 review letter and consisted of an updated *Traffic Impact and Access Study* dated February 16, 2016 (the “February 2016 TIAS”) and a response to comments memorandum with accompanying figures dated February 18, 2016.

Based on our review of the supplemental information submitted in support of the Project, we are satisfied that that Applicant’s engineer has addressed the comments that were raised in our review letter. That being said, a review of the Site Plans for the Project will be necessary to verify that the elements of the design support the assumptions, analyses and recommendations that have been provided as a part of the traffic analysis and our accompanying review.

For reference, listed below are the comments that were raised in our January 21, 2016 review letter that required additional information or analysis, followed by a summary of the response submitted on behalf of the Applicant, with additional comments indicated in **bolded** text for identification.

JANUARY 6, 2016 TRAFFIC IMPACT AND ACCESS STUDY

Pedestrian and Bicycle Facilities

Comment: *An inventory of bicycle accommodations within the study area should be provided and summarized in graphical format, depicting the location of both existing and planned future bicycle accommodations and their relationship and connectivity to the Project site. This will allow for an understanding of opportunities to integrate the Project into available transportation resources with the goal of reducing the overall traffic and parking demands associated with the Project.*

Response: A description of existing pedestrian and bicycle facilities was provided in the February 2016 TIAS with a graphical summary (figures) attached to the response to comments memorandum. As noted by the Applicant's engineer, at present, bicycle accommodations within the study area are limited; however, future planning for the Mass Central Rail Trail and the Bruce Freeman Trail through the Town of Sudbury provide opportunities for the Project site to connect to these facilities. In particular, the Mass Central Trail will traverse an alignment to the immediate north of the Project site with a connection to the Bruce Freeman Trail to the east.

As the Site Plans for the project are advanced, connections to the Mass Central Trail should be integrated into the Project and both the roadway network and pedestrian facilities should be designed to serve as an extension of this amenity within the Project site. No further response required.

Future Conditions

No-Build Conditions

Comment: *We are in general agreement with the methodology that was used to develop the future condition traffic volume projections for the Project, including the background traffic growth rate used in the base calculations and the inclusion of the identified specific development projects by others; however, we are not in agreement with the methodology that was used concerning the re-use of the Project site and would request that the Applicant's engineer revise the No-Build traffic volumes and the associated traffic operations analysis to reflect full-occupancy of the existing uses that occupy the Project site without consideration of the reassignment of the existing site traffic as such reassignment is speculative at this time, particularly with respect to travel routes for reassigned employees.*

Response: The Applicant's engineer revised the No-Build condition traffic volumes and analyses as requested, and we are in agreement with the resulting conditions as presented in the February 2016 TIAS. **No further response required.**

Comment: *The Applicant's engineer should provide a detailed discussion concerning the scope of the improvements that are under design by MassDOT for the Route 20/Landham Road intersection and the timing of their implementation. A review of the MassDOT project listing for the Town of Sudbury indicates that the 25 Percent Design Plans for the intersection improvements have been received and are currently under review by MassDOT.*

Response: The Applicant's engineer consulted with MassDOT concerning the scope and status of the improvements for the Route 20/Landham Road intersection. As currently designed, the improvements at the intersection will include the widening of Route 20 to provide a westbound left-turn lane and an eastbound right-turn lane, with 5-foot wide shoulders and improved sidewalks. The intersection will also be placed under traffic signal control. MassDOT indicated that the improvements are currently at the 25 Percent Design stage and a construction start date has not yet been identified. Given the 7-year planning horizon of

the study, the Applicant's engineer assumed that the improvements would be completed within that time. **No further response required.**

Build Conditions

Comment 1: *The trip-generation calculations for the retail/grocery store component of the Project should be reviewed and revised to reflect the use of the average of the calculated trip rates for the four (4) retail centers vs. applying the total trips of the observed sites to the total gross floor area of the (4) centers.*

Response: The trip-generation calculations for the retail/grocery store component of the Project were revised as requested and we are in agreement with the resulting values. The revised peak-hour traffic volume projections for the Project were shown to increase by between 30 to 40 vehicle trips on a weekday, and by 75 vehicle trips on a Saturday when compared to the traffic volumes that were presented in the January 2016 *Traffic Impact and Access Study*. **No further response required.**

Comment 2: *The pass-by trip rates applied to the retail/grocery store component of the Project should be consistent with the average pass-by trip rates cited in the ITE Trip Generation Handbook¹ and limited to no more than 26 percent during the weekday morning peak-hour, 34 percent during the weekday evening peak-hour and 26 percent during the Saturday midday peak-hour.*

Response: The Applicant's engineer provided additional data for pass-by trips for retail centers of comparable size to that which will be located within the Project site (80,000 sf). After reviewing this data, we are in agreement with the pass-by trip rates that were used by the Applicant and presented in the January 2016 *Traffic Impact and Access Study* (37 percent during the weekday morning and Saturday midday peak-hours, and 42 percent during the weekday evening peak-hour). **No further response required.**

Comment 3: *Internal captured trips should be reviewed and revised for the senior housing and apartment community components of the Project. The current projections indicate that approximately 45 percent of the trips generated by these uses during the weekday evening and/or Saturday midday peak hours will remain internal to the Project site. We would also suggest that the internal trips associated with the retail/grocery component of the Project are also overstated, particularly given that any internal trips associated with this use(s) will be derived from the residential component of the Project and are already accounted for as indicated above.*

Response: The Applicant's engineer revised the trip-generation calculations for the Project to limit the amount of internal trips to no more than 15 percent of the trips generated by the residential components of the Project (apartments and senior housing) during the weekday evening peak-hour and no more than 30 percent during the Saturday midday peak-hour (internal trips are negligible during the weekday morning peak-hour). We are in general agreement

¹*Trip Generation Handbook*, 3rd Edition, An ITE Proposed Recommended Practice; Institute of Transportation Engineers; Washington, D.C.; August 2014

with the internal trip limits and the resulting trip-generation calculations for the Project. **No further response required.**

Comment 4: *The Build condition traffic volumes should be developed by removing the traffic volume projections that were associated with the re-tenanting of the Project site from the No-Build traffic volumes and then adding the revised traffic volume projections for the new uses. The Applicant's engineer can provide a table summarizing the net difference in trips for contextual purposes; however, the trip patterns for the former and proposed uses are expected to be different and, therefore, applying the net difference in trips before and after the Project may not result in an appropriate condition from which to assess the impact of the Project. Traffic volume networks showing the removal of the re-tenanted traffic volumes from the study area roadways and intersections should be provided along with revised site traffic assignment networks for the Project.*

Response: The Applicant's engineer clarified the methodology that was to develop the Build condition traffic volumes, which is consistent with the approached outlined in the comment above. **No further response required.**

Comment 5: *The Applicant's engineer should reassess the trip-distribution for the residential component of the Project using Journey-to-Work data for the Town of Sudbury and the U.S. Census Tract in which the Project site is located. The resulting trip distribution should then be refined based on existing traffic patterns during the commuter peak hours and a review of the local and regional roadway network.*

Response: The Applicant's engineer reviewed the trip-distribution pattern for the residential component of the Project in relation to the U.S. Census Journey-to-Work data and confirmed that the resulting trip pattern was consistent with general traffic patterns within the study area during the commuter peak hours. **No further response required.**

Comment 6: *A review of traffic patterns at the Sudbury Plaza driveways during the peak hours indicates that approximately 75 percent of trips are oriented to/from the east of the plaza and 25 percent are oriented to/from the west, which differs from the trip assignment for the retail component of the Project. The Applicant's engineer should review the trip distribution pattern for this component of the Project and revise the trip assignments as appropriate.*

Response: The Applicant's engineer reviewed traffic patterns at both the Sudbury Plaza and Sudbury Farms retail centers during the Saturday midday peak-hour to develop the trip assignment for the retail component of the Project. Based on this review, the Applicant's engineer indicated that approximately 38 percent of retail trips are expected to be oriented to/from the west along Route 20 with the remaining 62 percent oriented to/from the east. Upon further review, we concur with the trip assignment that was used for the retail component of the Project. **No further response required.**

Traffic Operations Analysis

Comment: *The Applicant's engineer should revise the traffic operations analysis to reflect the comments herein relating to the development of the No-Build and Build condition traffic volumes. In addition and as noted by the Applicant's engineer, the traffic operations analysis indicates that extended vehicle queueing will occur along Route 20 at the signalized intersections within the study area. In order to ascertain the impact that this queueing will have on operating conditions at proximate driveways and intersections, and the ability of existing and proposed turning lanes to accommodate the projected vehicle queues, the Applicant's engineer should provide vehicle queue diagrams (a graphical depiction of vehicle queueing on the roadway network) for both the average and 95th percentile vehicle queues at the study intersections.*

Response: The Applicant's engineer provided revised traffic operations analyses for both the No-Build and Build conditions as a part of the February 2016 TIAS to reflect: i) the revised traffic volume projections described herein; and ii) relocation of the primary (east) Project site driveway opposite the westerly Sudbury Plaza driveway, inclusive of Highland Avenue. A review of the revised traffic operations analysis results confirms the overall conclusion that the addition of Project-related traffic to the study area roadways and intersections will not result in a significant impact (increase) on motorist delays or vehicle queueing over existing or anticipated future conditions without the Project. **No further response required.**

We note that the relocated primary Project site driveway is predicted to operate at an overall level-of-service "B" during the weekday morning peak-hour, at "E" during the weekday evening-peak hour and at "D" during the Saturday midday peak-hour without consideration of impacts associated with vehicles exiting Highland Avenue, with degraded operating conditions shown to occur if there is a material increase in traffic on Highland Avenue over current conditions. For this reason, **it is important that any future changes to Highland Avenue or increase in the intensity of the uses served by the roadway be considered in the context of the resulting impacts to operating conditions and safety at the intersection and along the Route 20 corridor. We support the relocation of the primary (east) Project site driveway as currently proposed as the relocation will also serve to also address operating conditions and safety at the Route 20/Highland Avenue/Sudbury Plaza driveway intersection.**

The Applicant's engineer provided vehicle queue diagrams for the study area intersections illustrating both the average and 95th percentile vehicle queues under No-Build and Build with Mitigation (improvements) conditions. A review of the queue diagrams indicates that the planned improvements will generally maintain or reduce vehicle queueing over No-Build conditions during the weekday peak hours; vehicle queues during the Saturday midday peak-hour are predicted to increase with the Project given the increase in traffic that the Project represents during this peak-hour over the current use of the site. **It is important to note that proper design and coordination of the traffic signal system along the Route 20 corridor will produce reduced overall travel times in the area and minimize queue spill back into intersections, particularly during the weekday peak hours. Further, the resulting safety benefits that are achieved with the installation of a traffic control signal at the Route 20/Highland Avenue/Sudbury Plaza driveway intersection**

and the opportunity to provide a controlled (signalized) pedestrian crossing of Route 20 also need to be considered.

Sight Distance

Comment: *The Applicant's engineer should provide sight distance measurements at the primary (east) Project site driveway intersection with Route 20 that should also include measurements for the relocated Sudbury Plaza driveway. These measurements will allow for an understanding of how the intersection would function as an unsignalized intersection or during a period when the signal is not functional.*

Response: The Applicant's engineer provided sight distance measurements for the primary (east) Project site driveway intersection with Route 20 as a part of the February 2016 TIAS. These measurements indicate that lines of sight both approaching the intersection along Route 20 and for motorists exiting the Project site exceed the required minimum distance for the intersection to function in a safe manner. The Applicant's engineer noted that lines of sight exiting the Project site driveway could be improved with selective trimming of vegetation along the back of the sidewalk. **No further response required.**

We recommend that any approvals that may be granted for the Project include a condition that that all signs and landscape features that are to be installed as a part of the Project along Route 20 and within the sight triangle areas of the Project site driveways be designed and located so as not to impede lines of sight. Such features should not exceed 2.5-feet in height as measured from the surface elevation of the Project site driveway. In addition, the Applicant should be required to selectively trim vegetation along the Project site frontage where necessary in order to enhance sight lines to and from the Project site driveways.

Recommendations

Comment: *We are in general agreement with the recommendations that have been provided by the Applicant's engineer; however, given the phased nature of the Project, a better understanding of the elements of the Project that will be included in each phase and the associated timing of the recommended improvements should be provided. This is particularly important to determine the traffic control measures that will be in place at the primary access to the Project site.*

We offer the following additional recommendations for consideration by the Applicant and as guidance in the development of the Site Plans:

- 1. The Project site driveways should be a minimum of 24-feet in width with vehicles exiting the driveways placed under traffic signal or STOP-sign control with a marked STOP-line provided, as appropriate.*



2. *Internal to the Project site, roadways and circulating aisles should be a minimum of 24-feet in width for two-way travel and a minimum of 16-feet in width for one-way travel or where two-way traffic is separated by a raised island (16-foot travel lanes on either side of a raised median or island).*
3. *Where perpendicular parking is proposed, the travel isle adjacent to the parking shall be a minimum of 23-feet in width in order to accommodate parking maneuvers.*
4. *Fire lanes and/or emergency vehicle access roads should be a minimum of 20-feet in width.*
5. *All Signs and pavement markings to be installed within the Project site shall conform to the applicable specifications of the Manual on Uniform Traffic Control Devices (MUTCD).²*
6. *Signs and landscape features to be installed along the Project site frontage within the sight triangle areas of the Project site driveways should not exceed 2.5 feet in height as measured from the surface elevation of the Project site driveways.*
7. *Snow windrows along the Project site frontage within the sight triangle areas of the Project site driveways shall be promptly removed where such accumulations would exceed 2.5 feet in height.*
8. *Sidewalks should be provided along one or both sides of the Project site driveways extending from Route 20 and linking the buildings and internal amenities within the Project.*
9. *Electric vehicle charging stations and dedicated parking for car/vanpools and alternatively fueled vehicles should be provided.*
10. *The TDM program should be coordinated with MassRides, MassDOT's rideshare coordinator.*
11. *A traffic monitoring program should be developed and proposed for the Project.*

Response: The Applicant's engineer provided a summary of the planned phasing of the Project and the associated improvements. As currently envisioned, construction would commence in 2016 with the first phase to include the grocery store which would open in late summer 2017. Construction of the balance of the Project would commence in 2017 and conclude in late 2018. The Applicant's engineer indicated that the site access and off-site improvements, including the installation of a traffic control signal and the associated roadway and intersection improvements at the Route 20/Highland Avenue/Sudbury Plaza driveway intersection, would be completed in conjunction with the first phase of the Project (the grocery store component).

The Applicant's engineer should provide a table summarizing the elements of the transportation improvement program for the Project as documented in the February 2016 TIAS, the schedule for implementation, and the responsible party, and include the following:

²Manual on Uniform Traffic Control Devices (MUTCD); Federal Highway Administration; Washington, DC; 2009.

- **Signs and landscape features to be installed along the Project site frontage within the sight triangle areas of the Project site driveways will not exceed 2.5 feet in height as measured from the surface elevation of the Project site driveways.**
- **Snow windrows along the Project site frontage within the sight triangle areas of the Project site driveways will be promptly removed where such accumulations would exceed 2.5 feet in height.**

In addition, the Applicant should commit to the completion of a traffic monitoring program for the Project that should include the following elements:

- i) Performing an automatic traffic recorder (ATR) count on the Project site driveways over a continuous 72-hour (Thursday through Saturday) period; and**
- ii) Performing manual turning movement and vehicle classification counts at the Project site driveway intersections with Route 20 during the weekday morning (7:00 to 9:00 AM), weekday evening (4:00 to 6:00 PM) and Saturday midday (11:00 AM to 2:00 PM) peak hours.**

The monitoring program should commence six (6) months after issuance of the first Certificate of Occupancy for the Project and should continue on an annual basis for a period of 2-years after Project completion. The results of the monitoring program will be summarized in a report provided to the Town within 2-months after the completion of the data collection effort. The report will document the traffic volumes associated with the Project as occupied at the time that the traffic counts are completed. If the measured traffic volumes associated with the Project exceed the traffic volume projections that form the basis of the February 2016 TIAS by more than 10 percent on a regular and sustained basis during the monitoring period, the Applicant will identify and undertake corrective measures in conjunction with the appropriate parties and subject to receipt of all necessary rights permits and approvals. These measures may include without limitation:

- Sign and pavement marking installation**
- Traffic signal timing adjustments**
- Consideration of geometric refinements at the Project site driveways**

The corrective measures, if any, will be documented in the transportation monitoring report and will identify the appropriate parties responsible for implementation, required approvals, and the timeline for implementation. The status of implementation of the identified improvement measures will be documented in the subsequent monitoring report.

Comment: *In addition, the Applicant should provide documentation to indicate that the owner of the Sudbury Plaza has agreed to allow for the modifications to the plaza as proposed by the Applicant, as these modifications are required to ensure that safe and efficient access can be provided to the Project site and maintained to the Sudbury Plaza. We note that the current design of the improvements along Route 20 modifies the access to the Sudbury Plaza such that the west driveway will serve as a right-turn, entrance only drive, the center driveway (to be placed under traffic signal control) will provide full access to the plaza, and the east driveway will be reconfigured as a right in/out only driveway. We support these changes to the Sudbury Plaza access, particularly given the high crash incidence at the Route 20/Highland Avenue/Sudbury Plaza driveway intersection.*

Response: The Applicant's engineer stated that the Applicant has been and will continue to coordinate with owner of the Sudbury Plaza and other abutters with regard to the planned improvements that are proposed as a part of the Project. The Applicant is aware that the completion of the site access and off-site improvements will be a requirement of the Project, and that it is the Applicant's responsibility to obtain all necessary rights, permits and approvals. **No further response required.**

SITE PLANS

Comment: *Site Plans for the Project were not available at the time of completion of this review. As such, the following initial comments are offered as guidance to the Applicant's engineer as the Site Plans are developed:*

- 1. A phasing plan should be included in the Site Plan submission that indicates the elements of the Project and the associated infrastructure (roadways, sidewalks/pathways, parking, etc.) that will be associated with each phase.*
- 2. A truck turning analysis should be completed for the Project site using the following design parameters as guidance: i) the analysis should be completed using the AutoTurn® or similar analysis software for the following design vehicles: a WB-67 (large delivery vehicle), SU-30/40 (small delivery/moving vehicle and trash/recycling vehicle) and the Town of Sudbury Fire Department design vehicle; ii) the analysis should include the swept path for the front and rear tires of the design vehicles and any overhangs that may extend past the front and rear bumper of the vehicle (i.e., basket of the aerial ladder of the fire truck if so equipped); iii) the analysis should depict all maneuvers required to enter and exit the Project site by way of Route 20 (both left and right-turn movements entering and exiting), and all turning and maneuvering required within the Project site; iv) Back-up maneuvers, where required, should be clearly identified.*
- 3. The grade of the Project site driveways should not exceed 2 percent within 50-feet (two (2) car lengths) of Route 20 in order to provide a leveling area for vehicles exiting the Project site.*
- 4. Sidewalks and pedestrian paths should be provided to link the buildings within the Project site and to the sidewalk infrastructure along Route 20.*

5. *Bicycle parking should be provided throughout the Project site to include both bicycle racks and covered parking.*
6. *The sidewalk along the Project site frontage should be reviewed for accessibility requirements and reconstructed as necessary.*
7. *The sight triangle areas for the Project site driveways should be shown on the Site Plans along with a note to indicate: "Signs, landscaping and other features located within the sight triangle areas shall be designed, installed and maintained so as not to exceed 2.5 feet in height. Snow windrows located within the sight triangle areas that exceed 2.5 feet in height or that would otherwise inhibit sight lines shall be promptly removed."*
8. *Parking calculations should be provided in order to demonstrate compliance with Town Zoning requirements for each use and phase (if the parking will be phased). If a waiver from Town Zoning requirements will be requested for parking, the Applicant should provide supporting documentation that is consistent with the methodology promulgated by the ITE³ and/or the Urban Land Institute (ULI)⁴ to demonstrate that adequate parking will be provided.*
9. *A tenant move in/out management plan should be provided for the apartment community and reflected in the truck turning analysis for the Project.*

Response: The Applicant's engineer stated that detailed site plans are only being advanced for the main access driveways, the grocery store use and the 40B apartment community. As the plans for these and the other components of the Project are advanced, the comments/recommendations noted above will be taken into consideration. **No further response required. We will provide comments on the Site Plans for the Project once they are provided for our review.**

SUMMARY

VAI has completed a review of the supplemental materials submitted on behalf of BPR Sudbury Development, LLC in support of the proposed Meadow Walk Sudbury mixed-use development to be located at 526 and 528 Boston Post Road (Route 20) in Sudbury, Massachusetts. This information was prepared in response to the comments that were raised in VAI's January 21, 2016 review letter. Based on our review of the supplemental information, we are satisfied that that Applicant's engineer has addressed the comments that were raised in our review letter concerning the January 2016 *Traffic Impact and Access Study* prepared in support of the Project.

As stated in our January 21, 2016 review letter, our review is limited to the traffic analysis that has been submitted in support of the Project as we have not been provided with copies of the formal Site Plans for the grocery store or any other component of the Project. We have provided recommendations by way of guidance for use by the Applicant in the development of the Site Plans; however, a formal review of the

³*Parking Generation*, 4th Edition; Institute of Transportation Engineers; Washington, D.C.; 2010.

⁴*Shared Parking*, Second Edition; Urban Land Institute; Washington, D.C.; 2005.

Ms. Jody Kablack
February 26, 2016
Page 11 of 11

Site Plans is required to verify that the elements of the design support the assumptions, analyses and recommendations that have been provided as a part of the traffic analysis and our accompanying review.

This concludes our review of the materials that have been submitted to date in support of the Project. If you should have any questions regarding our review, please feel free to contact me.

Sincerely,

VANASSE & ASSOCIATES, INC.

Jeffrey S. Dirk

Jeffrey S. Dirk, P.E., PTOE, FITE
Principal

JSD/jsd

cc: File

Ref: 7211

March 4, 2016

Ms. Jody Kablack
Director of Planning and Community Development
Town of Sudbury
278 Old Sudbury Road
Sudbury, MA 01776

Re: Review of Site Plans
Grocery Store at Meadow Walk Sudbury – 526 and 528 Boston Post Road
Sudbury, Massachusetts

Dear Jody:

Vanasse & Associates, Inc. (VAI) has completed a review of the Site Plans prepared by Vanasse Hangen Brustlin Inc./VHB on behalf of BPR Sudbury Development, LLC (the “Applicant”) in support of the proposed Grocery Store at Meadow Walk Sudbury to be located at 526 and 528 Boston Post Road (Route 20) in Sudbury, Massachusetts (hereafter referred to as the “Project”). The subject plans were issued on November 10, 2015 and revised through March 3, 2016. Our review focused on the following areas as they relate to the Site Plans: i) vehicle and pedestrian access and circulation; ii) Town Zoning requirements as they relate to access, parking and circulation; and iii) accepted Traffic Engineering and Transportation Planning practices. This review supplements our evaluation of the January 6, 2016 *Traffic Impact and Access Study* (TIAS), the subsequent February 16, 2016 updated TIAS and the February 18, 2016 response to comments memorandum that were also prepared by VHB in support of the overall Meadow Walk Sudbury development.

Based on our review of the Site Plans submitted in support of the Project, we have concluded that the plans were prepared in a professional manner and following the applicable standards of care. We offer the following comments that should be addressed by the Applicant’s engineer:

1. A truck turning analysis should be completed for the Project site using the following design parameters as guidance: i) the analysis should be completed using the AutoTurn® or similar analysis software for the following design vehicles: a WB-67 (large delivery vehicle), SU-30/40 (small delivery/moving vehicle and trash/recycling vehicle) and the Town of Sudbury Fire Department design vehicle; ii) the analysis should include the swept path for the front and rear tires of the design vehicles and any overhangs that may extend past the front and rear bumper of the vehicle (i.e., basket of the aerial ladder of the fire truck if so equipped); iii) the analysis should depict all maneuvers required to enter and exit the Project site by way of Route 20 (both left and right-turn movements entering and exiting), and all turning and maneuvering required within the Project site; iv) Back-up maneuvers, where required, should be clearly identified.

2. All centerline pavement markings that are to be installed within the Project site, including internal to the parking field, shall consist of a double-yellow line in accordance with the centerline pavement marking standards of the Manual on Uniform Traffic Control Devices (MUTCD).¹
3. Exterior bicycle parking should be provided proximate to the grocery store entrance and shown on the Site Plan.
4. Consideration should be given to locating a bus stop at an appropriate location within the Project site or along the primary access roadway. The identified location should afford a safe and accessible travel path to the grocery store building.
5. The sight triangle areas for the Project site driveways should be shown on the Site Plans along with a note to indicate: "Signs, landscaping and other features located within the sight triangle areas shall be designed, installed and maintained so as not to exceed 2.5 feet in height. Snow windrows located within the sight triangle areas that exceed 2.5 feet in height or that would otherwise inhibit sight lines shall be promptly removed."
6. The emergency signal that is to be installed by the Applicant at the fire station should be identified on the Site Plan.

Written responses to our comments should be provided so that we may continue our review of the Project on behalf of the Town. If you should have any questions regarding our review of the Site Plans prepared in support of the Project, please feel free to contact me.

Sincerely,

VANASSE & ASSOCIATES, INC.



Jeffrey S. Dirk, P.E., PTOE, FITE
Principal

JSD/jsd

cc: File

¹Manual on Uniform Traffic Control Devices (MUTCD); Federal Highway Administration; Washington, DC; 2009.



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Ref: 7211

March 14, 2016

Ms. Jody Kablack
Director of Planning and Community Development
Town of Sudbury
278 Old Sudbury Road
Sudbury, MA 01776

Re: Supplemental Review of Site Plans
Grocery Store at Meadow Walk Sudbury – 526 and 528 Boston Post Road
Sudbury, Massachusetts

Dear Jody:

Vanasse & Associates, Inc. (VAI) has completed a review of the supplemental materials that were submitted by Vanasse Hangen Brustlin Inc./VHB on behalf of BPR Sudbury Development, LLC (the “Applicant”) in support of the Site Plans prepared for the proposed Grocery Store at Meadow Walk Sudbury to be located at 526 and 528 Boston Post Road (Route 20) in Sudbury, Massachusetts (hereafter referred to as the “Project”). This information was prepared by VHB in response to the comments that were raised in VAI’s March 4, 2016 review letter concerning the Site Plans for the Project and consisted of a memorandum titled “*Response to 03-04-16 Review of Site Plans Comments, Grocery Store at Meadow Walk Sudbury, 526-528 Boston Post Road, Sudbury, Massachusetts*” dated March 9, 2016 with accompanying plans.

Based on our review of the supplemental information submitted in support of the Project, we are satisfied that that Applicant’s engineer has addressed the comments that were raised in our review letter and that the Site Plans have been updated/revised as necessary. We would suggest that consideration be given to imposing as a condition of any approvals that may be granted for the Project a requirement that the Applicant make best efforts to restrict deliveries to the Project by large tractor semi-trailer combinations to off-peak customer periods or while the grocery store is closed to customers.

This concludes our review of the Site Plans that have been submitted in support of the Project. If you should have any questions regarding our review, please feel free to contact me.

Sincerely,

VANASSE & ASSOCIATES, INC.

Jeffrey S. Dirk, P.E., PTOE, FITE
Principal

cc: File

Ref: 7305

May 3, 2016

Ms. Jody Kablack
Director of Planning and Community Development
Town of Sudbury
278 Old Sudbury Road
Sudbury, MA 01776

Re: Traffic Engineering Peer Review
Avalon Sudbury – 526 and 528 Boston Post Road
Sudbury, Massachusetts

Dear Jody:

Vanasse & Associates, Inc. (VAI) has completed a review of the materials submitted on behalf of Sudbury Avalon, Inc. (the “Applicant”) in support of the proposed Avalon Sudbury residential community (hereafter referred to as the “Project”) to be constructed within the Meadow Walk Sudbury mixed-use development located at 526 and 528 Boston Post Road (Route 20) in Sudbury, Massachusetts. The Project has been submitted to the Town for consideration of the issuance of a Comprehensive Permit under the provisions Massachusetts General Laws, Chapter 40B, Sections 20-23 (Chapter 40B). Our review focused on the following areas as they relate to the Project: i) vehicle and pedestrian access and circulation; ii) Massachusetts Department of Transportation (MassDOT) design standards; iii) Town Zoning requirements as they relate to access, parking and circulation; and iv) accepted Traffic Engineering and Transportation Planning practices.

In support the Project, the Applicant submitted the following materials which are the subject of this review:

1. *Traffic Memorandum*, Avalon Sudbury; VHB; March 1, 2016; and
2. *Site Plans*, Avalon Sudbury, Sudbury, MA; VHB and The Architectural Team, Inc.; January 20, 2016, no revisions.

By way of background, the traffic/transportation elements of the Project were the subject of a previous review conducted by VAI on behalf of the Town in conjunction with the Grocery Store at Meadow Walk Sudbury development (the “Grocery Store Development”). A comprehensive *Traffic Impact and Access Study* dated February 16, 2016 (the “February 2016 TIAS”) was submitted in support of the Grocery Store Development that included an assessment of the impacts on the transportation infrastructure associated with the build-out of the Meadow Walk Sudbury mixed-use development and included the Project. In addition, the site plans that were submitted for the Grocery Store Development included specific details of the access configuration, internal roadway network and off-site improvements along Route 20 to serve the entirety of the Meadow Walk Sudbury mixed-use development.

At this time, all comments that were raised in our previous review letters concerning the Grocery Store Development have been addressed, and we have concluded that the planned transportation infrastructure improvements that will be completed in conjunction with the Meadow Walk Sudbury mixed-use development will provide for safe and efficient access to the Project site, and afford sufficient capacity to accommodate the additional traffic demands that may be associated with the Project. For context, we have provided a summary of the traffic characteristics of the Project as presented in the February 2016 TIAS and a description of the site access and off-site improvements that will be completed in conjunction with the Meadow Walk Sudbury mixed-use development.

Given that the traffic/transportation elements of the Project were the subject of a previous review, this review focuses on the January 20, 2016 *Site Plans* (the “Site Plans”) and their relationship to the overall development of the Meadow Walk Sudbury mixed-use development. Based on our review of the Site Plans that were submitted for the Project, we have requested that the Applicant update the plans for consistency with internal roadway layout that was developed for the Grocery Store Development, and that specific elements of the plans be reviewed with respect to: i) pedestrian and bicycle accommodations; ii) vehicle access and maneuverability; iii) public transportation accommodations; and iv) sign and pavement marking details.

The following summarizes our review of the materials submitted in support of the Project. Our comments are indicated in *italicized* text, with those requiring responses or additional information **bolded**.

PROJECT DESCRIPTION

The Project will consist of the construction of a 250-unit residential apartment community to be known as Avalon Sudbury and will be situated within the overall Meadow Walk Sudbury mixed-use development located at 526-528 Boston Post Road (Route 20) in Sudbury, Massachusetts. On-site parking will be provided for 582 vehicles, including 274 surface parking spaces, 254 garage spaces, and 54 tandem/driveway spaces, or a parking ratio of approximately 2.3 spaces per residential unit.

The Meadow Walk Sudbury project entails the phased redevelopment of the approximate 50-acre Raytheon campus to accommodate a mixed-use development that will include 80,000± square feet (sf) of mixed retail space including a 45,000± sf grocery store; a 250 unit residential apartment community (the Project); an age-restricted, active adult residential community with up to 60 dwelling units; and an assisted living/memory care facility with up to 54 beds. At present the Raytheon campus contains 563,300± sf of office, research and development (R&D), and manufacturing space in multiple buildings that are operated by Raytheon and supported by 2,040± parking spaces and associated appurtenances. These facilities, excepting approximately 15,000± sf of R&D space, will be removed to accommodate the Meadow Walk Sudbury project.

Access to the Project site will be provided by way of two (2) driveways that will intersect the north side of Route 20 as follows: an unsignalized driveway (STOP-sign control) that will be situated parallel to the west property line at the location of the existing driveway that serves the Raytheon campus, and a new driveway that will be aligned opposite the westernmost driveway to the Sudbury Plaza that will be placed under traffic signal control and will incorporate Highland Avenue into the traffic signal system. The remaining driveways that serve the Raytheon campus will be closed. In conjunction with the access improvements, left-turn lanes will be added to Route 20 at the east Project site driveway (signalized), and the driveways to the Sudbury Plaza will be modified to accommodate the proposed roadway geometry.



We note that Boston Post Road (Route 20) is a State Highway under the jurisdiction of MassDOT and, as such, the Project and the overall Meadow Walk Sudbury development require the issuance of a State Highway Access Permit from MassDOT for access to Route 20 and to complete the associated roadway, intersection and traffic control improvements. In addition, the Project requires and the Applicant has filed an Environmental Notification Form (ENF) with the Secretary of Energy and Environmental Affairs (EEA) pursuant to the provisions of the Massachusetts Environmental Policy Act (MEPA) due to the net increase in traffic that the Project represents over the current use of the site.

TRAFFIC REVIEW CONTEXT

For context, the table below provides the projected traffic characteristics of the Project as presented in the February 2016 TIAS using trip-generation methodologies established by the Institute of Transportation Engineers (ITE)¹ and without consideration of the traffic volumes associated with the existing uses that occupy or that could be reoccupied within the Raytheon campus.

TRAFFIC VOLUME PROJECTIONS

Time Period/Direction	Vehicle Trips
	Avalon Sudbury (250 Units) ^a
<i>Average Weekday Daily:</i>	
Entering	819
<u>Exiting</u>	<u>819</u>
Total	1,638
<i>Weekday Morning Peak Hour:</i>	
Entering	25
<u>Exiting</u>	<u>101</u>
Total	126
<i>Weekday Evening Peak Hour:</i>	
Entering	101
<u>Exiting</u>	<u>54</u>
Total	155
<i>Saturday:</i>	
Entering	853
<u>Exiting</u>	<u>853</u>
Total	1,706
<i>Saturday Midday Peak Hour:</i>	
Entering	66
<u>Exiting</u>	<u>56</u>
Total	122

^aBased on ITE LUC 220, *Apartment*.

¹*Trip Generation*, 9th Edition; Institute of Transportation Engineers; Washington, DC; 2012.



In comparison to the traffic volumes that would be associated with re-occupancy of the existing facilities within the Raytheon campus by similar uses, the entirety of the Meadow Walk Sudbury mixed-use development, inclusive of the Project, was shown to result in a net reduction in traffic during the weekday morning and evening peak-hours, and a projected increase of approximately 645 vehicle trips during the Saturday midday peak-hour.

The Applicant's engineer provided a detailed assessment of traffic operations (motorist delays and vehicle queueing) at critical intersections along the Route 20 corridor which concluded that the additional traffic demands associated with the Meadow Walk Sudbury mixed-use development will not result in a significant impact (increase) on motorist delays or vehicle queuing over existing or anticipated future conditions without the Project. Given that the Project represents a subset of the overall Meadow Walk Sudbury mixed-use development, it can be similarly concluded that Project would not result in a significant impact on the transportation infrastructure. That being said, this conclusion is predicated on the Applicant's commitment to the implementation of specific site access and off-site improvements (discussion follows).

TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS

The Applicant has committed to a comprehensive transportation improvement program for the Meadow Walk Sudbury mixed-use development that includes physical roadway, intersection and traffic control improvements, and trip-reduction strategies. These improvements include the following:

Site Access

Primary Driveway – Placed under traffic signal control and aligned with Sudbury Plaza west driveway, with left-turn lanes to be provided on the Route 20 approaches to the intersection, pedestrian accommodations for crossing Route 20 and the driveways to both the Sudbury Plaza and the Project site, and bicycle detection. The traffic signal system will also incorporate Highland Avenue in order to address current safety deficiencies resulting from the proximity of Highland Avenue to the Sudbury Plaza driveway. The Applicant's engineer noted that if the apartment community proceeds first, the traffic signal would not be installed and the intersection would operate under STOP-sign control.

Secondary Driveway – Secondary access is proposed via the existing west driveway that serves the Raytheon campus which will be improved to accommodate truck turning maneuvers and will remain under STOP-sign control.

Pedestrian and Bicycle Improvements – Widen the existing sidewalk on the north side of Route 20 along the site frontage; extend the sidewalk along the south side of Route 20 to the Sudbury Plaza west driveway; subject to the availability of right-of-way, provide widened shoulders along both sides of Route 20 within the limits of the planned roadway improvements to accommodate bicycle travel; incorporate crosswalks, pedestrian traffic signal equipment and bicycle detection as a part of the proposed traffic signal system at the primary site driveway.

Sight Line Maintenance - Signs and landscape features to be installed within the sight triangle areas of the site driveways will not exceed 2.5 feet in height as measured from the surface elevation of the site driveways. Snow windrows within the sight triangle areas of the site driveways will be promptly removed where such accumulations would exceed 2.5 feet in height.



Off-Site

Fire Station Pre-Emption Signal – Design and install an emergency vehicle traffic control signal at the Sudbury Fire Department fire station that will be coordinated with the proposed traffic signal to be installed at the primary Project site driveway.

Traffic Signal Coordination – Design and install a time-based coordinated traffic signal system along Route 20 to include the following intersections: Primary site driveway; Nobscot Road; and Union Street.

Transportation Demand Management (TDM)

- A transportation coordinator will be assigned for the overall development
- Join the Metro West/495 Transportation Management Association (TMA)
- Encourage participation in ridesharing programs
- A bus stop will be provided to accommodate future expansion of Metro-West Regional Transit Authority (MWRTA) bus service to the development
- Pedestrian and bicycle accommodations will be provided within the development, including sidewalks throughout and bicycle racks at appropriate locations
- Electric vehicle charging stations will be provided
- Preferential parking for car/vanpools and alternatively fueled vehicles will be provided
- The TDM program will be coordinated with the Town and MassRides, MassDOT's rideshare coordinator

Traffic Monitoring and Reporting Program

The Applicant will conduct a traffic monitoring program that will include the following elements:

- i) Performing an automatic traffic recorder (ATR) count on the 20 site driveways over a continuous 72-hour (Thursday through Saturday) period; and
- ii) Performing manual turning movement and vehicle classification counts at the site driveway intersections with Route 20 during the weekday morning (7:00 to 9:00 AM), weekday evening (4:00 to 6:00 PM) and Saturday midday (11:00 AM to 2:00 PM) peak hours.

The monitoring program will commence six (6) months after issuance of the first Certificate of Occupancy for the Meadow Walk Sudbury development and will continue on an annual basis for a period of 2-years after the completion of the development. The results of the monitoring program will be summarized in a report provided to the Town within 2-months after the completion of the data collection effort. The report will document the traffic volumes associated with the development as occupied at the time that the traffic counts are completed. If the measured traffic volumes associated with the development exceed the traffic volume projections that form the basis of the February 2016 TIAS by more than 10 percent on a regular and sustained basis during the monitoring period, the Meadow Walk Sudbury developer will identify and undertake corrective measures in conjunction with the appropriate parties and subject to receipt of all necessary rights permits and approvals. These measures may include without limitation:

- Sign and pavement marking installation
- Traffic signal timing adjustments



- Consideration of geometric refinements at the Project site driveways

The corrective measures, if any, will be documented in the transportation monitoring report and will identify the appropriate parties responsible for implementation, required approvals, and the timeline for implementation. The status of implementation of the identified improvement measures will be documented in the subsequent monitoring report.

Comment: The Applicant should provide an update on the timing of implementation of the improvements as they relate to the schedule for the Project and the overall Meadow Walk Sudbury development. In addition, the Applicant should affirm the commitment to implement the elements of the TDM program as a part of the Project.

SITE PLANS

The following comments are offered with respect to our review of the January 20, 2016 Site Plans prepared by VHB in support of the Project:

- 1. The Site Plans should be updated to reflect the internal roadway network that was approved for the Grocery Store Development. In particular, the modern roundabout should be removed from the internal roadway network and the interface between the Project site and the balance of the overall Meadow Walk Sudbury roadway network should be updated.***
- 2. A truck turning analysis should be completed for the Project using the following design parameters as guidance: i) the analysis should be completed using the AutoTurn® or similar analysis software for the following design vehicles: an SU-30/40 (small delivery/moving vehicle and trash/recycling vehicle) and the Town of Sudbury Fire Department design vehicle; ii) the analysis should include the swept path for the front and rear tires of the design vehicles and any overhangs that may extend past the front and rear bumper of the vehicle (i.e., basket of the aerial ladder of the fire truck if so equipped); iii) the analysis should depict all maneuvers required to enter and exit the Project site by way of Route 20 (both left and right-turn movements entering and exiting), and all turning and maneuvering required within the Project site; iv) Back-up maneuvers, where required, should be clearly identified.***
- 3. An exterior bicycle rack(s) should be provided proximate to the entrance to the Clubhouse building and weather protected bicycle parking should be provided in secure areas within each of the residential buildings.***
- 4. A sign and pavement marking plan should be provided as a part of the Site Plans in order to verify that the proposed traffic control devices are appropriately designed and located within the Project site.***
- 5. The Applicant should consider replacing the all-way-stop controlled intersection along the main internal circulating roadway with a raised intersection and eliminating the STOP-signs on the north and southbound approaches. In addition, it is suggested that the crosswalks across the main internal circulating roadway be constructed using textured (stamped asphalt or similar) and colorized pavement. The requested sign and pavement marking plan should include the requisite pedestrian crossing warning signs for the proposed crosswalks.***



6. *Sidewalks and wheelchair ramps compliant with the Americans with Disabilities Act (ADA) should be provided where pedestrian crossings are proposed within the Project site.*
7. *A connection to the Mass Central Rail Trail that will about the Project site to the immediate north should be developed and shown on the Site Plans.*
8. *A tenant move in/out management plan (narrative) should be provided and reflected in the truck turning analysis for the Project.*
9. *A school bus waiting area should be provided within the Project site or at an appropriate location defined in consultation with the Town of Sudbury School Department.*
10. *The Applicant should consider incorporating electric vehicle charging stations into the Project.*

PARKING

The Project will provide parking for 582 vehicles, including 274 surface parking spaces, 254 garage spaces, and 54 tandem/driveway spaces, or a parking ratio of approximately 2.3 spaces per residential unit. This parking ratio is consistent with that required pursuant to Town Zoning requirements and exceeds the parking demand ratio for a residential apartment community in a suburban setting documented by the ITE (1.94 spaces per dwelling unit).²

SUMMARY

VAI has completed a review of the materials submitted on behalf of Sudbury Avalon, Inc. in support of the proposed Avalon Sudbury residential community to be constructed within the Meadow Walk Sudbury mixed-use development located at 526 and 528 Boston Post Road (Route 20) in Sudbury, Massachusetts. Our review focused on the following areas as they relate to the Project: i) vehicle and pedestrian access and circulation; ii) MassDOT design standards; iii) Town Zoning requirements as they relate to access, parking and circulation; and iv) accepted Traffic Engineering and Transportation Planning practices.

Given that the traffic/transportation elements of the Project were the subject of a previous review, this review has focused on the January 20, 2016 *Site Plans* and their relationship to the overall development of the Meadow Walk Sudbury mixed-use development. Based on our review of the Site Plans that were submitted for the Project, we have requested that the Applicant update the plans for consistency with internal roadway layout that was developed for the Grocery Store Development, and that specific elements of the plans be reviewed with respect to: i) pedestrian and bicycle accommodations; ii) vehicle access and maneuverability; ii) public transportation accommodations; and iii) sign and pavement marking details. Written responses to our comments should be provided so that we may continue our review of the Project on behalf of the Town.

²*Parking Generation*, 4th Edition; Institute of Transportation Engineers; Washington, D.C.; 2010.

Ms. Jody Kablack
May 3, 2016
Page 8 of 8

This concludes our review of the materials that have been submitted to date in support of the Project. If you should have any questions regarding our review, please feel free to contact me.

Sincerely,

VANASSE & ASSOCIATES, INC.

Jeffrey S. Dirk

Jeffrey S. Dirk, P.E., PTOE, FITE
Principal

JSD/jsd

cc: File



Ref: 7335

May 19, 2016

Ms. Jody Kablack
Director of Planning and Community Development
Town of Sudbury
278 Old Sudbury Road
Sudbury, MA 01776

Re: Site Circulation Review
Meadow Walk Sudbury – 526 and 528 Boston Post Road
Sudbury, Massachusetts

Dear Jody:

Vanasse & Associates, Inc. (VAI) has completed a review of the conceptual master plan and associated materials submitted by VHB on behalf of BPR Sudbury Development, LLC (the “Applicant”) in support of the proposed Meadow Walk Sudbury mixed-use open space development to be located at 526 and 528 Boston Post Road (Route 20) in Sudbury, Massachusetts. Our review focused on the following areas as they relate to the Project: i) vehicle, pedestrian and bicycle access and circulation; ii) parking design and layout; iii) accessibility for loading, delivery and emergency vehicles; and iv) consistency with accepted Traffic Engineering and Transportation Planning practices. Based on this review, we have concluded that access and circulation as depicted on the conceptual master plan for the Project will allow for safe and efficient access to the Project site, and accommodate internal circulation for vehicles, pedestrians and bicyclists in a safe, connected and unconstrained manner.

The following materials are the subject of this review:

1. *Overall Conceptual Planting Plan*, 526 & 528 Boston Post Road, Sudbury, MA; VHB; April 20, 2016, no revisions;
2. *Site Section Key Plan*, Meadow Walk Sudbury, 526 & 528 Boston Post Road Redevelopment; VHB, April 22, 2016;
3. *Master Vehicular Circulation Plan*, Meadow Walk Sudbury, 526 & 528 Boston Post Road Redevelopment; VHB, April 22, 2016; and
4. *Master Pedestrian Circulation Plan*, Meadow Walk Sudbury, 526 & 528 Boston Post Road Redevelopment; VHB, April 22, 2016.

In addition to the above materials, VAI is providing review services to the Town for the individual components of the Project which, to date, have included the Grocery Store at Meadow Walk Sudbury (the “Grocery Store Development”) and the Avalon Sudbury residential community. The Applicant submitted a comprehensive *Traffic Impact and Access Study* dated February 16, 2016 (the “February 2016 TIAS”) in support of the Grocery Store Development that included an assessment of the impacts on the transportation infrastructure associated with the build-out of all components of the Meadow Walk Sudbury mixed-use development, with detailed site plans also developed and submitted for both the

Grocery Store Development and the Avalon Sudbury residential community. These plans included specific details of the access configuration, internal roadway and sidewalk network, and off-site improvements along Route 20 to serve the Meadow Walk Sudbury mixed-use development.

At this time, all comments that were raised in our review letters concerning the Grocery Store Development have been addressed and we have offered comments on the site plans for the Avalon Sudbury residential community that are in the process of being addressed by Sudbury Avalon, Inc. With respect to the overall Meadow Walk Sudbury development, we have concluded that the planned transportation infrastructure improvements that will be completed in conjunction with the development will provide for safe and efficient access to the Project site, and afford sufficient capacity to accommodate the additional traffic demands that may be associated with the Project.

The Applicant has made application to the Massachusetts Department of Transportation (MassDOT) for a State High Access Permit to allow for access to the Project site and to complete the associated site access and off-site improvements within the State Highway Layout along Route 20. In conjunction with the MassDOT application, the Applicant submitted 25 Percent Design plans for the installation of a traffic control signal and associated roadway, sidewalk and bicycle accommodation improvements at the primary access to the Project site, inclusive of the installation of an emergency signal at the Sudbury Fire Department fire station located between the Project site driveways. These plans were reviewed by VAI on behalf of the Town prior to submission to MassDOT.

In addition, the Applicant has filed an Environmental Notification Form (ENF) with the Secretary of Energy and Environmental Affairs (EEA) pursuant to the provisions of the Massachusetts Environmental Policy Act (MEPA) due to the net increase in traffic that the Project represents over the current use of the site.

The following summarizes our review of access and on-site circulation as reflected on the conceptual master plan and supporting materials that have been submitted for the Project. In addition, we have attached a summary of the transportation infrastructure improvements that are planned as a part of the Project.

PROJECT DESCRIPTION

The Meadow Walk Sudbury project entails the phased redevelopment of the approximate 50-acre Raytheon campus located at 526-528 Boston Post Road (Route 20) in Sudbury, Massachusetts, to accommodate a mixed-use development that will include 80,000± square feet (sf) of mixed retail space including a 45,000± sf grocery store (the Grocery Store Development); a 250 unit residential apartment community (Avalon Sudbury); an age-restricted, active adult residential community with up to 60 dwelling units; and an assisted living/memory care facility with up to 54 beds. At present the Raytheon campus contains 563,300± sf of office, research and development (R&D), and manufacturing space in multiple buildings that are operated by Raytheon and supported by 2,040± parking spaces and associated appurtenances. These facilities, excepting approximately 15,000± sf of R&D space, will be removed to accommodate the Meadow Walk Sudbury project.

Access to the Project site will be provided by way of two (2) driveways that will intersect the north side of Route 20 as follows: an unsignalized driveway (STOP-sign control) that will be situated parallel to the west property line at the location of the existing driveway that serves the Raytheon campus, and a new driveway that will be aligned opposite the westernmost driveway to the Sudbury Plaza that will be placed



under traffic signal control and will incorporate Highland Avenue into the traffic signal system. The remaining driveways that serve the Raytheon campus will be closed. In conjunction with the access improvements, left-turn lanes will be added to Route 20 at the east Project site driveway (signalized), and the driveways to the Sudbury Plaza will be modified to accommodate the proposed roadway geometry.

CONCEPTUAL MASTER PLAN

The following comments are offered with respect to our review of the conceptual master plan drawings prepared by VHB in support of the Project:

1. The conceptual master plan incorporates an interconnected sidewalk network that links the uses that are proposed within the development to the sidewalk infrastructure along Route 20, with provisions for a future connection to the Mass Central Rail Trail that will abut the Project site to the immediate north. We also note that the plans include the installation of a landscaped buffer that will separate the sidewalk from the vehicular travelled-way, excepting the sidewalk fronting along the memory care facility where the sidewalk will be adjacent to the travelled-way to allow for the development of a larger landscaped buffer between the sidewalk and the building.
2. The internal roadway network provides 24-foot wide circulating roadways throughout the Project site, with parallel parking provided along both sides of the main circulating roadway within the Avalon Sudbury portion of the Project. This roadway width is sufficient to efficiently convey two-way traffic within the Project site and accommodate emergency vehicle operations. We note that the Master Vehicle Circulation Plan dated April 22, 2016 shows a fire access drive at the north end of the Project site. If it is intended that this access be gated, appropriate turn-around areas should be provided prior to the gates.
3. Bicycle accommodations are provided or have been requested to be provided throughout the Project site consisting of both interior and exterior bicycle parking. In addition, as noted above, provisions for a future connection to the Mass Central Rail Trail have been provided.
4. We have requested that the Applicant provide a truck turning analysis for the Project (this has been completed for the Grocery Store Development) using the following design parameters as guidance: i) the analysis should be completed using the AutoTurn® or similar analysis software for the following design vehicles: a WB-62 (intermediate size tractor semi-trailer combination; evaluate for commercial uses only), an SU-30/40 (small delivery/moving vehicle and trash/recycling vehicle) and the Town of Sudbury Fire Department design vehicle; ii) the analysis should include the swept path for the front and rear tires of the design vehicles and any overhangs that may extend past the front and rear bumper of the vehicle (i.e., basket of the aerial ladder of the fire truck if so equipped); iii) the analysis should depict all maneuvers required to enter and exit the Project site by way of Route 20 (both left and right-turn movements entering and exiting), and all turning and maneuvering required within the Project site; iv) Back-up maneuvers, where required, should be clearly identified.
5. A sign and pavement marking plan should be provided as a part of the individual site plans as they are developed for the Project in order to verify that the proposed traffic control devices are appropriately designed and located within the Project site.
6. Crosswalks across the main internal circulating roadway should be constructed using textured (stamped asphalt or similar) and colorized pavement, providing a consistent theme and pattern throughout the Project where pedestrian crossings are provided.



7. Sidewalks and wheelchair ramps compliant with the Americans with Disabilities Act (ADA) should be provided where pedestrian crossings are proposed within the Project site.
8. A school bus waiting area should be provided within the Project site or at an appropriate location defined in consultation with the Town of Sudbury School Department.
9. A bus stop has been provided within the Grocery Store Development to facilitate future bus service by the Metro West Regional Transit Authority (MWRTA).
10. The Applicant has agreed to incorporate electric vehicle charging stations into the Project.

PARKING

The formal site plans that have been submitted for review (the Grocery Store Development and the Avalon Sudbury residential community) have been designed to provide the requisite number of parking spaces required pursuant to Town Zoning requirements. We expect that the remaining elements of the Project will similarly comply with Town Zoning requirements as illustrated on the conceptual master plan. We also note that the parking layout in relation to the proposed uses is appropriate and conveniently located in relation to the proposed buildings.

SUMMARY

VAI has completed a review of the conceptual master plan and associated materials submitted in support of the proposed Meadow Walk Sudbury mixed-use open space development to be located at 526 and 528 Boston Post Road (Route 20) in Sudbury, Massachusetts. Our review focused on the following areas as they relate to the Project: i) vehicle, pedestrian and bicycle access and circulation; ii) parking design and layout; iii) accessibility for loading, delivery and emergency vehicles; and iv) consistency with accepted Traffic Engineering and Transportation Planning practices. Based on this review, we have concluded that access and circulation as depicted on the conceptual master plan for the Project will allow for safe and efficient access to the Project site, and accommodate internal circulation for vehicles, pedestrians and bicyclists in a safe, connected and unconstrained manner.

If you should have any questions regarding our review of access and circulation for the Project as envisioned as a part of the conceptual master plan, please feel free to contact me.

Sincerely,

VANASSE & ASSOCIATES, INC.



Jeffrey S. Dirk, P.E., PTOE, FITE
Principal

JSD/jsd

cc: File

MEADOW WALK SUDBURY TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS

The Applicant has committed to a comprehensive transportation improvement program for the Meadow Walk Sudbury mixed-use development that includes physical roadway, intersection and traffic control improvements, and trip-reduction strategies. These improvements include the following:

Site Access

Primary Driveway – Placed under traffic signal control and aligned with Sudbury Plaza west driveway, with left-turn lanes to be provided on the Route 20 approaches to the intersection, pedestrian accommodations for crossing Route 20 and the driveways to both the Sudbury Plaza and the Project site, and bicycle detection. The traffic signal system will also incorporate Highland Avenue in order to address current safety deficiencies resulting from the proximity of Highland Avenue to the Sudbury Plaza driveway.

Secondary Driveway – Secondary access is proposed via the existing west driveway that serves the Raytheon campus which will be improved to accommodate truck turning maneuvers and will remain under STOP-sign control.

Pedestrian and Bicycle Improvements – Widen the existing sidewalk on the north side of Route 20 along the site frontage; extend the sidewalk along the south side of Route 20 to the Sudbury Plaza west driveway; subject to the availability of right-of-way, provide widened shoulders along both sides of Route 20 within the limits of the planned roadway improvements to accommodate bicycle travel; incorporate crosswalks, pedestrian traffic signal equipment and bicycle detection as a part of the proposed traffic signal system at the primary site driveway.

Sight Line Maintenance - Signs and landscape features to be installed within the sight triangle areas of the site driveways will not exceed 2.5 feet in height as measured from the surface elevation of the site driveways. Snow windrows within the sight triangle areas of the site driveways will be promptly removed where such accumulations would exceed 2.5 feet in height.

Off-Site

Fire Station Pre-Emption Signal – Design and install an emergency vehicle traffic control signal at the Sudbury Fire Department fire station that will be coordinated with the proposed traffic signal to be installed at the primary Project site driveway.

Traffic Signal Coordination – Design and install a time-based coordinated traffic signal system along Route 20 to include the following intersections: Primary site driveway; Nobscot Road; and Union Street.

Transportation Demand Management (TDM)

- A transportation coordinator will be assigned for the overall development
- Join the Metro West/495 Transportation Management Association (TMA)
- Encourage participation in ridesharing programs
- A bus stop will be provided to accommodate future expansion of Metro-West Regional Transit Authority (MWRTA) bus service to the development
- Pedestrian and bicycle accommodations will be provided within the development, including sidewalks throughout and bicycle racks at appropriate locations
- Electric vehicle charging stations will be provided



**MEADOW WALK SUDBURY
TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS**

Transportation Demand Management (TDM) (Continued)

- Preferential parking for car/vanpools and alternatively fueled vehicles will be provided
- The TDM program will be coordinated with the Town and MassRides, MassDOT's rideshare coordinator

Traffic Monitoring and Reporting Program

The Applicant will conduct a traffic monitoring program that will include the following elements:

- i) Performing an automatic traffic recorder (ATR) count on the 20 site driveways over a continuous 72-hour (Thursday through Saturday) period; and
- ii) Performing manual turning movement and vehicle classification counts at the site driveway intersections with Route 20 during the weekday morning (7:00 to 9:00 AM), weekday evening (4:00 to 6:00 PM) and Saturday midday (11:00 AM to 2:00 PM) peak hours.

The monitoring program will commence six (6) months after issuance of the first Certificate of Occupancy for the Meadow Walk Sudbury development and will continue on an annual basis for a period of 2-years after the completion of the development. The results of the monitoring program will be summarized in a report provided to the Town within 2-months after the completion of the data collection effort. The report will document the traffic volumes associated with the development as occupied at the time that the traffic counts are completed. If the measured traffic volumes associated with the development exceed the traffic volume projections that form the basis of the February 2016 *Traffic Impact and Access Study* that was submitted in support of the development by more than 10 percent on a regular and sustained basis during the monitoring period, the Meadow Walk Sudbury developer will identify and undertake corrective measures in conjunction with the appropriate parties and subject to receipt of all necessary rights permits and approvals. These measures may include without limitation:

- Sign and pavement marking installation
- Traffic signal timing adjustments
- Consideration of geometric refinements at the Project site driveways

The corrective measures, if any, will be documented in the transportation monitoring report and will identify the appropriate parties responsible for implementation, required approvals, and the timeline for implementation. The status of implementation of the identified improvement measures will be documented in the subsequent monitoring report.