REF.: NEX-2200133.00

August 18, 2022

Ms. Lee Newman
Director of Planning and Community Development
Needham Department of Public Works
500 Dedham Avenue
Needham, MA 02492

SUBJECT: Highland Science Center, Gould Street, Needham, MA
MEPA DEIR – Traffic Peer Review

Dear Ms. Newman:

On behalf of the Town of Needham, ***Greenman-Pedersen Inc.*** (GPI) performed a review of the *Draft Environmental Impact Report*[1] (DEIR) prepared by Vanasse Hangen Brustlin, Inc. (VHB) for review by the Massachusetts Environmental Policy Act (MEPA) office for the proposed Highland Science Center in Needham, Massachusetts. The site is located on the northeast corner of the intersection of Highland Avenue and Gould Street, and currently contains a Muzi Ford car dealership, Charles River Media Group and WCVB Channel 5. The site was recently part of a rezoning effort by the Town to allow for the development of up to ±880,000 square feet (SF) of office, research and development (R&D), and ancillary retail and service space. GPI has reviewed the DEIR and supporting traffic analysis for consistency with the goals and studies prepared as part of the Town's rezoning, as well as for compliance with the MEPA Certificate issued on the *Environmental Notification Form* (ENF)[2], Massachusetts Department of Transportation (MassDOT) guidelines for traffic impact analysis and general engineering practice. The following summarizes GPI's comments related to the DEIR.

Changes Since ENF

1. At the time of the ENF filing, the Project was proposed to include extensive widening along Gould Street to provide five travel lanes approaching the intersection with Highland Avenue (a dedicated right-turn lane, a through lane, two left-turn lanes, and a receiving lane), as well as bicycle lanes along each side of the roadway. This plan was consistent with the concept plans prepared as part of the Town's rezoning effort for a development of the site with ±880,000 SF of office, R&D, and retail space. The currently proposed project consists of only ±530,000 SF of development, with only 10,000 SF being retail space. The reduction is square footage has reduced the volume of traffic anticipated to be generated by the proposed development. The capacity and queue analysis prepared by the Applicant as part of the ENF and DEIR indicates that a five-lane cross-section along Gould Street is not warranted for a project of this scale. As such, the concept plans have been modified to reduce Gould Street to a four-lane section with a shared through/right-turn lane, two left-turn lanes and one receiving lane. This modification will allow for improved pedestrian and bicycle accommodations along the corridor with the construction of a separated bicycle facility along the east side of Gould Street, a bicycle-accommodating shoulder along the west side, and upgraded sidewalks along both sides of the street. GPI supports this design change in favor of providing a multi-modal, Complete Streets design of Gould Street.

2. The project also previously included a dedicated right-turn lane on Gould Street northbound at TV Place, which has been eliminated as part of the currently proposed concept plans. The analysis provided by the Applicant indicates that this intersection can operate well without the dedicated right-turn lane based on the

[1] *Draft Environmental Impact Report, Highland Science Center, Needham Heights, Massachusetts;* prepared by Vanasse Hangen Brustlin, Inc. (VHB); July 2022.
[2] *Environmental Notification Form, Highland Science Center, Needham Heights, Massachusetts;* prepared by Vanasse Hangen Brustlin, Inc. (VHB); March 2022.

trip generation and distribution projections contained in the ENF and DEIR. However, the location of the parking garage and entrance close to TV Place may encourage office employees to utilize TV Place for access into the garage to avoid activity near the front door and Atrium. Therefore, GPI recommends that the site be designed to accommodate the potential future widening to provide a right-turn lane if needed, and that the post-occupancy traffic monitoring program include a review of the Gould Street / TV Place intersection to assess whether a right-turn lane is warranted at this location based on traffic operations. The design should include locating the proposed new Town right-of-way lines for Gould Avenue in a manner that will allow for future widening to provide a right-turn lane if and when needed. This will also ensure that adequate right-of-way is available should the Channel 5 site ever be redeveloped as contemplated in the Town's recent rezoning effort.

3. With the provision of the separated bicycle facility on the east side of Gould Street, the Applicant has proposed a new crosswalk with either LED warning signs or rectangular rapid flashing beacons (RRFBs) on Gould Street at the abandoned railroad right-of-way. GPI concurs with the location of this crosswalk as the railroad may be converted to a shared-use path in the future. The DEIR does not describe how the warning signs or RRFBs would be activated. Consideration should be given to implementing a passive detection system such as video or thermal detection to assist bicyclists in crossing without the need to dismount their bicycles to activate a push-button. Passive detection would be particularly beneficial if the railroad is converted to a shared-use path.

4. Section 1.3.2.3 of the DEIR describes that 25 percent of the proposed parking spaces will be equipped with EV charging stations and the Applicant will consider means to increase capacity for EV stations in the future as demand increases. GPI recommends that the EV stations within the surface parking lot be high-speed charging stations as these spaces will be primarily utilized by visitors and retail patrons who will make shorter trips to the site. For the purposes of efficient fire suppression, EV charging stations within the parking garage should be located along the outside walls of the garage.

Collision History

5. The collision diagram contained in the DEIR for the Hunting Road / Kendrick Street intersection indicates a high occurrence of crashes between vehicles traveling eastbound on Kendrick Street and through vehicles in both directions on Hunting Road. This may be an indication of red-light-running and insufficient clearance intervals at the intersection. The Applicant has proposed signal timing modifications at this intersection to optimize the operations. As part of this retiming, GPI recommends that the Applicant review the existing clearance intervals on all signal phases to verify that they are appropriate for the geometry of the intersection and adjust the timings accordingly.

Transportation Operations Analysis

6. The concept plans for the Highland Avenue / Gould Street / Hunting Road intersection contained in the DEIR indicate that bicycle boxes are proposed along Highland Avenue to allow two-stage left-turn movements for bicyclists using the bike lanes on either side of the roadway. With these bike boxes, the bike box is located on the far side of the intersection in front of the opposing through lane. For example, a bicyclist traveling westbound on Highland Avenue that wanted to turn left onto Hunting Road would travel straight through the intersection and wait in the bike box in front of the Gould Street southbound vehicles for the Gould Street southbound phase to be activated and then complete the turn by traveling south to Hunting Road. Because the bike box will be located in front of the through lane, right-turn-on-red movements must be prohibited when a two-stage bike box is provided. The analysis of the 2029 Build with Improvements condition prepared by the Applicant as part of the DEIR does not include a restriction of right-turn-on-red movements on the Gould Street southbound and Hunting Road northbound approaches. Therefore, the analysis results incorrectly represent improved operations at the intersection. The Applicant should update the analysis to reflect the required turn restrictions and re-evaluate whether a right-turn lane will be required on Gould Street southbound or whether additional improvements will be needed with these turn restrictions in place.

7. As the geometric modifications at the Highland Avenue / Gould Street / Hunting Road intersection will require substantial upgrades to existing signal equipment, the Applicant should consider installation of adaptive signal controls at this location as a means of further improving operations and ensuring that timings are optimized for all time periods as further growth and development occurs in the surrounding area. The Applicant should also consider installation of GridSmart or other high definition cameras, equipped with communication to the Needham Police Department for incident management and traffic monitoring.

8. As part of our review of the ENF, GPI noted that the Highland Avenue southbound approach to West Street will operate over capacity with long delays during the weekday PM peak hour under 2029 Build conditions, with an increase in delay of 22 seconds per vehicle generated by the project and requested that the Applicant review options to improve the operations of the intersection. The Applicant has proposed increasing the cycle length at the intersection and modifying the split times to reduce the delay on the southbound approach by approximately 19 seconds to bring the movement below capacity and back to a nearly No-Build condition. While this signal timing modification will reduce the delay on the southbound approach, the increase in cycle length will actually increase the queues on the southbound approach, which has the potential to create additional collisions at a location that already experiences a crash rate higher than the statewide average. It appears that the Applicant has designed the signal timing modifications to maintain the 2029 No-Build delays and queues on all other intersection approaches to the maximum extent feasible, rather than reoptimizing the intersection operations as a whole. GPI recommends that the Applicant reconsider the proposed timing changes at this location to optimize the operations. This may mean that other movements will experience longer delays and queues than estimated under 2029 No-Build conditions in order to improve the operations of the southbound approach.

9. Similarly, the analysis contained in the ENF indicated the Highland Avenue eastbound through/right-turn movement at the intersection with Webster Street will operate over capacity during the weekday AM peak hour under 2029 Build conditions, with an increase in delay of 26 seconds per vehicle generated by the project. The Applicant has proposed increasing the cycle length and modifying split times to reduce the delay on the eastbound through/right-turn movement. While the delay will be reduced to less than No-Build conditions as a result of these signal timing changes, the queues on this movement will increase by five vehicles and the Webster Street southbound approach will continue operating over capacity. Several of the movements at the intersection are anticipated to operate at LOS B or C under 2029 Build conditions with excess capacity. Therefore, it appears that the modified timings have been designed solely to reduce delay on the eastbound through/right-turn movement and do not consider the overall operations of the intersection as a whole. GPI recommends that the Applicant reconsider the proposed timing changes at this location to optimize the operations of the entire intersection. This may require delay or queues to increase on some movements as compared to 2029 No-Build conditions in order to improve the delays and queues on other movements.

10. The analysis contained in the ENF also indicated that, although not heavily impacted by project-generated traffic, the Highland Avenue westbound left/through movement at the intersection with 1st Avenue will be well over capacity during the weekday PM peak hour under both 2029 No-Build and Build conditions. The Applicant has proposed signal timing modifications at this intersection to reduce delay on the westbound left/through movement. While Table 5-7 indicates that the movement will still continue to operate over capacity, the timing changes will significantly reduce the delay on the westbound approach well below the 2029 No-Build condition and mitigate the Project's impacts on operations at this location.

11. The Applicant is proposing significant geometric modifications and signal improvements at the Highland Avenue / Gould Street / Hunting Road intersection as mitigation for the Project. The capacity and queue analysis contained in the ENF showed that some movements would still be operating at level-of-service (LOS) F and over capacity under 2029 Build conditions with the proposed improvements. The Applicant has since modified the improvement plan, as well as the signal timings at the intersection, to optimize the intersection operations. In most cases, the modifications result in 2029 Build conditions that are either improved from or similar to No-Build conditions. However, GPI notes that during the weekday PM peak hour, the Highland Avenue westbound through / right-turn movement is still anticipated to operate over capacity under 2029 Build

with improvements conditions. The opposing eastbound left-turn will operate at approximately 60 percent of capacity at LOS E during the same time period. The Applicant should consider a slight modification to the proposed signal timings to remove some green time from the eastbound left-turn and provide additional green time for the westbound through movement to better optimize operations. This may be done through post-occupancy monitoring of the intersection and adjusting the timings in the field based on observed delays and queues.

Parking

12. The Project includes the construction of a below-grade parking garage to be under the building, as well as a stand-along parking garage. The provision of multiple parking areas on-site with no connections between these parking areas other than via the single internal project roadway has the potential to create excessive recirculation of vehicles on-site looking for empty spaces and to cause congestion along the site roadway. The internal roadway is only approximately 500 feet long in its entirety and will include a drop-off area at the Atrium, and three separate intersections with driveways into the surface lot and two parking garages, as well as at least one pedestrian crossing over that short distance. Less than 100 feet of stacking distance is proposed between the drop-off zone and Gould Street when the capacity analysis results show queues on the driveway extending nearly 200 feet. Additional turns into and out of the parking areas to look for empty parking spaces will create additional congestion that has the potential to back onto TV Place and Gould Street. To avoid this scenario, GPI recommends that the Applicant implement a parking management program that could include either potential assignment of employees to designated parking areas or spaces, or installation of a driver alert system to let drivers know when parking areas are full before entering them. This driver alert system may also include means of directing drivers to open EV charging stations on-site.

13. There is a small stub parking area provided in the northwest corner of the below-ground parking garage that contains eight compact-car parking spaces. The size of the compact spaces will already make maneuvering in and out of the spaces difficult. In addition, the spaces are provided immediately adjacent to the wall without an area provided for a car to back out of the parking space to exit. As a result, drivers may need to back down the parking aisle and into the main drive aisle to exit the last two spaces in the garage. GPI recommends the Applicant consider elimination of the last two parking spaces to provide improved maneuverability for the spaces in this area.

14. The Applicant is committed to providing EV charging stations in 25 percent of the parking spaces within each of the surface, underground, and stand-alone garage parking areas. While GPI commends the Applicant on providing a high percentage of EV stations for sustainability, GPI also has concerns over the adequacy of the proposed parking supply to accommodate the anticipated parking demand by gasoline powered vehicles if such vehicles are not allowed to park in the EV spaces. The DEIR notes that while all of the analysis has been prepared assuming that 1,770 parking spaces will be provided on the site, the Applicant is seeking a Special Permit from the Town of Needham to request a reduced parking supply of only 1,408 spaces. With 25 percent of these being for EV charging only, only 1,056 parking spaces will remain for use by gasoline powered vehicles. Currently, fewer than 1.0 percent of vehicles on the roadway in the U.S. are electric vehicles and only just over 5.0 percent of vehicles sold in 2022 have been electric vehicles according to a report from Car and Driver Magazine on August 8, 2022. Therefore, the Applicant should ensure that the number of parking spaces provided for gasoline powered vehicles will be adequate to accommodate gasoline powered vehicle parking demand for opening year condition. If needed, spaces can be made EV ready and converted to EV spaces when demand within the provided EV spaces begins to reach capacity.

15. To encourage the use of electric vehicles, EV charging stations should be free for employee use within the parking garages. GPI also recommends that at least one accessible parking space be equipped with EV charging with additional spaces being EV ready.

16. A total of 30 parking spaces are proposed to be provided within the surface parking lot for use by visitors and the retail use. Approximately 10,000 SF of retail space is proposed on-site. Typically, at least one parking

space per 250 SF of retail space is provided, which would result in a parking demand of 40 spaces for the retail use alone. It is recognized that the proposed retail space will be ancillary to the on-site office and R&D space so many of the retail patrons may be office/R&D employees who are already parked in the garages. However, this small surface lot may not be sufficient to accommodate both retail and visitor parking, particularly under opening condition if 25 percent of the spaces are designated for EV charging only. GPI recommends that retail employees be required to park in the parking garages to leave the surface lot parking available for patrons. The Applicant should also monitor the use of the surface parking lot post-occupancy and consider signing additional visitor parking with the parking garage, if necessary. This may also include a driver alert system to direct visitors to open visitor parking spaces.

Transportation Demand Management

17. The Applicant is proposing to implement a shuttle between the site and nearby public transportation services, such as the commuter rail at Needham Heights and the Green Line D Branch at Newton Highlands. The DEIR notes that the MBTA recently developed a Bus Network Redesign Plan, a draft of which was released in May 2022, that eliminates some of the variations of Route 59 to simplify routes. As a result, the MBTA is not likely to be interested in modifying Route 59 to provide service closer to the site. GPI recommends that the Applicant reach out to the MBTA to assess whether a partnership makes sense for allowing area residents and employees an opportunity to use the Applicant's shuttle service for access to nearby transit services to supplement Route 59.

18. The DEIR notes that based on U.S. Census information, approximately five percent of Needham employees commuter to work via public transportation, walking, and bicycling. While the DEIR states that the TDM measures proposed by the Applicant are likely to result in a greater percentage of alternative means of travel, the Applicant has not identified any targeted mode share goals.

Mitigation Measures

19. Figure 5.1 provides a conceptual plan of the improvements proposed along Gould Street as mitigation for the proposed redevelopment. The plan is prepared on an aerial image with limited existing conditions linework that is scaled back in gray. It appears that the linework along Highland Avenue at the intersection of Gould Street / Kendrick Street is consistent with the MassDOT improvement plans along Highland Avenue, but there is not enough detail provided on the plans to determine this. The Applicant should provide a plan that clearly shows how the proposed improvements to be constructed by the Applicant will tie into MassDOT's improvements along Highland Avenue. This should include the layout of all signal equipment that will be necessary to accommodate the Applicant's proposed improvements. The Figure provides a note that states "Geometric and Signal Improvements at Intersection", but there are no signal improvements shown on the plan and the DEIR does not commit to installing new or relocating signal equipment.

20. In addition, Figure 5.1 does not show the proposed site plan or the existing and proposed municipal right-of-way and State Highway Layout (SHLO) lines along Gould Street and Highland Avenue. The Applicant should provide a plan that clearly shows how the site relates to the street and future right-of-way to verify that adequate setbacks will be provided from the street layout to the on-site structures. There are additional concept plans provided in Appendix D that are prepared on survey with some additional detail. However, these plans also do not depict the site layout or the proposed right-of-way boundaries. The plan of Gould Street along the site frontage depicts a 50-foot offset from the curb line and a 50-foot offset from the existing right-of-way line. However, the lack of site layout information on this plan does not allow for assessment of setbacks. In addition, the plan does not depict proposed right-of-way layout or a 50-foot offset from the proposed layout.

21. The Applicant has proposed a striped median with a shared left/through lane on Gould Street northbound approaching the site driveway based on Figure 5.1. GPI questions the Applicant's reasoning for providing this

median and shared lane in lieu of a dedicated left-turn pocket into the Wingate driveway. A dedicated left-turn pocket may provide reduced delays and queues and improve safety on Gould Street northbound.

22. Based on the concept plan for the Central Avenue / Gould Street intersection in Appendix D, the Applicant is proposing to signalize the two residential driveways on the northerly side of Gould Street as part of the improvements. The western-most of the residential driveways is proposed to operate concurrently with the Gould Street northbound approach. Due to the offset of the driveway from Gould Street and the low volume of traffic exiting the driveway, GPI does not recommend these movements operate concurrently. Gould Street is heavily used by commuters who will regularly traverse this intersection without encountering any opposing traffic from the residential driveway due to its low volume. This will reduce driver expectation of traffic exiting the driveway and cause traffic on Gould Street to assume right-of-way, generating the potential for a collision when a vehicle is present on the driveway. Therefore, GPI recommends that both residential driveways operate on their own signal phases. The additional signal phase is not expected to have a measurable impact on the operations of the intersection given the low volume on the driveway.

23. The Applicant is proposing to install signage along Noanett Road to restrict the roadway to local traffic only during the weekday morning and afternoon time periods. Cut-through traffic should be discouraged during all times of the day, not just during commuter time periods. Therefore, if such signage is to be installed, it should restrict the roadway to local traffic during all times.

24. The Applicant has proposed installing BLIND DRIVEWAY and SLOW CHILDREN PLAYING signage along Noanett Road at the request of residents along this roadway as mitigation for the project. It is important to note that SLOW CHILDREN PLAYING signs are not compliant with Manual on Uniform Traffic Control Devices (MUTCD) signage as they provide a false sense of security to residents, they do not indicate a particular location of a potential hazard, they do not indicate what speed is actually safe for travel, and they generally do not reduce vehicle travel speed. These signs also pose liability issues for the municipality as they imply that it is safe for children to play in the roadway. The Applicant has proposed installing NO CUT-THROUGH traffic signage on Noanett Road and will be installing a traffic signal at the intersection of Central Avenue / Gould Street as mitigation for the project. The presence of the new traffic signal at Central Avenue / Gould Street will facilitate left-turns from Gould Street onto Central Avenue and reduce the appeal for and likelihood of cut-through traffic along Noanett Road. Therefore, the majority of traffic along Noanett Road should be local residential traffic who will be familiar with the area and the potential for children in or close to the roadway. As a result, GPI does not recommend installation of SLOW CHILDREN PLAYING signage along Noanett Road.

25. The BLIND DRIVEWAY signs are proposed along Noanett Road at the residents' request because some of the driveways are located in close proximity to curves where sight lines are an issue. The sight line restrictions for these driveways are the residents' own landscaping, which could be removed to eliminate the sight line restriction without the installation of these signs. These signs are not included in the MUTCD as they provide a false sense of security to the resident exiting the driveway, they do not provide any legal message, they do not tell the driver what speed is safe to travel, and they are not enforceable. When a sight line restriction exists at a driveway, the responsibility belongs to the property owner to ensure adequate sight lines are provided. Therefore, GPI does not recommend installation of these signs along Noanett Road. If the curves along Noanett Road require vehicles to travel slower than the enforced speed of the roadway, installation of curve warning signage with supplemental curve advisory speed placards in advance of the curve would be a better option.

Traffic Monitoring Program

26. Section 5.7.1 of the DEIR describes an on-site parking facility study that will be conducted as part of the monitoring program to count vehicles as they enter and exit each of the parking areas. While these counts may be effective in determining the volume of vehicle trips generated by the development during the peak hours, this data will not provide an assessment of the actual use of the parking areas. GPI recommends that

the monitoring program include a parking utilization study to be conducted during the heaviest demand periods for the site as a whole and for each parking area to assess whether the parking provided in each area is meeting current parking demands. This should include a review of the utilization of EV charging stations, designated visitor or retail parking spaces, designated rideshare / carpool spaces if provided, and compact vehicle parking spaces to assess the need for modifications to the parking provisions.

Should you have any questions regarding these comments, please contact me directly at 603-766-5223.

Sincerely,

GREENMAN–PEDERSEN, INC.

Rebecca L. Brown, P.E.
Senior Project Manager