

MEMORANDUM

Date: May 13, 2022

To: Kara Brewton, Planning Director
Department of Planning and Community Development
333 Washington Street
Brookline, MA 02445

From: Jane R. Davis, P.E.

CC: James D. Fitzgerald, P.E., LEED AP

Subject 217 Kent Street Traffic Peer Review: Review of Response to Comments (RTC)

Environmental Partners (EP) has reviewed the responses prepared by Vanasse & Associates, Inc. (VAI) to the comments/questions raised in the Traffic Peer Review (dated September 22, 2021) regarding the proposed development located at 217 Kent Street in the Town of Brookline. EP has provided a response (“**EP Response 05/13/2022**”) to each of the original EP comments (“**EP Comment 09/22/2021**”) and subsequent VAI responses (“**VAI Response 03/18/2022**”) as outlined below.

Existing Conditions

Comment 1

EP Comment 09/22/2021:

The study area descriptions and figure appear to be accurate, with the exception of the following: the Kent Street at Francis Street intersection has pedestrian crossings across the north and west legs, which are not shown on the figure; the field-measured width of the site driveway is approximately 16 feet, while the figure indicates the driveway is 24 feet wide; Kent Street is functionally classified as an Urban Major Collector (not specified in the TIA) and its southern terminus is at the intersection with Washington Street and Harvard Street (as opposed to Route 9 as described in the TIA).

VAI Response 03/18/2022:

VAI agrees that the intersection of Kent Street at Francis Street has pedestrian crossings across the north and west legs, that the existing driveway width is approximately 16 feet, and that Kent Street is functionally classified as an Urban Major Collector with its southern terminus located at the intersection with Washington Street and Harvard Street.

EP Response 05/13/2022:

No further action; **Comment 1 closed.**

Existing Traffic Data

Comment 2

EP Comment 09/22/2021:

EP requests clarification on how the daily volume and the peak hour percent of daily traffic were estimated.

VAI Response 03/18/2022:

The peak hour percent of daily traffic was calculated from a number of counts conducted by MassDOT in the area. Looking at three separate daily counts at two locations, the average peak hour percent of daily traffic was determined to be 0.086. These calculations are provided in the appendix. However, Table 1 did appear to have incorrect numbers presented. The table has been revised with the correct numbers.

[See Table 1R]

As can be seen in Table 1R, Kent Street was found to accommodate approximately 9,250 vehicles on an average weekday (24-hour, two-way volume), with approximately 745 vehicles per hour (vph) during the weekday morning peak hour and 795 vph during the weekday evening peak hour. The predominant flow on Kent Street during the weekday morning is 67 percent in the northbound direction and during the weekday evening is 62 percent in the southbound direction.

EP Response 05/13/2022:

Information provided; **Comment 2 closed.**

Public Transportation

Comment 3

EP Comment 09/22/2021:

EP recommends including the bus route within the Transportation Demand Management (TDM) Plan.

VAI Response 03/18/2022:

Agree that MBTA Bus Route 66 stops approximately 0.5 miles from the site on Harvard Street at Vernon Street. This bus route will be included in transportation information provided to residents.

EP Response 05/13/2022:

No further action; **Comment 3 closed.**

Crash History

Comment 4

EP Comment 09/22/2021:

EP recommends reviewing crash reports provided by the Brookline Police Department (BPD).

VAI Response 03/18/2022:

Crash data for the study area intersections was provided by the Brookline Police Department (BPD) Records Division for the study area intersections from 2013-2020. This data was combined with the data from MassDOT to create a comprehensive crash data set which is summarized in Table 2R below. It should be noted that crashes involving pedestrians and bicyclist were not previously listed as their own crash types but have been in Table 2R.

As summarized in Table 2R, the intersection of Longwood Avenue at Kent Street experienced the highest frequency of accidents over the eight-year review period with a total of 26 accidents reported at the intersection, averaging 3.71 accidents per year. The majority of accidents involved property damage only (13 out of 26), occurred on dry pavement (19 out of 26), during daylight (20 out of 26), and involved angle-type collisions (9 out of 26). All of the study intersections were found to have a motor vehicle crash rate below the MassDOT average for the District in which the Project is located (District 6). No fatalities were reported at any of the study area intersections over the eight-year period reviewed.

In addition, the Highway Safety Improvement Program (HSIP) database was reviewed. The Longwood Avenue section between Kent Street and Chapel Street is also listed as a HSIP bicycle cluster in the most recent (2008 through 2017) HSIP bicycle cluster listing. Longwood Avenue at Kent Street experienced 4 crashes involving pedestrians and 4 crashes involving bicyclist over the eight-year review period while Kent Street at Chapel Street experienced 1 crash involving a pedestrian and 3 crashes involving bicyclist over the eight-year review period.

[See Table 2R]

EP Response 05/13/2022:

VAI obtained crash reports from BPD and summarized the data in combination with the MassDOT data for a comprehensive review, additionally separating the pedestrian and bicycle crashes in the summary table. With the more comprehensive data set, the crash rates remained below the MassDOT average. The updated crash data indicated that within the study area, five crashes involved a pedestrian and nine crashes involved a bicyclist, further illustrating the potential need for mitigation related to bicycle and pedestrian accommodations, as discussed in subsequent comments. **Comment 4 closed.**

[Comment 5](#)

EP Comment 09/22/2021:

EP recommends consideration for mitigation related to bicycle accommodations.

VAI Response 03/18/2022:

We are coordinating with the Brookline Department of Public Works and the Transportation department to determine the appropriate mitigation for this development.

EP Response 05/13/2022:

It is understood that appropriate mitigation measures will be coordinated with the Town; EP has no further comments at this time.

Future Traffic Growth

[Comment 6](#)

EP Comment 09/22/2021:

Although EP recommends including backup data to justify a general background growth rate, EP does not take exception to the use of a one-percent growth rate, since this rate is within the reasonable range and is consistent with other nearby traffic studies. EP assumes that VAI's research and correspondence with the Town of Brookline has adequately identified all major projects and developments that may impact travel patterns in the seven-year study period; verification from the Town is recommended.

VAI Response 03/18/2022:

The Town's Planning and Community Development Department was contacted to identify which developments may impact travel patterns within the seven-year study period. The following developments were included in the future condition networks:

1. 1299 Beacon Street
2. Hampton Court
3. The Coolidge
4. 209 Harvard Street
5. 83 Longwood Avenue
6. Kent/Station Street Affordable Senior Housing

EP Response 05/13/2022:

Information provided; **Comment 6 closed.**

Trip Distribution and Assignment

Comment 7

EP Comment 09/22/2021:

EP recommends including backups for the trip distribution.

VAI Response 03/18/2022:

The Project trip distribution was based on a review of existing travel patterns at the study area intersections and Journey-to-Work data for Brookline obtained from the United States Census Bureau. The Journey-to-Work data and calculations used to determine the Project trip distribution are provided in the Appendix.

EP Response 05/13/2022:

The trip distribution calculations appear to be reasonable based on the information provided. **Comment 7 closed.**

Future Build Conditions

Comment 8

EP Comment 09/22/2021:

Figure 9 of the TIA graphically depicts the 2028 Build Peak Hour Traffic Volumes, which appears to be accurate (the figure is mislabeled with the incorrect year as 2026).

VAI Response 03/18/2022:

Agreed, Figure 9 was mislabeled as 2026 Build. The correct label is 2028 Build Peak Hour Traffic Volumes.

EP Response 05/13/2022:

No further action; **Comment 8 closed.**

Traffic Operations Analysis

Comments 9

EP Comment 09/22/2021:

At the intersection of Kent Street at the site driveway, the peak hour factors (PHF) in the Synchro analysis are not consistent with the PHF in the traffic count data. Please revise the PHFs in the analysis at this intersection.

VAI Response 03/18/2022:

The analysis was revised such that the PHFs in the analysis match those in the count data. See updated analysis results in Table 9R and Table 10R in response to Comment 11.

EP Response 05/13/2022:

No further action; **Comment 9 closed.**

[Comments 10](#)

EP Comment 09/22/2021:

For all three signalized intersections in the study area, lost time adjust is set at -2 seconds in the Synchro analysis. Lost time adjust is calculated as a function of clearance time, and should vary between signalized intersections with variable phase clearance times. EP requests clarification on adjustments made to this variable.

VAI Response 03/18/2022:

The lost time adjustment in Synchro is used to adjust the lost time (yellow interval plus the all-red interval) at a signal to more accurately reflect field conditions. In general, at signalized intersections, drivers utilize part of if not all of the yellow interval to navigate through the intersection. In more congested locations, it is not uncommon to see drivers utilizing the all-red interval to navigate through the intersection. This behavior shows that part of the yellow interval is used as green time at this signal. To model this in Synchro the lost time is adjusted by 2 seconds to account for drivers navigating through the signal during the yellow interval. Only adjusting the lost time by 2 seconds is a conservative adjustment as most of if not all of the yellow time is used by drivers navigating through the intersection in practice.

EP Response 05/13/2022:

The provided clarification seems reasonable. **Comment 10 closed.**

[Comments 11](#)

EP Comment 09/22/2021:

VAI did not include conflicting pedestrians (or pedestrian calls) or bicycle movements in the Synchro analysis, where applicable. Given the relatively high volume of pedestrians and bicycles in the study area, the analysis should accurately represent the inclusion of all modes. As such, EP recommends including conflicting pedestrian volumes (and pedestrian calls) and bicycle volumes for more accurate analysis results.

VAI Response 03/18/2022:

The analysis was revised to include conflicting pedestrian volumes/pedestrian calls and bicycle volumes. See updated analysis results in Table 9R and 10R for signalized and unsignalized intersections, respectively.

As shown in Table 9R, the overall intersection LOS remains unchanged under 2028 Build conditions compared to 2028 No-Build conditions. The intersections operate at an overall LOS D or better under the weekday morning and weekday evening peak hours.

As shown in Table 10R, the critical movement LOS remains unchanged under 2028 Build conditions compared to 2028 No-Build conditions. The intersections operate at an overall LOS D or better under the weekday morning and weekday evening peak hours. Generally, a movement/intersection operating at LOS D or better is considered acceptable.

[See Tables 9R and 10R]

EP Response 05/13/2022:

We concur that each of the intersections operates at an overall acceptable level of service (LOS D or better) and that there is no degradation between the 2028 No-Build and 2028 Build conditions as a result of the project.

However, there was a notable decrease in level of service for the Longwood Avenue westbound approach at the intersection with Kent Street during the evening peak hour under future conditions with the revisions, which is expected to operate at an unacceptable LOS F. As discussed below, EP recommends re-optimizing the signal timing and phasing to mitigate the poor operations on this approach.

Comments 12

EP Comment 09/22/2021:

The Synchro analysis for the intersection of Kent Street and Aspinwall Avenue shows a 6 second southbound protected lead phase in the weekday morning peak hour, and a 23 second northbound protected lead phase in the weekday afternoon peak hour. Variable phasing during different periods of the day is atypical, and as such EP requests verification of the existing signal phasing at this location.

VAI Response 03/18/2022:

The latest signal timing and phasing plans for this intersection were obtained from the Town of Brookline. The phasing on the plans was compared to field observation conducted during the weekday morning and weekday evening peak hours. It was determined that this intersection has variable phasing during different periods of the day and the phasing used in the analysis is accurate.

EP Response 05/13/2022:

Information provided; **Comment 12 closed.**

Sight Distance

Comment 13

EP Comment 09/22/2021:

EP requests that the Applicant provide a sight distance evaluation for both the existing site driveway and the location of the proposed semi-circular dedicated drop-off area for both vehicles and pedestrians (pedestrian sight distance as per Town of Brookline Zoning By-Law requirements (Section 6.04.4.f.1)), and depicted on a site plan using sight triangles.

VAI Response 03/18/2022:

Figure 1 depicts the vehicle sight triangles for the south site driveway. Figure 2 depicts the vehicle sight triangles for the north site driveway. Figure 3 depicts the pedestrian sight triangles for both the north and south driveways.

EP Response 05/13/2022:

The sight distance figures do not appear to take into account the proposed parking on the eastern side of Kent Street adjacent to the semi-circular driveway. This is inconsistent with the vehicle turning movement diagrams, which illustrate parked vehicles in this location. We request further reconciliation of this discrepancy.

EP also notes that the parking space immediately south of the southern driveway will be removed under proposed conditions. To achieve the sight distances as shown, it appears that more than one parking space may need to be removed. We request further clarification.

Conclusions and Recommendations

Comment 14

EP Comment 09/22/2021:

In addition to VAI's recommendations, EP requests that the Applicant provide truck-turning templates for all Project site access for emergency vehicles, refuse vehicles, etc. for review. Fire truck access is of particular importance, as noted in correspondence from the Captain of the Brookline Fire Department to the Town Planner indicating concern that a fire truck will not be able to use the site driveway due to the spacing from the adjacent building and the slope of the roadway and may only be able to access the front of the building. EP requests clarification on the emergency access plan.

VAI Response 03/18/2022:

Figure 4 through Figure 10 depict truck-turning diagrams for a fire truck entering and exiting the driveway ramp, the fire truck on the driveway ramp with outriggers fully extended, the profile of the fire truck traversing the driveway ramp without any ground clearance issues, the fire truck entering and exiting the pick-up/dropoff lane from the north and south, respectively, a refuse vehicle entering the pickup/ drop-off lane from the south and exiting to the north, and a delivery vehicle entering the pick-up/drop-off lane from the south and exiting to the north.

EP Response 05/13/2022:

The vehicle turning movements appear to be adequate as shown on the provided figures. We note that no template is included to accommodate a delivery truck approaching from the north. During a working meeting on February 2, 2022, the Applicant's team indicated a need to inform delivery services to only enter from the south. As this was not discussed within the RTC, we recommend confirmation that such coordination will be made.

Comment 15

EP Comment 09/22/2021:

As noted above in the Public Transportation section, EP recommends including the additional bus route (Route 66) in the nearby public transportation options for residents.

VAI Response 03/18/2022:

Agreed. Bus Route 66 will be included in the transportation information provided to residents.

EP Response 05/13/2022:

No further action; **Comment 15 closed.**

Comment 16

EP Comment 09/22/2021:

EP also recommends an off-site, street-level bicycle rack in addition to the proposed bicycle storage inside the parking area for visitors and fast turnover for daily use, which will provide additional convenience and further promote bicycle usage.

VAI Response 03/18/2022:

We are coordinating with the Brookline Department of Public Works and the Transportation department to determine the appropriate mitigation for this development.

EP Response 05/13/2022:

It is understood that appropriate mitigation measures will be coordinated with the Town; EP has no further comments at this time.

Comment 17

EP Comment 09/22/2021:

A key part of the TDM relies on walking alternatives and public transportation services, which itself depends on accessibility for pedestrians; the provided trip generation assumes a substantial 60 percent reduction in vehicular trips to account for other modes, the majority of which will be pedestrians walking or seeking transit. EP reviewed existing pedestrian facilities during the site visit, and noted non-compliance with ADA guidelines throughout the study area. None of the pedestrian curb ramps at the study intersections appear to be ADA-compliant, and some sidewalk locations within the study area appear to contain steep cross-slopes that are likely not ADA-compliant. Since these issues may adversely affect the use of public transportation services and walking alternatives, EP recommends considerations be made for addressing accessibility issues.

VAI Response 03/18/2022:

We are coordinating with the Brookline Department of Public Works and the Transportation department to determine the appropriate mitigation for this development.

EP Response 05/13/2022:

It is understood that appropriate mitigation measures will be coordinated with the Town; EP has no further comments at this time.

Comment 18

EP Comment 09/22/2021:

EP recommends tightening intersection corners or installing curb bump-outs within the study area (where applicable) to shorten crosswalks and reduce delay for pedestrians at signalized intersections.

VAI Response 03/18/2022:

We are coordinating with the Brookline Department of Public Works and the Transportation department to determine the appropriate mitigation for this development.

EP Response 05/13/2022:

It is understood that appropriate mitigation measures will be coordinated with the Town; EP has no further comments at this time.

Comment 19

EP Comment 09/22/2021:

EP recommends installing new pedestrian signal systems compliant with current standards at signalized intersections to replace outdated equipment (where applicable), including but not limited to signal displays with countdown, tactile push buttons, and Accessible Pedestrian Signals (APS).

VAI Response 03/18/2022:

We are coordinating with the Brookline Department of Public Works and the Transportation department to determine the appropriate mitigation for this development.

EP Response 05/13/2022:

It is understood that appropriate mitigation measures will be coordinated with the Town; EP has no further comments at this time.

Comment 20

EP Comment 09/22/2021:

As noted above, the study area roadway of Longwood Avenue, which includes the study intersections with Kent Street and Chapel Street, falls within an HSIP bicycle crash cluster. Given the significant volume of bicycles traveling through the study area, which is anticipated to grow as a result of the proposed development, EP recommends considering improvements to the bicycle accommodations along the study roadways, including but not limited to designating bicycle lanes where width allows, installing bicycle boxes at intersections, and using green colored pavement and/or signage to heighten awareness of bicycles.

VAI Response 03/18/2022:

We are coordinating with the Brookline Department of Public Works and the Transportation department to determine the appropriate mitigation for this development.

EP Response 05/13/2022:

It is understood that appropriate mitigation measures will be coordinated with the Town; EP has no further comments at this time.

Comment 21

EP Comment 09/22/2021:

EP recommends reviewing the signal timing and phasing for the signalized intersections and re-optimizing if appropriate; this should include the yellow and all-red vehicle clearance intervals and the timing for the pedestrian phases and should conform to MUTCD standards. (EP notes that the exclusive pedestrian phase at the intersection of Kent Street at Aspinwall Street is only 14 seconds and does not appear to be adequate.)

VAI Response 03/18/2022:

Overall operations at the signalized intersections within the study area show level-of-service (LOS) D or better under weekday morning and weekday evening peak hour under all conditions. Based on the analysis, signal timing optimization is unnecessary at these intersections as they all operate at an acceptable overall LOS under 2028 Build conditions. Acceptable LOS is generally considered LOS D or better.

EP Response 05/13/2022:

As discussed under Comment 11, although the intersections operate at an overall LOS D or better, the Longwood Avenue westbound approach at the intersection with Kent Street during the evening peak hour is expected to operate at an unacceptable LOS F under future conditions. We also reiterate that the exclusive pedestrian phase at the intersection of Kent Street at Aspinwall Street does not appear to be adequate. Our recommendation for reviewing and re-optimizing the signal timing and phasing remains to mitigate the poor traffic operations and to provide adequate timing for the pedestrian phase.

Summary of Outstanding Items

VAI has provided additional information and adequately addressed many of EP's comments from the original peer review. Outstanding comments include the following:

- Further clarification on the available sight distance under proposed conditions
- Confirmation on coordination with delivery vehicles
- Further consideration for reviewing and re-optimizing the signal timing and phasing at the signalized intersections

We also recommend the Applicant continue to coordinate with the Town on the mitigation measures outlined in the original peer review and as discussed herein.

We remain available for any further review or discussion regarding the outstanding items listed above.