ENVIRONMENTAL PARTNERS
— An Apex Company —

MEMORANDUM

Date January 17, 2024

To Mr. William F. O'Connell, Jr.
Bellingham Planning Board
Municipal Center
10 Mechanic Street
Bellingham, MA 02019

From Jane R. Davis, P.E.
Steve Shekari

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Subject 306 Maple Street Traffic Peer Review
Review of Traffic Impact and Access Study – Proposed Warehouse

Environmental Partners (EP) has reviewed the Traffic Impact and Access Study (TIAS) dated August 31, 2023, and prepared by Chappell Engineering Associates, LLC (CEA) for the proposed warehouse ("the Project") located at 306 Maple Street in the Town of Bellingham, Massachusetts ("the Town").

In general, CEA has prepared this assessment in a professional manner, consistent with standard engineering practices. The following is a summary of EP's traffic review.

Project Description

The TIAS outlines the following project description:

"As proposed, the project entails the construction of an approximate 59,400+ square foot (sf) warehouse building. The facility will provide a total of 119 parking spaces, including five handicap accessible parking spaces. Twelve loading docks will be provided to the rear of the building. Access to the project will be provided via a new driveway onto the eastern side of Maple Street. The driveway is proposed to be located opposite the existing driveway that serves the 351-353 Maple Street property. The project site is generally bounded by Maple Street to the west, and by private properties to the east, north, and south."

The Project study area includes Maple Street, Mechanic Street/West Central Street (Route 140), and Hartford Avenue (Route 126) as the study roadways and the following study intersections:

Study Intersections:

- Maple Street at Mechanic Street/West Central Street (Route 140)
- Maple Street at Hartford Avenue (Route 126)
- Maple Street at 351-353 Maple Street driveway/site driveway (proposed)

Comments

The following summarizes EP's traffic review of the Project. Although EP performed a thorough review of the TIAS, comments on items that are minor in nature and are not anticipated to impact the findings of the TIAS or EP's recommendations have been omitted for brevity.

Existing Conditions

1. The TIAS does not include the intersection of Maple Street and High Street as a study intersection, which is an unsignalized intersection approximately 500 feet south of the proposed site driveway and provides access to destinations to the west of the site. The trip distribution presented in the TIAS was determined by a review of existing traffic patterns (further clarification requested on the methodology below). The trip distribution shows that 90 percent of the site-generated traffic will travel through this intersection to access points to the east, west, and south, with 25 percent traveling to/from the west through the intersection of Maple Street at Mechanic Street. It is unclear what percentage of existing traffic may use High Street to access points west instead of Mechanic Street. We note that, as presented, only three (3) vehicles travel to/from the west at Mechanic Street during each of the peak periods, and we further note that there is a truck exclusion for trucks over five (5) tons along High Street. For traffic traveling along Maple Street, which is the free movement, we would not anticipate a noticeable increase in delay at the intersection. While we would typically recommend studying this intersection for potential impacts on the operations from the STOP-controlled approach, given the relatively low volume of turning vehicles that may travel to/from the west at this intersection, we would not anticipate a significant impact on the operations. We would, however, recommend providing a safety analysis since 90 percent of the vehicles will be traveling through the intersection.

2. Traffic count data was collected during the weekday morning and evening peak hours, which is typical for many projects. However, given the proposed use, it may be beneficial to analyze the impacts during the weekday midday peak hour and/or the Saturday peak hour as the Project could generate its peak traffic during one of these periods depending on the type of warehouse. Unless the Applicant can verify that the warehouse will generate peak traffic during the weekday morning and evening peak hours, EP recommends including all potentially pertinent traffic data, including the midday and Saturday peaks.

3. In reviewing the motor vehicle crash analysis, we found a discrepancy between the number of crashes for the intersection of Maple Street at Mechanic Street/West Central Street (Route 140) as presented in the TIAS against EP's independent research through the Massachusetts Department of Transportation (MassDOT) crash database. For the same analysis period between 2015 and 2019, the MassDOT crash database shows a significantly higher number of crashes at the intersection. EP understands that given multiple adjacent driveway openings, not all those crashes may be attributed to operations at the intersection. However, given the significant difference in crash numbers, we recommend a closer review of the crashes at this location by obtaining crash reports from the Town's Police Department to include any relevant crashes to the intersection and to gain clearer insight into the potential deficiencies at the intersection.

4. EP notes that aside from crashes at the study intersections, the MassDOT crash database shows approximately 60 crashes along Maple Street between Mechanic Street/West Central Street (Route 140) and Hartford Avenue (Route 126). We recommend further review of the crashes along Maple Street to determine any potential trends in the crash data and/or if the crashes occurred at specific locations, including the intersection of Maple Street at High Street, as discussed above.

5. The presented values for desirable Intersection Sight Distance (ISD) are based on 35 miles per hour (mph) posted speed limit. Similar to the minimum required Stopping Sight Distance (SSD), values for ISD should be calculated based on the 85th percentile speeds, equating to approximately 395 feet for 41 mph when turning right (looking south) from the site driveway, and 490 feet for 44 mph when turning left (looking north) from the site driveway. Considering the increase in the ISD and based on EP's field observations, the ISD will not be achieved at the Project site driveway without vegetation removal. As per the requirements of §240-61 from Town of Bellingham Zoning Bylaws, both SSD and ISD shall be provided at driveways serving 10 or more parking spaces. It appears that the ISD will be met south of the site driveway with vegetation clearing, as noted in the TIAS; however, it is unclear if the ISD will be met north of the driveway based on the 85th percentile speed. EP requests sight triangles be provided for the Project site driveway to show the measured sight distances and indicate areas where all obstructions should be removed and/or maintained to provide adequate sight distance.

Future Conditions

6. The TIAS incorporates a one percent annual background growth rate into the future conditions analyses based on a nearby MassDOT count station and based on consistency with the growth rate used for other recent traffic studies in the area; EP notes that no backups have been provided to support the selected growth rate. Though one percent is typically a reasonable growth rate, considering that the TIAS states a decrease in traffic in recent years, a 0.5 percent growth rate may be more appropriate to avoid overestimating the future growth over existing traffic. EP recommends including backups to support the one percent growth rate or potentially establishing a lower growth rate, confirming its appropriateness with Boston Region Metropolitan Planning Organization. We note that while this item alone is not anticipated to have a significant impact on the overall outcome of the study, cumulative alterations identified within this document may have an impact.

7. The TIAS states that six (6) planned developments in the area were incorporated into the analysis of future conditions. However, no backup calculations are provided to verify the extent of the volumes generated by these other developments and as such, EP is unable to verify the future conditions volumes. We request additional information to confirm the impacts of these developments on the future conditions analysis.

8. Discrepancies exist in how the Project-generated trips were determined using the Institute of Transportation Engineers (ITE) methodology. The weekday daily trips are based on the fitted curve, whereas the weekday morning and evening peak hours are based on the average rate. Based on the sample of data for this land use, ITE recommends using the fitted curve. For the morning and evening peak periods, this would increase the number of total trips by more than

20 vehicles per hour. EP recommends performing the analysis with the increased number of trips from the fitted curve. We note that while this item alone may not have a significant impact on the overall outcome of the study, cumulative alterations identified within this document may have an impact.

9. ITE trip generation methodology estimates 132 vehicle trips per day, including 96 passenger vehicle trips and 36 truck trips. The site plans show 12 loading docks and 119 passenger vehicle spaces as required by the zoning bylaw. If all parking spaces were used by employees, there would be a minimum of 238 passenger vehicle trips (119 entering, 119 exiting) per day, which is approximately 100 vehicle trips more than the ITE trip generation estimate of 132 passenger vehicle trips per day. EP highlights the discrepancy between projected site trips and site parking spaces but notes that the Applicant has provided only the minimum number of parking spaces required by the zoning bylaw.

10. Based on ITE data, traffic using warehouse developments typically peaks in the afternoon, during which they're expected to generate approximately 20 percent more traffic and 10 percent more parking than during the evening peak period. This further supports EP's recommendation above to collect traffic data during the weekday (and Saturday) midday peak periods and to provide analysis during these periods to better understand the impacts of the Project on the surrounding roadway network.

11. No backups were provided in the TIAS for the trip distribution. EP requests clarification on how the distribution of traffic entering and exiting the study area was derived, and what, if any, percentage may travel along High Street to/from the west. EP also requests clarification regarding how the ten (10) percent traffic traveling along Maple Street north of the site will be distributed along Hartford Avenue to the northeast and/or southwest.

Capacity Analysis

12. At the intersection of Maple Street and Mechanic Street/West Central Street (Route 140), there is a short exclusive right-turn lane on the southbound approach under existing conditions that will be extended through a roadway improvement project under future conditions. The analysis accounts for the southbound right-turn lane under the future conditions only. This lane was not accounted for under the existing conditions, presumably, as the TIAS stated the lane is regularly blocked by the queues in the adjacent through lane. EP takes no exception to this methodology; however, we note that during the time of our observations, the traffic operations were slightly better than those shown in the analysis due to the presence of the short right-turn lane.

13. At the intersection of Maple Street and Mechanic Street/West Central Street (Route 140), the Mechanic Street eastbound approach is analyzed with an exclusive right-turn lane. However, under the existing intersection layout, the eastbound approach contains a shared through/right-turn lane that is channelized for the right turns. For a more accurate analysis, EP recommends the traffic analysis be updated accordingly. We note that while this item alone is not anticipated to have a significant impact on the overall outcome of the study, cumulative alterations identified within this document may have an impact.

14. The traffic analysis for the two signalized intersections of Maple Street at Mechanic Street/West Central Street (Route 140) and Maple Street at Hartford Avenue (Route 126) does not take into account the exclusive pedestrian phase. EP notes that given the relatively low number of pedestrians, the traffic analysis is likely more accurate without incorporating the exclusive pedestrian phase since the phase is not anticipated to be called often. As such, EP takes no exception to the traffic analysis methodology for excluding the pedestrian phase.

Site Plan

15. The site plans do not provide truck turning templates for emergency vehicles and intended tractor trailers, and as such, no review of these items is performed. We request these turning templates be provided for review, depicting feasibility of all intended maneuvers accessing the site and within the site itself.

16. EP recommends the crosswalk pavement markings be expanded from five (5) feet to minimum of eight (8) feet in width for better visibility. Also, we recommend considering shortening the crosswalk by tightening the corners as truck turning templates allow and/or providing a pedestrian median refuge.

17. EP recommends providing a sidewalk along the southern side of the driveway to connect the sidewalk along Maple Street to the pedestrian accommodations within the site. Additionally, we recommend a continuous sidewalk be provided along the northern and southern side of the building for added pedestrian safety and minimizing walking of pedestrians within the vehicle/truck travel space.

18. The “STOP” sign controlling the site driveway exit appears to be shown within the Maple Street sidewalk. EP recommends relocating the sign off the sidewalk and pedestrians walking path.

19. A discrepancy exists between the site plan layout and the site driveway description in the TIAS. The site plan shows the two directions of travel on the site driveway are separated by a flush concrete rumble strip, whereas the TIAS states the separation is provided by a raised median island. EP requests reconciliation of this inconsistency.

20. A detail for “No Right Turn for Trucks” sign have been provided in the site plans. However, no such signage is located on the site plan layout.

21. The sign schedule detail shows the sign to be installed at a height of six (6) feet from the ground. EP notes that the Manual on Uniform Traffic Control Devices (MUTCD) would require a minimum height of seven (7) feet from the ground wherever pedestrian activity is likely to occur.

22. A discrepancy exists on the accessible parking space detail, where the width of the access aisle shows both eight (8) feet and nine (9) feet dimensions. EP requests reconciliation of this inconsistency. Accordingly, the width of the pedestrian curb ramp may need to be updated to remain consistent with the dimensions of the access aisle.

23. The pedestrian curb ramp details are missing detectable warning panels. In addition, the ramp transitions show a fixed dimension of six (6) feet, whereas according to the MassDOT requirements, the dimension of the low side transition must be a minimum of 6.5 feet, and the

dimension of the high side transition must follow detail E.107.9.0 of the MassDOT Construction Standard Details dated October 2017.

As presented in the TIAS, it appears the project will result in minimal impact to the traffic operations in the surrounding area; however, as noted throughout the document, there are several items that may have an impact on the traffic operations. While these individual items alone may have minor or negligible impact on the outcome of the Project, we are unable to comment on the potential cumulative impacts of all the items. In addition to the potential operational impacts, we have requested additional crash analysis and/or clarifications in order to comment on any potential safety concerns within the study area.

We appreciate the opportunity to be able to assist you with this project. We remain available for any questions or additional review.