

MEMORANDUM

Date: February 3, 2022

To Ms. Jacki Byerly, Town Planner
Town of Andover
36 Bartlett Street
Andover, MA 01810

From Greg E. Lucas, PE, PTOE, RSP

CC James D. Fitzgerald, PE, LEED AP – EP, Director of Transportation

Subject 140 Haverhill Street – Traffic Peer Review

Environmental Partners (EP) has reviewed the January 19, 2022 Traffic Impact and Access Study (TIAS) prepared by Bayside Engineering (Bayside) for the proposed Commonwealth Detox/Topsail Facility located at 140 Haverhill Street in Andover, MA. It is understood that the project proposes redevelopment of an existing medical office building to provide an Acute Treatment Services (ATS) and Clinical Stabilization Services (CSS) facility to be known as Commonwealth Detox, and relocation of an existing outpatient facility known as Topsail which is currently operating in the building to be redeveloped.

In general, the TIAS was prepared in a professional manner, consistent with standard engineering practices. The following is a summary of EP's traffic peer review. Trip generation for the site was previously reviewed by EP in a memorandum dated January 14, 2022; comments related to trip generation and distribution included herein are intended to supplement comments provided in the January 14 memorandum.

Project Description

The TIAS provides the following project description:

“The site is in the northwest corner of the intersection of Haverhill Street (Route 133) and High Street. Currently, the site consists of Doctors Park I and Doctors Park II. Two driveways currently serve the site, one from Haverhill Street and one from High Street.

The current development proposal consists of construction of two buildings. The first building, consisting of 39,000 gross square feet of space will include a sixty-four (64) bed Acute Treatment Services (ATS) facility and the Clinical Stabilization Services (CSS) facility, to be known as

Commonwealth Detox. The second building will consist of a 9,180 square foot (sf) out-patient facility (Topsail) that is currently operating in the existing Doctors Park I building and will be relocated.

Commonwealth Detox will have 34 bedrooms with 64 beds. The first floor will have small offices, a cafeteria and a large group room. The second floor will have a lobby, an exam room, a nurses' station, two (2) bathrooms with showers, a community room, and several sitting areas. The third floor will have several small offices, two (2) medium size group rooms, a nurses' station, an exercise room, and an open lounge area.

Topsail will have an entrance lobby, several small offices, and group meeting rooms on the first floor. The second floor will have clinical staff offices, a conference room and a staff break room. The basement level will have a lunchroom with a small kitchen area, mechanical room, and access to a terrace at the back of the building.

The Commonwealth Detox facility will provide the medical equivalent of withdrawal and detoxification services (in-patient) and the non-medical component of addressing withdrawal on an out-patient basis. Topsail provides clinical addiction recovery services.

The two buildings will replace the existing Doctors Park I building. Access would continue to be provided by way of the driveways to Haverhill Street and High Street. Figure 1 shows the site location in relation to the surrounding area."

EP finds the overall project description to be accurate.



Figure 1 - Site Location Map (Source: Bayside TIA)

Existing Conditions

The project site is located at the corner of Haverhill Street (Route 133) and High Street, and as such the TIAS study area includes the intersection of Haverhill Street and High Street, and the existing site driveway intersections with both Haverhill Street and High Street.

The TIAS describes existing conditions including roadway jurisdiction, lane designation, posted speed limits, and traffic control type.

The study limits comply with the Massachusetts Department of Transportation (MassDOT) Traffic Impact Assessment (TIA) Guidelines. Study area descriptions appear to be accurate with the following minor exceptions:

- **Typos exist in the descriptions for High Street and the intersection of High Street and the existing site driveway. References to High Street are incorrectly identified as Haverhill Street.**
- **Haverhill Street is under Town of Andover jurisdiction. (Source: <https://gis.massdot.state.ma.us/roadinventory/>)**
- **Sidewalks are provided on the south side of Haverhill Street, but end approximately 600 feet east of High Street at the YMCA driveway.**
- **High Street is functionally classified as an Urban Minor Arterial, not a rural major collector. (Source: <https://gis.massdot.state.ma.us/roadinventory/>)**
- **Sidewalk is provided on the east side of High Street south of Haverhill Street, but end approximately 200 feet south of the intersection.**
- **Sidewalks are not present in the vicinity of the existing site driveway on High Street. Reference to Haverhill Street appears to be a typographical error.**

Existing Traffic Data

Bayside collected traffic data in December 2021 and consisted of the following components:

Turning Movement Counts (TMCs)

TMCs were conducted at the study intersections on Wednesday, December 15, 2021 from 7:00 AM to 9:00 AM and from 4:00 PM to 6:30 PM.

The weekday morning peak hour was found to occur from 7:45 to 8:45 AM, while the weekday evening peak hour was found to occur from 4:15 to 5:15 PM.

Automatic Traffic Recorder (ATR) Counts

ATR counts were conducted for Haverhill Street and High Street on Wednesday, December 15 and Thursday, December 16, 2021.

Traffic Volume Adjustments

The TIAS reviewed continuous count station data maintained by MassDOT for Turnpike Street (Route 114) near Merrimack College and determined that traffic volumes for the month of December were slightly lower than average month volumes by approximately two percent. The TIAS also references MassDOT's "seasonal summary" and notes that December is lower than average by approximately

13 percent, and as such adjusted data upwards by a factor of 1.13 to represent average month conditions, suggesting that the higher adjustment factors would account for any impact to Merrimack College, noting that it was Finals week at the college when data was collected.

EP's review confirms that the "seasonal summary" referenced in the TIAS is the 2019 Weekday Seasonal Factors maintained by MassDOT, which is included in the TIAS Appendix. **The adjustment factor is based on Group R4-R7 for rural roadways, which is not appropriate since Andover is classified as an urban area for the purpose of functional classification of roadways. As such, Group U3 is appropriate based on the functional classification of Haverhill Street as an Urban Principal Arterial; the adjustment factor for Group U3 for December is 1.00, therefore no seasonal adjustment is necessary.**

The TIAS further reviewed historical data maintained by MassDOT to determine if an adjustment is appropriate to account for the impact of the ongoing COVID-19 pandemic. Available count data from a count station on Haverhill Street at the North Andover town line were reviewed, and revealed that the 2021 ADT was approximately 13 percent lower than 2018 counts when adjusted to 2021 using a 0.5 percent annually compounded growth factor. As such, a 1.13 factor was applied to seasonally-adjusted traffic count data to account for the COVID-19 pandemic.

EP offers the following comments on collected data, adjustment factors, and resultant compiled data shown in Table 1 and Figure 2 of the TIAS:

- **While the 1.13 seasonal adjustment factor used by Bayside is conservative and would account for any impact of reduced Merrimack College traffic, it may overstate existing traffic volumes at the study area intersections.**
- **The April 2020 "Guidance on Traffic Counting Data" published by MassDOT establishes a procedure by which 2019 data is considered current data. 2018 count station data should be grown to 2019 using methods established by MassDOT in this guidance memo, and compared to 2021 data to determine the variance between pre-COVID (2019) and COVID-impacted (2021) data.**
- **EP requests review and clarification of data presented in Table 1. A cursory review of data presented in the TIAS Appendix reveals discrepancies in peak hour data and resultant calculations for K factor and directional distribution.**
- **A cursory review of Figure 2 data suggests that individual peak hour data for each study intersection were adjusted to populate Figure 2. Given the proximity of the site drive intersections to the intersection of Haverhill Street and High Street, a consistent peak hour and volume balancing would be more appropriate.**

Vehicle Speeds

Vehicle speeds were measured for Haverhill Street and High Street in conjunction with ATR counts. Data revealed 85th percentile speed of 34 miles per hour (mph) eastbound and 37 mph westbound on Haverhill Street, which are generally consistent with the posted 35 mph speed limit; and 37 mph northbound and 35 mph southbound on High Street, which exceed the posted 30 mph speed limit. The 85th percentile speed is the speed at which 85 percent of the observed vehicles travel at or below. **EP takes no exception to the collected data.**

Crash Data

MassDOT recognizes crash rates as an effective tool to measure and compare the safety of intersections by quantifying the frequency of crashes against vehicle exposure. Intersection crash rates, expressed as crashes per Million Entering Vehicles (MEV), found to be higher than the Statewide and District averages could indicate a potential safety issue. The Statewide average crash rate for a signalized intersection is 0.78, while the District 4 average rate is 0.73. Statewide and District 4 average crash rates for an unsignalized intersection are both 0.57.

The TIAS states that crash data were obtained from the MassDOT Crash Portal for a seven-year period, from 2015 through 2021, and revealed a total of thirty-four (34) crashes, thirty-three (33) of which occurred at the intersection of Haverhill Street and High Street.

EP offers the following comments on crash data as presented in the TIAS and Appendix:

- **The crash rate worksheet included in the Appendix reveals a crash rate of 0.59, a slight discrepancy from the rate summarized in Table 3 but still below both the Statewide and District 4 averages for signalized intersections. EP requests clarification of the K factor utilized for the crash rate worksheet.**
- **EP notes that 2020 and 2021 are not considered “closed” years for MassDOT, and as such may not contain all reported crashes for these years.**

Public Transportation

The TIAS notes that the Merrimack Valley Regional Transportation Authority (MVRTA) operates several bus routes in the vicinity of the project site. Bus Route 21, the Andover Shuttle, provides service along Haverhill Street serving the existing Doctors Park site, running between the Andover Senior Center and the North Andover Mall. This route operates Monday through Friday from 8:10 AM to 6:28 PM. Bus Route 32 provides service from the Buckley Transportation Center in Lawrence to the intersection of School Street and Main Street in Andover, traveling along North Main Street (Route 28) approximately $\frac{3}{4}$ mile west of the project site. Bus Route 33 provides services from the Buckley Transportation Center to North Andover Mall. **EP confirmed the closest stop for Route 33 is approximately $\frac{1}{2}$ mile east of the project site.**

The TIAS also notes that the MBTA Commuter Rail provides service to Andover, with Andover Station on the Haverhill line located at 17 Railroad Street approximately two miles from the project site.

EP confirmed provided data, and notes that MVRTA Route 39A also provides service to the project site, running on weekdays and Saturday.

Future Traffic Growth

Future traffic demands on the study area were determined through a consideration of background traffic growth and background development.

Background Traffic Growth

Bayside consulted Central Transportation Planning Staff (CTPS) to determine an appropriate growth rate for the study area to project collected traffic volume data and applied a seven year horizon to the year 2028. CTPS indicated growth in the area is 0.33 percent; therefore, a 0.5 percent annually compounded growth rate was used. **EP concurs with this approach.**

Background Development Projects

The Town of Andover was contacted to determine if any planned projects may impact further traffic in the study area. Two projects were identified:

- Proposed Lab – Brickstone Square
- 7 Tantalon Road (24 unit multi-family residential)

Trips for the proposed lab were obtained from the Traffic Assessment prepared for the project; no traffic study was prepared for the Tantalon Road project, and as such traffic expected to be generated by the site were estimated from the Institute of Transportation Engineers (ITE) *Trip Generation Manual*.

EP offers the following comments on future traffic estimations:

- **Trip distribution for the 7 Tantalon Road site is presented in the TIAS Appendix and assumes a distribution of approximately half of the site-generated trips to and from Haverhill Street to the east of the residential project site, which as a result have the potential to impact the study area for the 140 Haverhill Street project. EP notes that this represents a conservative analysis; given the proximity of Tantalon Road to Route 28 and the proximity of Route 28's interchange with Interstate 495, the majority of site generated traffic for the proposed residential development is likely destined to and from the west and will have little to no impact on the study area for the 140 Haverhill Street site.**
- **Verify if adjustments are appropriate to 2028 No-Build volumes summarized in Figure 3 based on prior comments on 2021 Existing data presented in Figure 2.**

Trip Generation

As noted, EP previously reviewed trip generation for the proposed site based on Bayside's November 24, 2021 Traffic Memorandum Update and provided comment in a memorandum dated January 14, 2022. Discussion presented in the TIAS appears fundamentally similar to that included in the November 24, 2021 memorandum; with summary trips for Commonwealth Detox matching the prior memorandum, and summary trips for Topsail showing a slight increase over the November 24, 2021 memorandum. **Comments included in EP's January 14, 2022 memorandum should be considered and resolved in tandem with comments on the TIAS presented in this memorandum. As noted in the January 14, 2022 memorandum, EP confirms the appropriateness of the stated conclusion that "(c)ompared to estimated traffic generation from Doctors Park I as a medical office building, the proposed traffic generation is substantially lower and is attributed to the nature of the operations of the Commonwealth Detox and Topsail facilities."**

Trip Distribution

The TIAS distributed trips expected to be generated by the proposed development through the study area based on existing driveway distributions, assuming that these trips are representative of traffic expected to be generated by the project site. Table 9 of the TIAS summarizes distribution percentages, which assume 44 percent of trips to and from the west on Haverhill Street, 28 percent to and from the north on High Street, 21 percent to and from the east on Haverhill Street, and 7 percent to and from the south on High Street.

- **The distribution of existing trips may not be an accurate predictor of future trips, as it represents trips generated by both existing buildings and may be driven by the most proximate driveway to the specific building and/or trip destination; for example, a trip generated by the existing Doctors Park II building may utilize the High Street driveway, even if the trip is destined to the west on Haverhill Street. EP notes that minor adjustments in trip distribution percentages would not fundamentally change the resultant trips, and as such do not fundamentally change the conclusions of the TIAS.**
- **Trip distribution should be updated as appropriate based on comments provided by EP in our January 14, 2022 trip generation memorandum.**

Future Traffic Volumes – Build Condition

Site-generated traffic was distributed and added to the No-Build traffic volumes to represent the 2028 Build conditions. The TIAS notes that no adjustment was made to remove the existing Topsail trips, as there was no way to distinguish between existing Topsail trips and existing trips to Doctors Park II. **EP notes that this results in a conservative assessment of site driveway trips and operational analysis results.** Table 10 of the TIAS offers a comparison of 2028 No-Build and Build conditions and reveals expected percentage increases ranging from 4.1 percent to 0.3 percent, and notes that the highest increase in vehicles is thirty (30) for Haverhill Street west of the site driveway, which is equivalent to one additional vehicle every two minutes per direction on average during the peak hour.

Traffic Operations

Capacity analyses were conducted for each scenario for peak hour traffic conditions using Synchro software based upon methodology contained in the 2010 *Highway Capacity Manual* (HCM).

Table 13 of the TIAS presents analysis results for the signalized intersection of Haverhill Street and High Street. This table reports favorable overall level of service (LOS) in the weekday morning peak hour for the intersection under Existing, No-Build and Build conditions, with individual approach operations at LOS C or better, and no degradation in LOS between 2028 No-Build and 2028 Build conditions. This is indicative of an intersection that has additional reserve capacity to handle anticipated future growth projected site-generated traffic in the weekday morning peak hour.

For the weekday evening peak hour, the summarized analysis results indicate overall LOS C under Existing conditions, and acceptable LOS D under 2028 No-Build and Build conditions. Further review indicates LOS F for the Haverhill Street eastbound approach under Existing, No-Build and Build

conditions, indicating an existing operational deficiency that will be further degraded by increasing traffic resulting from background growth, background development, and project-generated trips.

Table 14 presents operational analysis results for the unsignalized site driveways at Haverhill Street and High Street. This indicates LOS C or better exiting the driveway for 2021 Existing, 2028 No-Build, and 2028 Build conditions.

EP offers the following comments on operations analyses:

- **No-Build and Build conditions are mislabeled as 2026.**
- **Analysis results indicate that the Haverhill Street eastbound approach is at or near capacity presently in the weekday evening peak hour and in need of mitigation to support additional traffic load. Traffic signal timing optimization should be considered.**
- **Verify that yellow and all red clearance times are accurately reported for the signalized intersection. Recommended modifications to signal timing should include conformance to MUTCD standards for vehicle and pedestrian clearance times.**
- **EP recommends excluding Synchro-reported LOS and Delay results from the “Lanes, Volumes, Timings” report presented in the Appendix, which presents conflicting results when compared to the HCM 2010 reports. It is understood that the HCM 2010 results were compiled in Table 13.**
- **Verify peak hour factors for 2021 Existing weekday evening peak hour analysis.**
- **Verify heavy vehicle percentages for the Haverhill Street eastbound left entering the site driveway in both the weekday morning and weekday evening peak hours.**

Parking

The TIAS includes a parking analysis to determine parking demand for the site and to verify that adequate parking supply is provided.

For the Commonwealth Detox facility, peak parking demand is expected at 3:00 PM when the shift change occurs. Based on projected staffing, this requires 70 parking spaces on a weekday and 72 spaces on the weekend. Outside of this peak period, parking demand is stated to range from 27 to 38 spaces.

The TIAS further notes that by Andover Zoning Bylaw, 215 parking spaces are required for the proposed use, and that 78 spaces are provided on the current site plans.

For the Topsail facility, peak parking demand follows the hours of operation of the facility, as staff and patients are all on site together. This is assumed to require 27 parking spaces based on 16 staff members, 10 patients who drive themselves, and one van for patient transport. The TIAS states a worst case demand of 52 parking spaces if all patients drive.

The TIAS further notes that the Zoning Bylaw requires 66 spaces, and that 75 are provided for the Topsail facility.

Based on the proposed parking supply, four accessible spaces are required for Commonwealth Detox, while three are required for Topsail. A review of the site plans indicates four accessible

spaces along the south of the Commonwealth Detox building, but only two accessible spaces adjacent to the Topsail building. Access aisles are provided at both facilities to provide van accessibility.

Stated requirements of the Zoning Bylaws are based on requirements for a medical clinic. As noted in the TIAS when evaluating trip generation for the site, the site's intended operation does not clearly align with a typical medical clinic. As such, the parking analysis provided is a more effective method to determine whether the proposed parking supply is adequate. EP generally concludes that the parking supply will meet the expected demand, with the following clarifying comments:

- **Parking assumptions for the Topsail facility assume 10 patients drive themselves, while trip generation and distribution estimates assumed 20 patients drive themselves. It should be noted that the worst case is stated where all patients drive themselves, and that proposed parking supply exceeds this worst case demand of 52 parking spaces.**
- **The stated parking supply for the Commonwealth Detox and Topsail facilities are based on lot lines as shown on the site plans and include splitting the parking area to the west of the Haverhill Street site drive. Although these spaces are more directly adjacent to the Commonwealth Detox facility, 25 of the spaces in the area are counted towards Commonwealth Detox, while 31 are counted towards Topsail, in addition to the 44 spaces more directly adjacent to the proposed Topsail facility. While both individual facilities have a parking supply which exceeds expected demand, the Applicant should confirm that all parking spaces on site will be available to staff, patients, and visitors to either facility.**
- **One additional accessible space is required for the Topsail facility to meet the requirements of 521 CMR. EP recommends designating all three spaces along the east side of the building as accessible.**
- **The Zoning Bylaws include a requirement of four parking spaces for each “doctor or dentist”. While the parking table in the site plans identifies five doctors per site in their parking space calculations, it is unclear how this correlates to the staff list provided in the TIAS.**
- **The Zoning Bylaws require “an adequate number” of off-street loading areas for any use which may be served by delivery vehicles. The TIAS includes a description of expected deliveries for linens, food items, and other medical deliveries or pickups for the Commonwealth Detox facility. The site plans should identify the loading area, as well as the trash pick up area.**
- **A loading area should similarly be identified on the plan if deliveries are expected for the Topsail facility.**

Sight Distance

Bayside performed and reported sight distance measurements at both site driveways in accordance with MassDOT and AASHTO requirements. Both Stopping Sight Distance (SSD) and Intersection Sight Distance (ISD) were measured. Required minimum SSD and desirable ISD values were calculated

based on recorded 85th percentile speeds, which is appropriate. Measured values exceed minimum SSD values.

EP offers the following comments:

- **“Required minimum” ISD values included in Table 15 are noted to indicate desirable ISD values and should include only the most restrictive value for the directional movement proposed. For the Haverhill Street site driveway, the distance looking to the east would only include the lower value for vehicles turning right, while the distance looking to the west would include the higher value for vehicles turning left, as they are contemplating crossing both directions of traffic.**
- **Measured sight distance does not meet desirable ISD values for the Haverhill Street driveway looking to the west, and for the High Street driveway in both directions. Sight triangles should be included on the site plans to clearly indicate areas where low height vegetation must be maintained to provide clear sight lines, and to verify that clear sight lines can be maintained within the site property boundaries.**

Recommendations

The TIAS concludes that the proposed project will not result in a significant impact on traffic operations at the study area intersections during the weekday morning or weekday evening peak hours. It also recommends that driveways be placed under STOP-sign control, and that a sight triangle be established within which vegetation should be trimmed back and site signage should be designed to be low so as not to impede sight distances.

EP supports these recommendations, and reiterates two prior comments related to Bayside’s stated conclusions:

- **Analysis results indicate that the Haverhill Street eastbound approach is at or near capacity presently in the weekday evening peak hour and in need of mitigation to support additional traffic load. Traffic signal timing optimization should be considered.**
- **Sight triangles should be included on the site plans to clearly indicate areas where low height vegetation must be maintained to provide clear sight lines, and to verify that clear sight lines can be maintained within the site property boundaries.**

Conclusions

In general, EP is of the opinion that the TIAS generally captures the expected impact of the proposed project. We request additional clarification and verification as outlined in both this memorandum and our trip generation review memorandum dated January 14, 2022. EP’s more significant comments include the following:

- Existing seasonal adjustment factors were determined based on a rural, not urban, functional classification and may be overly conservative.
- Summary traffic count data should be reviewed for accuracy.
- K factor for crash rate calculation should be verified.

- Comments on trip generation outlined in EP's January 14, 2022 memorandum should be considered and resolved in tandem with comments contained in this memorandum,
- Analysis results indicate that the Haverhill Street eastbound approach is at or near capacity presently in the weekday evening peak hour and in need of mitigation to support additional traffic load. Traffic signal timing optimization should be considered.
- Parking supply is expected to meet the anticipated demand. The Applicant should confirm that all parking spaces on site will be available to staff, patients and visitors to either facility.
- Sight triangles should be included on the site plans to clearly indicate areas where low height vegetation must be maintained to provide clear sight lines, and to verify that clear sight lines can be maintained within the site property boundaries.