



To: Ms. Alison Manugian
Community Development Director
Town of Dracut Town Hall
62 Arlington Street
Dracut, MA 01826

Date: March 12, 2024

Memorandum

Project #: 16273.00

From: Michael A. Santos, PE
Vinod K. Kalikiri, PE, PTOE

Re: Proposed Multi Family Residential Development
Murphy's Farm – 231 Wheeler Street
Dracut, Massachusetts
Transportation Peer Review

On behalf of the Town of Dracut, VHB conducted an independent peer review of the Traffic Impact Assessment (TIA) dated October 2, 2023, prepared by Vanasse & Associates, Inc. (the Applicant's Traffic Engineer) for a proposed multi-family residential development to be located at Murphy's Farm (231 Wheeler Street) in the Town of Dracut, Massachusetts. VHB also reviewed the conceptual site plan dated June 3, 2022 included in the Comprehensive Permit Application prepared by the Applicant's team.

The purpose of this review is to verify that the traffic analysis included in the TIA conforms to industry, local, and state standards; that the TIA methodology is appropriate for the Project setting; and to determine the appropriateness of any recommended mitigation to adequately address potential project impacts. The traffic-focused review of the site plan involved an assessment of specific transportation elements of the plan, such as parking, vehicular circulation, site access, and traffic control within the site and at the site driveways' intersections with the public roadway network.

The Project involves the construction of a 300-unit multi-family residential development on an undeveloped site that will be generally located between Rinzee Road and Elizabeth Drive. The total count of 300 units will be spread over 46 buildings. The schematic site plan exhibit included in the TIA indicated that four (4) bedrooms are proposed for each unit. A total of 600 parking spaces are proposed for the development, at the rate of 2.0 spaces per unit. Access to the overall development will be provided via a new roadway network, with connections to existing cul-de-sacs at the ends of Poppy Lane and Elizabeth Drive. These two existing streets will serve the majority of the proposed residential units. Elizabeth Drive connects to Wilshire Circle and Wheeler Road within the Town of Dracut. Poppy Lane connects to Rinzee Road, which intersects the west side of Wheeler Street in the City of Methuen. In addition to the connections to the two existing streets, a new access point serving three of the buildings will be constructed on the west side of Wheeler Street within the City of Methuen, approximately 600 feet north of Rinzee Road.

The findings of our review of the TIA and the site plan are presented in the following sections. VHB's comments and recommendations are identified and numbered throughout the document.

Scope of Review

The following topics were reviewed by VHB:

- › Study area and Study Methodology
- › Existing Traffic Volumes
- › Pedestrian, Bicycle, and Public Transportation Facilities
- › Motor Vehicle Crash Analysis
- › No-Build Traffic Volumes
- › Trip Generation

- › Trip Distribution
- › Build Traffic Volumes
- › Traffic Operations Analysis
- › Sight Distance Evaluation
- › TIA Recommendations
- › Parking and Site Plan traffic review

Study Area and Study Methodology

The traffic analysis provided in the TIA presented an evaluation of 2023 existing conditions and future conditions, projected to a seven-year time horizon (year 2030), with and without the Project. The study area consisted of six unsignalized intersections that will serve vehicles traveling to and from the site. Four study intersections are located along Wheeler Street between North Lowell Street (Route 113) and Lowell Boulevard (Route 110) within the City of Methuen and two intersections are located along Wheeler Road within the Town of Dracut. The proposed driveway off Wheeler Street was also evaluated as part of the future conditions with the Project.

North Lowell Street (Route 113) and Lowell Boulevard (Route 110) are under the jurisdiction of the Massachusetts Department of Transportation (MassDOT) and the other roadways are under municipal control.

1. **The study methodology is used to prepare the TIA is generally consistent with the MassDOT guidelines for traffic impact assessment.**
2. **Based on the traffic analysis provided in the TIA, approximately 20% of the development related traffic oriented to/from the west would use Route 113 and 10% would use Wheeler Road. However, a review of the roadway connectivity in the area indicates that the potential exists for a higher percentage of site traffic to use Wheeler Road to travel west. Notwithstanding this observation, and since the signalized intersection of Broadway (Route 113) at Wheeler Road/Jones Avenue will carry approximately 30% of the site traffic, VHB recommends that the intersections of Route 113 at Wheeler Road/Jones Avenue and Wheeler Road at Parker Road be also included in the TIA to quantify any existing safety or capacity deficiencies at the locations, and whether the additional traffic Project will exacerbate the conditions, triggering the need for any remedial actions.**

Existing Traffic Volumes

Traffic data was collected in March 2023 at each study area location by conducting turning movement counts (TMCs) during the peak commuter periods (7-9 AM and 4-6 PM). Automatic traffic recorders (ATRs) were also used to collect daily traffic volumes and vehicle speeds along Wheeler Street, south of Rinzee Road and Wheeler Road between Wilshire Circle East and West. The TIA reviewed seasonal adjustment factors from MassDOT and indicated that traffic volumes in March are above average-month condition traffic volumes and that no seasonal adjustments are necessary. The TIA also noted that adjustments to account for COVID-19 impacts are not recommended based on MassDOT guidance. As such, no adjustment factors were applied to the traffic counts.

3. **The data was collected during typical commuter peak periods on a weekday in March. The peak time count durations represent the peak commuter periods of the traffic in the study area and the Project generated traffic.**

4. The seasonal adjustment factors were reviewed in accordance with MassDOT guidelines.

Pedestrian, Bicycle, and Public Transportation Facilities

The TIA provided a description of pedestrian, bicycle, and public transportation facilities that serve the Project site. It also noted that sidewalks are provided one side of Route 113, Rinzee Road, Wilshire Circle, and Paddock Lane, and along both sides of Route 110. The TIA noted that bicycle facilities are not present within the study area, but that the roadways have sufficient width to accommodate shared vehicle/bicycle travel. The TIA noted that public transportation services are not available at the Project site but are provided within the Town of Dracut and the City of Methuen.

- 5. VHB conducted a site visit to determine the condition of the existing transportation network including pedestrian, bicycle, and public transportation and confirmed that there are no continuous sidewalks or bicycle facilities located along Wheeler Street or Wheeler Road. Recommendations related to multimodal accommodations within the site and the ability to reduce peak commuter traffic through potential TDM measures are noted later in this review.**
- 6. The Applicant should also discuss with the Town of Dracut any pedestrian accommodation needs in the area that could be addressed by the Project, especially on Elizabeth Drive, Wilshire Circle and Rinzee Road that will experience increased traffic from the development.**

Motor Vehicle Crash Data

The Applicant provided an evaluation of motor vehicle crash data obtained from MassDOT for the years 2016 – 2020 to investigate crash trends within the study area. The evaluation indicates that a total of 28 crashes occurred in the study area during this time period, with the highest prevalence of crashes occurring at the intersections of Route 113/Wheeler Street and Route 110/Wheeler Street. The TIA compared crash rates at each intersection to both the MassDOT District 4 and statewide averages for similar intersections and indicated that crash rates within the study area are below average. A review of MassDOT data also indicated that there are no locations within the study area that are listed as a Highway Safety Improvement Program (HSIP) eligible location.

The crash rate at the intersection of Wheeler Road/Wilshire Circle/Paddock Lane experienced a crash rate that exceeds the statewide and District 4 average and noted that specific recommendations are provided to enhance safety.

- 7. The crash rates at the intersections of Route 113 at Wheeler Street and Route 110 at Wheeler Street were found to be slightly below the statewide and District 4 average crash rates for unsignalized intersections and experienced the fewest crashes during the year 2020. Due to the changes in traffic patterns related to COVID-19 during 2020, VHB recommends that the crash rates be recalculated using data for the five years between 2015 – 2019 to determine if the rates exceed the District 4 averages. If crash rates for any locations exceed the District 4 average crash rates, preparation of collision diagrams is recommended to identify any prevalent crash patterns and trends. As noted earlier, the intersection of Broadway (Route 110) at Wheeler Road and Jones Avenue and Wheeler Road at Parker Road should also be included in the updated evaluation.**

No-Build Traffic Volumes

The TIA developed future 2030 No-Build traffic volumes by applying a one percent annual growth rate to the 2023 Existing traffic volumes. The TIA also added traffic volumes expected to be generated from the proposed Berube Farms located on Wheeler Road in Dracut. The TIA also identified residential projects on Genest Street and Wheeler Road but did not include traffic from those projects due to the relatively low impact at the study area intersections. The TIA also identified a roadway project being undertaken by MassDOT along Route 110 through Dracut that will resurface the road, reconstruct the sidewalk, and construct a shared-use path along the south side.

8. The TIA included 2030 No-Build traffic volumes using methods consistent with standard traffic engineering practice.

Trip Generation

The TIA estimated the trips generated by the project based on data provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition, using Land Use Code (LUC) 215 – *Single-Family Attached Housing*.

9. The TIA used trip generation estimates based on the *Trip Generation Manual* using LUC 215 – Single-Family Attached Housing. While the LUC assumption is consistent for the type of development proposed (townhouse style buildings, each with multiple units), it is noted that the Project is proposing a development that contain 100-percent 4 bedroom units (1,200 bed rooms) rather than a mix of bedroom types. As such, using the unit count as an independent variable, may underestimate the trip generation. VHB recommends that alternative trip generation estimates be considered, including but not limited to other comparable datasets with empirical data collected at developments with 100-percent 4-bedroom units, for analysis purposes. For comparison, ITE LUC 210 (Single Family Detached Housing) would generate approximately 30-percent more daily traffic than the land use code used in the TIA.

10. The alternative trip generation estimates as outlined above should be used to revise the traffic operations analysis presented in the TIA. The findings and recommendations of the TIA should also be updated, as necessary, based on the revised analysis.

Trip Distribution

The estimated peak hour Project-generated trips were assigned to the study area intersections based on Journey-to-Work (JTW) data for residents living in the Town of Dracut. Based on this evaluation, the trips were distributed throughout the study area. Specifically, the TIA indicates that approximately 50-percent of the trips will be oriented to/from the City of Methuen to the east and 50-percent are oriented to/from the west. The trips assigned to/from the west are split between 20-percent along Route 113, 20-percent along Route 110, and 10-percent along Wheeler Road. The analysis indicates that a total of 40-percent of the trips are assigned to Wilshire Circle and Elizabeth Drive via Wheeler Road, but only 10-percent travel to/from the west on Wheeler Road.

11. The usage of JTW data is the appropriate method to develop trip distribution patterns and is consistent with standard traffic engineering practice. Given the locations of the regional highways (I-93, I-495 and Route 3), it is recommended that the coverage of the trip distribution graphic be expanded to include the percentages of site traffic heading to/from the three regional highways, the corresponding trip assignments along the local roads that would be used to reach the highways.

12. **Based on the location of the Project and the layout of the roadway network, it is likely that a higher percentage of trips traveling to/from the west could use Wheeler Road, as it provides a shorter distance than using Route 113 between Wheeler Road and Wheeler Street for traveling west. Therefore, VHB recommends that a sensitivity analysis be provided that assigns a higher percentage of site trips along Wheeler Road to/from the west in comparison to Route 113. This sensitivity analysis should also incorporate VHB's Comment #9 related to trip generation.**

Build Traffic Volumes

The TIA added the estimated Project-generated trips to the No-Build traffic volumes to develop the 2030 Build traffic volumes.

13. **The 2030 Build traffic volumes should be updated based on response to Comments 9 through 12.**
14. **The traffic volume networks indicate that the Project will result in a substantial increase traffic along Rinzee Road, Poppy Lane, Elizabeth Drive, and Wilshire Circle. These roadways currently operate as low-volume residential streets that terminate in cul-de-sacs that will experience fundamental changes in traffic patterns. A traffic volume summary table should be prepared to show the change in traffic volumes and percentage change in the peak traffic volumes on each of the study area local roads that connect to Route 113 and Route 110 based on the revised trip generation and distribution assumptions.**

Traffic Operations Analysis

The TIA included traffic operations analysis for the existing conditions, the 2030 No-Build conditions, and the 2030 Build conditions. The operations analysis presented an evaluation of vehicular delays, queues, volume-to-capacity ratios, and levels-of-service (LOS) for the study area intersections including the proposed site driveway on Wheeler Street.

The TIA identifies the impacts of the Project on the operations and capacity of the study intersection and states that the intersections of Route 113 at Wheeler Street and Route 110 at Wheeler Street will experience increases in delay that results in a degradation to LOS E at each location.

15. **VHB review of the operations analysis indicates that it has been conducted in a manner consistent with standard engineering practice. VHB recommends that the traffic operational analysis be updated to reflect the revised trip generation and distribution assumptions based on previous comments.**
16. **A preliminary traffic signal warrant analysis should be conducted at the intersection of Route 113 at Wheeler Street to determine how close the traffic volumes are to warranting traffic signal control, with and without the development related traffic.**

Sight Distance Evaluation

The TIA provided an evaluation of the sight distances at the four main access points to the site: Wheeler Street/Rinzee Road, Wheeler Street/proposed driveway, Wheeler Road/Wilshire Circle/Paddock Lane, and Wheeler Road/Wilshire Circle. Both stopping sight distance (SSD) and intersection sight distance (ISD) were reviewed. The sight distance requirements were based on speeds of 35 mph on Wheeler Street and 40 mph on Wheeler Road, which are above the reported 85th percentile speeds. The TIA states that SSD is met at all locations. The recommended SSD is not met at

three locations: Wheeler Road/Rinzee Road looking to the south from Rinzee Road, Wheeler Road/Wilshire Circle/Paddock Lane looking to the west from Wilshire Circle; and Wheeler Road/Wilshire Circle looking to the west from Wilshire Circle. The TIA also notes that SSD will be met at the proposed intersection of Wheeler Street at the new site driveway with the trimming and removal of trees and vegetation and the regrading of the embankment along the west side of Wheeler Street north of the driveway.

- 17. It is recommended that sight line sketches be prepared at the intersections of Wheeler Road at Wilshire Circle (both locations), Wheeler Street at Rinzee Road, and Wheeler Street at the proposed site driveway to identify the areas for which vegetation removal is required to meet the SSD and ISD requirements, to confirm that the vegetation clearing can be achieved within the public rights-of-way and that sight line easements on private properties will not be required. In addition to the horizontal geometry, the diagrams should also show the vertical geometries (profile views) of the sight lines in areas where the vertical geometry could pose a challenge. The Applicant should commit to any necessary vegetation removal at the time of construction, and to regularly maintaining clear sight triangles at the locations in perpetuity. The site design should ensure that signage, landscaping, snow windrows will not impede future sight lines at the site driveways.**
- 18. Field observations by VHB indicated that the intersection of Wheeler Street at Wheeler Road could potentially have sight distance deficiencies for vehicles exiting Wheeler Road and for vehicles turning left from Wheeler Street northbound, primarily due to the horizontal curvature and vegetation along the west side of Wheeler Street, north of the intersection. Currently, a convex mirror, mounted opposite the Wheeler Road approach at the intersection, assists drivers traveling through the intersection. VHB recommends that graphical exhibits based on the 85th percentile speeds be prepared for the required ISD and SSD values in comparison the actual available measurements. The graphics should show the property line limits at the intersection. The review should also include potential measures to improve and sight lines and safety for traffic traveling through the intersection.**

TIA Recommendations

Project Access Recommendations

The TIA provided recommendations related to Project access and the proposed roadway network to be constructed as part of the Project. The recommendations in the TIA include the following measures related to the site plan design:

- › The Project site driveways should be a minimum of 24 feet in width and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle.
- › Where perpendicular parking is proposed, the drive aisle behind the parking should be a minimum of 23 feet in order to facilitate parking maneuvers.
- › Vehicles exiting the Project site should be placed under STOP-sign control with a marked STOP-line provided.
- › All signs and pavement markings to be installed within the Project site should conform to the applicable standards of the Manual on Uniform Traffic Control Devices (MUTCD).
- › A sidewalk is proposed along at least one side of the roadway network within the Project site that extends to Poppy Lane and Elizabeth Drive, and to Wheeler Street for the separate development area.

- › Americans with Disabilities Act (ADA)-compliant wheelchair ramps will be provided at pedestrian crossings that are to be constructed or modified in conjunction with the Project.
- › Signs and landscaping to be installed as a part of the Project within the intersection sight triangle areas of the Project site roadways and at intersections internal to the Project site should be designed and maintained so as not to restrict lines of sight.
- › Snow accumulations (windrows) within sight triangle areas should be promptly removed where such accumulations would impede sight lines.
- › Secure bicycle parking should be provided within the site.
- › Consideration should be given to providing electric vehicle (EV) charging stations for use by residents and guests.
- › The existing trees and vegetation located along the west side of Wheeler Street within the sight triangle areas of the Project site driveway should be selectively trimmed or removed and maintained in order to provide the required line of sight and the existing embankment/rock wall north of the Project site driveway should be regraded.

19. **The specific elements of the circulation related comments listed above should be incorporated into the site plans. Additional recommendations related to the site circulation design are provided in the next section.**

20. **VHB recommends that the Applicant develop Transportation Demand Management (TDM) plan for the Site, including partnering with the Merrimack Valley Transportation Management Association (MVTMA) and exploring the potential for peak hour commuter shuttles for residents to the Lowell Commuter Rail station, to reduce the Project's overall traffic impact.**

Off-Site Recommendations

The TIA provided recommendations related to off-site improvements and include the following measures:

Wheeler Road at Wilshire Circle and Paddock Lane

- › Install new, 12-inch wide, high-visibility STOP-lines (thermoplastic material) on the Wilshire Circle and Paddock Lane approaches;
- › Replace and relocate the STOP-sign on the Wilshire Circle approach adjacent to the STOP-line;
- › Install a STOP-sign on the Paddock Lane approach adjacent to the STOP-line; and
- › Install intersection ahead (W2-1 and W16-9P) signs on the Wheeler Road eastbound approach to the intersection in advance of the curve to the west of the intersection.

Route 110 at Wheeler Street

- › Independent of the Project, a marked STOP-line should be provided on the Wheeler Street approach to Route 110.

Wheeler Road at Wilshire Circle

- › Independent of the Project, a marked STOP-line should be provided on the Wilshire Circle approach to Wheeler Road.

Wheeler Street at Rinzee Road

- › Independent of the Project, a STOP-sign and marked STOP-line should be provided on the Rinzee Road approach to Wheeler Street.
- 21. **VHB agrees with the above measures and recommends that they be implemented by the Applicant as part of the Project.**
- 22. **In addition to the recommendations listed above from the TIA, VHB recommends that the following additional measures be reviewed and incorporated into the Project mitigation if warranted:**
 - › **Review the need for a marked stop line on the Wheeler Street approach to Route 113.**
 - › **Perform a left turn lane warrant analysis for the Route 113 westbound approach to Wheeler Street, with and without the Project generated traffic.**
 - › **Determine if double-yellow longitudinal centerline pavement markings and traffic regulatory signage will be necessary along Wheeler Street, Wheeler Road, Wilshire Circle, Elizabeth Drive, Rinzee Road, and Poppy Lane to provide additional guidance for the added traffic on these roadways.**
 - › **Review the need for a stop line and stop sign on the Elizabeth Drive approach to Wilshire Circle.**
 - › **Review the need for intersection ahead (W2-2 and W16-9P) signage on the Wheeler Road northbound and southbound approaches to Rinzee Road.**
 - › **Comment on the night time lighting/visibility conditions at the site access points along Wheeler Road and Wheeler Street.**

Parking and Site Plan Review

VHB conducted a review of the transportation-related elements of the schematic site plan included in the Comprehensive Permit Application dated June 3, 2022. The site plan provides conceptual level detail and shows the proposed layout of the internal roadway network, the connection points to the surrounding roadways along Wheeler Street, Poppy Lane, and Elizabeth Drive, and the parking layout on the site. Access to the Project site will be provided by new connections to the cul-de-sacs at the ends of Poppy Lane and Elizabeth Drive and by a new driveway along the west side of Wheeler Street, approximately 600 feet north of Rinzee Road. The following comments and recommendations are related to the review of the schematic site plan.

- 23. **As previously noted, the site plans should include additional details based on the specific circulation comments included in this review.**
- 24. **Comment on the viability of extending Poppy Lane to Wheeler Street to provide an additional point of access/egress for the development.**
- 25. **The recommendations provided in the TIA related to roadway widths, drive aisles, pavement markings, and signage should be reflected in the site plans.**
- 26. **Stop signs and lines should be installed along the minor approaches at internal intersections on the site, where appropriate.**
- 27. **Traffic calming measures should be considered on the Site in areas where the geometry may promote increased speed to travel, for example in the vicinity of the clubhouses depicted on the schematic site plan exhibit and on relatively long sections of the driveways without any interruptions.**

28. **Lighting along the main driveways should take into consideration illumination needs at internal intersections and pedestrian crossing areas.**
29. **Locations and dimensions of sidewalks, crosswalks, and curb ramps for continuous pedestrian connectivity should be shown on the site plans. Further, pedestrian connectivity should be provided to the public rights-of-way along Poppy Lane, Elizabeth Drive, and Wheeler Street.**
30. **A total of 600 parking spaces are proposed for the 300 residential units. The TIA indicated that the parking is in compliance with Section 3.10.24 of the Town's Zoning By-Laws. The Applicant should provide confirmation that the parking supply would satisfy the operational demand of a development comprised of 100-percent 4-bedroom units.**
31. **Prepare vehicle turning templates for the largest emergency vehicle for the Town of Dracut and coordinate with the Dracut Fire Department to ensure adequate emergency/public safety access throughout the site. If intermunicipal agency emergency support is provided to the site, the site design should be adjusted where needed to accommodate City of Methuen emergency apparatus.**
32. **VHB recommends that the Applicant commit to providing electric-vehicle (EV) charging stations as well as EV-ready spaces on the site, both to meet the new building code requirements as well as to make the site future-ready. The exact number of EV and EV-ready spaces and how they are distributed throughout the site should be reviewed with town staff.**
33. **Provide a discussion of traffic control measures that may be appropriate to discourage vehicles from using the site as a cut-through route between Wheeler Street and Wheeler Road.**
34. **School bus access to/from the site should be outlined, and necessary accommodations for on-site bus stop(s) and turnarounds should be reviewed.**
35. **Describe site operations and policies related to trash/recycling, move-in/move-out, mail and package deliveries, pick-up/drop-off, TNCs (Uber & Lyft) and snow storage. Specific areas for each activity should be identified on the site plans, where appropriate.**

The above comments should be addressed by the Applicant in a response letter, along with the appropriate supporting information. VHB's review of the response material from the Applicant may prompt additional comments, and/or result in the modification of the comments presented herein. Please contact VHB if there are any questions or if any aspect of the review requires further discussion.