

October 25, 2016

Dracut Planning Board
62 Arlington Street
Dracut, MA 01826

Attn: Ms. Elizabeth Ware, Director of Community Development

Subject: Transportation Peer Review Comments
Murphy's Farm Residential Development
Dracut, MA

Dear Betsy:

MDM Transportation Consultants, Inc. (MDM) is pleased to provide you with the following transportation review comments for the above-referenced project. These comments have been prepared based on a site visit in October 2016, discussions with you and review of the documents identified below. To facilitate response by Applicant, review items requiring response are noted in ***Bold Italic***.

In summary, MDM finds that the Transportation Impact Assessment (TIA) has been prepared in general conformance with industry standards and reasonably quantifies existing/baseline traffic conditions for area roadways, traffic generation characteristics for the Site, and traffic impacts/operations at study intersections. MDM also finds that the proposed subdivision roadway, by virtue of connecting two existing (temporary) cul-de sac roadways, will facilitate emergency vehicle access/circulation to the Site and existing adjoining residential properties from both Wheeler Road and Wheeler Street. To further validate the ability for the new roadways to accommodate the Town's emergency apparatus (ladder truck) MDM recommends that the Applicant provide AutoTurn® vehicle turn analysis/exhibits for the project file. Further clarification of the safety characteristics of the primary intersections serving the Site (specifically sight lines) is also requested as specified herein, with provision for enhancing safety through vegetative clearing/maintenance and providing advance warning signs where applicable.

Documents Reviewed

MDM has reviewed the following documents to gain an understanding of the project and determine if industry standards have been applied in determining the potential impacts of the project. The following relevant documents were reviewed:

- *Transportation Impact Assessment, Murphy's Farm Open Space Development, Dracut, Massachusetts, prepared by Vanasse & Associates, dated October 2016.*
- *Preliminary Subdivision Plan, Open Space Development Murphy's Farm, Dracut, Massachusetts, prepared by Andover Consultants Inc., dated June 22, 2016.*

Proposed Development

The proposed site development, as presented in the TIA and associated Subdivision Layout Plan, consists of 33 single family residential units to be accessed via existing roadways that include Wilshire Circle and Elizabeth Drive which connect to Wheeler Road; connection to Wheeler Street will be provided via Poppy Lane and Rinzee Road.

Proposed Site access will essentially connect Elizabeth Drive and Poppy Lane which each currently terminate in separate cul-de-sacs. These roadways were approved and built in the late 1980's as part of the Rolling Meadows subdivision and Asadoorian Heights subdivision with provision of "temporary cul-de-sacs", anticipating the possibility of a future roadway connecting these roadways.

Traffic Impact and Access Study Comments

Existing Conditions

1. *Study Area:* The study area includes the intersecting roadways of Wilshire Circle at Wheeler Road opposite Paddock Lane, Wilshire Circle at Wheeler Road and Rinzee Road at Wheeler Street. MDM concurs that these study locations are appropriate and in context with the likely traffic impacts for the Project.

2. *Traffic Volumes:* Traffic volumes for study locations were conducted in September 2016 under normal traffic conditions with schools in session during mid-week AM and PM peak hours. MDM concurs that traffic volumes presented in the TIA are a reasonable representation of typical/average traffic volume conditions for weekday peak AM and PM peak hours along area

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roadways, noting that September data is slightly above-average volume month based on nearby permanent count station data published by MassDOT.

3. *Accidents/Crash Data:* The TIA presents relevant crash data for the study intersections for the period 2010-2014 confirming that crash rates are below statewide and district-level average rates. Likewise, the study locations are not listed as high crash locations on the MassDOT HSIP crash clusters. MDM concurs with the crash analysis methodology and conclusions as presented in the TIA.

4. *Vehicle Speeds:* Vehicle speeds presented in the TIA are derived from 48-hour automatic traffic recorder (ATR) counts conducted by an independent third-party vendor. MDM concurs with the methodology used to calculate average and 85th percentile travel speeds along Wheeler Road and Wheeler Street, and which serve as the basis for calculating intersection sight line criteria. The reported travel speed data are also generally consistent with field observations conducted by MDM in October 2016 under non-peak travel conditions.

5. *Sight Distances:* Calculated minimum sight distance requirements for the intersections providing access to the Site range from 305 feet (minimum) to 445 feet (ideal) based on measured 85th percentile travel speeds following AASHTO guidance. MDM concurs with these calculated minimum and ideal distances. ***However, as noted under comment 10: Site Access, MDM has identified sight line impediments that must be addressed to meet minimum criteria at two locations.***

Future Conditions

6. *Traffic Growth:* Future traffic volumes are projected to a 7-year horizon using 1 percent annualized growth plus permitted but unbuilt residential developments in Dracut. MDM concurs that these growth factors are consistent with protocols customary to the industry and present a reasonable basis for estimating "No Build" traffic volume conditions for purposes of the Project TIA.

7. *Trip Generation:* Trip estimates for the Project are appropriately based on characteristics published by the Institute of Transportation Engineers (ITE) in *Trip Generation* 9th Edition for single family detached housing, Land Use Code (LUC) 210. On this basis, the TIA estimates peak hour trip levels ranging from 33 to 39 vehicle-trips during peak hours and 380 vehicle-trips daily. MDM finds that this represents a reasonable estimate of traffic activity for the development and reflects a modest level of additional trip activity on area roadways.

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8. *Trip Distribution:* Regional trip patterns for Site traffic presented in the TIAS are reasonably consistent with existing travel patterns on area roadways and likely travel paths used by future residents of the development. The overall assignment of trips to area roadways presents a modest increase relative to "No Build" conditions and presents a reasonable estimate for analysis purposes, understanding that these trip increases are modest even under reasonable fluctuation in the assumed trip distribution.

MDM further concurs that there is not likely to be substantial "cut-through" between Wheeler Road and Wheeler Street given the modest volume of these roadways and the relatively low travel time benefit that the subdivision roadway affords for this purpose. The subdivision roadway does, however, provide the improved ability for municipal vehicles and emergency vehicles to serve area residences more directly from multiple access points.

9. *Operations Analysis:* Operational analyses are presented in the TIA follow generally accepted traffic engineering practices and protocols, indicating ample capacity at study intersections to accommodate Project trip increases. Modest trip increases due to the Project are not expected to materially change operations or delays relative to "No Build" conditions with nominal delays and level-of-service (LOS) B or better operations during peak hours. These operating levels are well within delays considered acceptable in suburban settings.

Site Access and Circulation Comments

10. *Site Access:* Access to the Site is provided via two existing intersections along Wheeler Road at Wilshire Circle and one existing intersection along Wheeler Street at Rinzee Road. MDM has conducted a field review of sight lines at each of these locations to validate measurements cited in the TIA, finding that most (but not all) sight lines are consistent with those identified in TIA Table 9. Noted differences include the following:

- *Wheeler Road at Wilshire Circle:* MDM's measured sight line looking northeast from Wheeler Road from a stopped position 10-feet from the travel way is 390 feet versus the TIA estimate of 427 feet; however, this sight line is substantially limited (less than 100 feet) when measured from the standard 14.5-foot travel way setback. Intersection sight lines are significantly impaired by vegetation at the northeast corner of the intersection. This sight line limitation may worsen under wintertime conditions, warranting clearing of the vegetation within the sight triangle. See **Exhibit 1: Wilshire Road Northeast Sight Line.**

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- *Wheeler Street at Rinzee Road:* MDM's measured sight line looking south from Rinzee Road ranges from 230 feet (14.5-foot setback from the travel way) to 260 feet (10-foot setback from the travel way) which falls below the minimum required distance of 305 feet. This condition warrants removal of vegetation within public way (a shrub located between a hydrant and utility pole) to achieve an effective sight line of approximately 360 feet). See **Exhibit 2: Rinzee Road South Sight Line**.

Based on the above, MDM recommends that the Applicant address the following:

- *MDM recommends that the applicable sight line triangles be shown for each of the study intersections along with measured sight lines to confirm that minimum sight line criteria are met (305 feet), and if possible the ideal Intersection Sight Distance (ISD) of 385 feet for right turns and 445 feet for left-turns. The sight line triangles should not encroach onto adjoining (private) property to achieve minimum and/or ideal sight line criteria.*
- *MDM recommends clearing of vegetation within public way for sight line triangles at each study intersection, including trimming of branches on trees to a height of 7-feet above ground level to maximize sight lines.*
- *MDM recommends placement of an "intersection ahead" and 25 mph speed advisory plaque along Wheeler Street south of Rinzee Road to warn motorists of limited sight distance. Placement of the signs should conform to the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).*

11. *Site Circulation:* Applicant should confirm that the Site Layout Plan provides sufficient maneuvering area to accommodate the Town's largest responding fire apparatus (ladder truck) and service vehicles (SU-30 type design vehicles or equivalent) by conducting AutoTurn® vehicle turn analysis/exhibits.

12. *TIA Recommendations:* In addition to the above recommendations, MDM concurs with the TIA recommendations with respect to the Project site roadway including signs, markings, bus waiting area, crosswalks and sight triangles.

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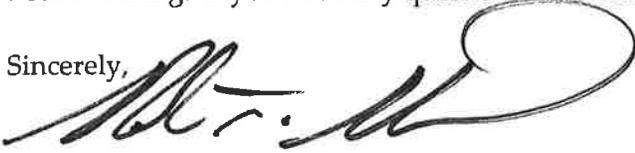
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MDM appreciates the opportunity to provide Transportation Planning & Engineering Services to the Town of Dracut and look forward to discussing our findings at the upcoming Planning Board hearing. If you have any questions or concerns, please feel free to contact this office.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. Michaud', with a large, stylized loop at the end.

Robert J. Michaud, P.E.

Managing Principal

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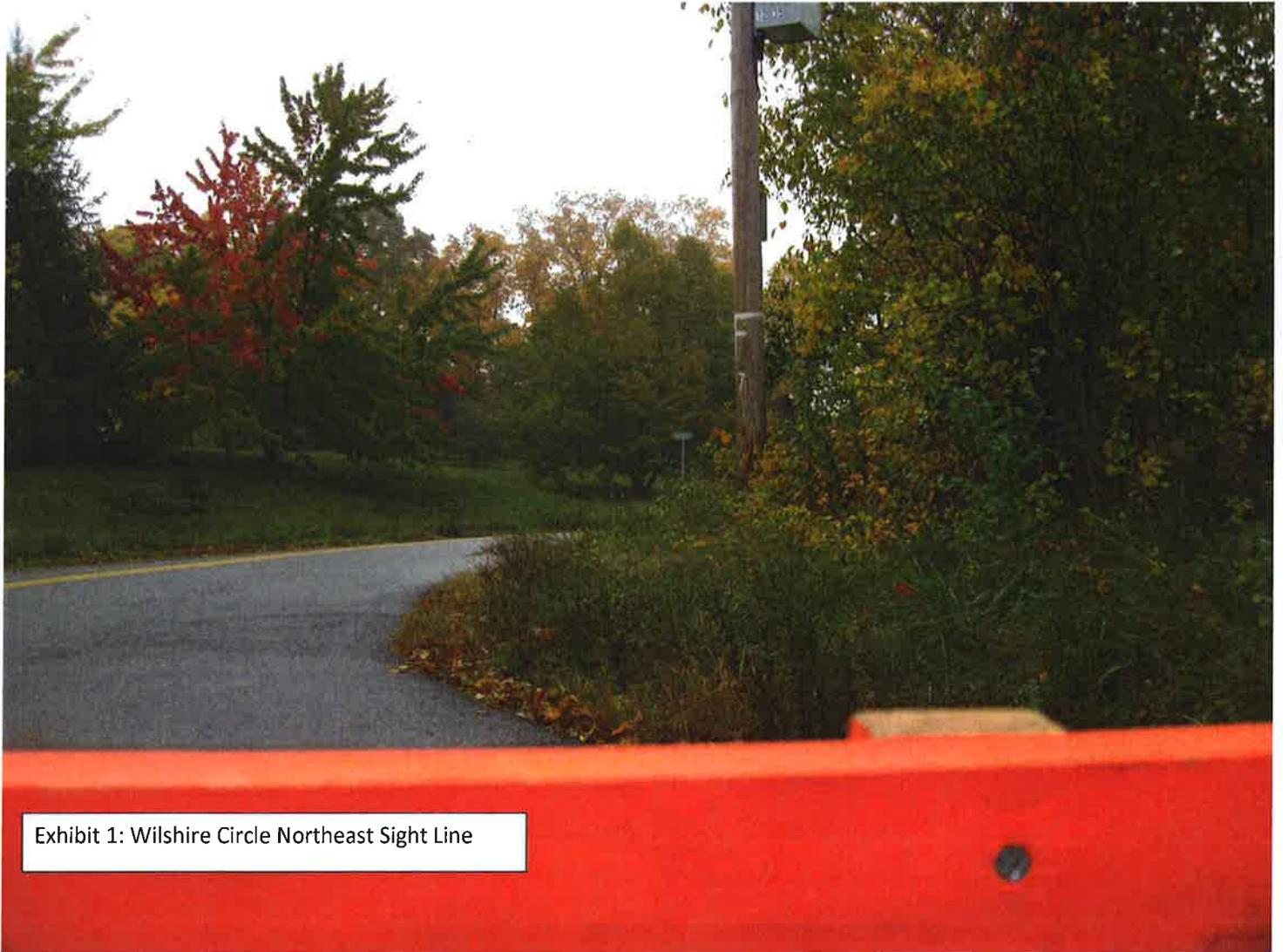


Exhibit 1: Wilshire Circle Northeast Sight Line



Exhibit 2: Rinzee Road South Sight Line