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MEMORANDUM

Ref: 1475
Subject: Traffic Peer Review
144 Seekonk Street
Norfolk, Massachusetts
From: Kim Eric Hazarvartian, Ph.D., P.E., PTOE
Principal
Date: September 30, 2019

INTRODUCTION

On behalf of the Town of Norfolk, Massachusetts, TEPP LLC has performed a traffic peer review of the proposed 96-unit residential development at 144 Seekonk Street (hereinafter the Project). This memorandum summarizes TEPP LLC's findings and recommendations.

FIELD ASSESSMENT

TEPP LLC conducted a field assessment September 3, 2019 and observed:

- existing physical and traffic-control conditions
- potential driveway sight lines and distances
- traffic operations on Seekonk Street

TRAFFIC STUDY OVERVIEW

TEPP LLC reviewed the July 30, 2019 memorandum prepared by WSP on the subject Seekonk Street Proposed Development Traffic Study (hereinafter Traffic Study). The Traffic Study:

- analyzed a proposed development as 96 single-family detached houses
- had a study area consisting of the Seekonk Street/proposed driveway intersection
- analyzed 2019 and 2026 build conditions
- analyzed the weekday AM and PM street-peak periods between 7:00 and 9:00 AM and between 4:00 and 6:00 PM
- included existing physical and traffic-control conditions
- analyzed sight distances for the Seekonk Street/proposed driveway intersection

- did not include accident history and analysis
- did not present pedestrians, bicycles and transit in terms of existing or potential pedestrian facilities, bicycle facilities and public transit systems, including access and connectivity
- considered background-traffic growth
- considered site trip generation, distribution and assignment for the proposed development
- included capacity analysis, including levels of service and delays for the Seekonk Street/proposed driveway intersection
- assessed driveway and roundabout design

TRAFFIC STUDY NETWORKS

T.1 The Traffic Study presented the weekday AM-street-peak hour and the weekday PM-street-peak hour under the following conditions:

- 2019 existing
- 2019 build
- 2026 no-build
- 2026 build

The Traffic Study body should include traffic-volume networks that depict:

- the above peak hours and conditions for the expanded study area described below
- site-traffic volumes alone

The traffic-volume networks will help readers:

- understand existing traffic
- understand future traffic volumes
- compare traffic volumes to understand better Project traffic impacts

T.2 The only intersection that the Traffic Study analyzes is the Seekonk Street/proposed driveway intersection. The Traffic Study area should be expanded to include the following intersections:

- Seekonk Street/Cleveland Street
- Seekonk Street/Fruit Street

See, Norfolk Subdivision Rules and Regulations, §3.3.2.23.1.4. Further, TEPP LLC recommends that WSP confer with the Town Planner to assess if the Project-generated traffic will likely use any other intersections that may already experience delays, such as

- Main Street/Seekonk Street
- Route 27/South Street

T.3 An automatic-traffic recorder (ATR) was placed on Seekonk Street on Wednesday, November 30, 2016 and Thursday, December 1, 2016. These data are greater than two years old and are not current pursuant to Massachusetts Department of Transportation Traffic Impact Assessment Guidelines dated March 13, 2014, unless the reviewing authority accepts the data. Since obtaining ATR data is not time- or labor-intensive, and can usually be done in a short period of time, we recommend that WSP collect new ATR data over at least a two-day period, midweek, and not during a week with a holiday or a school vacation.

TRAFFIC STUDY VEHICLE SPEEDS

T.4 The ATR obtained speed data on Seekonk Street near the site. The traffic study reported the:

- posted speed limit was 35 miles per hour (mph)
- northbound 85th percentile speed was 40 mph
- southbound 85th percentile speed was 41 mph

As noted above, these data are than two years old, and therefore should be updated.

TRAFFIC STUDY SIGHT DISTANCES

T.5 The Traffic Study provided an opinion that the Seekonk Street/proposed driveway intersection provides stopping sight distance (SSD) both to/from the north and south along Seekonk Street, per the American Association of State Highway and Transportation Officials (AASHTO). With respect to intersection sight distance (ISD), the Traffic Study states that AASHTO's "desirable" sight distance is not met in either direction due to vegetation. The Traffic Study did not provide a plan or profile supporting either of its SSD or ISD statements.

T.6 Concerning ISD, AASHTO states:

> If available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance vehi-

cle operations, intersection sight distances that exceed stopping sight distances are desirable along the major road.

To elaborate, SSD is the linear distance that a vehicle on the major road (i.e., Seekonk Street) travels to stop to avoid a collision with another object in its lane of travel (i.e., another vehicle stopped, a child chasing a ball, etc.). Providing ISD limits the speed reductions of major-road vehicles to avoid collisions with vehicles exiting from the minor road.

Table 1 summarizes information in the Traffic Study indicating that existing sight distances at the Seekonk Street/proposed driveway intersection do not provide AASHTO values for SSD and ISD. The Applicant should provide a plan and profile showing appropriate sight distances at this intersection in both directions and should identify full improvement measures. The Traffic Study did not state whether the vegetation limiting sight distances is on private property, or is within the Seekonk Street right-of-way. If the vegetation is on private property, the applicant would need to obtain a view easement to maintain appropriate sight distances.

Table 1. Sight distances for Seekonk Street/proposed driveway intersection.

View along Seekonk Street	85th Percentile Speed (mph)	Existing Sight Distance (ft)[a]	AASHTO SSD for 85th Percentile Speed	AASHTO ISD for 85th Percentile Speed
To/from North	40	270	305	445
To/from South	41	40	312	451

[a] Information is from the Traffic Study has not been verified.

TRAFFIC STUDY ACCIDENTS

T.7 The traffic study should provide accident history and rate analysis as applicable for Seekonk Street at least between and including its intersections with Cleveland Street, to the north, and Fruit Street, to the south. The accident history and rate analysis should be for the five most recent years of appropriate data available from the Massachusetts Department of Transportation.

TRAFFIC STUDY PEDESTRIANS, BICYCLES AND TRANSIT

T.8 The traffic study should present existing and future pedestrian, bicycles and transit considerations on the site and in the area.

TRAFFIC STUDY SITE TRIPS

T.9 The proposed development was analyzed as 96 single-family-detached housing units.[1] The analysis used the Institute of Transportation Engineers (ITE) *Trip Generation Manual*,[2] per typical professional practice. TEPP LLC calculated weekday vehicle-trips as:

- daily, 1,001 (total of in and out), compared to 906 in the traffic study
- AM-street-peak hour, 73 (18 in and 55 out), the same as in the traffic study
- PM-street-peak hour, 98 (62 in and 36 out), the same as in the traffic study

The difference in weekday-daily vehicle trips does not affect weekday-street-peak hour traffic operations.

T.10 The traffic study distributed and assigned site trips along Seekonk Street as follows:

- to and from the north, 75 percent
- to and from the south, 25 percent

This distribution and assignment is consistent with existing traffic patterns reported in the body of the traffic study, subject to updated traffic counts.

TRAFFIC STUDY CAPACITY ANALYSIS

T.11 The traffic study body presents capacity analysis, including levels of service and delays, for the Seekonk Street/proposed driveway intersection. More complete capacity analysis, including queues, is appended to the traffic study. The presented levels of service are high, with low delays and short queues. However, the traffic study should be expanded to present levels of service, delays and queues at the intersections discussed in the "traffic study networks" section above.

TRAFFIC STUDY ROADWAY AND ROUNDABOUT DESIGN

The proposed main roadway:

- intersects the east side of Seekonk Street
- is about 1,115-feet long

[1] The current proposal is for 44 single-family homes and 52 units located in two-family structures.

[2] ITE, *Trip Generation Manual*, 10th edition (Washington DC, September 2017).

- includes a roundabout feature when the initial entrance drive intersects with the main loop road
- has one access point on Seekonk Street

Single Access Point

T.12 The Norfolk Subdivision Rules and Regulations require that subdivisions having 25 or more lots "shall have at least two points of access to an existing through street separated by a minimum distance of 350 feet, or shall have two separate passable access routes via existing primary streets to an existing through street where the points of access are." The Project has 96 housing units on 70 lots, with one access point on Seekonk Street. The Applicant should confirm that an emergency access, remote from the proposed roadway, is not available or practicable, and if not, should consider additional safety mitigation measures.

Safety risk increases as the length of single access increase and intensity of land development increases. Longer single-access roadways increase the risk of an incident, such as a fallen tree or vehicle accident, which could block or impede emergency response. More intense land developments, such as those with larger numbers of dwelling units, are likely to increase the need for and frequency of emergency response.

Internal Roadway Network

T.13 The applicant should provide a "swept path" analysis and plan, utilizing tools such as turning templates or the AutoTURN software program, demonstrating that all of the Town of Norfolk's emergency vehicles and other anticipated large vehicles can safely navigate the proposed roadway and roundabout. Further, the Applicant should make the median of the main entrance segment traversable by emergency vehicles. Also, the Applicant should consider modifying the end of the proposed stub driveway at Units 16 and 17 to provide a hammer head turnaround, to enable vehicles, including emergency vehicles, to reverse direction

T.14 The Applicant should demonstrate that the anticipated range of vehicles can: (a) appropriately make turning movements at the Seekonk Street/proposed driveway intersection, (b) appropriately enter and exit from the proposed parking spaces near the proposed community mailbox; and (c) appropriately enter and exit from the proposed residential units along the proposed driveway.

T.15 The Applicant should provide a STOP sign on the proposed driveway approach to Seekonk Street. Further, as noted above, the Applicant should explain how future residents can safely walk to Seekonk Street, and identify where sidewalks are located on Seekonk Street and cross streets within one mile of the Project Site.