

November 14, 2018

Nathan A. Poore, Town Manager
Town of Falmouth
271 Falmouth Road
Falmouth Maine 04105

Subject: Falmouth Center Traffic Peer Review Services

Dear Nathan:

In accord with your request, T.Y. Lin International (TYLI) is pleased to provide a general initial overview of traffic engineering procedures and methodologies as it relates to the preparation of a traffic impact study and obtaining both local and state permits.

Town of Falmouth Ordinance for Traffic Study

When promulgating any subdivision regulations and when reviewing any subdivision for approval, the Planning Board shall consider the following criteria, and before granting approval, shall determine that the proposed subdivision:

Will not cause unreasonable highway or public road congestion or unsafe conditions with respect to use of the highways or public roads existing or proposed.

Given this standard, the Town has the ability to seek transportation improvements above those required by MaineDOT.

MaineDOT Traffic Movement Permit

How will the Study Area for the Traffic Study will be based determined?

- (1) The development entrance(s) or exit(s);
- (2) The first major intersection in either direction from the development entrance(s) and exit(s) unless waved by the Engineer of Traffic or his/her designee at the scoping meeting; and
- (3) All intersections where, during any one-hour period, traffic attributable to the proposed development equals or exceeds:
 - (a) 25 vehicles in a left-turn-only lane;
 - (b) 35 vehicles in a through lane, right-turn lane, or a combined through and right-turn lane; or

- (c) 35 vehicles (multiplying the left-turn volume by 1.5) in a combined left-turn and through lane, or a combined left-turn, through and right-turn lane.

Generally, the vicinity as defined by the above criteria would *be limited to a radius of 2 miles* from the site unless the Department, at the scoping meeting, determines that the proposed development will impair the safe and efficient flow of traffic beyond a two-mile radius due to the development's scale, location, or nature.

The Applicant has noted a 2-mile study area limit. This may expand but is a reasonable assumption at this time.

How much traffic will be generated?

Trip generation must be calculated using the Institute of Transportation Engineers' (ITE) Trip Generation Guide, edition shown on MDOT's Fact Sheets enclosed with the application. If ITE data is not available for the proposed land use, trip generation must be estimated in accordance with a methodology approved by the Department. The trip generation data must be presented in a summary table listing each type of land use, the size involved, the trip generation rate used (total daily traffic and a.m. /p.m. peak), and the resultant total trips generated for the design peak hour of the adjacent street, or the design peak hour of the generator, whichever is the worst-case scenario for the network.

Traffic or trips from the project consist of four types as noted as follows:

- *Internal Capture* – those trips between buildings and land uses on the proposed new development site;
- *Pass-By Trips* – those trips made by users who are on the way to their primary destination and stop at the proposed new development without changing their route;
- *Non-Pass-By Trips*
 - *Diverted Trips* – those trips made by users who have a primary trip but will now go out of their way (divert) to make a stop at the proposed new development;
 - *New (Primary) Trips* – those trips made by users who are making new primary trips and are adding new traffic to the region

The project is expected to generate approximately 1,100 new weekday PM peak hour trips to and from the site (the highest peak hour). This accounts for reduction for internal land use interaction and existing traffic already on area roadways. Given the location of the project, a significant portion of this traffic (75%) would use either the Maine Turnpike or I-295, thus reducing the impact to local roads.

How will transportation system adequacy be determined?

Level of service (LOS). A measure of the quality of the operating conditions within a traffic stream as determined from a capacity analysis, using the methodology described by the Transportation Research Board (TRB), a service of the National Research Council, in the edition of the “Highway Capacity Manual,” Special Report 209 referenced on the MDOT Fact Sheets received with the application.

Unreasonable congestion. Level of Service D, as determined from a capacity analysis, is considered the minimum level of service needed to provide safe and convenient traffic movement. Where a road, intersection, or any approach lane to the specific intersection or intersections being evaluated in the vicinity of the proposed development is determined to operate at LOS E or LOS F in the horizon year, the proposed development is considered to result in unreasonable congestion, unless: Improvements will be made to raise the level of service of the road or intersection to D or above, except as otherwise provided in one or more of the paragraphs below.

(1) The level of service of the road or intersection will be raised to D or above through transportation demand management techniques.

(2) The Department finds that it is not reasonably possible to raise the level of service of the road or intersection to D or above by road or intersection improvements or by transportation demand management techniques, but improvements will be made or transportation demand management techniques will be used such that the proposed development will not increase delay at a signalized or unsignalized intersection, or otherwise worsen the operational condition of the road or intersection in the horizon year.

The standard used to evaluate traffic operating conditions of the transportation system is referred to as the Level of Service (LOS). This is a qualitative assessment of the quantitative effect of factors such as speed, volume of traffic, geometric features, traffic interruptions, delays, and freedom to maneuver.

Level of Service provides a measurement of the delay experienced at an intersection as a result of traffic operations at that intersection. In general, there are six levels of service: Level of Service A to Level of Service F. The highest, Level of Service A, describes a condition of free-flow operations where the effects of incidents are easily absorbed. Level of Service B, describes a state in which maneuverability and speed limits are beginning to be restricted by other motorists although level of comfort is still high. In Level of Service C, experienced drivers are still comfortable but maneuverability is noticeably restricted. Level of Service D brings noticeable congestion and driver comfort levels decrease. In Level of Service E, roadway capacity is reached and disruptions are much more prevalent – driver comfort has declined. Finally, Level of Service F is the results of volumes greater than roadway capacity with congestion and possible stopped conditions. MaineDOT has determined that Levels of Service

A-D are acceptable conditions for intersections. The measures of delay for each Level of Service rating for unsignalized and signalized intersections are found in below.

Signalized Intersection	Unsignalized Intersection
≤10 sec	≤10 sec
10–20 sec	10–15 sec
20–35 sec	15–25 sec
35–55 sec	25–35 sec
55–80 sec	35–50 sec
>80 sec	>50 sec

It should be noted that in some cases where constraints exist or where roadway infrastructure expansion is not compatible with area context, flexibility in design may be possible. In many cases communities seek a balance between achieving a good level of service for only a short period of time versus roadways that are too wide and don't meet area context.

What about safety and crash problems?

Traffic accidents. An inventory and analysis of traffic accidents in the vicinity of the proposed development during the most recent 3-year period. The inventory must include:

- (a) A listing of the critical rate factor for each road and intersection in the vicinity of the proposed development;
- (b) Identification of high accident locations (see Section 4D of this chapter);
- (c) Collision diagrams for each high accident location identified; and
- (d) Identification of feasible countermeasures based on discernible accident pattern at any high accident location.

Unsafe conditions. Road segments, intersections, or development entrances and exits may be deemed as unsafe when traffic encounters conditions such as, inadequate turning radii , poor geometrics, limited sight distance or high accident locations. High accident locations are road segments or intersections where eight (8) or more accidents have occurred over the most recent three (3) year period, and the "critical rate factor" is greater than one (1.0). The applicant shall submit a proposal to improve or eliminate the unsafe conditions if they exist or if they are determined to be created or exacerbated by the proposed development.

Nathan A. Poore
November 14, 2018
Page 5 of 5

As noted the applicant shall submit a proposal to improve or eliminate the unsafe conditions if they exist or if they are determined to be created or exacerbated by the proposed development.

Please contact me if you have any questions.

Best regards,

T.Y. LIN INTERNATIONAL

A handwritten signature in black ink that reads "Thomas A. Errico". The signature is written in a cursive style with a large, prominent initial 'T'.

Thomas A. Errico, PE
Senior Associate / NE Traffic Engineering Director