
To: Mr. John Grace
Hillwood Enterprises, L.P.

From: Richard S. Bryant, P.E.
William R. Moore

File: Hudson Logistics Center
43 Steele Road
Hudson, NH
Trip Generation Review

Date: October 19, 2020

Stantec Consulting Services Inc, (“Stantec”) conducted a peer review of the trip generation forecasts for the above referenced project documented in the traffic impact study prepared by Langan Engineering & Environmental Services, Inc. dated April 2020 and revised August 2020. Based on our review we find that the forecasts were developed in accordance with standard engineering practice and provide a reasonable estimate of project generated traffic. Also, in our opinion the trip generation forecasts as applied in the traffic study create a conservative, or over-estimate of future Build condition traffic volumes on the area roadway network.

Langan Traffic Forecasts – Langan considered two possible methods to forecast project generated traffic volumes and chose for analysis the higher volumes resulting from the two methods. Standard engineering practice and stated policies in many jurisdictions recommend that analysts apply Institute of Transportation Engineers (ITE) trip generation rates published in *Trip Generation* when developing traffic forecasts for proposed land use changes. Section 6 of the Town of Hudson Engineering Department *Engineering Technical Guidelines & Typical Details* states that “traffic study data should meet requirements set forth in the latest version of ... *Trip Generation [Rates, Plots and Equations]*, as published by the Institute of Transportation Engineers.” *Trip Generation* includes empirical data collected at operating facilities across the United States and Canada. It covers a wide range of land uses and is updated on regular basis as new data are collected. For land uses that are not considered in *Trip Generation*, alternative methods or data should be applied.

The 10th edition of *Trip Generation* was recently supplemented to add data for the proposed use, High-Cube Fulfillment Center Warehouse - Non-Sort, Land Use Code 155. Available trip rates can be used to estimate vehicle trips during the peak hours of the adjacent street using either employee counts or building floor area as the independent variable. Trip estimates for the peak hours of the generator can also be calculated based on the building floor area. The adjacent street trip rates are based on studies done at 22 sites since 2000. These rates were applied to the each of the three buildings in the program including 1,702,400 square feet of floor space indicating 573 AM peak hour trips and 703 PM peak hour trips during the peak hour of the generator. Trip estimates for the peak hour of the generator, based on one study, are 70 percent higher than the estimates for the peak hours of the adjacent street. Langan chose to apply the higher “peak hour of generator” trip estimates in the traffic analysis, with one exception, to represent a very conservative analysis condition. The one exception uses even higher volumes for Building A as described below.

As an alternative to applying ITE trip rates, Langan also considered tenant provided information regarding expected operations, employee counts, and schedules. The expected tenants and staffing data are known for Buildings A and B. Trip estimates developed for Building A based on expected operations are the same as or higher than the ITE floor area-based estimates. For Building B the tenant operations based estimates are much lower. Again, using the higher numbers, Langan applied the known tenant operations based volumes for Building A in the traffic analysis. The higher, floor area-based estimates were used for Building B. With the higher numbers, the full development is assumed to generate 573 AM peak hour trips and 795 PM peak hour trips.

The PM peak hour trip estimate derived for Building A based on tenant data was compared to the ITE data. The PM peak hour trip estimate for Building A based on the tenant data is 384 trips. As noted above, 22 sites

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were studied by the ITE under Land Use Code 155. Only eight of these sites generated more than 200 PM peak hour trips and the highest observation was approximately 385 trips. Again, this indicates that a conservative trip estimate has been applied. The estimate of 238 trips for the AM peak hour is higher than the trip counts for 18 of the sites in the 22-sites in the ITE database.

The Building A tenant data trip generation estimate was also compared to ITE trip rates for Light Industrial uses, ITE Land Use Code 110. This land use was considered as: it also involves shift work; it includes a larger data base (40 studies); and, more employee-based data. For this land use there are 3.05 vehicle trips per day per employee and 16 percent of these trips occur during the PM peak hour. Applying these rates to the proposed land use program for Building A with 683 employees indicates 2083 daily vehicle trips and 333 PM peak hour trips. Langan applied 384 trips again indicating an over-estimate of project trip generation.

The above analysis indicates that trip estimates used for both the AM and PM peak hours are conservative, that is, overstated. However, by using the tenant data based trip estimates for the PM peak hour for Building A the total PM peak hour trip estimates are more conservative than the AM peak hour estimates. The traffic operations analyses in the traffic study indicate that PM commuter peak hour operations are more critical than AM peak hour conditions. (Reported intersection No Build condition operating volume-to-capacity ratios at intersections proximate to the project site are higher during the PM peak hour than during the AM peak hour.) Consequently, the more conservative PM peak trip estimates have been applied to the more critical peak hour from a traffic operations perspective.

Additional Study Assumptions— Stantec prepared this memo to document our review of the trip generation component of the study however, there are other study assumptions that also reflect a conservative or “worst-case scenario” approach.

- *Peak Hours*-As noted above, project trip estimates reflect expected traffic generation during the peak hour of the generator. Tenant data suggests that the peak hours of traffic generation for the project will not coincide with the peak hours of traffic on the roadway system. However, the study combines peak hour volumes of the generator with the peak hour volumes of the adjacent street system to reflect a worst-case scenario.
- *Mode Choice*-When applying tenant based data to forecast traffic for Building A it was assumed that all workers would drive alone to and from the site. ITE data relative to ridesharing suggests that the trip estimates could be reduced by as much as 23 percent to account for carpooling and public transit access.
- *Existing Site Traffic*-Estimated traffic associated with the proposed development was added to the roadway network as new traffic without accounting for traffic associated with the existing golf course on the subject site. Existing volumes generated by the golf course could have been removed from the network to create a less conservative analysis condition.
- *Background Growth Rate*-When developing future No Build traffic volume networks Langan applied a traffic growth rate of one percent per year. This approach is conservatively high as the Nashua Regional Planning Commission's *Hudson Boulevard Traffic Analysis*, dated June 22, 2018, indicates only a 0.65% per year growth rate.
- *Level of Proposed Improvements*. Stantec also reviewed the traffic study level of service (LOS) results and associated off-site improvement plans. The proposed improvements were found to fully mitigate the development's projected traffic impacts and, in some cases, provide additional capacity over what is available today. In particular, the improved Route 3A intersection with Dracut, River and Steel Roads is predicted to operate at LOS A and C during the morning and evening peak hours as compared to a LOS B and F during the same existing peak hours with no improvements. In addition, the improved Route 3A intersection with Sagamore Bridge Road is predicted to operate at LOS B

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during the morning peak hour as compared to a LOS D during the existing morning peak hour with no improvements.

The above assumptions reflect an effort to present a conservative or worst case future traffic scenario.

Conclusions - Overall, we find that Langan has followed industry accepted practices and Town guidance in developing vehicle trip estimates for the project and that the resulting trip estimates applied in the traffic study are conservative, or an over-estimation of the traffic impact on the area roadway network.

Thank you for providing us the opportunity to provide peer review services. Please do not hesitate to call if we can be of further assistance.

Stantec Consulting Services Inc.



Richard S. Bryant P.E.

Senior Associate - Transportation



William R. Moore P.E.

Senior Principal - Transportation