

16 May 2022
Project: 220296

David Thaler
Development Engineering Coordinator
The District Municipality of Muskoka
70 Pine Street
Bracebridge, ON P1L 1N3

Dear Mr. Thaler:

RE: TECHNICAL REVIEW – THE STARBOARD TRAFFIC IMPACT STUDY, TATHAM ENGINEERING LIMITED

The purpose of this letter is to document the technical review of the “*The Starboard Traffic Impact Study*” (TIS) dated October 27, 2021. The TIS was prepared by Tatham Engineering Limited (the consultant).

The study was undertaken to assess the traffic impact of a proposed mixed-use development on a site at 195 Cherokee Lane, Town of Gravenhurst, District of Muskoka. The site is on the Lake Muskoka waterfront in the Muskoka Wharf area of the Town. The proposed development includes 129 residential units in a seven-storey building, 927 SM (9,980 SF) retail space in the ground floor of the residential building, 992 SM (10,678 SF) boathouse retail on a new wharf, and a 640 SM (6,890 SF) restaurant also situated on the new wharf. The top floor of the residential building is also proposed to include a 1,492 SM (16,060 SF) rental event space with capacity for 250 people. As well, the new wharf would accommodate 55 boat slips.

The proposed vehicular access for the site is a single two-way driveway at the end of Cherokee Lane. The site is also accessible by water (Lake Muskoka).

Detailed Commentary

The following points provide the detailed technical review of the TIS.

▶ **Study Scope:**

- There is no description of the type of development application that this study has been prepared in support of – i.e. there are no references to Official Plan, zoning (other than Zoning By-law parking requirements), or site plan-related applications

- The purpose of the study is stated as addressing the requirements of the Town of Bracebridge and District Municipality of Muskoka as related to potential transportation impacts of the proposed development. The consultant has not documented any consultation with Town or District staff but the TIS appears to follow the District's TIS guidelines

► **Existing Conditions:**

- The consultant provides accurate descriptions of the functional classifications and characteristics of the study area roads, which include Muskoka Road 169, Cherokee Lane, Greavette Street, Clairmont Road, and Muskoka Road 18 as well as the key intersections along Muskoka Road 169
- We note that no observations were conducted of existing traffic operations, however, we understand that traffic conditions were not likely typical at the time of the study because of the effect of the Covid pandemic on travel. Notwithstanding, observations of the specific intersections within the study area that have non-conventional traffic controls (e.g. three of four or two of three approaches under stop control) could have been useful
- The consultant conducted traffic counts at the Muskoka Road 169 intersections with Cherokee Lane, Greavette Street, and Clairmont Drive on Tuesday, July 6, 2021, and obtained a Wednesday, December 5, 2018 traffic count (presumably from the District) for the Muskoka Road 169/Muskoka Road 18 intersection
- To establish a 2021 base year summer traffic condition for weekday AM and PM peak hours, the recent summer counts were increased by 20% to adjust for the effects of the Covid pandemic on travel. The December 2018 count was increased by approximately 6% to account for general growth between 2018 and 2021 and increased again by 25% to reflect a summer condition. The consultant based these adjustments on a review of historical traffic data. Since Muskoka Steamships, which is accessed via Cherokee Lane, operated on a limited schedule in 2021 due to Covid precautions, the consultant assigned an additional 75 inbound and outbound trips to the study area roads to adjust for their lake tours operating at capacity post-pandemic. We agree with the methodology used to estimate 2021 base year AM and PM peak hour traffic volumes
- The consultant conducted an analysis of the 2021 base year weekday AM and PM peak hour traffic volumes using Synchro software and the SimTraffic module within Synchro. SimTraffic¹ was specifically used due to the unconventional traffic control at the Muskoka Road 169 intersections with Greavette Street (T-intersection with free flow for the northbound approach and stop control on the other two approaches except for channelized right turns on yield control) and Clairmont Road (four-leg intersection with free flow for southbound and stop control on the other three approaches except for channelized right turns on yield control)

¹ SimTraffic is a micro-simulation program that models the movement of individual vehicles within a traffic forecast.



- We note that the consultant has not described the parameters for the SimTraffic analysis and only includes the worksheets that summarize the operational performance in the appendices. Typically, additional details are provided such as the seed time (typically 10 minutes to pre-load the network with traffic), the recording time for the simulation (typically 60 minutes), and the number of runs used (typically five to 10) from which average results are determined. The consultant should confirm the parameters used for the SimTraffic analysis. For the purposes of this review, we have assumed that appropriate parameters were used and our comments pertain to the analysis results as presented
- The analysis results show that with the existing lanes and traffic control, the study area intersections operate at a good level of service (B or better) and well within capacity. The consultant concludes that no capacity improvements are currently required. We agree with the approach used for the operational analyses under the current circumstances and agree with the consultant's conclusion
- For future reference, however, we note that observations of traffic conditions are useful for confirming the results of an existing conditions analysis. This is especially true for unconventional intersections where field observations may reveal specific details of traffic operations that are not apparent in a desktop analysis. This may include shorter or longer delays experienced by minor traffic movements as well as potential safety concerns where there may be unexpected conflicts between vehicles, pedestrians, cyclists, etc. due to potential confusion over who has the right-of-way

► **Background Traffic Forecasts**

- The consultant estimates traffic forecasts for three future horizon years starting with 2024, which is the anticipated date for full build-out of the proposed development, and five (2029) and 10 (2034) years after completion. These horizon years are consistent with the requirements of the District TIS guidelines
- To determine a general growth rate to be applied to the base year conditions to estimate horizon year background traffic forecasts, the consultant has considered projected population and employment growth in the Town and trends in historical traffic volumes. Based on these sources, the consultant determines that a 2% annual growth rate should apply to District roads, 1% per year should apply to Greavette Street (citing its local nature), and no general growth should be anticipated for Cherokee Lane or Clairmont Road since there is no through traffic on these roads. We agree with this approach and consider it to be conservative (errs on the higher side)
- The consultant also included the additional traffic associated with three future development proposals in the Town including Brickbay Development (assumed complete by 2024), Muskoka Bay Development (initial phases for 2024, 2029, and assumed completion by 2034), and Muskoka Bay Creekside (assumed complete by 2024)



- Spot checks of the various components of the background traffic assignments as shown in Figure 4 (Brickbay), Figure 5A/5B/5C (Muskoka Bay), and Figure 6 (Muskoka Bay Creekside), and the total background traffic forecasts including the general growth factors as shown in Figure 7 (2024), Figure 8 (2029), and Figure 9 (2034), indicate that this part of the traffic forecasting has been presented correctly. As an example of the background traffic growth that has been estimated, the approximate increases in traffic entering the Muskoka Road 169/Cherokee Lane intersection in the weekday PM peak hour for each horizon year are 10% from 2021 to 2024, 20% from 2021 to 2029, and 30% from 2021 to 2034. In each year, the general growth factor accounts for most of the increase
- Based on an analysis of the horizon year weekday AM and PM peak hour traffic forecasts for 2024, 2029, and 2034 with the existing lanes and traffic control, the consultant finds that all study area intersections would continue to operate at a good level of service (C or better) and within capacity except for the eastbound left turn from Muskoka Road 169 to Greavette Street in the PM peak hour (exceeds capacity in 2034). The consultant correctly notes that the latter result reflects the use of an all-way stop control analysis since three-way stop control at a four-leg intersection cannot be modeled in Synchro. The all-way stop control analysis produces more conservative results (i.e. longer delays) than would likely be observed in practice. In contrast, the consultant's SimTraffic (microsimulation) analysis of delay shows that this movement should have very low delays, which results in a level of service A result (the best level of service). By definition, level of service A would be consistent with a traffic movement that operates well within capacity, however, SimTraffic does not include a volume to capacity calculation to provide a definitive result. In summary, we agree with the consultant's conclusion that no capacity improvements would be required through to 2034 under background traffic conditions

► Site Traffic Forecasts

- The site trip generation has been estimated based on information contained in the Institute of Transportation Engineers (ITE) Trip Generation manual for uses described as "*Multifamily Housing – Mid-rise*", "*Quality Restaurant*", and "*Shopping Centre*". We find that these are representative of the land uses being proposed
- The trip generation as presented in Table 10 is correctly presented. The consultant applies a 10% reduction to the initial estimates to account for some trips to/from the site being multi-purpose (e.g. a restaurant customer also visiting on-site retail uses). We agree that this is a reasonable adjustment for a development with complementary uses
- The consultant undertakes a first principles estimate of trips for the proposed event space (or commercial entertainment space as written in the TIS) based on its maximum person capacity, an assumed three persons per vehicle average occupancy, an assumption that events will be longer than one hour creating separate peak inbound and peak outbound trip activity, and an assumption that 10% of attendees will be dropped off or picked up at the site. We find that these are reasonable assumptions



- The consultant considers three scenarios for the weekday PM peak hour to estimate site traffic for a typical day when no event is taking place, when an event is starting during the weekday PM peak hour (captures peak arrival traffic), and when an event is ending during the weekday PM peak hour (captures peak departure traffic). The consultant also notes that most events are anticipated to occur during the weekend and outside of the typical late morning/early afternoon peak periods associated with weekend recreational traffic or shopping activities. We agree with the consultant that conducting traffic forecasting and analysis specifically for a weekend event would not represent a design condition due to its off-peak nature. Overall, we find that the consultant’s approach to sensitivity testing of the different possibilities for site trip generation is reasonable and conservative. By showing how the road network would function for these higher volume scenarios during the weekday PM peak hour provides sufficient information to determine a potential “*worst-case*” traffic impact of an at-capacity event
- The consultant estimates the directional distribution of site traffic based on the site location relative to the built-up area of Gravenhurst and the tourist nature of Muskoka Wharf. We agree with the estimated 60% to/from east and 40% to/from west directional split along Muskoka Road 169 as well as assigning the trips to the various study area intersections according to observed turning movement patterns
- Spot checks of the site traffic assignments shown in Figure 11 and Figure 12 were conducted and found to be correct

► **Total Traffic Forecasts**

- The consultant combined the AM and PM peak hour site traffic assignments for a typical day with no event with the background traffic forecasts to determine total traffic forecasts for each horizon year. Additionally, the consultant combined the PM peak hour site traffic assignments for the two event scenarios (start and end of an event) with the background traffic forecasts for the 2034 horizon year to establish a “*worst-case*” (highest traffic volume) total traffic forecast. The total “*no event*” traffic forecasts shown in Figure 13 (2024), Figure 14 (2029), and Figure 15 (2034), and the “*with event*” traffic forecasts shown in Figure 16 (2034 PM), were spot-checked and found to be correct

► **Operational Analysis of Future Conditions**

- The consultant analyzes AM and PM peak hour study area intersection traffic operations for a typical day with no event for all horizon years with the same methodology, lane configurations, and traffic control as used for the assessment of existing base year (2021) conditions. For the event condition, the consultant limits the analysis to the PM peak hour for the 2034 horizon year since this represents the “*worst-case*”, highest traffic volume condition
- The analysis of typical conditions without the event space in operation shows that the study area intersections would operate at a good level of service (C or better) for 2024 and 2029 and with similar and acceptable levels of service (D or better) for 2034. The consultant finds the same anomaly regarding the PM peak hour analysis



of the Muskoka Road 169/Greavette Street intersection as noted in the analysis of existing conditions – i.e. a good level of service (low delay) for the eastbound left turn but with a volume that exceeds the theoretical capacity for this movement – as before, this reflects the use of two different analysis methodologies to assess the unconventional traffic control at this intersection. In summary, we agree with the consultant’s conclusion that no study area intersection improvements are required

- The analysis of a maximum capacity event during the 2034 weekday PM peak hour shows similar results for the study area intersections compared to the “no event” scenario except for a poor level of service (F) for southbound traffic turning from Cherokee Lane to Muskoka Road 169 for the “event end” scenario. This scenario combines the traffic associated with participants leaving a weekday afternoon event with regular site and other traffic that would be using Cherokee Lane. Despite the poor level of service indicating very long delays for access to Muskoka Road 169, the volume demand would be just within capacity (volume to capacity ratio of 0.97, i.e. 97% of capacity being utilized). We agree with the consultant’s conclusion that no intersection improvements are required to address the poor level of service given that this scenario of a capacity event during a weekday afternoon is anticipated to be an unlikely occurrence. Notwithstanding, it should be acknowledged that site event planning should include scheduling events for off-peak traffic periods and avoiding overlap with other Muskoka Wharf events to mitigate the potential for cumulative traffic (and/or parking) impacts
- Since there is an existing eastbound left turn lane on Muskoka Road 169 at Cherokee Lane, the consultant focuses an assessment of turn lane requirements on the potential need for a westbound right turn lane at this intersection. While the consultant finds that the lower forecasts without an event exceed the MTO guideline for the provision of a right turn lane, they conclude that a right turn lane is not required. The rationale includes the conservative nature of the forecasts (erring on the higher side), the higher volumes would only occur under peak summer conditions, some site (and non-site) traffic may use other Muskoka Wharf parking facilities served by different intersections along Muskoka Road 169, and that the intersection would provide a good level of service without a right turn lane. We agree with this rationale and also note from available street view imagery that there appear to be significant property and utility constraints along the north side of Muskoka Road 169 to providing a westbound right turn lane. As well, no right turn lanes are currently in place at Muskoka Road 169 intersections in the Muskoka Wharf area where there would be similar traffic volumes and the same constraints

► Site Plan

- While it’s not clear in the introduction of the report as to whether the study is in support of a site plan application, the consultant has included some analysis of typical site plan concerns such as parking, loading, and internal traffic circulation
- The consultant notes that the proposed residential parking (serving residents and visitors) will be 153 spaces, which is nine less than the reported Town Zoning By-law requirement. The consultant does not provide a direct rationale to support this



shortfall but does note that there will be 55 boat slips. Presumably, this is to suggest that some residents and visitors will travel by boat and the boat slips should assist in accommodating the overall parking demand at least for the boating season. The Town may require further clarification regarding the sufficiency of residential parking

- The consultant notes that no parking will be provided for the proposed commercial uses, which comprise ground floor retail in the residential building as well as the boathouse retail and restaurant situated on a new wharf. Compared to the Town Zoning By-law requirements, this represents an additional parking shortfall of 233 spaces. The consultant supports this approach by stating that there would be synergy between the proposed residential use and the commercial uses, and by describing Muskoka Wharf as a general tourist attraction where customers of the proposed commercial uses could use the municipal parking lots that are provided throughout the wharf area
- Related to the use of the municipal parking, the consultant cites a Town pre-pandemic (summer 2019) parking study that found 525 of 899 municipal parking spaces were occupied (59% occupancy) under peak mid-afternoon Saturday conditions, which included a Dockside Festival of Arts event. And further, that the weekday peak occupancy was only 338 of 899 municipal parking spaces (38% occupancy). This indicates that the potential additional peak demand of 233 spaces with the proposed on-site commercial uses could be accommodated, which would increase the Saturday occupancy to 84% (758 occupied of 899 total spaces). We note that the Town's parking study, which was conducted by the IBI Group, states that a parking lot above 85% occupancy is considered "*effectively full*" due to the difficulty for newly arriving drivers to find parking under these circumstances. Therefore, assuming that there are no other new developments proposed for Muskoka Wharf, it appears that there is just enough municipal parking to accommodate the proposed Starboard development
- The consultant also acknowledges that the Town's 2019 parking study showed that the municipal lots in proximity to the subject site (Lots 10, 11, 17, and 18) had the highest occupancies of all Muskoka Wharf lots during the Saturday peak period (85% or higher occupancy), which was likely associated with the Dockside Festival of Arts event. This means that under this type of event condition, additional visitors to this area of Muskoka Wharf would have to use the parking lots that are further away. The consultant notes that the lots further west along Muskoka Road 169 that could have capacity are within a reasonable walking distance of the subject site. We note the Town's parking study states that a typical publicly accepted walking distance is 300 to 400 metres. As measured on Google Earth, the approximate walking distance between the subject site and the lots that had capacity during the 2019 parking study is between 550 and 850 metres. This suggests that under peak summer conditions with an event, the overall Muskoka Wharf parking supply would be sufficient, but that as recommended in the Town's parking study, it would be prudent to install directional signage to inform motorists of the parking alternatives where capacity should be available. It may also be necessary to include wayfinding signage for pedestrians (if not already in place) given the potential for longer walking



distances between parking and Muskoka Wharf attractions. This also emphasizes the need to coordinate the scheduling of events to mitigate both traffic and parking impacts

- The consultant notes that two loading spaces for the commercial uses are proposed for the site whereas the Town Zoning By-law requires three. The consultant acknowledges the need to make an application for the proposed variance. We note that while not mentioned by the consultant, it appears that a similar application will be necessary for the site parking variance as well unless it is intended to be addressed through a site-specific Zoning By-law
- The consultant provides vehicle maneuvering diagrams in Appendix E to illustrate truck movements through and within the proposed development. The diagrams show that a garbage truck and medium size delivery truck could be accommodated within a surface parking lot located on the adjacent developer-owned lot just south of the proposed residential building. The diagrams also show that a fire truck could access the south end of the proposed residential building. The consultant reports that smaller cargo vans will provide other delivery services within the residential building's parking garage. It is presumed that additional details will be provided through a site plan application to address the logistics related to waste collection, deliveries, and emergency services for the entire site

Conclusions

The conclusions of the technical review are presented in the table on the next page.



**TECHNICAL REVIEW
THE STARBOARD TRAFFIC IMPACT STUDY, GRAVENHURST**

Proposed Development	Key Points	Actions Required	Overall Summary
<p>Mixed-use development on a site with the municipal address of 195 Cherokee Lane, Gravenhurst, which is part of the Muskoka Wharf area</p> <p>Seven-storey building with 129 residential units, 927 SM (9,280 SF) ground floor retail, 1,492 SM (16,060 SF) rental event space, and 153 parking spaces (parking garage and surface parking)</p> <p>Wharf with 992 SM (10,678 SM) boathouse retail, 640 SM (6,890 SF) restaurant, 55 boat slips, and no vehicle parking</p> <p>One site access via Cherokee Lane and its intersection with Muskoka Road 169</p>	<p>The consultant shows that the total site traffic forecasts for horizon years 2024 (anticipated site build-out date), 2029, and 2034 could be accommodated with no improvements to the study area intersections including Muskoka Road 169/ Cherokee Lane</p> <p>The consultant concludes that while the site would have a residential parking deficiency of nine spaces and a commercial parking deficiency of 233 spaces relative to the Town’s Zoning By-law requirements, there is sufficient parking available in the Muskoka Wharf municipal lots to accommodate this shortfall</p> <p>The consultant states that the site will have a loading deficiency of one space, which will require a planning application for the proposed variance</p> <p>The consultant finds that site will accommodate the circulation of a garbage truck and a medium sized delivery truck on the adjacent developer-owned lot just south of the subject site, and fire truck access to the south end of the proposed residential building</p>	<p>The following items should be addressed:</p> <p>Clarify the type of planning application that the TIS has been prepared in support of</p> <p>Provide additional details regarding the traffic analysis methodology related to the SimTraffic microsimulation analysis</p> <p>Acknowledge that site event planning should include scheduling events for off-peak traffic periods and avoiding overlap with other Muskoka Wharf events to mitigate the potential for cumulative traffic and parking impacts</p> <p>Town staff should request additional justification for the proposed residential parking shortfall relative to Zoning By-law requirements</p> <p>Town staff should review the proposed sharing of Muskoka Wharf municipal parking to accommodate the commercial parking shortfall relative to Zoning By-law requirements, and determine if the proposed sharing is consistent with the parking goals and objectives for this area</p> <p>Provide further detail, presumably through a Site Plan Application, to confirm waste collection, delivery truck, and emergency services circulation requirements</p>	<p>The Traffic Impact Study generally follows the District TIS Guidelines</p> <p>As noted under Actions Required, there are several areas of the study that should be clarified</p> <p>An Addendum letter or a revised report should be requested to provide the additional clarification, and if necessary, supporting technical work</p> <p>Town staff should provide additional review and comment related to the proposed parking as well as other aspects of the study that relate to the proposed site plan</p>



If you have any questions or comments, please contact the undersigned.

Yours very truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED



Garry Pappin
LEL
Senior Consultant

