Canadian National

**Darren Reynolds**
Project Director

61 James Snow Parkway
Milton, Ontario Canada
L9E 0H1

July 12, 2019

Lesley Griffiths
Review Panel Chair
160 Elgin St.
Ottawa, ON K1A 0H3

By email
Dear Ms. Griffiths:

**RE: Milton Logistics Hub – Response to Supplemental Evidence filed with the Panel by the Halton Municipalities**

I am writing to provide the Panel with the following:

- A response to a previously undisclosed slide deck introduced for the first time during the Halton Municipalities' presentation to the Panel on Traffic and Safety matters on June 26, 2019 (CEAR #881 – Exhibit 6);

- A response to supplemental evidence on the topic of traffic modelling filed by the Halton Municipalities on July 9, 2019 (CEAR #935); and

- A response to supplemental evidence from Dr. Frank Bercha filed by the Halton Municipalities on July 10, 2019 (CEAR #942).

Sincerely,
<Original signed by>

Darren Reynolds
Project Director

Cc:
William G. McMurray, Review Panel Member (by email)
Isobel Heathcote, Review Panel Member (by email)
Joseph Ronzio, Review Panel Manager (by email)
Mark Lerner, CN Vice President
Luanne Patterson, CN Senior Systems Manager – Environmental Assessment

# Memorandum

**TO:**
**Darren Reynolds**
Project Director
61 James Snow Parkway
Milton, Ontario Canada
L9E 0H1

**FROM:**
Amy Z. Jiang, M.Eng., P.Eng.

**PROJECT:**
6071-11
CN Milton Logistics Hub

**DATE:**
July 11, 2019

**SUBJECT:** REVIEW OF NEW SLIDES INTRODUCED DURING HALTON MUNICIPALITIES' TRAFFIC & SAFETY PRESENTATIONS ON JUNE 26, 2019

This memorandum presents BA Group's response to a new slide deck (referred to by Halton Municipalities as "slides") introduced for the first time during the Halton Municipalities' presentation to the Joint Review Panel on *Traffic and Safety* matters on June 26, 2019 (CEAR 881 – Exhibit 6). A total of 7 new slides were handed to the parties and the Panel as the presentation began. The slides were titled:

1. Defining Major Transit Requirements in Halton
2. Existing Transit Service in the Town of Milton
3. Financed Projects & Planned Improvements (Not Financed)
4. Regional Roads Planned Capital Projects Start of Construction (Not Financed)
5. Existing Roundabouts in Town of Milton
6. Types of Roads in Halton Region (Local Roads)
7. Types of Roads in Halton Region (Regional Roads)

## 1.0 TRANSIT PLANNING IN MILTON (RESPONSE TO SLIDES 1 & 2)

Slide 1 refers to a recently-released document that was endorsed by Halton Regional Council on June 19, 2019, titled "*LPS45-19/PW-18-19 – Defining Major Transit Requirements in Halton Region*"[1]. This document evaluates existing and proposed Major Transit Station Areas (MTSAs) in the Region and identified preliminary recommended Transit Priority Corridors (TPCs) for the 2031 and 2041 horizons.

[1] "*Report No. LPS45-19/PW-18-19 – Defining Major Transit Requirements in Halton Region*". Report to the Regional Chair and Members of Regional Council. Endorsed by Halton Regional Council June 19, 2019. Attachment #1: "*Defining Major Transit Requirements in Halton Region*". Prepared by HDR, Cole, Urban Strategies on behalf of Halton Region, dated March 26, 2019.

Slide 1 refers to a map from the report titled “Preliminary 2031 Recommended Transit Priority Corridor Network – Infrastructure” (Attachment #2 to report *LPS45-19/PW-18-19*). This map illustrates preliminary recommended transit corridors in the 2031 horizon. Slide 1 highlights Britannia Road as a planned Priority Bus Corridor (High Occupancy Vehicle + Transit Signal Priority) by 2031. The corridor would contain the following elements (as defined on page 148 of report *LPS45-19/PW-18-19*)*:*

- Bus operations shared with High Occupancy Vehicles (HOVs)
- Transit Signal Priority (TSP)
- Typically accommodated within a 6-lane cross-section
- HOV lanes can be enforced during specific days and time periods
- Located on the outside lane and is indicated by signage

The above indicates that Britannia Road, which will be improved in the near future to 6 general purpose lanes (plus dedicated turn lanes at signalized intersections), will be altered to 4 general purpose lanes plus 2 HOV/bus priority lanes by the 2031 horizon.

BA Group’s response is as follows:

- In our opinion, a 6-lane Regional arterial road containing HOV/priority bus lanes in the two outer lanes will continue to appropriately accommodate mixed traffic including heavy-truck traffic within the remaining 4 lanes. From a traffic operations perspective, there is no evidence of incompatibility between bus operations in a designated curb-lane and heavy-truck traffic on such roads. There is no reference in the slides to a proposed change in Regional Official Plan (OP) policy to restrict the use of Regional arterial roads by heavy-trucks where such a road is designated as a planned Priority Bus Corridor.

- While the total vehicular capacity of a 6-lane road containing HOV/priority bus lanes may be lower than a 6-lane road without them (as there are usually fewer high occupancy vehicles on the road than single occupancy vehicles), the purpose of introducing HOV/priority bus lanes is to enable the road to carry more *people* overall, and thus reduce total *vehicular* traffic overall.

- The introduction of HOV/priority bus lanes would typically be timed with the introduction of increased, higher-frequency bus transit. While there are no strict rules in this regard, it would be logical to expect that such lanes would be introduced in conjunction with, or following, the introduction of improved transit service in the Town of Milton that will shift more people away from automobiles.

- BA Group has, in fact, fully and appropriately accounted for the presence of HOV lanes on Britannia Road in the operations analysis of Britannia Road in the 2031 horizon. Specifically, in Attachment IR2.33-1 (“*Terminal Road Access Study*”, prepared by BA Group, dated May 4, 2017), which undertook a detailed operations analysis of the Britannia Road / Terminal Access Road intersection in the 2031 horizon, the traffic analysis assumed there would be only 4 ‘general purpose lanes’ available for use by heavy-truck traffic (as noted in Section 7.1.1.2 “2031 Future Total”).

## 2.0 TIMING OF NEAR-TERM ROAD IMPROVEMENTS (RESPONSE TO SLIDE 3)

Slide 3 illustrates the timing of planned construction on Britannia Road, Tremaine Road and Dundas Street.

Of specific interest to the proposed CN Milton Logistics Hub ( "the Project"), Slide 3 states that the widening of Britannia Road and the construction of the Tremaine Road interchange at Highway 401 is scheduled as follows:

- Britannia Road widening from 2 to 6 lanes:
  - From Tremaine Road to Regional Road 25 (including in the vicinity of the Project) – Construction starting in fall of 2019 with anticipated duration of 3-4 years.
  - From Regional Road 25 to Highway 407 – Construction timing pending financing.
- Tremaine Road interchange with Highway 401:
  - Construction work on the Tremaine Road extension from Steeles Avenue to No. 3 Side Road is ongoing; pre-construction work for the Highway 401 interchange is underway. Interchange construction starting in 2021 with anticipated duration of 2 years.

Halton has stated that the timing of completion of the Britannia Road widening from 2 to 6 lanes east of Regional Road 25 (i.e., from Regional Road 25 to Highway 407) is uncertain, as they are subject to funding and a financing plan.

<u>BA Group's response is as follows:</u>

**Britannia Road**

- In Halton Region's most recent Public Information Centre (PIC) about the Britannia Road widening held on April 9th, 2019 (CEAR 941 – Exhibit 12), Halton Region communicated to the public that the widening of Britannia Road from Tremaine Road to Highway 407 will be completed by fall of 2022, with phasing as follows:

  - Phase 1 (Tremaine Road to Regional Road 25) – Construction starting in summer 2019, completion in spring 2022.
  - Phase 2 (James Snow Parkway to Highway 407) – Construction starting in fall 2019, completion in summer 2022.
  - Phase 3 (Regional Road 25 to James Snow Parkway) – Construction starting in spring 2020, completion in fall 2022.

  While Phases 2 and 3 are noted to be "subject to construction financing", it would be reasonable to expect that such financing would be secured through routine Council action as a matter of course at the time that such funds are required. In our experience, if the "subject to construction financing" was meant to indicate serious risk to the construction schedule, it would not have been relegated to a footnote.

  The widening of Britannia Road is a project that has been many years in the making. The 2011 Halton Region Transportation Master Plan (TMP) identified the need for road widening of Britannia

Road as part of a two-phase widening program[2]. The full Environmental Assessment study for the road widening was completed in 2017, recommending widening the road from 2 to 6 lanes from Tremaine Road to Highway 407 starting in fall 2018 and ending in 2021. The widening is being undertaken to support population and employment growth that is forecast in the Town of Milton and in Halton Region, including the current (ongoing) buildout of growth areas including the Boyne Survey Secondary Plan area and the Derry Green Business Park Secondary Plan area. Given the expectation of the many developers relying on the widening project, it is reasonable to expect it will be completed in its entirety by 2022, as presented to the public three months ago.

- During the construction of Britannia Road, there would be a construction management plan in place to manage traffic. The PIC materials state that two lanes will be maintained open (similar to existing conditions), with detour plans in place during short road closures in off-peak periods. Thus, the road will continue to accommodate mixed traffic including heavy-truck traffic. There will likely be traffic delays during construction, which is typical of such work, but the condition is temporary. There has been no evidence to support the proposition that temporary road construction work would justify the delay of commencement of operation of adjacent developments that the road improvements are intended to support.

- It is acknowledged that prior to the completion of the road widening, Britannia Road will not have the capacity to accommodate the forecast future traffic volumes for a 6-lane condition. However, we note that during construction, non-local traffic that might otherwise use the road will likely *not* use the road. Therefore, during construction, when Britannia Road will continue to operate as a 2-lane road (similar to today).

**Tremaine Road**

- In 2015, BA Group undertook sensitivity analyses of the road network in the 2021 planning horizon, in consideration of the possibility that the Tremaine Road interchange at Highway 401 may not be complete at the time of Project opening. These sensitivity analyses were published in the Environmental Impact Statement (EIS) Appendix E-17 ("*Review of Terminal-Generated Truck Traffic*", prepared by BA Group, dated November 30, 2015) and Attachment IR2.33-1 ("*Terminal Road Access Study*", prepared by BA Group, dated May 4, 2017).

- These sensitivity analyses demonstrate that prior to the Tremaine Road interchange opening, Project-generated traffic that would otherwise use the interchange would distribute across other available routes on the Regional arterial road network to / from Highway 401, and can be accommodated.

**Dundas Street**

- Forecast Project-generated heavy-trucks volumes on Dundas Street are very low (in the order of 0% to 2% of total Terminal-generated heavy-truck traffic or less than one truck-trip per peak hour on average). Therefore, the timing of the widening of Dundas Street from 4 to 6 lanes is not a relevant consideration.

---

2 "The Road to Change – Halton Region Transportation Master Plan 2031". Halton Region. September 2011. Figure 7.4 – Halton Region Roads Capital Projects (2012-2031), page 56.

## 3.0 TIMING OF LONG-TERM ROAD IMPROVEMENTS (RESPONSE TO SLIDE 4)

Slide 4 illustrates the potential timing of other planned capital projects in the Town of Milton in the longer-term planning horizon. A number of road infrastructure improvements (i.e., road widenings) are planned to the 2031 horizon. The slide notes that these construction projects are not financed.

BA Group's response is as follows:

- The Region of Halton publishes, on an annual basis, a Capital Budget Plan that allocates budget to the completion of capital projects including each of the capital projects identified in Slide 4. The timing of these capital projects is assessed from year-to-year based on forecast need, priority and availability of funds.

- The timing of the capital projects identified in Slide 4 appears to be generally consistent with the most recently published (2019) Halton Region Capital Budget Plan, and are consistent with BA Group's assumptions and assessments to date.

## 4.0 USE OF ROUNDABOUTS BY HEAVY TRUCKS (RESPONSE TO SLIDE 5)

Slide 5 identifies locations of existing roundabouts in the Town of Milton (seven in total), and shows a photograph of each.

BA Group's response is as follows:

- Of these 7 existing roundabouts, only 4 are located on Regional arterial roads that are forecast to be used by Project-generated heavy-truck traffic. These are located along Tremaine Road, at the junctions of Britannia Road, Louis St. Laurent, Main Street and Steeles Avenue.

- Tremaine Road is a Regional arterial road and all of its roundabouts have been designed, and are capable of, accommodating heavy-trucks. This was confirmed by Halton Region during consultation with CN in the early stages of the project. All 4 of the roundabouts are designed with truck aprons to accommodate the movement of heavy-trucks.

- It is typical for heavy-trucks and other large vehicles (such as buses) to utilize the truck aprons and/or adjacent lanes within a roundabout. This is permitted in the *Highway Traffic Act*. There is signage in place at each roundabout warning cars not to drive beside large trucks when approaching or within the roundabout. This is a typical feature of modern multi-lane roundabout design.

- Trucks are capable of navigating roundabouts, just as they are capable of navigating signalized or STOP-controlled intersections.

- Halton Region's website has a page dedicated to roundabouts[3], which notes that "roundabouts are generally safer than conventional intersections". Furthermore, the page has a Frequently Asked Questions section titled "Can roundabouts accommodate large vehicles and trucks?" The website's response to this question is "Yes. Roundabouts have a raised area called a truck apron around the centre island. It allows large vehicles and trucks easier circulation in the roundabout."

## 5.0 TYPES OF ROADS IN HALTON REGION (RESPONSE TO SLIDES 6 & 7)

Slide 6 illustrates typical cross-sections of local roads under the jurisdiction of the Town of Milton, while Slide 7 illustrates typical cross-sections of arterial roads under the jurisdiction of Halton Region.

These slides state that "local roads provide access within communities to individual properties and parcels", and "major arterials have a high degree of access control and are intended to accommodate all users to provide efficient movement across Halton Region connecting urban and rural communities".

BA Group's response is as follows:

- The information contained in these slides is consistent with BA Group's assessments of the road network. In particular, it is BA Group's assessment that Regional arterial roads are intended to accommodate the movement of all users (including heavy-trucks) within the Region.

- The Terminal Access Road is proposed on Britannia Road as the fourth leg of an already-planned signalized T-intersection on Britannia Road for the Boyne Survey Secondary Plan area. Thus, the Project does not propose to introduce a new intersection on a Regional arterial road, but rather connect to an intersection that is already planned.

[3] https://www.halton.ca/For-Residents/Roads-Construction/Roundabouts.

# Memorandum

**TO:**
**Darren Reynolds**
Project Director
61 James Snow Parkway
Milton, Ontario Canada
L9E 0H1

**FROM:**
Amy Z. Jiang, M.Eng., P.Eng.

**PROJECT:**
6071-11
CN Milton Logistics Hub

**DATE:**
July 11, 2019

**SUBJECT:** RESPONSE TO A SUBMISSION FROM HALTON MUNICIPALITES DATED JULY 9, 2019 CAPTIONED "MILTON LOGISTICS HUB PROJECT – RESPONSE FROM DR. HADAYEGHI TO PANEL QUESTIONS ON MODELLING"

This memorandum provides BA Group's response to a submission to the Joint Review Panel on July 9, 2019 by Halton Municipalities ("Halton") on the topic of traffic modelling, titled "*Milton Logistics Hub Project – Response from Dr. Hadayeghi to Panel Questions on Modelling*". The Halton submission is in response to a question raised by the Panel during the Traffic and Road Safety Session held on June 26, 2019:

> "I don't know what to make of this. We had two competing analysis – intersection analyses, so from Halton we had something that was based on their analysis of the level of service and from you we had one that was a capacity analysis. And they seem like – so what's a Panel to do? That's my question. I was hoping to have some – get some clarity there."
>
> *– CEAR 879, Hearing Transcript Volume 5, June 26, 2019, page 1483-1484.*

The Halton submission consists of a letter to the Panel from Gowling WLG (Canada) LLP supported by a memo to Halton Region from CIMA+ dated July 9, 2019 and captioned **"***B000609 CN Milton Logistics Hub – Comparison: Halton Municipalities Traffic Congestion Assessment Compared to that Submitted by BA on Behalf of Canadian National*".

The Halton submission states:

> "The Halton Municipalities have used data, parameters, and MOEs that are consistent with industry-approved practices, and importantly, are in accordance with Halton Region's Transportation Impact Study Guidelines. For these reasons, our opinion is that the Halton Municipalities analyses is to be preferred over the CN analyses."

Halton's submission discusses five issues in responding to the Panel's question. In this memo, BA Group responds to each of the five issues identified by Halton as follows:

1. Background Data/Date of Data Used
2. Horizon Year for Analysis
3. Road Network Improvements
4. Model Parameters
5. Overall Congestion Assessment

## 1.0 BACKGROUND DATA/DATE OF DATA USED

Halton asserts that the traffic volume data CN used in its traffic analysis, which was published in 2017 in Attachment IR2.33-1 ("*Terminal Road Access Study*", prepared by BA Group, dated May 4, 2017) and Attachment IR2.33-3 ("*Transportation Considerations*", prepared by BA Group, dated August 17, 2017), do not reflect accurate traffic growth forecasts. It is our opinion that the traffic volumes adopted in BA Group's analyses are supportable, fully traceable, and suitable for the intended purpose.

Furthermore, Halton asserts that it has published sufficient background data for its own analysis that a reader could understand key assumptions and methodology used in the analysis.

BA Group's response is as follows:

**Traffic volume forecasts**

- The 2017 BA Group analyses (documented in Attachment IR2.33-1 and Attachment IR2.33-3) adopted the most recent information that was available at the time. That data had been previously developed and approved by Halton Region.

  The 2017 BA Group analyses adopted the following traffic volume forecasts for the 2021 and 2031 study horizons[1]:

  - For the Britannia Road corridor – Traffic volume forecasts contained in the Britannia Road Environmental Assessment (EA) study, completed by Halton Region in 2014[2]. This study provided the most recent, publicly available, forecasts of detailed turning movement volumes on Britannia Road that had been reviewed and approved by Halton Region. The EA study reported that these volumes were developed based on the Halton Region's 2011 Transportation Master Plan (TMP) EMME traffic model. These EA volumes are those that were used by Halton Region as the need and justification for the Britannia Road widening from 2 to 6 lanes.

[1] As discussed in:
- Attachment IR2.33-1, Section 6.2.4 "Adopted Future Background Total Traffic Volumes", and
- Attachment IR2.33-3, Appendix A "Traffic Forecasting Memo" – Section 4.0 "Adopted Future Background Total Traffic Volumes".

[2] "*Environmental Study Report Britannia Road (Regional Road 6) Transportation Corridor Improvements*". April 2014. Prepared by Delcan for the Regional Municipality of Halton.

- For other arterial road corridors – BA Group applied link-level growth rates that were provided to CN by Halton Region in the fall of 2015 (at the request of CN) for the purpose of assessing future traffic volume growth. At that time, Halton stated that these growth rates were based on the Halton Region's 2011 Transportation Master Plan (TMP) traffic model.

- In November 2018, CN made a request to Halton Region for the regional traffic volume forecast information as may be available to assist CN specifically in responding to IR8.4. Consequently, Halton Region provided CN with traffic volume outputs from its EMME traffic model for the PM peak hour. EMME traffic model output consists of *corridor-level* traffic volumes (i.e. two-way volumes). The volumes provided did not give any indication of traffic volumes at individual *intersections* (i.e. turning movement volumes).

  Halton's letter appears to refer to this as the more up-to-date information. It is our understanding that this model contained the same population and employment projections as the previous version of the model that was used as the basis of the above-noted traffic volume forecasts (i.e. the 2011 Halton Region *Best Planning Estimate v3.032 approve*d by Council in July 2011[3]). However, the model was reportedly calibrated and validated more recently through use of a newer, 2011 Transportation Tomorrow Survey (TTS), which provides information on travel patterns in the Greater Toronto Area (GTA) and its surrounding areas. Note that the TTS is not a model onto itself. However, Halton has not previously provided CN with any indication, or information, about the 'calibration and validation' work that has reportedly been done.

  As noted in IR8.4(e) Section 4, BA Group carefully reviewed the EMME model output in relation to the forecasts previously prepared by BA Group. BA Group determined that while the EMME model output is valid at a *screenline* level, it is certainly not applicable to forecasts of traffic on *individual corridor segments* or at *specific intersections*. As further discussed in IR8.4(e) Section 4, it was concluded that the forecasts prepared by BA Group in 2017 are supportable and remain well suited to their intended purpose and that there is no reason to apply a different set of forecasts to this analysis.

**Analytical documentation**

- While the Halton analyses does provide documentation on *some* of the assumptions used, it does not provide some of the most *critical* information essential to understand how it arrived at the conclusion that key intersections would "fail" in the future.

- For example, the Halton analyses does not report the following information that are absolutely critical to understanding the analyses:
  - Traffic volumes for all movements at each intersection assessed; and
  - Traffic signal timing and phasing plans at each intersection assessed.

[3] "*Best Planning Estimates of Population, Occupied Dwelling Units and Employment 2021-2031*". Halton Region. June 2011 (approved by Regional Council in July 2011).

Although the prior Halton submission (CEAR 800, Halton Municipalities – Submissions Package 3, Memorandum to Lisa De Angelis dated Monday May 27, 2019, titled "*B000609 CN Milton Logistics Hub Intersection Operations Technical Memo*"), in Appendix A "Detailed Summary Tables", publishes traffic volumes for *some* of the movements at each intersection, it does not publish forecast traffic volumes for *all* of the movements for any of the intersections. Without this information, or information on the signal timing and phasing plans that were adopted at any of the intersections, it is impossible to determine how Halton reached the conclusion that an intersection would fail.

For example, in Table A-4 of Appendix A (and in all of the other tables in that Appendix), traffic volumes are provided for the eastbound left and southbound right turn movements at the Britannia Road / Trafalgar Road intersection. However, no volumes are provided for the eastbound through/right, southbound left/through, westbound and northbound movements. This information, as well as the adopted signal timing and phasing plan, would be the minimum required to understand the intersection capacity analysis.

- The Halton Region *Traffic Impact Study Guidelines*[4] ("Halton TIS Guidelines") clearly requires the reporting of all assumptions used in the analysis. In addition to the complete set of traffic volumes, the additional required information not documented in the Halton material and therefore not in accord with the Halton TIS Guidelines includes:
    - lane configuration/use;
    - pedestrian/cyclist;
    - saturation flows;
    - traffic signal cycle length, phasing and timing; and
    - utilization of the inter-green phase and other relevant parameters.

  *– Halton TIS Guidelines, Section 3.6.1 "Capacity Analysis at Intersections"*

## 2.0 HORIZON YEAR FOR ANALYSES

Halton states that CN only conducted intersection capacity analyses for the 2021 horizon year (reflecting the opening year condition) providing no insight into future conditions.

BA Group's response is as follows:

- The BA Group analysis published in Attachment IR2.33-1 and Attachment IR2.33-3 was undertaken in 2017. Although it is typical practice to adopt a 5-year study horizon from the date of the study (which at the time would have been 2022), all of Halton Region's Transportation Master Plan, Capital Budget and other forecasting information was based on the 2021 and 2031 horizon years. Therefore, 2021 was selected as the representative 5-year horizon.

[4] "*Transportation Impact Study Guidelines*". Halton Region. January 2015.

- The 2021 horizon also represents a timeframe in which there can be somewhat greater certainty in future traffic volumes and the road network (where sufficient information is available) for an intersection capacity analysis that has a high degree of precision with outputs such as volume-to-capacity (V/C) and queueing that is reported in metres.

- A longer-term horizon year was not assessed as the Region's 2031 model already includes an expansion of the Milton urban boundary including the Project Lands and a substantial number of jobs (approximately 5,400) within the larger traffic zone. Consequently, the traffic demand associated with development on CN lands has already been incorporated into the Region's 2031 planning horizon and the planned road improvements.

  Also, as noted in the response to IR4.61(a), given the magnitude of development planned in Milton and Halton Region by 2031, it would not be possible derive a reasonably accurate estimate for the increase in traffic volumes across the entire Regional arterial road network at an intersection-turning-movement level of detail.

- However, BA Group did in fact conduct intersection capacity analysis for the 2031 horizon year for the Terminal Access Road intersection at Britannia Road as documented in Attachment IR2.33-1. The 2031 analysis was completed at the location where the proportion of trucks is highest on the road network and accordingly, which would have the greatest impact.

## 3.0 ROAD NETWORK IMPROVEMENTS

Halton asserts that CN assumed that all proposed road improvements would be in place at the time the facility opens.

BA Group's response is as follows:

- The BA Group analysis published in Attachment IR2.33-1 and Attachment IR2.33-3 was undertaken in 2017, and adopted the most up-to-date road network for the 2021 horizon that was available at the time in the Halton Region Roads and Capital Program.

- As described in Attachment IR2.33-3 (Section 2.0 "Halton Region Roads and Capital Program"), as part of the 2021 transportation assessment, the Region's most recent Budget and Business Plan 10 Year Capital Budget for Transportation at the time was reviewed to identify what improvements were expected by Halton to be completed by the 2021 horizon year. These improvement assumptions were identified in Figure 3 and Figure 4 of Attachment IR2.33-3.

- Since 2017, there has been a change (delay) in the expected opening of the Terminal and some changes to the schedule of completion of the elements of the Halton road improvement program. The elements most relevant to the Project, namely the widening of Britannia Road and the completion of the Tremaine Road interchange at Highway 401, have been considered and are discussed in a separate BA Group memorandum dated July 11, 2019, titled "*Review of New Slides Introduced During Halton Municipalities Traffic & Safety Presentations on June 26, 2019*".

## 4.0 MODEL PARAMETERS

Halton asserts that CN "chose an optimistic view in conducting traffic analysis". It appears that this assertion relates to the choice of peak hour factor and saturation flow.

For peak hour factors (PHF), Halton asserts that a "more realistic" value of 0.92 should be used, instead of 1.0 which was adopted by BA Group. For context – a "peak hour factor" is a measure of traffic fluctuations within the peak hour itself. It is calculated by dividing the hourly volume by the peak 15-minute flow rate within the hour. Thus, a peak hour factor of 1.0 implies that traffic flow is uniform throughout the whole hour, while a peak hour factor of 0.5 implies that the busiest 15-minute period is twice as busy as the other periods during that hour. The adoption of a peak hour factor effectively means that analysis is being undertaken on the busiest 15 minutes within the peak hour, rather than the entire peak hour. In mature, busy, urban areas, peak hour factors tend to be high, and often approach 1.0.

For saturation flow, Halton asserts that a 'more typical' value of 1,900-1,950 should be used, instead of values of 1,850-2,100 that were adopted by BA Group. For context – the saturation flow rate is the theoretical traffic flow rate that can be achieved within a lane within an hour, and is expressed in vehicles per hour per lane. The saturation flow rate is one of the factors used in determining the theoretical capacity of an intersection. Saturation flow rates are often higher on arterial roads with access control and favourable geometry such as those in Halton Region.

BA Group's response is as follows:

**Peak hour factor**

- Contrary to Halton's assertion, it is not standard industry practice, nor is it "realistic", to apply a peak hour factor of 0.92 across the board. 0.92 is simply the default value in the Synchro analysis software. It is industry standard practice to adjust the PHF to suit the circumstances.

  For the analysis of existing conditions, standard industry practice is to calculate the *existing* peak hour factor based on *observed* traffic volumes. Accordingly, BA Group has reviewed *existing* peak hour factors based on field studies of existing conditions (data published in IR2.33-3, Appendix A "Traffic Data").

  Importantly, based on BA Group's traffic counts at existing intersections published in IR2.33-3, *existing* peak hour factors in the Town of Milton are already as high as 0.99 at a number of intersection locations. This demonstrates that at multiple locations in the Town of Milton, the road network is sufficiently mature that traffic flows are uniform throughout the entire peak hour.

  Thus, applying a lower peak hour factor of 0.92 for the analysis of future conditions would not be logical, given that they are already higher than this today.

- The Halton TIS Guidelines do not provide guidance on what peak hour factors to adopt. Engineering judgement is required to determine an appropriate factor depending on context.

- In other jurisdictions in the vicinity of Halton Region, including in Peel Region and Waterloo Region, Regional TIS guidelines recommend the adoption of a peak hour factor of 1.0 for future planning horizons. A peak hour factor of 1.0 is appropriate for future planning applications, as it ensures that a road authority does not overbuild a road network simply to accommodate the busiest 15 minutes of the day, but rather builds it to accommodate the busiest hour.

- Thus, for the purpose of BA Group's analysis, in recognition of anticipated future traffic volumes, a peak hour factor of 1.0 was adopted for the future (2021 and 2031) study horizons. This is entirely appropriate and consistent with industry practice.

**Saturation flow**

- The default saturation flow rate in the Synchro analysis software is 1,900 vehicles per hour per lane.

- While it is typical to adopt saturation flow rates of 1,900-1,950 vehicles per hour per lane for many urban conditions, there are some busy, high-capacity locations that operate with significantly higher saturation flow rates. In these cases, it is standard industry practice to undertake saturation flow studies according to established methodologies.

- The Halton TIS Guidelines do not provide guidance on what saturation flow rates adopt. Engineering judgement is required to determine an appropriate rate depending on context. However, the guidelines do state that: "*Supplementary surveys or analyses may be needed to assess saturation flows, gap availability, projected queue lengths and possible blocking queues*." (Section 3.6.1 "Capacity Analysis at Intersections")

  Thus, the Halton TIS Guidelines acknowledge that saturation flow rates can vary depending on context, and that supplementary saturation flow studies may be appropriate.

- BA Group undertook saturation flow rate studies at several busy, high-capacity Regional arterial road intersections in the Town of Milton to better understand existing saturation flow characteristics. These studies were fully documented in Attachment IR2.33-3, Appendix B "Traffic Operations Memo" – Section 2.8 Saturation Flow Rates". The studies were undertaken using Highway Capacity Manual (HCM) methodology, which is an industry-standard methodology, and is the underlying methodology used in the Synchro traffic analysis. The studies found that existing, measured, saturation flow at these locations[5] is in the order of 1,855 to 2,117 vehicles per hour per lane. Thus, BA Group quite appropriately adopted saturation flow rates of 1,850 to 2,100 at the locations where the field studies had been done, and 1,900 at other locations where field studies had not been done.

[5] Saturation flow studies were undertaken at the intersections of Derry Road / Trafalgar Road, Britannia Road / Trafalgar Road and Derry Road / James Snow Parkway.

## 5.0 OVERALL CONGESTION ASSESSMENT

Halton asserts that CN's analyses showed that a number of intersection movements would operate at level of service (LOS) E or F in 2021, "which is a failure".

BA Group's response is as follows:

- Throughout its analysis, Halton has relied on use of *level of service (LOS)* as the primary metric in determining the operation of the intersections on the road network. As context – level of service is an indication of the 'delay' experienced by a vehicle. LOS for a signalized intersection is defined in the Highway Capacity Manual (HCM) as:

  LOS A: Control Delay ≤ 10s
  LOS B: 10s < Control Delay ≤ 20s
  LOS C: 20s < Control Delay ≤ 35s
  LOS D: 35s < Control Delay ≤ 55s
  LOS E: 55s < Control Delay ≤ 80s
  LOS F: Control Delay > 80s

- However, level of service is not the industry standard for evaluating the performance of *signalized* intersections, nor is it an effective indication of how well an intersection operates. Rather, the *volume-to-capacity (V/C)* ratio is the more widely accepted, effective indicator of *signalized* intersection performance.

  For context – The volume-to-capacity (V/C) ratio is calculated by dividing the traffic volume demand by the processing capacity, taking into account a number of factors including intersection geometry, signal timing, saturation flow, distribution of volumes across the different movements, critical movements, and so on. Thus, a V/C ratio of 0 reflects zero volume, while a V/C ratio of 1.0 reflects 'at-capacity' conditions.

- For signalized intersections, the 'delay' (i.e. LOS) experienced by a user is irrelevant without taking into account other factors such as signal timing.

  Rather, a user's perception of how well a signalized intersection is operating is based on whether they can clear the intersection within a single signal cycle (i.e. within a single green phase), not necessarily on how long they are waiting during the red phase. For example, at busy intersections with few pedestrians (e.g. at Britannia Road / Trafalgar Road, Britannia Road / Regional Road 25, Steeles Avenue / Martin Street, etc.), existing signal cycles are long – between 120 seconds to 180 seconds (i.e. 2 to 3 minutes). Thus, by default, the wait time during the red phase is long (LOS E or F), but users will accept this 'delay' as long as they are still able to clear the intersection during the green phase – which is indicated by the V/C ratio.

  In particular, left turn movements are specifically designed by traffic engineers to operate at high V/C ratios, i.e. near capacity, as left turn volumes are typically lower than through volumes so they are not prioritized, and left turners will accept longer wait times as long as they are able to turn left within one cycle. For this reason, left turn movements inherently have high LOS (i.e. higher delay). But the V/C

ratio, and not the LOS, is the true indication of whether or not the left turner is able to clear the intersection within one cycle.

- We note that while LOS is not the most appropriate metric for signalized intersections, it is the most appropriate metric for evaluating *unsignalized* intersections, where user perception and experience is primarily based on the level of experienced delay. For this reason, BA Group has utilized LOS in its assessment of the proposed unsignalized Employee Access Road at Tremaine Road, as documented in IR2.33-1 (Section 7.3 “Administration Access Road / Tremaine Road”).

Canadian National

**Darren Reynolds**
Project Director

61 James Snow Parkway
Milton, Ontario Canada
L9E 0H1

July 12, 2019

Lesley Griffiths
Review Panel Chair
160 Elgin St.
Ottawa, ON K1A 0H3

By email
Dear Ms. Griffiths:

**RE: Response from Dr. Frank Bercha to CN remarks regarding accident and malfunctions**

I am writing in response to a letter sent to the Panel from the Halton Municipalities on July 10, 2019 (CEAR #942), regarding a response from Dr. Frank Bercha to CN's summation remarks delivered on June 26th regarding the Project Description and Railway Operations and Services technical session held on June 25th.

In the above-noted correspondence, provided approximately two weeks after his testimony, Dr. Bercha responded to one of the errors he had made in his interpretation of Transportation Safety Board (TSB) data, which served to significantly exaggerate the risk profile of the proposed Milton Logistics Hub. While we appreciate his acknowledgment of the error, he has unfortunately made several further (similar) errors in the additional analysis he provided.

By way of example/illustration only:

- Dr. Bercha states in the fourth full paragraph of page 2 of his response letter that CN "failed to inform the Panel that in 2016, TSB reported 7 [dangerous goods] DG Leaker occurrences, even under the new definition." CN has reviewed available data[1] regarding these incidents and can confirm that six of the seven documented DG Leaker incidents occurred on CN's network and of those, all occurred while the old definition[2] of a DG Leaker was still in effect. None of them meet or would be reportable under the new definition.[3] In fact, of the six, based on CN data, five do not actually meet the old definition either, and should not be included in the TSB's list of DG Leaker incidents. CN has no information regarding the seventh documented DG Leaker incident, which occurred on CP's network, beyond what is available on the TSB database.

- Dr. Bercha indicates in the next paragraph of his response letter:

[1] http://www.bst-tsb.gc.ca/eng/stats/rail/index.html
[2] https://laws-lois.justice.gc.ca/eng/regulations/SOR-2014-37/20140701/P1TT3xt3.html
[3] https://laws-lois.justice.gc.ca/eng/regulations/SOR-2014-37/page-3.html#h-810365

"*Second, the statistics under the prior definition of DG Leakers are still relevant. There was an average of 71.50 DG Leakers annually from 2008 to 2015, and these would have been large spills or releases of DGs, some of which resulted in serious injuries and fatalities*."

In fact, the kinds of incidents captured within the old definition of a DG Leaker were not typically large spills or releases. For example, while data are not publicly available for all of the reported DG Leakers, CN can confirm that the DG Leaker incidents reported on its intermodal network from 2008 to 2015 were typically less than 20 litres in volume. Nor – according to the TSB records – did any of the DG Leaker incidents from 2008 to 2015 (including non-CN incidents) involve serious injury or fatality.[4]

Further, the 71.50 events annually that Dr. Bercha cites as "still relevant" cover all aspects of rail operations (including all types of freight movement and handling both within and outside of rail yards) for all railroads across the entire country. As we have previously noted, using that kind of broad statistic to characterize the risk profile of a single intermodal terminal, with distinct operational characteristics, is misleading in a fundamental way.

- Finally, Dr. Bercha implies in the second paragraph of page 3 that, of the 13 events recorded for the Brampton Intermodal Terminal (BIT) in the last ten years, some were rail accidents that caused a DG release. In fact, none of the accidents/collisions/minor derailments involved the release of any DGs.

We understand that the TSB data can be confusing for those not familiar with it. It is nevertheless important that the Panel – and the members of the public who are following this proceeding – are not left with the mis-impression that the exaggerated risk profile advanced by Dr Bercha is supported by all the available data.

Thank you for your consideration of this additional information.

Sincerely,

<Original signed by>

Darren Reynolds
Project Director

Cc:
William G. McMurray, Review Panel Member (by email)
Isobel Heathcote, Review Panel Member (by email)
Joseph Ronzio, Review Panel Manager (by email)
Mark Lerner, CN Vice President
Luanne Patterson, CN Senior Systems Manager – Environmental Assessment

[4] CN reviewed TSB DG Leaker data from 2008 to 2015 available via the "Railway occurrence data from January 2004" link on the following website: http://www.bst-tsb.gc.ca/eng/stats/rail/data-1.html