Region of Halton

Environmental Impact Study Review

CN Multi-modal Yard

10 March 2017

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Region of Halton

Environmental Impact Study Review

CN Milton Multi-Modal Yard
Road Safety and Traffic Flow Review

File n° B000609

Prepared by :

Hart Solomon, P. Eng., M.Eng.

PEO Registration : 43593011

Verified by :

Ali Hadayeghi, Ph.D., P. Eng.

PEO Registration : 100115483

CIMA+
3027 Harvester Road
Suite 400
Burlington ON
L7N 3G7

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Executive Summary

CIMA+ was engaged by the Regional Municipality of Halton, the City of Burlington, the Town of Halton Hills, the Town of Milton and the Town of Oakville (the "Halton Municipalities") to review the Environmental Impact Study (E.I.S.) and associated documents and reports submitted by CN for the proposed CN Multi-Modal Yard with regards to traffic safety and traffic operations (traffic flow and congestion). We focused on the sufficiency of the traffic assessment in terms of the technical validity of the information, methods, analysis, and conclusions regarding the significance of any environmental effects, any proposed mitigation measures, and any plans for related follow-up programs. This report presents our findings, recommendations, and requests for additional information.

On an overall basis, CN's documentation as presented lacks sufficient information and detail to determine if there is the potential for significant environmental effects. As such, it does not meet the requirements of the EIS Guidelines as we understand the requirements.

In our opinion, CN has not used the correct timeframe upon which to base its measurements or assess impacts, which may result in certain conclusions being understated or not being indicative of the expected impacts. CN bases its transportation and traffic assessment on assumptions regarding yard capacity, traffic flow, road safety, rail safety and traffic congestion without providing sufficient (or any) data, information, and rationales to allow us to assess the validity of the assumptions. CN has also failed to discuss several safety issues including overall collision effects of the additional truck trips, the effects on pedestrian and cyclist collisions and the effects of additional hazardous goods movements. CN's methods and analysis are not consistent with the municipal requirements as set out in the Region's Transportation Impact Study Guidelines (TISG).

Accordingly, we have set out 15 information requests that we suggest be made to CN in respect of traffic safety and traffic operations. Most of these requests would be fulfilled if CN prepared a Transportation Impact Study for the proposed development in accordance with the Region's TISG.

1. INTRODUCTION

1.1 Purpose of Review and Scope of Report

Canadian National Railways (CN) proposes to build a multi-modal rail facility in the Town of Milton, which is in the Regional Municipality of Halton ("Halton", the "Region") in an area bounded by Britannia Road, Tremaine Road, First Line and Lower Base Line. It has been directed by the Minister of the Environment that this project will be subject to a review under the Canadian Environmental Assessment Act and also under section 98(2) of the Canada Transportation Act.

In response, CN has submitted documents to both the Canadian Environmental Assessment Agency (CEAA) and the Canadian Transportation Agency (CTA) in support of their application.

The purpose of the CIMA+ review was to determine if the Environmental Impact Study (E.I.S.) and associated documents and reports includes sufficient information and data to assess the environmental and transportation impacts of the proposed CN Multi-Modal Yard on traffic safety (including that of non-motorized road users), traffic flow/roadway congestion and other roadway associated effects. We considered whether the CN documents include the technical information and data required by the CEAA "Guidelines for the Preparation of an Environmental Impact Statement," dated July 2015 (E.I.S. Guidelines). We focused on the sufficiency of the traffic assessment in terms of the technical validity of the information, methods, analysis, and conclusions regarding the significance of any environmental effects, any proposed mitigation measures, and any plans for related follow-up programs.

The physical scope included roads immediately adjacent to the site as well as the more general road system in the Region of Halton. Also considered were railway at-grade crossings that might be impacted by the development.

We have also reviewed whether sufficient information has been provided in the E.I.S. to determine whether the project meets the requirements of the standards set out in the Halton Brief.

1.2 Qualifications

Hart Solomon, P.Eng., M.Eng.

Hart Solomon has been a Licensed Professional Engineer since 1977, specializing in traffic engineering, road safety, traffic operations, road operations and systems development. He has Bachelor of Applied Science and Master of Engineering degrees from the University of Toronto, the latter specializing in Transportation. Hart has a Diploma in Public Administration from Western University.

Hart has a wide range of experience in detailed design, traffic safety, project management of traffic engineering/traffic operations projects and in providing traffic engineering input to development, construction and major civic projects. Hart has extensive "hands-on" experience in the public sector, having spent almost his entire career at the municipal level, prior to joining CIMA+ in 2011. He led the City of Hamilton's Traffic Engineering and Traffic Operations groups for almost the entire period from 1985 to 2011, with secondments to direct the Roads and Traffic Division and to manage a major maintenance management software development and installation project. As Manager, Hart's section was responsible for reviewing the traffic aspects of all new developments in the City, which included developing the City's first Traffic Impact Study Guidelines in 2009. More recently at CIMA+, Hart has

prepared or participated in the preparation of a number of road safety studies, including those focused on pedestrians and cyclists and has been involved in assessing the safety of at-grade rail crossings.

Ali Hadayeghi, Ph.D., P.Eng.

Ali Hadayeghi, P.Eng., is a partner and vice-president of transportation group with CIMA+. Ali completed his PhD and Master's degree in Transportation Engineering at the University of Toronto and his Bachelor's degree in Civil Engineering at Ryerson University. He is a licensed professional Engineer in the provinces of Ontario, Manitoba and Saskatchewan. Dr. Hadayeghi has over 17 years of academic and practical experience in the fields of transportation planning, traffic engineering, statistical modeling and road safety. Ali has managed projects that involve transportation planning, road safety analysis, rail crossing safety, roadway capacity analysis and methodologies for analyzing collision data. Ali is currently the Chair of Road Safety Standing Committee for the Transportation Association of Canada.

2. ASSESSMENT OF CN E.I.S. REPORT, CTA APPLICATION AND TECHNICAL APPENDICES

2.1 Traffic and the EIS

The EIS Guidelines require CN to address traffic-related items including: approved transportation corridors and routes for truck traffic (Part 2, s. 2.2), forecast of volumes of truck traffic, rail transport seasonal schedules, and transportation of employees (Part 2, s. 3.2.2), socio-economic conditions (which would include the impact of the addition of truck traffic) (Part 2, s. 6.1.10 and 6.3.5), and the environmental effects of malfunctions or accidents that may occur in connection with the project (Part 2, s. 6.6.1).

Traffic impacts are also relevant to section 98(2) of the Canada Transportation Act, taking into consideration the "interests of the localities" that will be affected by the line.

2.2 Region's Transportation Study Guidelines

The Region's Transportation Impact Study Guidelines are applicable to this project and the requirements of the EIS Guidelines and s. 98(2) of the CTA. The E.I.S. does not reference the TISG. In the BA Group's assessment of the impacts of terminal-generated heavy truck traffic (Appendix E.17) it is stated that there "are no stipulated or fixed criteria applicable to undertaking the assessment provided in this study"[1]. In fact, the TISG provide clear directions for evaluating the effects of facilities.

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The Regional Official Plan, in section 173 (22), "Requires the proponent of any development considered to have a transportation impact to carry out a detailed study to assess the impact of the proposal and to recommend necessary improvements to the transportation network and services consistent with goals, objectives and policies of this Plan." The TISG is an approved Regional guideline which applies to all significant developments in the Region and gives specific direction as to how to conduct such a study.

[1] Appendix 17, p. 23

The Region has prepared, published and requires development proponents to follow the TISG, latest version dated January 2015. The TISG provide a logic framework for describing the effects on roadway flows and roadway safety, resulting from the establishment of a new development either adjacent to a road, or in the general region. The TISG requires that the study area "should extend far enough, within reason, to contain all municipal, regional and provincial roadways that will be noticeably affected by trips generated by the proposed development."

The BA Group study is not consistent with the methods, criteria or analysis requirements set out in the TISG.

2.3 Horizon Year

The term "horizon year", as per the TISG, refers to the point of time in the future on which the predictions of traffic impacts are based. The TISG allow for 5 year, 10 year or longer planning horizons, as the Region deems appropriate. The planning horizon is projected forward based on the date of the study. For a major facility such as this the time frame would be at least 10 years. **Therefore, all discussions of roadway capacity and traffic safety should be based *on the horizon year*, and not 2020.** Given the rapid traffic growth in the Milton area, the difference of seven to ten years or more in terms of the background traffic to which the multi-modal year traffic will be added, could be quite significant, especially if the current roadways are already reaching the limits of their abilities to carry traffic. As well, use of the horizon year, means that increases in use (and therefore truck traffic) at the multi-modal yard after a number of years of operation will be reflected.

Note: While the use of the Horizon year for traffic analysis was not considered in the E.I.S. or supporting documents, traffic volumes for the year 2031 were calculated for 166 road segments for air quality assessments in Attachment IR13-2 – Cumulative Air Quality Effects Assessment.

Freight flows are seasonal, and vary considerably with consumer demand, peaking in time for the December holiday season. The E.I.S. and Appendix E.17 refer to 800 entering and 800 leaving trucks per day by the year 2020. However, these volumes appear to be an average and do not account for seasonal peaking. It is known that container flows follow consumer buying trends and are heavier at peak times such as the holiday season. It would be appropriate to have the seasonal variation stated, so that the peak flows would be known. This variation should be part of the calculation of the horizon year volumes.

Topic	Reference to CN E.I.S. and Information Responses	Requested Information	Rationale
Planning Horizon E.I.S. Guidelines Part 2 s. 2.2, 3.2.2, 6.1.10, 6.3.5 and 6.6.1 Halton Brief Table D.5	Appendix E.17 states that the flows of 800 trucks in and 800 trucks out will be reached by 2020, and	T1. Horizon year Prepare and provide all calculations and conclusions based on a horizon year.	The impact of the proposed development may be significantly greater based on a time a number of years into the future, given

Topic	Reference to CN E.I.S. and Information Responses	Requested Information	Rationale
CTA s. 98(2)	this is considered "full operation"		background traffic growth, and the possibility of growth within the facility beyond opening day.
Traffic Flow E.I.S. Guidelines Part 2 s. 2.2, 3.2.2, 6.1.10 and 6.3.5 Halton Brief Table D.5 CTA s. 98(2)	The E.I.S. and Appendix E.17 both state that the expected daily truck volumes will be 800 in and 800 out.	T2. Seasonal Variations in goods movement Provide a projection of seasonal variations in truck flow in and out of the intermodal facility, including data in support.	Freight flows are seasonal and vary considerably with consumer demand, peaking in time for the December holiday season. The 800/800 volume does not appear to account for seasonal peaking.

2.4 Truck and Train Volume Assumptions

The E.I.S. on pages 2, 26 and 61 as well as in Appendix E.17, states that the expected truck traffic volumes will be 650 in plus 650 out per day, rising to 800 each way by 2020. The latter is based on 450,000 containers annually. Conversely, page 4 of E.17 suggests that the terminal will become operational in the year 2020.

Section 4.3.3 of the E.I.S. Guidelines provides: "When relying on existing information to meet requirements of the E.I.S. guidelines, the proponent with either include the information directly in the E.I.S. or clearly direct the reader to where it may obtain the information i.e., through cross-referencing). When relying on existing information, the proponent will also comment on how the data were applied to the project, separate factual lines of evidence from inference, and state any limitations on the inferences or conclusions that can be drawn from the existing information."

The truck traffic volumes were provided to the BA Group by CN, and relate back to the capacity of the yard to service containers. Appendix E. 17 does not provide any further background information, calculation or basis for these assumptions.

No fundamental basis for the stated container truck volumes is presented, nor is an upset limit presented. It is not clear if "full operation", the term used to note the 800/800 scenario, means the expected demand based on business projections, or the true capacity of the yard, operated 24/7 at maximum throughput. Appendix E.17 suggests traffic flows for the 800 (times 2) truck volumes are centered on the 0600 to 2100 time period, which would seem to suggest the potential for greater overall truck usage on a 24 hour basis. However, this report again simply states that these were the flows provided by CN developed

through an analysis of data of hourly gate volumes at the Brampton Intermodal Terminal (BIT). No background information or data was provided regarding the volumes at the Brampton Intermodal Terminal. The report simply states that the container traffic to be accommodated at the Milton project is to derive from a transfer of container traffic from the BIT.

Appendix E. 17 provides no logical foundation for this volume transferring from the BIT or being created from growth. It would be appropriate to know what the expected flows are relative to the absolute capacity of the site as proposed.

Since existing information and data regarding the BIT is used as the basis for the assumptions regarding truck and train volume and the capacity of the proposed Milton Intermodal, CN should provide the information and data it is relying on. This should be structures to provide a comparison to the proposed Milton yard, assuming no change in loading/unloading equipment type or capacity.

While the E.I.S. recognizes that there will be service-related flows (that is, employees, materials necessary to operate the yard and maintenance vehicles; non-container traffic flows) entering from Tremaine Road (as versus the container truck traffic from Britannia), these flows or their effects are not quantified anywhere in the documentation. These flows will add to the impact of the container trucks on Regional Road traffic.

Page 3 of the E.I.S. states that four trains per day will use the site, but that two of them would be existing trains, so that the overall increase in train traffic would only be two trains. It is not clear how this is to be achieved. Are two of the trains already carrying containers to the Brampton Yard and will be diverted? Will two trains be greatly extended in length? Or will CN somehow divert two existing trains completely away from the Region to be replaced by container trains destined for the new yard?

Topic	Reference to CN E.I.S. and Information Responses	Requested Information	Rationale
Yard Capacity E.I.S. Guidelines Part 2 s. 4.3.3, Part 2, s. 2.2, 3.2.2, 6.1.10, 6.3.5 Halton Brief Table D.5 CTA s. 98(2)	Appendix E. 17, sections 1.0	T3. Brampton Intermodal Terminal information and data Please provide all data and information regarding the Brampton Intermodal Terminal in support of the assumptions regarding truck and train volumes and the capacity of the proposed Milton Intermodal. Include the size of the	Existing information and data regarding the Brampton Intermodal Terminal is used as the basis for the assumptions regarding truck and train volume and the use/capacity of the proposed Milton Intermodal Hub. CN should provide the information and data it is relying on as required by Section

Topic	Reference to CN E.I.S. and Information Responses	Requested Information	Rationale
		Brampton yard, the number of truck trips generated by that facility, and data and information forming the basis of the transfer of traffic from the Brampton Intermodal to the Milton facility.	4.3.3 of the E.I.S. Guidelines.
Yard Capacity E.I.S. Guidelines Part 2, s. 2.2, 3.2.2, 6.1.10 and 6.3.5 Halton Brief Table D.5 CTA s. 98(2)	Appendix E. 17, sections 1.0, 6.1	T4. Yard capacity projections of truck and train trips Please provide yard ultimate capacity, in terms of trains and containers, and when capacity may be achieved, so an understanding of the absolute traffic can be projected along with a projection of the actual proposed truck and other user vehicular and train flows for the design horizon.	It is important to understand the true capacity of the facility, and expected flows at the design horizon date so that mitigation can be determined in advance.

2.5 Traffic Flow Distribution – Temporal and Spatial

Page 2 of the E.I.S. states that the 800/800 truck flows will have "the predominant flow of truck traffic occurring on weekdays, during the daytime." On page 61, a slightly different statement is made: "More specifically, it is estimated that approximately 85% of truck movements will occur between 06:00 and 21:00 as identified in the Review of Terminal-Generated Truck Traffic (Appendix E.17)".

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No foundation is provided for the assumption that the time of arrival/departure of the trucks will be the same as for the Brampton Intermodal Terminal. Appendix E.17 bases the temporal distribution on the demand and usage of the BIT, based on data provided by CN of inbound and outbound gate movements at the BIT over the course of a year. This data was not provided or described in any detail in the E.I.S, nor is any foundation provided for the assumption that the time of arrival/departure of trucks will be the

same as for the Brampton Intermodal Terminal. The BA Group assumes: "Since container traffic to be accommodated at the proposed Terminal is to derive from a transfer of container traffic from the BIT, BA Group determined that the pattern of hourly truck movements would be a reasonable proxy for the estimation of future heavy-truck movements at the Terminal."

CN states that the BIT is approaching capacity, while the Milton Yard is to be newly opened. Using the travel profile from a yard that is approaching capacity (E.I.S. 1.2, page 2) and applying it to one that is being developed to accept new and overflow business may not portray the true yard usage accurately. Also, by using the BIT profile, truck traffic is spread out across the day and smaller volumes are assumed to travel the roads during peak hours, thereby minimizing the effect of the new truck traffic on the road system, which may not reflect the pattern if the Milton Yard were implemented.

The basis for the travel patterns to and from the proposed Milton Yard is not sufficiently documented or substantiated. With regard to the directional distribution of terminal-generated heavy-truck trips, the BA Group relied on information collected through a comprehensive Commercial Vehicle Survey undertaken by the Ministry of Transportation of Ontario (MTO) at the existing BIT. The data and results of this survey were not provided in the E.I.S. The BA Group adopts the origin-destination information collected through the MTO survey at BIT as "suitably representative of the distribution of truck trips generated" by the Milton Yard based on CN's advice that the "same customer base will be served by the relocation of container traffic from the BIT to the proposed Terminal in Milton in 2020." No evidence or support for this assumption is provided.

Further, it is not clear in Appendix E.17 whether the same pattern as the Brampton Terminal was used or whether it was customized for the Milton Yard. The travel patterns leaving the yard seem oriented toward Toronto. Page 1 of Appendix E.17 states, in regard to the proposed terminal, that "The local movement of containers, primarily within the western Greater Toronto and Hamilton area ("GTHA"), is facilitated by truck." This implies that the truck flows would have a westerly orientation rather than toward Toronto as evidenced by the information such as Figure 4 or Appendix E.17. The basis for the geographic distribution needs to be substantiated and described in more detail.

Topic	Reference to CN E.I.S. and Information Responses	Requested Information	Rationale
Heavy Truck Traffic Time of Day Flow Distribution E.I.S. Guidelines Part 2, s. 2.2, 3.2.2, 6.1.10, 6.3.5, and 4.3.3 Halton Brief Table D.5 CTA s. 98(2)	Appendix E. 17, sections 1.0, 6.1	T5. Hourly flow of trucks Please provide the BIT hourly flow rates and provide the foundation for the assumption that the pattern of hourly truck movements at BIT is an accurate projection of the hourly flow rates of trucks in and out of the Milton facility.	CN does not provide any foundation for its assumption that the time of arrival/departure of trucks will be the same as for the Brampton Intermodal Terminal. Using the Brampton Intermodal provides potentially misleading results if that yard is in fact near capacity.

Topic	Reference to CN E.I.S. and Information Responses	Requested Information	Rationale
		Please provide an in-depth and accurate projection for the hourly flow rates of trucks in and out of the Milton Intermodal facility, for start-up and for the horizon year, including seasonal variations.	
Geographic Distribution of Heavy Truck Trips E.I.S. Guidelines Part 2, s. 2.2, 3.2.2, 6.1.10, 6.3.5, and 4.3.3 Halton Brief Table D.5 CTA s. 98(2)	Appendix E. 17, sections 3.0 to 5.0	T6. Origin/destination of truck trips Please provide the comprehensive Commercial Vehicle Survey undertaken by MTO at the existing BIT, including all data and results. Please provide additional information on the way the origin/destination of truck trips for the proposed facility was calculated. Are those the same as the Brampton Yard, or have they been customized, taking into the account the location of the proposed Milton site relative to its customers ?	The foundation for the BA Group's assumptions regarding travel patterns to and from the Milton Yard is not provided. CN should provide the information and data it is relying on as required by Section 4.3.3 of the E.I.S. Guidelines.

2.6 Road Safety for the Roads/Intersections Immediately Adjacent to the Site and In the Area

2.6.1 Road Safety for the Intersections Immediately Adjacent to the Site

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Two new entrances are planned for the facility: one for the container trucks (off Britannia Road) and one for employees/service vehicles off Tremaine Road. It is proposed that the Britannia Road entrance be signalized and the Tremaine Road entrance be stop-controlled for the entrance only. The E.I.S. concludes that the risk of motor vehicle collisions at the two intersections is low, and that risk of traffic

accidents and the long-term effect is not significant[2]. No numerical analysis is provided to compare predicted collision patterns with other Regional intersections. As required in the TISG, a thorough evaluation of the collision potential of the two new proposed intersections adjacent to the site should be provided.

Three mitigation measures are noted in the E.I.S.: the installation of traffic signal control for the main truck access, creation of a left turn lane at the truck access, and creating a queueing area inside the facility so that trucks waiting to enter do not back up onto the public roadway system. No connection between the potential risk and the mitigation measures is provided. The report places all other (and future) responsibility for mitigation on the users and the local road authorities. Under mitigation, it also mentions "Project-specific and standard mitigation, including on-going communication with local and regional service providers, including emergency services". Section 6.6.2.6.2 of the E.I.S. refers to the Ontario legislation *Making Ontario's Roads Safer Act*, and implies that by local authorities implementing these new provisions that the roads around the Milton Yard will be made safer. The new legislation has provisions about distracted driving, pedestrian crossing facilities and passing of cyclists. If either of these latter two measures are expected to reduce collisions, this needs further explanation since the collision data was not provided, nor was the connection to the legislation made clear.

2.6.2 Road Safety for Roadways Immediately Adjacent and the Regional Road System on a Wider Scale

No assessment of the safety impacts of the additional truck trips through the LAA and RAA (Local Assessment Area and Regional Assessment Area) parts of the system was provided. The LAA is the area around the proposed facility while the RAA is the broader regional road system. For Tremaine Road and Britannia Road, it is stated that: "standard traffic safety measures will be implemented."[3] While the starting point is 1600 trips per day, it is not clear what the horizon year volumes might be, and there is the potential that they are much larger. The safety impacts on Tremaine and Britannia Roads should be quantified.

No safety analysis is provided for the broader Regional road system, between the proposed facility and the provincial 400 series highways which are the major origin or destination. As per the TISG, key intersections in the LAA and the RAA should be checked to see the effect of the added trucks, based on the horizon year background volumes as projected. As required in the TISG, these effects should be analyzed, summed and defined, and mitigation proposed, as required.

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2.6.3 Road Safety for the Cyclists and Pedestrians

No assessment of the impacts of the additional truck and general purpose traffic on the cycling and walking network is provided. The Halton Active Transportation Master Plan[4] was adopted by Halton Regional Council in November of 2015. It includes proposed cycling lanes and proposed multi-use

[2] Summary of E.I.S., 6.6.3., page 57
[3] E.I.S, Summary section 6.6.3, page 56
[4] Halton Active Transportation Master Plan, Report PW-17-15 to the Planning and Public Works Committee, as amended and approved by Regional Council.

boulevard trails on both Britannia Road and Tremaine Road beside the proposed facility. The interaction of the increased truck traffic with the cycling lanes, in particular, should be addressed.

2.6.4 Road Safety at At-Grade Rail Crossings

No safety assessment of grade crossings is provided. The requirement for grade separation (underpass or overpass) for the rail crossings at Lower Base Line and Britannia Road are recognized and discussed. However, the additional train and road traffic may raise the risk levels at other at-grade level crossings in the Region. Each of the level crossings impacted by either increased train or increased truck traffic needs to be assessed and the overall effect identified and summed. It may be that the added road and train traffic is sufficient to change the requirements for crossing protection type under Transport Canada requirements.

2.6.5 Hazardous Goods Movement

The E.I.S.[5] indicates that approximately 2.7% of shipments contain goods classified as hazardous. This equates to over 12,000 new hazardous loads being introduced annually to either the rail lines or roads in Halton, or both. It is indicated that these would be handled in accordance with the *Transportation of Dangerous Goods Act.* No indication of the potential increase in risk associated with these goods is defined, nor is any mitigation discussed.

2.6.6 Information Requests regarding Road Safety

Topic	Reference to CN E.I.S. and Information Responses	Requested Information	Rationale
Road Safety – Adjacent Intersections and Adjacent Roadways E.I.S. Guidelines part 1, s. 3.2, Part 2, s. 2.2, 6.1.10, 6.3.5, 6.4 and 6.6.1 Halton Brief Table D.5 CTA s. 98(2)	E.I.S. p. iv., sections 6.6.2.6, 10.1.2, Tables 6.5.1, 10.1 and 10.2 Appendix E. 17, sections 1.0 and 5.0	T7. Collision prediction for two adjacent intersections and two adjacent roadways Please provide a collision prediction for the two new proposed intersections based on detailed intersection information. Please assess the effects of the additional truck and service traffic on Tremaine and Britannia Roads. Please provide data and analysis in support of the mitigation measures proposed.	Stated as being “not significant”, but not quantified or compared to any standard.

[5] E.I.S., Section 3.4.2

Topic	Reference to CN E.I.S. and Information Responses	Requested Information	Rationale
		Please provide any additional proposed mitigation for collisions based on the expected performance of the two adjacent intersections and roadways, compared to typical intersections/roadways carrying the same flows.	
Road Safety – Region-wide E.I.S. Guidelines part 1, s. 3.2, Part 2, s. 2.2, 6.1.10, 6.3.5, 6.4 and 6.6.1 Halton Brief Table D.5 CTA s. 98(2)	Not addressed in the E.I.S.	T8. Expected vehicular collision occurrence overall across the Region Please provide an analysis of the collision effects across the Region as a result of traffic generated by the yard, and proposed mitigation, for the horizon year.	On a broader base, the collision effects are much smaller at individual intersections but may add up to a significant amount in total.
Road Safety _ Vulnerable Road Users E.I.S. Guidelines part 1, s. 3.2, Part 2, s. 2.2, 6.1.10, 6.3.5, and 6.6.1 Halton Brief Table D.5 CTA s. 98(2)	Not addressed in the E.I.S.	T9. Expected safety impact on cycling and walking on roads bordering the proposed facility Please provide an analysis of cyclist and pedestrian safety on Tremaine Road and Britannia Road adjacent to the facility, with emphasis on the entrance intersections, accounting for the proposed Regional cycling and trail facilities.	The E.I.S. Guidelines at section 6.3.5 require an assessment of the safety impacts on cycling and walking at the two entrance points of the facility. Given the Region's plan to upgrade facilities in the area to provide bicycle lanes and multi-use paths, safety around the west and north sides of the property for cyclists and pedestrians should be assessed.
Road Safety – Rail Crossings E.I.S. Guidelines part 1, s. 3.2, Part 2, s. 2.2, 3.1, 6.1.10, 6.3.5, and 6.6.1 Halton Brief Table D.5	Not addressed in the E.I.S.	T10. At-grade rail crossing review Please provide analysis of all at-grade rail crossings impacted by the increased rail and/or truck flows,	The requirement for grade separation (underpass or overpass) for the rail crossings at Lower Base Line and Britannia Road are recognized and discussed.

Topic	Reference to CN E.I.S. and Information Responses	Requested Information	Rationale
CTA s. 98(2)		based in the horizon year.	However, the additional train and road traffic may raise the risk levels at other at-grade level crossings in the Region.
Road Safety – Hazardous Goods E.I.S. Guidelines part 1, s. 3.2, Part 2, s. 2.2, 6.1.10, 6.3.5, 6.4 and 6.6.1 Halton Brief Table D.5 CTA s. 98(2)	E.I.S. 3.4.2, 6.6.2, 6.6.2.4, 6.6.2.5, 6.6.2.7	T11. Hazardous goods movement Please provide an assessment of the Region-wide risk of incidents involving hazardous goods, and propose mitigation measures.	No indication of the potential increase in risk associated with these goods is defined, nor is any mitigation discussed.

2.7 Road Operations for the Roads/Intersections Immediately Adjacent to the Site and In the Greater Regional Area

2.7.1 Truck Percentage Calculations

The effects of heavy trucks on key intersections is presented in a way that appears to understate the effect. Appendix E.17, the BA Group Assessment of Truck Traffic Flows, provides a depiction of the travel patterns and time of day of heavy vehicle flows. The presentation of the data in Tables 2 through 9 of the change in truck percentages is somewhat misleading. In each there is a column are headed "Change in Percentage of Heavy Vehicles". The numbers presented are calculated as if considering trucks to be the same as light vehicles as a percentage of the total traffic stream entering an intersection. It is not the change in the volumes of heavy vehicles itself, so the numbers shown are much smaller. An example: in Table 5, the fifth entry shows truck volumes entering the Britannia/RR 25 intersection as rising from 43 to 144 in the afternoon peak hour, but defines this as a 4.31% increase. In reality, this is 165% increase in truck traffic.

Even if it was preferred to show the truck traffic as a proportion of total traffic, the tables are still misleading, as the effect of a heavy truck on intersection operation is typically evaluated as being 2.5 to 3.5 passenger car units. The Canadian Capacity Guide for Signalized Intersections (which is not referenced in the E.I.S.) defines procedures for evaluating the performance of intersections under the control of traffic signals and includes a table[6] showing the equivalency between passenger cars and heavier vehicles, including laden trucks (for multi-unit trucks, the equivalency ranges from 2.5 to 3.5

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[6] Canadian Capacity Guide for Signalized Intersections, Canadian Institute of Transportation Engineers, February 2008, Table 3.2.

depending on how heavily loaded the truck is). This equivalency is understandable due to the performance (acceleration and braking) characteristics of heavy vehicles, so the 4.31% increase noted above is in reality the same as a 10 to 15 % increase in light vehicle traffic. Truck flows should be converted to passenger car equivalents when considering capacity effects.

The impacts of heavy trucks have been quantified in Appendix E.17 for both road sections and intersections. This was done for both by categorizing the flows into three levels of change: Imperceptible, Noticeable and Considerable. As noted above, in the appendix the criteria were based on the authors' engineering judgement rather than any accepted standard. The assessment was done on an absolute basis, not in comparison to the existing background truck volumes. However, the recognized calculation technique required by the TISG, the use of volume-to-capacity ratios, was not undertaken.

2.7.2 Road Operations for the Roads/Intersections Immediately Adjacent to the Site

No numerical assessment (level of service, delay) is presented for the operation of the two new proposed intersections, or how they will impact on flows on the road other than to note that the extended entry length will provide sufficient storage that truck traffic will not back up onto the Regional road system. Capacity and sight-distance calculations should be performed for the adjacent signalized and stop-controlled intersections and these should be done in the context of the horizon year, or even yard capacity.

CN proposes mitigation measures for the entry intersections[7]: to "seek collaboration with Halton Region to install a signalized intersection, as necessary, on Britannia Road with a turning lane for trucks entering the terminal from the east, to manage vehicle movements and the safety of other road users, including motor vehicle operators, cyclists and pedestrians." No confirmation or calculation as to the need for a traffic signal or the effect on Britannia Road flows is provided, nor are any other measures presented. Similarly, one-way stop control is proposed for the service entrance on Tremaine Road, but no assessment of the applicability or expected impacts of this form of control is presented. It is stated that "Improvements associated with this entrance will be determined at a later stage through discussions with Halton Region."[8]

The E.I.S. expects noticeable and considerable change to be experienced along Britannia Road and Tremaine Road[9]. This reflects the proposed increase in traffic, although the effects are not quantified in terms of level of service changes. The E.I.S. assumes that the impacts can be mitigated through:[10] "reasonable and convention traffic engineering and operational control measures that would not result in a significant increase in road congestion". The E.I.S. states that these measures would be developed in consultation with Halton Region and could include signal timing changes, signage, adjustment to queuing lanes, new turn lanes and the provisions to ensure the safety of pedestrians and cyclists."[11] A detailed list of measures is provided in Attachment IR23[12], but no analysis is given as to whether or the degree to

[7] Appendix G, page G.7
[8] E.I.S. page 48.
[9] E.I.S. page 28.
[10] E.I.S. page 28.
[11] Appendix E.17, page 24
[12] CN Response to CEAA Information Request 1, May 18, 2016, Attachment IR23, Supplemental Mitigation Measures, page 7

which these measures would be effective. The combination of the horizon year background traffic flows and possibly more intensive use of the facility may present a different scenario from that in the E.I.S. which requires a revised analysis. A clear statement of the mitigation measures expected to be needed for the horizon year should be presented along with their predicted effectiveness in addressing congestion.

2.7.3 Road Operations for the Roads/Intersections in the Greater Regional Area

No mention is made in the E.I.S. of the socio-economic effect of adding 1600 (or many more) heavy vehicles trips daily to the overall traffic flow. For intersections close to the site, as depicted in Figures 11 and 12 of Appendix E.17, the impact of the additional heavy truck traffic may be sufficient to cause significant additional congestion. Under the TISG requirements, these intersections should be assessed under initial and expanded development conditions for current and horizon time periods, to ensure that the additional truck traffic does not push these intersections into unsatisfactory levels of service. Truck volumes should be properly expanded to passenger car equivalents.

2.7.4 Restricted Load Roadways

Appendix E.17 (page 3) discusses the issue of roadways which have reduced load restrictions (which are defined by the Region as 5 metric tonnes per axle). Some are restricted from March 1 to April 31 each year due to spring thaw conditions while others have permanent, 12 month restrictions. Both Britannia Road and parts of Tremaine Road are in this category. In fact, Britannia Road across the proposed entrance all the way to Highway 407 has a spring-time restriction, while Tremaine Road from Britannia Road south to Highway 407 has a permanent restriction. These are two of the major paths from the proposed facility toward the 400-series highways that are the expected origin and destination of much of the facility truck traffic (as presented in Appendix E.17). The stated assumption is that all roads scheduled for upgrading under the Halton Transportation Master Plan will be completed by the time the Milton Multimodal Yard is operational. No contingency plan is presented, nor is any plan discussed for construction access of construction vehicles either during the half-load periods or until the adjacent roads are upgraded.

2.7.5 Information Requests regarding Road Operations

Topic	Reference to CN E.I.S. and Information Responses	Requested Information	Rationale
Road Operations – Truck Volumes E.I.S. Guidelines Part 2, s. 3.2.2, 6.1.10 and 6.3.5 Halton Brief Table D.5 CTA s. 98(2)	Appendix E. 17, Tables 2 through 9	T12. Increase in truck traffic Please provide calculations regarding the increase in truck traffic as a result of the Milton Facility, considering horizon year and appropriate	Tables 2 through 9 in Appendix E. 17 are misleading as they do not correctly show the change in volumes of heavy vehicles, nor are they based on the horizon year.

Topic	Reference to CN E.I.S. and Information Responses	Requested Information	Rationale
		(stated) truck equivalency factors.	
Road Operations – Congestion, Adjacent Roads E.I.S. Guidelines Part 2, s. 3.2.2, 6.1.10,6.3.5 and 6.4 Halton Brief Table D.5 CTA s. 98(2)	E.I.S. page 28, Appendix E. 17, sections 6.2, 6.3, and 7.0	T13. Expected congestion increases (adjacent roads and intersections) Please provide an analysis of the two new intersections and the two adjacent roadways in terms of their level of service, based on the horizon year, to determine level of service and delay, and whether there are any flow or queuing effects beyond the intersections. Use passenger car equivalents for truck volumes. Capacity and sight-distance calculations should be performed for the adjacent signalized and stop-controlled intersections. Please provide a clear statement of the mitigation measures expected to be required for the horizon year, along with details, data and analysis regarding their predicted effectiveness in addressing congestion	An assessment of the new intersections to be built adjacent to the site as well as the boundary roadways should be conducted for the horizon year. Mitigation actions may follow from this assessment.
Road Operations – Region-wide Intersections	E.I.S. page 28, Appendix E. 17, sections 6.2, 6.3, and 7.0	T14. Expected congestion increases (area-wide roads and intersections)	No assessment of the socio-economic impacts of the additional truck traffic generated by the

Topic	Reference to CN E.I.S. and Information Responses	Requested Information	Rationale
E.I.S. Guidelines Part 2, s. 3.2.2, 6.1.10, 6.3.5 and 6.4 Halton Brief Table D.5 CTA s. 98(2)		Please provide an analysis of major Regional intersections in terms of their level of service, based on horizon year, and using truck volumes expanded to passenger car equivalents. Please provide proposed mitigation measures.	proposed facility is provided.
Road Operations – Reduced Load Roadways E.I.S. Guidelines Part 2, s. 3.2.2, 6.1.10 and 6.3.5 Halton Brief Table D.5 CTA s. 98(2)	Appendix E. 17	T15. Reduced load roadway requirements. Please provide an assessment in the event that all roads in the area have not been reconstructed and that load restrictions are in place during spring thaw. Please provide contingency plans and assessment of construction traffic management during reduced load periods.	Contingency and construction plans.

3. MUNICIPAL STANDARDS

I have been asked to list any technical information within my expertise that is necessary to apply the standards in the Halton Brief relevant to my area of expertise. The municipal standards and definitions below are from the Halton Brief. My commentary is limited to the second, third, and fourth columns of the below table.

Municipal Standard with references to Halton Brief Appendices A & B	Additional Information required to apply the standard	Does CN propose mitigation relevant to this standard?	Does CN propose any follow-up relevant to this standard?
Major Transportation Facilities To adopt a functional plan of *major* transportation *facilities*[13] for the purpose of meeting travel demands for year 2021 as well as protecting key components of the future *transportation system*[14] to meet travel demands beyond year 2021 (ROP Reference 173(1)) Halton Brief, Table D.5 Halton Brief, App. B, Part C.3.1 Halton Brief, App. A, fig 23: Major Transportation Facilities	Complete assessment of all effects, safety and congestion, predicted to occur as a result of the development, conducted as per the Region's TISG. Please see **T1-T4, T5, T6, T7 – T11, T12 – T15** in this report. Base assumptions must be properly substantiated, and put correctly in the context of this site, based on a horizon year. Please see **T1-T4** in this report.	Yes, but it is not possible to determine if the mitigation will be sufficient. With respect of two adjacent intersections, CN has proposed the installation of traffic signal control for the main truck access off Britannia (if required), creation of a left turn lane at the truck access, and creating a queueing area inside the facility. CN also proposes stop control for the service entrance off Tremaine. CN noted that "The residual effect on road safety for road users will largely be managed through Project-specific and standard mitigation including on-going communication with local and regional service	No. CN deferred follow-up to local authorities after the Project is built, with intent to communicate.

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[13] **Major facilities (PPS):** Facilities which may require separation from sensitive land uses, including but not limited to airports, transportation infrastructure and corridors, rail facilities, marine facilities, sewage treatment facilities, waste management systems, oil and gas pipelines, industries, energy generation facilities and transmission systems, and resource extraction activities. **Major goods movement facilities and corridors (PPS):** Transportation facilities and corridors associated with the inter- and intra-provincial movement of goods. Examples include: intermodal facilities, ports, airports, rail facilities, truck terminals, freight corridors, freight facilities, and haul routes and primary transportation corridors used for the movement of goods. Approaches that are freight-supportive may be recommended in guidelines development by the Province or based on municipal approaches that achieve the same objectives.

[14] **Transportation system (GP):** A system consisting of corridors and rights-of-way for the movement of people and goods, and associated transportation facilities including transit stops and stations, cycle lanes, bus lanes, high occupancy vehicle lanes, rail facilities, park-and-ride lots, service centres, rest stops, vehicle inspection stations, inter-modal terminals, harbours, and associated facilities such as storage and maintenance (Provincial Policy Statement, 2005).

Municipal Standard with references to Halton Brief Appendices A & B	Additional Information required to apply the standard	Does CN propose mitigation relevant to this standard?	Does CN propose any follow-up relevant to this standard?
	Effects identified should not only be immediate to the site (**T7, T9, T13)**, but Region-wide (**T8, T10, T11, T14)**, as appropriate. Mitigation can then be identified and validated based on a thorough understanding of the expected impacts. Requests **T7, T11, T8, T13** and **T14** discuss mitigation measures.	providers, including emergency services," For Tremaine Road and Britannia Road, CN states that: "standard traffic safety measures will be implemented…All traffic is expected to conform to the *Highway Traffic Act of Ontario*. It is anticipated the new *Making Ontario's Roads Safer Act* will also be enforced by local authorities where appropriate to reduce potential accidents. To further reduce potential interactions between truck traffic entering the Terminal site, 6 queuing lanes to accommodate approximately 140 trucks will be built.." The standard safety measures referred to include adjusted traffic signal timing, provision of advisory or regulatory signage, adjustments to the length of vehicle storage lanes, addition of auxiliary left or right turn lanes and provisions to address safety of pedestrians and cyclists. See also the proposed grade separations referred to in the next section. **Response:** No specifics for number, or location, of these measures is stated. No justification for or validation of the sufficiency of these measures has been provided. In fact, the main safety measure proposed, that of a traffic signal at the main entrance is noted as "if required".	

Municipal Standard with references to Halton Brief Appendices A & B	Additional Information required to apply the standard	Does CN propose mitigation relevant to this standard?	Does CN propose any follow-up relevant to this standard?
		No mitigation of safety impacts or road congestion effects is proposed beyond the immediate area of Tremaine and Britannia Roads Much of the mitigation noted is deferred to local authorities.	
Railway Networks and Crossings To support the provision of a safe and efficient railway network by securing grade separations of railways and *arterial roads*[15] where warranted, supporting the monitoring and necessary actions to improve the safety of the movement of dangerous goods by rail, and ensuring where possible compatible uses adjacent or in proximity to *railway corridors*[16] and terminal facilities including railway yards and intermodal facilities (ROP Reference 147(18)) Halton Brief, Table D.5 Halton Brief, App. B, Part C.3.3 Halton Brief, App. A, fig 24: Train Lengths North Halton Brief, App. A, fig 25: Train Lengths South	Safety impacts of increased road and rail traffic on at-grade crossings across the Region, compared to Transport Canada standards for crossing protection. Please see **T15** in this report.	Yes. CN proposed grade separations on Lower Base Line and Britannia Road. No mention is made of any other at-grade crossing in the Region which might be impacted. Response: The changes to other at-grade crossings in the Region (increased train or traffic volumes) as a result of this Project may result in the requirement to upgrade at-grade crossing protection – this is not considered in the E.I.S.	None discussed.

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[15] **Arterial roads (ROP):** A Major Arterial, a Multi-Purpose Arterial, or a Minor Arterial as shown on Map 3 of this Plan (the ROP).
[16] **Transportation corridors (GP):** A thoroughfare and its associated buffer zone for passage or conveyance of vehicles or people. A transportation corridor includes any or all of the following: a) Major roads, arterial roads, and highways for moving people and goods; b) Rail lines/railways for moving people and goods; c) Transit rights-of-way/transitways including buses and light rail for moving people.

4. CONCLUSIONS

The proposed Project will create additional traffic flows in the Region, particularly heavy truck traffic. These flows will have impacts, perhaps significant, on human health (motor vehicle collisions) and socio-economically (roadway congestion). While the E.I.S. and associated documents address some of the potential issues, the approach taken to predict the effects is neither rigorous enough, nor complete enough to understand the expected impacts, especially a number of years into the future.

Mitigation measures are discussed, but with the exception of two railway grade separations, the mitigation measures are presented as potential actions, without clear commitment to numbers, locations or details. The mitigation measures are often defined as the responsibility of the road authority, and left to be worked out after the development has opened.

Complete, in-depth analyses done according to accepted industry and Regional standards are required to assess the effects on traffic safety and traffic flows resulting from the proposed development. This would allow the development, more accurately, in advance, of any necessary mitigation measures, thereby protecting human health and the socio-economic base from the outset.

APPENDIX A

Region of Halton

Transportation Impact Study Guidelines,

January 2015

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TRANSPORTATION IMPACT STUDY GUIDELINES

Dated: January 2015

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1.0 INTRODUCTION

1.1 Transportation Impact Study

The goal of a Transportation Impact Study (TIS) is to assess the potential effects of traffic caused by a proposed development on Regional and local roadways and to identify the required roadway and access improvements needed to ensure that the roadway system will operate at an acceptable level upon completion of the proposed development.

Transportation Impact Studies are an important part of the development review and approval process to assist developers and public agencies in making land use decisions, such as Official Plan amendments, re-zonings, subdivisions, site plans, planning approvals and other development reviews, where the proposal may have a significant impact on traffic and transportation operations.

Transportation Impact Studies benefit the municipality by:

- Providing decision makers with a basis on which to assess transportation implications of proposed development applications;
- Providing a rational basis on which to evaluate if the scale of development is appropriate for a particular site and what improvements may be necessary, on and off the site, to provide safe and efficient access and traffic flow;
- Providing a basis for assessing existing or future localized transportation system deficiencies that should be improved;
- Addressing transportation-related issues associated with development proposals that may be of concern to neighbouring residents, businesses and property owners; and

A Transportation Impact Study may vary in scope and complexity depending on the type and size of the proposed development.

1.2 Need and Justification

Halton Region has prepared these guidelines in order to streamline the approval process and provide a standardized framework for consultants to follow when submitting traffic/transportation studies for review and should be complemented with appropriate transportation engineering judgement.

1.3 Purpose of Guidelines

The purpose of these guidelines is to ensure that Transportation Impact Studies prepared for the Region's review meet the following criteria:

- Objective assessment – the study will evaluate the impacts of proposed new development in a rational manner;
- Consistency – the study will utilize assumptions consistent with the Region's accepted methodologies and parameters and thus be comparable to other transportation studies in the Region;

- Recognized by developers and consultants – the guidelines will provide a standard approach to be followed and will reduce confusion and delay in processing development proposals;
- Promote understanding of process – the steps outlined in these guidelines will enable proponents, reviewers and elected officials to understand the process more effectively; and
- Ease of review by staff – a standardized set of guidelines will aid the efficiency of staff in reviewing Transportation Impact Studies.

1.4 Transportation Demand Management

Transportation Demand Management (TDM) is a term used to describe a wide variety of initiatives aimed at reducing the amount of travel by single occupant vehicles and achieving a more balanced mode split in the transportation system, particularly during the commuter peak hours.

The Region launched the Smart Commute Initiative in 2006 which is a program of Metrolinx and the municipalities in the GTHA. Smart Commute Halton encourages active and sustainable transportation by offering services and tools designed to make commuting easier for the employees of local organizations. Smart Commute is continuing to expand across the Region in partnership with Metrolinx, the local municipalities and local employers.

Traffic Impact Studies should consider TDM initiatives such as:

-Promotion and support for reduced single occupant vehicle use through carpool programs,
-Promotion of transit and employer subsidized transit programs,
-Implementation of bicycle/pedestrian infrastructure and bikeshare programs,
-Multi-modal marketing programs (web site, access guides, individualized marketing programs, information kiosks, way-finding signage, emergency ride home),
-Parking Programs (transportation allowance, preferential parking, unbundled parking),
-Alternative Work Programs (compressed work weeks, flexible work schedules, telework programs)

2.0 GENERAL TRANSPORTATION IMPACT STUDY REQUIREMENTS

2.1 Staff Consultation

It is imperative that prior to commencing a Transportation Impact Study, the consultant meet with Regional and area municipal staff, as appropriate, in order to review the level of detail and confirm the Scope of Work for the TIS, arrange contacts with the various affected road jurisdictions and to determine data requirements and its availability.

In addition to Halton Region requirements, the area municipal and provincial roadway authorities may require additional information or analysis to satisfy their requirements for a development/redevelopment proposal. The proponent should contact these roadway authorities, where applicable, to determine these requirements.

2.2 Study Updates

Generally, a Transportation Impact Study will have a "shelf life" of five years. Major changes within the study area may reduce the "life" of the document if they were not considered in the impact assessment. Where the timing of subsequent development approvals exceeds five years, a new study will generally be required.

2.3 Data Collection

The applicant must provide both electronic and hard copies of all raw data collected for the TIS. This includes but is not limited to the following:

- Turning Movement Counts;
- Traffic signal timings;
- ATR & AADT counts;
- Collision records;
- Gap Study observations;
- Queue Studies;
- Proxy site surveys;
- Cordon counts;
- Transit information
- Pedestrian and Cyclist circulation plan;
- Other data as requested

3.0 Transportation Impact Study Outline

The following sections outline the format and requirements of the Transportation Impact Study. Area municipal or provincial roadway authorities may require additional information or analyses beyond the Regional requirements outlined in these guidelines. The contents and extent of the TIS generally depend on the location and size of the proposed development/redevelopment and the conditions prevailing in the surrounding area.

3.1 Description of the Proposal and the Study Area.

A description of the development proposal, its location and the proposed Transportation Impact Study area is required to permit Regional Staff to identify the site location, its anticipated operation and area of potential impact. In addition, this information allows timely review of key study assumptions ranging from the study area limits and horizon years to the trip assignment assumptions.

3.1.1 Description of the Development or Redevelopment Proposal

The Transportation Impact Study should provide a full description of the proposed development. This may include the following elements, as applicable:

- Municipal address;
- Existing land uses or permitted use provisions in an Official Plan, Official Plan Amendments, Zoning By-law etc.
- Proposed land uses and relevant planning regulations to be used in the study;

- Total building size and building locations;
- Floor space including a summary of each type of use/number of residential units;
- Anticipated date of occupancy;
- Approximate hours of operations;
- Planned phasing of the development;
- **Near-by intersections and accesses to adjacent developments and those on the opposite side of the road including type of control;**
- Proposed access points and type of access (full movement, right-in-right-out, turning movement restrictions, etc.);
- Nearby transit facilities/stops;
- Near-by Active Transportation Facilities – sidewalks, multi-use trails, bike lanes, etc.,

It is a requirement to provide a site plan, of a suitable scale, for consideration in the review of the Transportation Impact Study. If the proposed development/redevelopment is to be constructed in phases, describe each phase and the proposed timing of implementation.

3.1.2 Study Area

The study area should extend far enough, within reason, to contain all municipal, regional and provincial roadways that will be noticeably affected by the trips generated by the proposed development. The study area should be determined through the Scope of Work and the Region reserves the right to establish the study area as may be deemed necessary.

A description of the existing transportation system in the study area, using a combination of maps and other documentation should identify relevant information, such as the following:

- All adjacent and nearby roads, indicating the number of lanes, and posted speed;
- All adjacent/across and affected intersections/access, indicating type of control, access type, lane configurations, lane widths, and any turning or similar restrictions;
- If appropriate, on-street parking spaces/standing/stopping restrictions in the vicinity of the development site and those which would affect the operation of key intersections being analyzed;
- Transit routes and stops;
- Heavy vehicle prohibitions and restrictions;
- All pedestrian and cyclist routes; and
- Other transportation facilities as appropriate.

Potential future transportation improvements that are currently being considered and may facilitate the traffic demand produced by the development/redevelopment should be identified. These improvements should be described to a level of detail sufficient to assess their implications for travel to/from the development. In each case, the status and anticipated date of implementation should be identified.

3.2 Horizon Year and Time Periods for Analysis

3.2.1 Horizon Year

In general, the horizon year for impact analysis must be **five (5),** and, depending on the development size and phasing periods, ten (10) years (to be determined by Halton Region) from the date of the transportation impact study unless an earlier date for full occupancy of the project can be identified and justified in consultation with Regional staff.

3.2.2 Peak Periods

The critical time period for traffic generated by a given project is directly associated with the peaking characteristics of both the development related traffic and the transportation system traffic. Typically, the AM and PM peak traffic period will constitute the "worst case" combination of site related and background traffic; however, in the case of retail, entertainment, religious, institutional, sports facility uses, golf courses or as determined by Halton Region, the Saturday, Sunday and/or site peak may require analysis. As part of the consultation process prior to commencing the study, the consultant should determine in conjunction with Regional staff the selected time periods for analysis.

3.3 Existing Traffic Conditions

To provide a representative picture of the existing transportation conditions with exhibits showing the existing traffic volumes and turning movements for all modes of transportation for roadways and intersections in the study area including pedestrian/cyclist volumes and heavy truck movements, should be included.

Traffic volumes may be acquired from the Region, local municipalities or previous transportation planning, traffic operation or traffic impact studies undertaken in the study area. Traffic counts more than two years (2) old or counts that appear not to be reflecting existing conditions should be updated to ensure that they reflect current traffic levels. All data requests are at the cost of the Developer/Owner.

A field observation (peak one hour count at minimum) should be undertaken to verify that traffic volumes through an intersection reflect actual demand and to determine the necessary adjustments to level-of-service calculation so that actual conditions are fairly represented.

3.4 Background Traffic Growth

3.4.1 Background Traffic

The background growth in traffic should be established in consultation with Regional staff through one of the following methods:

- Estimation of roadway growth factors from a calibrated traffic forecast model;
- A growth rate based on area transportation studies.

In some situations, alternative assumption or methods, such as the application of development absorption rates may be appropriate. In the absence of these methods, rates provided by the municipality should be used.

An Applicant will also be required to work in conjunction with the Local Municipality and Transit Authorities, as well as the Province.

3.4.2 Other Area Developments

All significant developments under construction, approved, or in the approval process within the study area and are likely to occur by the specific horizon years should be identified and recognized in the study. The land-use type and magnitude of the probable future developments in the horizon years should be identified through consultation with Regional and area municipal staff. In some cases, the traffic impact of other area developments will need to be explicitly considered in the analysis of the traffic impact of the proposed development.

3.4.3 Transportation Network Improvements

Changes to the present or planned transportation network should be determined from the approved Regional, Provincial and local capital improvement programs. A realistic assessment of timing and certainty should be made. The impacts of the transportation system changes should be identified; in particular, diversion of volumes from other facilities to new or improved facilities should be estimated.

3.4.4 Transit/HOV Considerations

A TIS should evaluate the impacts of site generated transit demand for the relevant time periods and scenarios on all transit services and transit stops/stations/terminals where ridership will be increased by 5% or more by site generated transit demand.

For HOV analysis, the lane analyses must use a lane utilization factor of 0.80 for the assumption that 20% is assumed as the HOV lane usage.

3.5 Estimation of Travel Demand

3.5.1 Trip Generation

Traffic volumes expected to be generated by the proposed development shall be forecast using the latest edition of the ITE Trip Generation Manual, unless local & more reliable trip generation data is available.

Trip generation parameters shall be selected using the principles as described in Chapter 3 of the ITE Trip Generation Handbook.

The estimation of traffic volumes shall be based on the full build-out condition and/or maximum land use intensity allowed under existing or proposed zoning regulations.

Adjustments to trip generation rates and generated traffic volumes to account for internal traffic, pass-by traffic and increased modal splits is permitted provided that assumptions are clearly documented and justified, and illustrated in separate diagrams.

All trip generation assumptions and adjustments assumed in the calculation of "new" vehicle trips should be documented and justified in terms of previous research or surveys. Sensitivity analysis should be undertaken where trip generation parameters have the potential to vary considerably and most probable values cannot be readily identified.

A table should be provided in the study report identifying the categories and quantities of land uses, with the corresponding trip generation rates or equations and the resulting number of trips. For large developments that will be phased in over time, the table should identify each significant phase separately.

3.5.2 Trip Distribution

All trip distribution assumptions must be documented and justified. Due consideration should also be given to potential differences in trip distribution patterns associated with different time periods, days of the week and development land-use types.

Engineering judgement should be utilized to determine the most applicable of the above methodologies for each particular application. Halton Region staff may have data available that assists in determining appropriate trip distribution.

3.5.3 Trip Assignments

Traffic assignments should consider logical routings, available and projected roadway capacities, and travel times. Traffic assignments may be estimated using a transportation planning model or "hand assignment" based on knowledge of the proposed/future road network in the study area. Halton Region can provide assistance with confirming growth rates. All data requests are at the cost of the Developmer/Owner.

3.5.4 Summary of Traffic Demand Estimates

Figure(s) should be presented indicating the assignment of all site-generated traffic volumes and pass-by volumes (if applicable) separately to the local road network, as well as to the individual site access locations by direction and by turning movement where required.

For each time period, include figures that summarize:
- Existing traffic/transit volumes;
- Existing plus background growth for each horizon year; and,
- Existing plus background growth plus site generated volumes for each horizon year

A summary of the future traffic demands (each combination of horizon year and peak period for both site generated and total future traffic conditions) should be provided in the form of

exhibits. Pass-by traffic assumptions should be clearly identified and illustrated on an exhibit, which summarizes the reassignment of pass-by traffic.

3.6 Evaluation of Impacts of Site Generated Traffic

The evaluation of impacts shall be conducted for all of the time periods of each horizon year. The existing volumes, existing plus background growth and existing plus background growth plus site-generated traffic by direction and by turning movement should be included, as well as the scenarios with and without any relevant major transportation system improvements.

Supplementary surveys or analyses may be needed to assess saturation flows, gap availability, projected queue lengths and possible blocking queues.

3.6.1 Capacity Analysis at Intersections

Capacity analysis at intersections will assess the operations of individual intersections and movements anticipated to be impacted by the proposed development. The adequacy of operations before and after the proposed development will be determined based on the analysis methodology and Regional thresholds as described below.

The evaluation of signalized and unsignalized intersections affected by site generated traffic volumes is required for all relevant time periods and scenarios and summaries are to be provided in a tabular format. The objective should be to maintain existing levels of service.

Documentation in the TIS appendix is required to detail all assumptions used in the analysis concerning lane configuration/use, pedestrian/cyclist activity, saturation flows, traffic signal cycle length, phasing and timing, utilization of the inter-green phase and other relevant parameters. Existing signal timings must be used for existing intersections and signal timing modifications may be considered as a measure to address capacity or level of service deficiencies.
Supplementary surveys or analyses may be needed to assess saturation flows, gap availability, projected queue lengths and possible blocking queues.

The summary should include the level-of-service including average vehicle delay and volume to capacity (v/c) ratios for overall intersection operations and individual critical movements, for all analysis periods and time horizons. Full documentation of the results of all level of service analyses should be provided in an appendix.

The Region accepts both the Highway Capacity Manual (HCM) and Canadian Capacity Guide (CCG) methodologies of intersection analysis. Specific software packages include CCG/CALC2, InterCalc HCS Version 3.0 or higher, Synchro 7.0 or higher. Analysis parameters should be confirmed with Halton Region staff through the pre-consultation and the submission of a scope of work. Should a consultant wish to utilise a software package other than these listed above, prior approval from the Region must be obtained.

The analysis should include the mitigation of impacts to signalized intersection operations where:

- Volume/capacity (V/C) ratios for overall intersection operations, through movements, or shared through/turning movements increased to 0.85 or above:
- V/C ratios for exclusive movements increased to 0.95 or above; or
- Queues for an individual movement are projected to exceed available turning lane storage.

The analysis should also include unsignalized intersections where:

- Level of service (LOS), based on average delay per vehicle, on individual movements exceeds LOS "D", or
- The estimated 95th percentile queue length for an individual movement exceeds the available queue storage.

Conventional signal timing plans should be used and all proposed adjustments to traffic signal timing, phasing and cycle lengths should be evaluated in terms of pedestrian crossing time, effect on queue lengths, adequacy of existing storage and effects on the existing signal co-ordination.

3.6.2 Safety Analysis

Potential safety or operational issues associated with the following, as applicable, should be identified:

- Weaving;
- Merging;
- Transit operational conflicts
- Corner clearances;
- Sight distances;
- Vehicle-pedestrian conflicts;
- Traffic infiltration;
- Access conflicts;
- Cyclist movements;
- Heavy truck movement conflicts;
- Queuing

3.6.3 Traffic Collision Analysis

Where the development is adjacent to an area with identified problems, existing collision data (available from the Region) should be reviewed and an assessment of the impact of the proposed development provided. Such information may be helpful to minimize any additional problems through the design or location of access points.

3.7 Site Access and Circulation

Site access location and design shall be determined with respect to the operational analysis in conjunction with Halton Region's "Access Management Guidelines."

All site access points on Regional roads shall be evaluated in terms of capacity, safety and sight distance & adequacy of queue storage capacity. This evaluation shall be similar in scope to that for the signalized and unsignalized intersections described previously.

Proposed access points shall be evaluated with respect to existing access points and intersections, on-street weaving problems, need for acceleration or deceleration lanes and pedestrian and cycling safety. As development occurs within the Nodes and Corridors (reference Regional Right-of-Way Guidelines), especially those adjacent to future HOV/transit corridors networks; Halton Region will work with the local Municipality to ensure that there is proper integration between pedestrian walkways, cycling paths and transit routes and vehicular access to development. Halton Region will also support any Municipal initiatives to encourage and increase safety for pedestrians and cyclists. Additional studies to review active transportation strategies for development proposals within Node and Corridor areas may be required and will be done in consultation with the local Municipality.

On-site parking and circulation systems shall be evaluated to demonstrate appropriate clear throat distances and avoid any possible queuing onto the Regional roads.

Sight lines should be evaluated to ensure safe conditions in accordance with Halton Region's "Access Management Guidelines" and based on Decision Sight Distance as identified in Transportation Association of Canada – 1999 Geometric Design Guide for Canadian Roads (TAC Manual).

Proposed truck/courier loading facilities and access to these facilities shall be evaluated to ensure that they are adequately sized, designed and provided with suitable access so that they will not adversely affect traffic and transit operations on Regional roads.

Any required turning or other restrictions should be identified.

Generally, it is preferable to minimize the number of private site accesses to regional roads, in order to maintain the integrity of the arterial road network. Site access should be provided only to the local road network wherever possible. Benefits to the Regional road network should be demonstrated when an access is proposed. Any additional accesses above minimum shall be justified as described in Halton Region Access Management Guideline for Regional Roads.

3.8 Sight Distance Evaluation

At each proposed access and/or at each intersection where a new road is proposed, the sight distance requirements should be determined based on Decision Sight Distance and Turning Sight Distance as identified in Transportation Association of Canada – 1999 Geometric Design Guide for Canadian Roads (TAC Manual). The availability of sight distance shall be determined from actual field measurements. Additional information available can be found in Halton Region's "Access Management Guidelines."

3.9 Transportation System Mitigation Measures

This section outlines the process of identification of operational transportation system improvements and other measures required to ensure that acceptable operation of the transportation system is maintained. The improvements must incorporate recommendations and standards outlined in previous Regional transportation or corridor studies.

3.9.1 Required Roadway Improvements

The physical and operational road network deficiencies that have been identified in the Transportation Impact Study must be addressed and solutions provided that are feasible and economic to implement.

Functional design plans or detailed design drawings may be required for identified physical improvements to ensure their feasibility.

3.9.2 Required Traffic Signal Improvement

Any traffic signal operational deficiencies that have been identified in the Transportation Impact Study must be addressed and solutions provided that are feasible to implement. The design requirements for traffic signals are outlined in the "Design Information for Proposed Road and Traffic Signal Works on Region of Halton Roads."

3.9.3 Preliminary Cost Estimate

A preliminary cost estimate must be provided for all identified infrastructure improvements.

3.10 Recommendations

A summary of the key findings with respect to the transportation impact of the proposed development shall be presented along with a summary of the recommended improvements if necessary.

It is important to structure recommendations for improvements within appropriate time perspectives. Recommendations should be sensitive to the following issues:

- Timing of short-range and long-range network improvements that are already planned and scheduled;
- Anticipated time schedule of adjacent developments;
- Size and timing of individual phases of the proposed development;
- Logical sequencing of various improvements or segments;
- Right-of-way needs and availability of additional right-of-way within the appropriate time frames;

4.0 Documentation and Reporting

The structure and format of the Transportation Impact Study should follow the guidelines outlined in this document, as applicable. The following is a suggested study structure:

- Executive Summary
- Site/Development Description (Site plan if applicable);
- Study Area (Map identifying the study area and site);
- Existing Conditions (Exhibit required);
- Analysis Periods;
- Background Traffic Demand – Existing and Future Background (Exhibits required);
- Site Generated Traffic (Exhibits required);
- Level of Service Analysis;
- Total Traffic Demand – Future Background plus Site Generated Traffic (Exhibits required);
- Improvement Alternatives Required to Mitigate Traffic Impacts
- Traffic Impacts for Future Background and Total Traffic with and without mitigation measures (Tabular Summaries);
- Access Considerations; and
- Recommendations.

This format will facilitate review, discussion and communication. Relevant maps, graphs and tables should be placed adjacent to the relevant text.

The Transportation Impact Study should consist of a main document, supplemented by technical appendices containing detailed analyses as required. The Region reserves the right to request digital copies of the analysis.

Documentation in an appendix to the traffic impact study of all assumptions used in the analysis concerning lane configuration/use, pedestrian activity, saturation flows, traffic signal cycle length, phasing and timing, utilization of the inter-green phase and other relevant parameters. Existing signal timings should be used for existing intersections and signal timing modifications may be considered as a measure to address capacity or level of service deficiencies.

All information submitted to Regional staff in connection with any Transportation Impact Study will be considered to be in the public domain.

Two (2) copies of the "draft" and two (2) copies of the final Transportation Impact Study complete with supporting documentation should be submitted to Regional staff for review.

APPENDIX B

List of Documents Reviewed

List of Documents Reviewed

- Milton Logistics Hub, Environmental Impact Statement, prepared for Canadian National Railway Company by Stantec Consulting, December 7, 2015.
- Appendices to the Environmental Impact Statement
  - Appendix E.17, Review of Terminal-Generated Truck Traffic, BA Consulting Group Ltd. November 30, 2015
  - Appendix G Mitigation Measure and Commitments
- Milton Logistics Hub, Environmental Impact Statement, Summary of the Environmental Impact Statement, prepared for Canadian National Railway Company by Stantec Consulting, December 7, 2015.
- Guidelines for the Preparation of an Environmental Impact Statement, pursuant to the Canadian Environmental Assessment Act, 2012, Milton Logistics Hub Project, Canadian National Railway Company, Canadian Environmental Assessment Agency, July 2015.
- Milton Logistics Hub Project Environmental Assessment Requirements for Additional Information, CEAA, March 11, 2016
- Response to CEAA Request for Information, CN Rail, May 18, 2016
  - Attachment IR1 – Amended Concordance Table 1.2
  - Attachment IR2 – Amended E.I.S. Tables
  - Attachment IR5 – Conceptual Project Schedule
  - Attachment IR6 – Site Selection Alternatives Addendum
  - Attachment IR23 – Supplemental Mitigation Measures
- Response to CEAA Request for Information, CN Rail, Additional Information Request 2 Received – July 14 and July 28, 2016
  - Attachment IR13-2 – Cumulative Air Quality Effects Assessment

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