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Milton CN Intermodal Logistics Hub Development Project
Review of Environmental Impact Statement and Supporting Documents

Intermodal Transport

Submitted to:
Region of Halton

Prepared by:
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1.0 INTRODUCTION

1.1 Executive Summary

CN proposes to construct and operate a new satellite intermodal terminal (the "Terminal") including the realignment and extension of existing mainline tracks, referred to as the Milton Logistics Hub (the "Project" or the "MIT Project" or "MIT").

CN's Environmental Impact Statement ("CN EIS") and supporting documentation (collectively the "CN EIS Documents") provided in support of the MIT Project does not include:

1. all of the technical information and data required by the Canadian Environmental Assessment Agency "Guidelines for the Preparation of an Environmental Impact Statement," dated July 2015 pursuant to the *Canadian Environmental Assessment Act, 2012* ("CEAA") (the "EIS Guidelines"); nor

2. sufficient Project information and data to assess:

    a) the "purpose" of the MIT Project;

    b) the "alternative means" of carrying out the MIT Project;

    c) the terminal design, construction activities and operations of the MIT Project; nor

    d) the "requirements for railway operations and services" under section 98(2) of the *Canada Transportation Act* (the "CTA").

Additional information and data is needed to properly assess the proposed MIT Project. Accordingly, I have set out 45 information requests that I suggest be made to CN with respect to MIT.

1.2 Purpose of Review and Scope of Report

I was retained 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 provide an expert opinion on the sufficiency of the CN EIS Documents with regards to the proposed MIT Project's purpose/rationale, siting, intermodal terminal planning, design, construction, proposed intermodal terminal operations and alternative means for carrying out the MIT Project.

In relation to the above categories, I have been asked to answer the following questions relative to my area of expertise:

- Do the CN EIS Documents provide the technical information and data required by the EIS Guidelines?"

- Do the CN EIS Documents provide sufficient Project information and data to assess: (1) the purpose of the MIT Project; (2) the alternative means for carrying out the MIT Project; (3) the terminal design, construction activities and operations of the MIT Project; and (4)

the requirements for railway operations and services as set out under Section 98(2) of the CTA?

If the CN EIS Documents are not sufficient, relative to the above questions, I have been asked to describe the required additional information and data needed in order to properly assess:

- the purpose of the MIT Project;
- the alternative means for carrying out the MIT Project;
- terminal design, construction activities and operations of the MIT Project; and
- whether the location of the railway line is reasonable under Section 98(2) of the CTA.

1.3 Qualifications and Related Professional Experience

I am the President of Vickerman & Associates, LLC, a firm specializing in the development planning and design of port, intermodal rail and freight logistics facilities worldwide. I have worked on major port and intermodal rail terminal projects throughout North America and the world for more than 40 years. I was the Principal-In-Charge and/or Project Manager for 67 of the 90 North American deep-water general cargo container port and intermodal rail terminal development strategic master plans. The majority of North American container ports have included intermodal rail terminal development in their strategic port master plans. North American Ports have included “on-dock,” “near-dock,” or “far-dock” intermodal rail terminals to support, complement, and take advantage the international movement of container goods through gateway container ports.

My port and intermodal rail terminal development strategic planning experience includes work for major Canadian Ports, the Ports of Rotterdam and Hong Kong, the intermodal freight analysis for the Eurotunnel (the Chunnel between England and France), as well as port and intermodal strategic master planning projects in Panama, Australia, Brazil, and China. In Canada, I have planned and analyzed the need for port and intermodal rail terminal development in Canada’s two largest port complexes on both coasts. My experience with port and intermodal terminal planning has included many Great Lakes ports and proposed associated intermodal rail terminals.

I completed two terms as the Chairman of the Intermodal Freight Terminal Design and Operations Committee under the purview of the US Transportation Research Board (TRB)/National Research Council (NRC) and the National Academy of Science. I have served on many national policy committees for the TRB including organizing and facilitating TRB’s first national conference on the emerging intermodal rail terminal industry including concepts, methodologies, and design techniques for modern intermodal rail terminal operations.

Under contract to the US Department of Transportation, Federal Highway Administration (FHWA), I was the “Principal Investigator” chosen to prepare the USDOT first intermodal landside access technical manual/workbook titled “Landside Access For Intermodal Facilities Manual and Workshop Participant Workbook” published by the USDOT/FHWA, National Highway Institute (NHI), Course No. 15264, Publication No. FHWA-HI-95-043. This manual accompanied a technical three day training course where I was the principal presenter on designing modern intermodal facilities North American wide and at various US State Department of Transportation (State DOT) locations.

I am both a licensed professional civil engineer and registered architect in 23 states. I hold a Master of Science Degree in Structural Engineering and Structural Mechanics from the University of California, Berkeley, with Honors, and a Bachelor of Science Degree in Architectural Engineering from California Polytechnic State University in San Luis Obispo, California, with Honors.

I retired as a Captain in the Civil Engineer Corps of the United States Naval Reserve after 38 years of continuous service primarily focusing on US Navy facility planning and design projects.

My detailed project experience resume is attached as **Appendix A** to this report.

1.4 Documents Reviewed

The analysis, findings and conclusions presented in this report are based on my own professional analysis work to date, and my personal evaluation of the materials and information referred to in **Appendix B** to this report.

2.0 INTERMODAL RAIL TERMINAL PLANNING AND DEVELOPMENT: BACKGROUND AND CONTEXT

Before beginning my assessment of the CN EIS Documents, it is important to introduce the first principles of intermodal terminal planning, which include consideration of: (1) the function of an intermodal terminal; and (2) the rationale for an intermodal terminal.

2.1 Function of an Intermodal Terminal

Intermodal transportation can be defined as the movements of passengers or freight from one mode of transport to another, commonly taking place at a terminal specifically designed for such a purpose. In North America, the term “intermodal rail” is also used to refer specifically to containerized rail cargo transportation. Thus, intermodal transportation in the literal sense refers to an exchange of passengers or freight between two transportation modes. Intermodal rail terminals in North America have become more commonly used to strictly relate to international and domestic container cargo shipping transport. For the purposes of this report, I will only discuss containerized freight transport and goods movement intermodalism.

Intermodal freight goods movement transport involves the conveyance of containerized cargo typically in International Standards Organization (“ISO”) intermodal containers, using multiple modes of transportation (rail, ship, and truck) without direct handling of the freight cargo itself within the ISO container when changing modes.

Intermodal freight can also be defined as the movement of containerized cargo goods from Origin to Destination (“O/D”) by several modes of transport with each transport mode having a different transport provider or entity responsible for the container movement, each with its own independent transport contract. Thus, during the single O/D journey multiple transport carriers are involved with the containerized cargo movement during the journey.

2.2 Rationale for an Intermodal Terminal

Intermodal terminal development planning is generally intended to increase the operational efficiency and throughput capacity of an intermodal transport facility or intermodal system to enable it to handle anticipated business market growth and forecasted cargo demand for the intermodal terminal or the intermodal transport system.

The following simple cargo demand market-driven formula is what I use to determine "Justifiable Terminal Need":

F - C = N

"Cargo **F**orecasted Demand **minus** Current Terminal **C**apacity **equals** Justifiable Terminal **N**eed"

Each of the elements of this equation will be discussed in more detail in the following sub-paragraphs.

2.2.1 F: Cargo Forecasted Market Demand

Intermodal terminal development planning typically involves the preparation of a market driven cargo demand forecast (which can also be referred to as a "market assessment" or "market demand forecast").

The process of preparing a market-driven cargo demand forecast is not a single distinct event, but rather a continuing strategic business planning function typically accomplished on an annual ongoing basis which should adapt to dynamic changes in the competitive marketplace.

Strategic development planning for modern intermodal rail facilities today in North America almost always includes a fairly refined upfront "market-driven" mandate for the intermodal terminal development program. Today's intermodal terminal owner/operator will typically prepare in-house or commission a detailed market assessment or an econometric cargo demand forecast providing the terminal planners and designers with projected terminal container cargo volumes at five year increments out to the terminal planning horizon, whatever that might be.

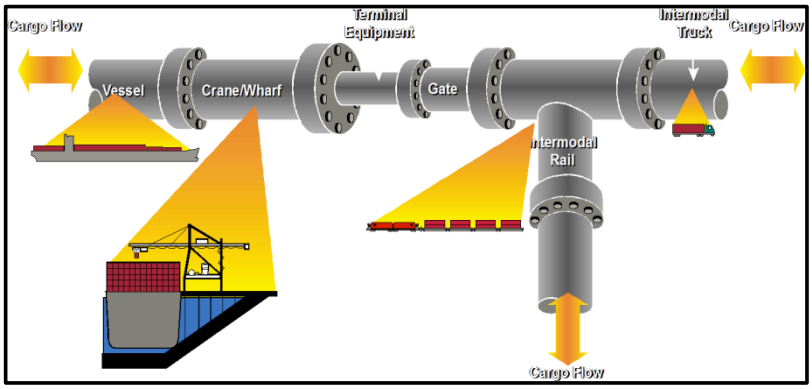
In today's corporate environment, this future cargo forecast determination is an integral part of the strategic business planning processes in today's Class I railroad transport corporations. Frequently, corporate shareholders will mandate that a market demand study be prepared as a prerequisite for development of any new intermodal facility development within the railroad's network. Typically, in North America, an intermodal terminal development program needs assessment will be predicated on a detailed containerized cargo market forecast with a planning horizon of at least 5 to 10, and more typically 15 to 20, years.

In addition, a return-on-investment ("ROI") analysis and a terminal cost benefit assessments are frequently prepared to satisfy the public and/or the private sector intermodal terminal owners and operators, as well as involved public-private-partnerships, of the soundness of the financial or financial bonding transaction contemplated for the intermodal terminal investment.

2.2.2 C: Terminal Capacity

Considering the current or future throughput capacity of the intermodal rail terminal is an important consideration. Changes in terminal equipment modes and terminal operating equipment can dramatically increase the overall intermodal throughput capacity of the intermodal terminal and the region it serves.[1]

The determination of the capacity of a modern intermodal rail terminal is a complex assembly of various terminal contributing components that may vary over the year and from year to year. My model for conceptualizing marine and intermodal rail terminal throughput capacity is one of an analogous "pipeline" as illustrated below, wherein the least diameter pipe segment represents the most restrictive flow of cargo through an intermodal port or rail terminal.



The originating basis for this approach can be found in the 1986 publication: "Improving Productivity in U.S. Marine Container Terminals" produced by the NRC and published by the National Academy Press. This publication was prepared under the guidance of the US DOT, Maritime Administration (MARAD) and the National Academy of Science and describes the basic methodology for assessing the productivity of various terminal components. Today this analogous approach to capacity modeling of marine and intermodal rail terminal throughput and operational capacity analysis has been generally adopted by many port and intermodal rail terminals throughout North America.

Taking the above analogy into account, the process for improvement of an intermodal rail terminal's productivity would be one of improving the most restrictive terminal characteristics /

[1] A "**TEU"** is a unit of measurement that is an approximate measure of container cargo capacity often used to describe the capacity of container ships as well as port and intermodal container terminals. Aggregate container capacity is often expressed in twenty-foot equivalent units (TEUs) which is a unit of capacity equal to one standard 20 × 8 ft. (6.10 × 2.44 m) (length × width) container. Because the TEU is an approximate measurement unit, it cannot be converted precisely into other units of measure. Most containers are manufactured according to specifications from the International Standards Organization (ISO) and are suitable for multiple transportation modes including intermodal terminals.
An intermodal rail terminal **"Container Lift"** is defined as a single pick of an ISO container (dry, refrigerated (reefer), import, export, 40 foot or 20 foot) by an intermodal yard crane either on or off a one container high container train or a double stacked container train. In North America, the typical ratio between TEUs and Lifts is a factor of 1.7 (1.7 TEUs = 1 Lift). This ratio is generally dependent on the percentage of 40 foot and 20 foot ISO containers and does not vary widely.

components in a one-after-another iterative process until the entire intermodal terminal throughput has reached its maximum practical capacity. The "maximum diameter pipe sections" in this analogy, therefore, represents the intermodal rail terminal's future potential capability and future maximum value from an operating standpoint as viewed by an intermodal terminal owner or operator.

Lowering intermodal terminal container dwell times (the time the container remains within the terminal boundary) is an operational goal and strategy for many intermodal rail terminal operations. The lower the overall terminal container dwell time the more productive the intermodal rail terminal operation.

Today in the North American intermodal container industry, the average container dwell time in a container terminal is approximately 5 to 8 days for ports and marine facilities and approximately 1.5 to 2 days for modern intermodal rail terminals, both for import and export container loads. Reducing the intermodal terminal container dwell times by half could approximately double the capacity of the overall intermodal container terminal. Thus, container dwell time reduction is a key strategic operating goal for intermodal container terminal operators.

2.2.3 N: Justifiable Terminal Need

As stated above, justifiable terminal need is the result of market demand forecast minus existing or current terminal capacity. However, throughout the planning process, where a justifiable need for an intermodal system may be demonstrated, further design and equipment considerations related to capacity can be considered, which can, in some cases eliminate or reduce the justifiable terminal need requirements, as will be described in sub-section 3.2.2.1 of my report.

3.0 ASSESSMENT OF CN EIS DOCUMENTS AND CTA APPLICATION

3.1 Methodology of Review

This assessment report provides my expert opinion regarding the following key questions relative to my area of expertise.

I reviewed the CN EIS Documents referring to the technical validity of information, methods and analysis used and conclusions made, in order to answer the following questions:

- Do the CN EIS Documents provide the technical information required by the EIS Guidelines?
- Do the CN EIS Documents provide sufficient information and data to assess: (1) the purpose of the MIT Project; (2) the alternative means of carrying out the MIT Project; (3) the terminal design, construction activities and operations of the MIT Project; and (4) the impact on railway operations and services as set out in Section 98(2) of the CTA.

With respect to understanding the "technical information" required by the EIS Guidelines, I am primarily guided by Part 1, Section 4.2 "Study strategy and methodology" and Part 1, Section 4.3.3 "Existing information", which requires the proponent to adhere to the following guidelines, summarized below:

i. document how scientific, engineering, traditional and local knowledge were used to reach conclusions (4.2);

ii. clearly identify and justify assumptions (4.2);

iii. document all data, models and studies so they are transparent and reproducible (4.2);

iv. specify all data collection methods (4.2);

v. indicate the uncertainty, reliability and sensitivity of models used to reach conclusions (4.2);

vi. identify significant gaps in knowledge and understanding related to key conclusions and the steps taken to address these gaps (4.2);

vii. describe modelling methods and equations, including calculations of margins of error or other relevant statistical information, used for baseline data that has been extrapolated or otherwise manipulated to depict environmental conditions in the study areas (4.2); and

viii. when relying on existing information to meet requirements of the EIS Guidelines, include the information directly in the EIS or clearly direct the reader to where it may obtain the information (i.e., through cross-referencing) and comment on how the data was 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 (4.3).

Where CN has not adhered to the above requirements, the rationale for my information requests will be referred to as a "technical information deficiency."

3.2 Categories of Review

I have reviewed the entire CN EIS and all relevant supporting documents given to me to determine the technical validity of the information presented and completeness of the information and data from my expertise. I have evaluated the methods and analysis used in the CN EIS Documents and have evaluated the conclusions reached.

The following categories constitute the outline of this CN EIS assessment review:

3.2.1 Purpose/Rationale for the Project
3.2.2 Alternative Means of Carrying Out the Project
3.3.3 Design Information
3.3.4 Construction Information
3.3.5 Operations Information
3.3.6 Requirements for Railway Operations and Services

3.2.1 Purpose/Rationale for the Project:

With respect to the "Purpose of the Project", Part 2, Section 2.1 of the EIS Guidelines states that the CN EIS will: "describe the purpose of the project by providing the rationale for the project, explaining the background, the problems or opportunities that the project is intended to satisfy and

the stated objectives from the perspective of the proponent."

The Operational Policy Statement Addressing "*Purpose of" and "Alternative Means" under the Canadian Environmental Assessment Act of 2012* (March 2015) ("OPS 2015") indicates that the purpose of the designated project is defined as the rationale or reasons for which the designated project would be carried out from the proponent's perspective. It conveys what the proponent intends to achieve by carrying out the designated project. OPS 2015 states that "Purpose of" is often described concisely in terms of a number of considerations, including "the problems that the project is intended to address…or any other objectives of the proponent in carrying out the project".

As part of its discussion of "Purpose", the CN EIS addresses the problems that the project is intended to address by referencing throughout the document: (1) the need for a satellite terminal prompted by growing demand; and (2) limited expansion at Brampton Intermodal Terminal ("BIT"). These two factors are addressed throughout the CN EIS and CN EIS Documents, as outlined further below.

3.2.1.1 Market Demand and Rationale for an Intermodal Terminal

The following excerpts from the CN EIS Documents found in the table below are representative of CN excerpts discussing the rationale for increasing intermodal capacity based on "**need**" and "**growing demand**" (bolded terms are mine):

Table 1: Growing Demand

Document (Collectively, the "Table 1 Documents")	Section Reference	Quote
CN EIS	Executive Summary	To address the **need** to support **long-term growth**, CN made a strategic decision to move forward with plans to develop a satellite intermodal terminal in the western portion of the GTHA, where **CN's growing customer base** is located.
CN EIS	1.2	The proposed project will accommodate the **growing demand** for intermodal services and ensure service fluidity through the Greater Toronto and Hamilton Area (GTHA) as the Brampton Intermodal (BIT) approaches capacity with limited land available for expansion.
CN EIS	2.1	The purpose of the Project is to construct and operate a satellite intermodal terminal to meet CN's **growing operational and commercial needs**. Given that the economy, including transportation and warehousing, has grown by 20% between 2001 and 2011 (Hemson Consulting Ltd. 2012), the Project positions CN to serve the **growing demand** for logistics support in the GTHA and western Ontario markets (Strategic Projections Inc. 2013).
CN EIS	2.1	To address the need to support **long-term growth**, CN made a decision to move forward with plans to develop a satellite intermodal terminal in the western portion of the GTHA, where CN's **growing customer base** is locating.
CN EIS	3.1	Since 2010, the rail industry has seen **significant growth in demand** for intermodal services rather than rail-serviced industrial sites.

Document (Collectively, the "Table 1 Documents")	Section Reference	Quote
CN EIS	3.1	The location and design of the Terminal is based on an iterative planning process that has been undertaken by CN to address **market demand** for intermodal service.
CN Project Description Report ("CN PDR")	Executive Summary	The purpose of the hub is to handle intermodal containers between trucks and railcars to meet the **growing demand** of the movement of goods within the Greater Toronto and Hamilton Area.
CN PDR	2.1.1	The proposed project with accommodate the **growing demand** for intermodal services and ensure service and fluidity through the GTHA as the Brampton Intermodal Terminal approaches capacity with limited land available for expansion.
CN PDR	2.1.2	To meet **growing demand** for intermodal services, CN's strategy has evolved to a two-facility concept for the GTHA.
CN EIS, App. E.12 – Technical Data Report, Socio-Economic Baseline (SEB)	1.1	To accommodate the **growing demand** for intermodal services and ensure service and fluidity through the Greater Toronto and Hamilton Area (GTHA), CN proposes to construct and operate the Project, which consists of a new satellite intermodal terminal (the Terminal) and the realignment and extension of the existing mainline. The **need** for a satellite intermodal terminal is prompted by **market growth** in the Western GTHA and the limited expansion opportunities at the existing Brampton Intermodal Terminal.
CN Site Selection Study (Appendix F)	1.1	The terminal will support BIT by facilitating the **growing demand** for intermodal shipping in an area of the GTHA with the greatest opportunity for growth, as seen through the Province of Ontario's Growth Plan for the Greater Golden Horseshoe (Ministry of Infrastructure consolidated 2013). A satellite intermodal terminal within the GTHA will meet CN's **intermodal operational and commercial needs** and position CN to continue to efficiently serve the **future needs** of the GTHA.
CN Site Selection Study (Appendix F)	3.4	C&W [*Cushman & Wakefield – Valuation & Advisory June 2015. Land Availability Review for Satellite Intermodal Terminal Facility*] examined the land availability of sections along the mainline that may be suitable to host a satellite intermodal terminal that could address the **needs** of the **growing customer base** served by BIT.
CN Site Selection Study (Appendix F)	6.0	An intermodal terminal in the western half of the GTHA is required to meet CN's and its customer **current and future intermodal commercial needs**.
Planning Justification Report In Support of a Logistics Hub Planned in Southwest Milton	2. & 2.1	The following technical reports were prepared to explain the **need** for additional intermodal capacity in the GTA and the process followed in the selection of the preferred site in south Milton… 2.1 STRATEGIC PROJECTIONS INC. REPORT (SEPTEMBER 2013) In September 2013, Strategic Projections produced a report entitled "The Need for an Intermodal Facility on CN's Lands in Milton" (the "SPI Report")….In terms of **need**, the SPI Report [Strategic Projections Inc. Report September 2013], concludes that

Document (Collectively, the "Table 1 Documents")	Section Reference	Quote
(Appendix 11) ("CN PJR")		the GTA will require a doubling of its intermodal facility capacity over the next three decades in order to meet this **growing demand**.
CN PJR	5.0	(iii) In this circumstance, while the Logistics Hub will result in a relatively small reduction in the planned twenty year inventory of future employment lands in Milton, there is also a clearly identified need for infrastructure in order to meet the **growing demand** for additional capacity to handle the movement of goods in the GTA.

In most cases, CN does not clearly identify the source its information, including substantive background studies or reports that quantify the "growing demand" for intermodal services or that provide justification for additional intermodal capacity.

The CN EIS Documents do not reference a Greater Toronto and Hamilton Area ("GTHA") regional or MIT intermodal containerized trade market assessment, cargo demand econometric study or intermodal containerized cargo demand forecast providing estimates for future container cargo volumes for the GTHA region at large (BIT plus MIT) or for the planning and design of a particular intermodal rail terminal (BIT expansion or MIT).

The CN EIS Documents do not provide sufficient current and future container volume market cargo forecast data to properly plan, design, construct and operate MIT.

Although CN has publicly indicated that the GTHA region experienced a "68 percent growth increase in intermodal rail volume from 2009 to 2014" which substantially exceeded previous CN intermodal cargo anticipated growth rates,[2] no statement in the CN EIS Documents has substantiated this dramatic intermodal container growth.

A container cargo demand forecast can analyze, evaluate, and quantify the regional container market forecast for containerized cargo demand and the specific rationale for proposing a satellite intermodal hub facility (MIT) operating in conjunction with CN's largest North American Intermodal Terminal Hub, BIT.

Section 2.1 of the CN EIS states that the GTHA and its western expansion is the fastest growing area in Canada. Understanding the market-driven containerized intermodal growth forecast requirements for cargo freight movement (container volumes) in this region is vital and indeed essential to understanding intermodal rail development requirements for this region into the future.

OPS 2015 directs that the information regarding the "Purpose of the Project" should be sufficient to provide context for public and technical comment periods during the environmental assessment, and ultimately to allow the decision maker to understand the purpose of the designated project. In my opinion, without a container market forecast, or a definitive intermodal terminal capacity analysis

[2] Marie-Therese Houde, CN's former Director of Corporate Development, referenced this growth increase during her presentation regarding the proposed MIT Project to Halton Regional Council on May 27, 2015: video available online at: https://www.youtube.com/watch?v=_E3A5EU1OdI.

for BIT, the true purpose of MIT remains unclear.

Where CN has referred to a relevant background study in the CN EIS Documents in relation to defining the purpose of MIT, it has not provided us with the relevant study. Specifically, CN has not provided the following documents: (i) *Strategic Projections Inc 2013: The Need for an Intermodal Facility on CN's Lands in Milton. Prepared for the Canadian National Railway Company, September 2013 ("Strategic Projections Inc. 2013")*; and (ii) *Cushman & Wakefield – Valuation & Advisory June 2015. Land Availability Review for Satellite Intermodal Terminal Facility. Prepared for the Canadian National Railway Company ("Cushman & Wakefield – Valuation and Advisory June 2015")*.

As a result, I propose the following information requests, which would help explain CN's statement of purpose of the MIT Project as required under the EIS Guidelines:

Information Requests:

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
Purpose: Market Demand for an Intermodal Terminal EIS Guidelines, Part 2, Section 2.1 OPS 2015	CN EIS, Section 2.1 & Table 1 Documents	**IT.1** **Market Demand Information** Please provide any reports, analyses, data, studies or assessments to support the CN EIS statements, in the form of current and future container volume market cargo forecasts that quantify the "growing demand" for intermodal services, provide justification for additional intermodal capacity and support the conclusion that "additional capacity is required to enable CN to continue to support the growing demand for intermodal services in the GTHA"	Technical information deficiency. Further, It is not clear what market demand MIT will serve. This information is required in order to understand the Purpose of MIT.
Purpose: Market Demand for an Intermodal Terminal EIS Guidelines, Part 2, Section 2.1 OPS 2015	CN EIS, Section 2.1 & Table 1 Documents	**IT.2** **Missing Referenced Document** Please provide the following document: *Strategic Projections Inc 2013: The Need for an Intermodal Facility on CN's Lands in Milton. Prepared for the Canadian National Railway Company, September 2013*	Technical information deficiency. Further, CN references this report to explain the purpose and rationale for MIT, but does not provide it as part of the CN EIS Documents. This information is required in order to understand the Purpose of MIT.
Purpose: Market Demand for an Intermodal Terminal	CN EIS, Section 2.1 & Table 1 Documents	**IT.3** **Missing Referenced Document** Please provide the following document: *Cushman & Wakefield –*	Technical information deficiency. Further, CN references this report to explain the needs of growing customer base at BIT, that the potential for future growth around

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
EIS Guidelines, Part 2, Section 2.1 OPS 2015		*Valuation & Advisory June 2015. Land Availability Review for Satellite Intermodal Terminal Facility. Prepared for the Canadian National Railway Company*	BIT is limited and to explain the site selection process. However, CN does not provide the report as part of the CN EIS Documents. This information is required in order to understand the purpose of MIT.

3.2.1.2 BIT Capacity and Expansion Limitations

As part of its discussion of the "Purpose of the Project", the CN EIS Documents state that MIT is required because BIT is nearing capacity. The following excerpts from the CN EIS Documents found in the table below are representative of CN statements regarding BIT nearing capacity and limited expansion available at BIT (bolded terms are mine):

Table 2: BIT Capacity and Expansion Limitations

Document (Collectively, the "Table 2 Documents")	Section Reference	Quote
CN EIS	Executive Summary	**BIT is nearing capacity** and in order for CN to meet customer demand and maintain its competitiveness, additional capacity is required. To address the need to support long-term growth, CN made a strategic decision to move forward with plans to develop a satellite intermodal terminal in the western portion of the GTHA, where CN's growing customer base is located.
CN EIS	1.2	The proposed Project will accommodate the growing demand for intermodal services and ensure service and fluidity through the Greater Toronto and Hamilton Area (GTHA) as the **Brampton Intermodal Terminal (BIT) approaches capacity with limited land available for expansion**.
CN EIS	2.1	Expansion projects and productivity initiatives at BIT deferred the immediate requirement to develop the land for intermodal use. After investing over $50 million to support the growing volumes at BIT, **this facility is now approaching capacity with limited opportunities for significant expansion**. A land review confirmed that sufficient and suitable land could not be acquired around BIT (*Cushman & Wakefield – Valuation & Advisory June 2015*).
CN EIS	3.1	CN's intermodal terminal in Brampton is **now reaching capacity and cannot be easily expanded due to a lack of available land**. Therefore, its ability to accommodate the anticipated growth is limited, despite the investments made between 2001 and 2014.
CN PDR	2.1.2	The Brampton Intermodal Terminal handled close to 1 million containers in 2014. However, **further expansion of this existing terminal is limited by the distribution centers and other logistics facilities** that have grown significantly in

Document (Collectively, the "Table 2 Documents")	Section Reference	Quote
		the area.
CN Site Selection Study (Appendix F)	1.1	At present, **BIT is nearing capacity and additional capacity is required** to expand CN intermodal services and to maintain CN's competitiveness. In order to determine the practical ability to expand BIT, CN retained Blake, Cassels & Graydon LLP who commissioned Cushman & Wakefield – Valuation & Advisory (C&W) to review and evaluate the availability of surrounding land required for the expansion of BIT. C&W determined that **BIT is landlocked and that sufficient and suitable lands to meet the requirements of CN are not available around BIT**. This study confirmed that the **potential for further expansion around BIT is limited and does not represent a long-term growth solution** (C&W 2015). An alternate location to construct and operate a new satellite intermodal terminal is required.
CN PJR	1.1	By 2014, the **capacity limitations at Brampton had become all too visible** and the need for a relief facility undeniable. As discussed below, certain studies had been commissioned by CN, and more would follow.
CN EIS, App. E.12 – SEB (SEB)	1.1	The need for a satellite intermodal terminal is prompted by market growth in the Western GTHA and the **limited expansion opportunities at the existing Brampton Intermodal Terminal.**
CN EIS, App. E.12 – SEB	5.3.5.4	Although operating rates are not available for all intermodal facilities, CN's **Brampton Intermodal Terminal was operating at 82% capacity in 2012 and was expected to reach 100% of its capacity by 2018** (*Strategic Projections 2013*).
Application for an Order Pursuant to section 98(2) for Authorizing Construction, CN, January 22, 2016	Para. 97	Such growth in CN's intermodal traffic originating in or destined to the region has led to a situation of **very tight capacity at BIT**. In spite of continuous efforts to improve the productivity of the operations at BIT during the last five years and given market expansion towards the GTHA, CN now finds itself in a position where it must establish new intermodal terminal capacity in the western Toronto area.

Despite stating that BIT is reaching capacity, the CN EIS Documents provide very little background information regarding BIT and do not provide the studies CN references or the underlying data behind those studies, including: (i) *Strategic Projections Inc. 2013*[3]; and (ii) *Cushman & Wakefield – Valuation and Advisory June 2015"*.[4]

The CN EIS Documents also reference $50 million spent on projects at BIT in order to increase

[3] Please see IT.2 above for mu information request for *Strategic Projections Inc. 2013*.
[4] Please see IT.3 above for my information request for *Cushman & Wakefield – Valuation & Advisory June 2015*.

capacity, but provide no details with respect to those investments, nor does CN discuss whether it considered alternatives such as upgrading equipment at BIT as part of increasing capacity in order to eliminate or reduce justifiable terminal need for a new intermodal facility, as is outlined in Section 2.2.3 of my report. We are not told anything about the description of the projects to improve capacity at BIT.

I propose the following information requests, which would help explain the purpose of the MIT Project as required under the EIS Guidelines:

Information Requests:

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
Purpose: BIT Capacity and Expansion Limitations EIS Guidelines, Part 2, Section 2.1 OPS 2015	CN EIS, Section 2.1 & Table 2 Documents	**IT.4** **BIT Capacity and Expansion Limitations Information** Please provide any reports, analyses, data, studies or assessments to support the CN EIS conclusion that the BIT is "approaching capacity with limited opportunities for significant expansion".	Technical information deficiency. Further, CN states that BIT is approaching capacity, but has not provided sufficient information with respect to how it came to this conclusion. This information is required in order to understand the Purpose of MIT.
Purpose: BIT Expansion and Expansion Limitations EIS Guidelines, Part 2, Section 2.1 OPS 2015	CN EIS, Section 2.1 & Table 2 Documents	**IT.5** **Particulars of Expansion Project** Please provide Particulars of the "expansion projects", "productivity initiatives" and the $50 million investment at BIT which had deferred the immediate need for the development of MIT.	Technical information deficiency. Further, CN states that BIT is approaching capacity, but has not provided sufficient information with respect to the options CN has explored in order to prevent BIT from reaching capacity and defer the need for a satellite intermodal. This information is required in order to understand the Purpose of MIT.

3.2.1.3 Meaning of a Satellite Terminal for this Project

CN states that MIT is intended to function as a "satellite" terminal to BIT. However, CN does not provide information regarding the rationale behind choosing a satellite terminal over a separate terminal and the differences between the two options in their operations. It refers to the MIT Project as a "two-facility concept" but does not provide any further information on what that concept means. In fact, there is conflicting information on whether MIT is considered an expansion of BIT, where CN has specifically stated in Section 2.3.3 of the CN PDR that "[t]his Project is not an expansion of an existing hub."

The following excerpts from the CN EIS Documents found in the table below are representative of CN statements referencing MIT as a satellite terminal (bolded terms are mine):

Table 3: Meaning of a Satellite Terminal

Document (Collectively, the "Table 3 Documents")	Section Reference	Quote
CN EIS	1.2	The Project consists of the construction and operation of [a **new satellite intermodal terminal**] and the realignment / extension of the existing mainline tracks in the Town of Milton. The proposed Project will accommodate the growing demand for intermodal services and ensure service and fluidity through the Greater Toronto and Hamilton Area (GTHA) as the Brampton Intermodal Terminal (BIT) approaches capacity with limited land available for expansion.
CN EIS	3.1	CN's intermodal terminal in Brampton is now reaching capacity and cannot be easily expanded due to a lack of available land. Therefore, its ability to accommodate the anticipated growth is limited, despite the investments made between 2001 and 2014. CN has determined that a **satellite intermodal terminal is required** to accommodate western GTHA intermodal market growth (Strategic Projections Inc. 2013).
SEB	1.1	The need for a **satellite intermodal terminal** is prompted by market growth in the western GTHA and the limited expansion opportunities at the existing Brampton Intermodal Terminal.
CN PJR	2.12	To meet growing demand for intermodal services, CN's strategy has evolved to a **two-facility concept** for the GTHA.
CN Site Selection Study (App. F)	3.1	Principle 1 was developed to ensure that potential sites considered to host the intermodal terminal would be able to adequately service CN's principal market within the western half of the GTHA and could **act as a satellite facility to BIT**
CN Site Selection Study (App. F)	3.4	C&W [*Cushman & Wakefield – Valuation & Advisory June 2015. Land Availability Review for Satellite Intermodal Terminal Facility*] examined the land availability of sections along the mainline that may be suitable to host a **satellite intermodal terminal** that could address the needs of the growing customer base served by BIT.

In order to understand whether CN provides sufficient information to assess the purpose of the MIT Project, MIT must be more clearly defined as either a new standalone intermodal rail logistics hub or a satellite facility to BIT. CN must also explain whether MIT will serve a larger market or the same market that BIT serves.

As set out in the table above, CN does not provide sufficient information regarding how MIT will function as a satellite to BIT. The following information is required in order to understand the Purpose of MIT as a satellite to BIT or otherwise:

Information Requests:

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
Purpose: Meaning of a Satellite Terminal for this Project EIS Guidelines, Part 2, Section 2.1 OPS 2015	CN EIS, Sections 2.1 & 3.1 & Table 3 Documents	**IT.6** **Information re MIT as Satellite Terminal** Please provide a description of the intended functions and operations of MIT in its role as a satellite terminal to BIT, including whether MIT will serve a larger market or the same market that BIT serves.	CN states that MIT is intended to function as a satellite terminal to BIT. However, CN has not provided sufficient information regarding what a satellite terminal is in terms of its function and operations for this Project. This information is required in order to understand the Purpose of MIT.
Purpose: Meaning of a Satellite Terminal for this Project EIS Guidelines, Part 2, Section 2.1 OPS 2015	CN Site Selection Study (App. F), Sections 3.1 & 3.4	**IT.7** **Criteria for Satellite Terminal** With respect to Principle 1 of the Site Selection Principles in the Site Selection Study, please provide the criteria used to consider how a location could act as and be suitable to host a satellite intermodal terminal.	CN states that the site location must act as a satellite terminal to BIT. However, CN has not provided sufficient information regarding what criteria were used to inform an independent reviewer what a satellite terminal is in terms of its relationship to BIT. This information is required in order to understand the Purpose of MIT.

3.2.2 Alternative Means of Carrying Out the Project

Part 2, Section 2.2 of the EIS Guidelines requires CN to "identify and consider" the effects of alternative means of carrying out the MIT Project "that are technically and economically feasible."

For more information on "alternative means", the EIS Guidelines direct CN to OPS 2015. OPS 2015 states that "alternative means" can include "options for locations, development and/or implementation methods, routes, designs, technologies, mitigation measures etc."

OPS 2015 also provides a required four-step analysis for considering the alternative means for carrying out the Project ("4-Step Analysis"):

Step 1: Identify technically and economically feasible alternative means;

Step 2: List their potential effects on valued components;

Step 3: Select the approach for the analysis of alternative means; and

Step 4: Assess the environmental effects of alternative means.

The CN EIS considers the following alternative means of carrying out the Project in Section 2.2:

> *Alternative means of carrying out the Project consider the technical and economic feasibility of the following:*
>
> - *alternative project site location;*
> - *alternative transportation corridors (i.e., routes for truck traffic for vehicles owned and operated by CN); and,*
> - *location and design considerations of key Project components of the preferred site location…*

Each of these alternative means is discussed further in the following sections.

3.2.2.1 Alternative Project Site Locations: BIT

(A) Site Selection Study: Phase 1

With respect to the 4-Step Analysis outlined in OPS 2015, the first step of identifying technically and economically feasible alternative means involves a selection of technical criteria to determine the alternative means and to document the rationale in "sufficient detail for an independent reviewer to assess the criteria developed, the nature of the alternative means considered, the approach taken to assess these alternative means against the criteria, and the alternative means retained for further analysis.

In Section 2.2.1 of the CN EIS, CN evaluates four alternative site locations. However, the detailed Site Selection Study is found in the CN EIS Documents, Appendix F. In Section 3.2 of the Site Selection Study, CN considers 12 potential sites for the Terminal in Phase 1 of the Study, including MIT (Site #9) and BIT (Site #4).

At page 7 of the Site Selection Study, Table 3.1 outlines that BIT fails as a potential site based on Principle 2: "[s]ites that do not meet the minimum size and site orientation requirements along the CN mainline necessary to construct and operate the proposed intermodal terminal include BIT…" Accordingly, BIT was not carried forward to Phase 2 of the Study for consideration.

In circumstances where the Project includes a reference to BIT approaching capacity, and expanding BIT was indeed one of the site locations identified as an alternative means of carrying out the Project to meet CN's "growing operational and commercial needs", insufficient information in relation to BIT as a site location was provided. More specifically, I do not know how the criteria used in Phase 1 of the Site Selection Study to assess site locations against each other were selected or implemented and/or whether the approach taken to assess these alternative means against the criteria also considered using more sophisticated technology/equipment and analysis at BIT to increase capacity and therefore require less space adjacent and parallel to the CN mainline to meet the construction and operational requirements for an intermodal terminal.

I have reviewed CEA Agency Information Requests and CN Information Request Responses regarding the Site Selection Study (specifically, in relation to IR-6), and further information given by CN in response to information requests were only based on Phase 2 of the Site Selection Study and not Phase 1 of the Study. Further information is required to assess the sufficiency of Phase 1

of the Site Selection Study in order to determine whether a satellite terminal is even required to satisfy the "Purpose of the Project".

Design, Equipment and Technology

I believe that an alternative means for increasing the overall BIT terminal throughput capacity is available and was not considered and apparently not included in the CN EIS Documents, even though the "Project" definition includes a reference to BIT approaching capacity. Design, equipment and technology considerations should have been addressed as part of the alternative means assessment in relation to site selection.

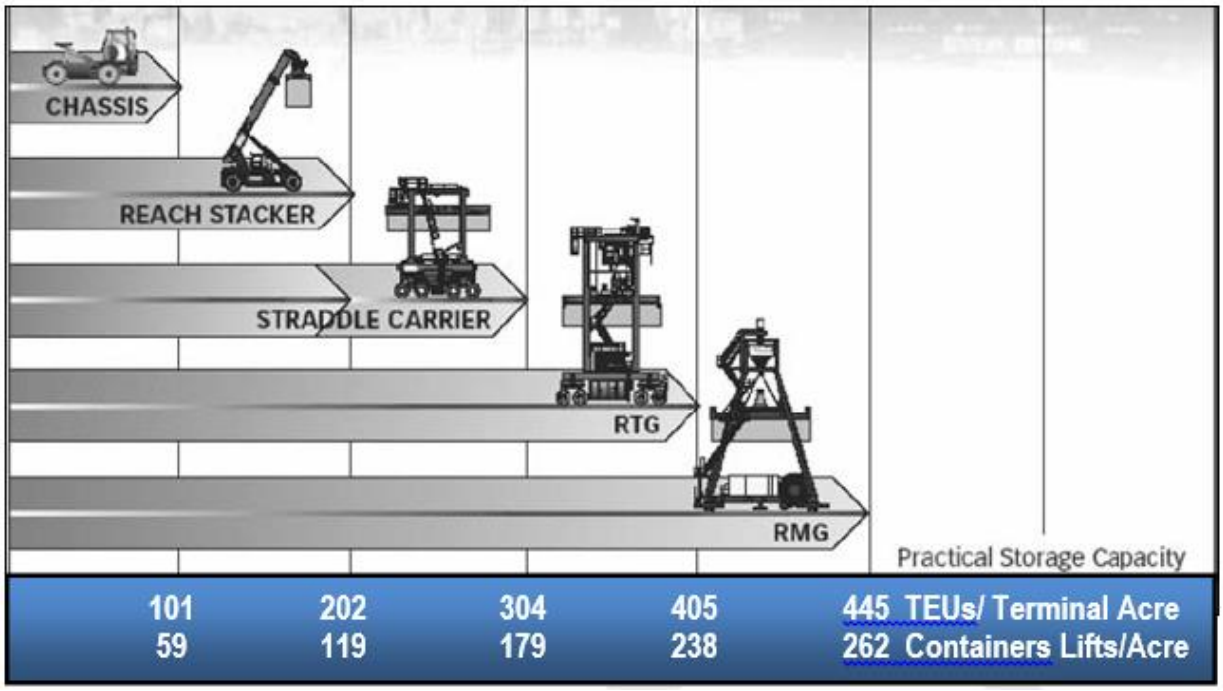
CN has long operated the BIT and other intermodal terminals in their network as a "Reach Stacker" yard crane operation. The Reach Stacker terminal equipment mode of operation, although highly flexible, is generally accepted in the North American intermodal industry as lower productivity terminal yard equipment type. As indicated previously in this report, today's modern intermodal terminal operations have many yard choices that could offer dramatically increased intermodal terminal capacity with smaller footprints and substantial reductions in air contaminant emissions.

Higher productive yard crane operational modes could offer BIT a meaningful alternative, apparently yet to be investigated by CN. This approach would change the current existing BIT intermodal container yard crane equipment from the current yard Top Lift-Forklifts/Reach Stackers and current rail loading Rubber Tired Gantry ("RTG") to one of the following terminal crane equipment operating modes with substantial productivity and throughput benefits:

- A full RTG container yard layout operation replacing the current Top Lift-Forklifts/Reach Stackers yard cranes and keeping the current rail loading RTGs.

- A full container yard layout using state-of-the-art Zero Emission, Electric Drive Wide Span Cranes ("WSC") (a high throughput, small footprint Rail Mounted Cranes ("RMC") container yard operation).

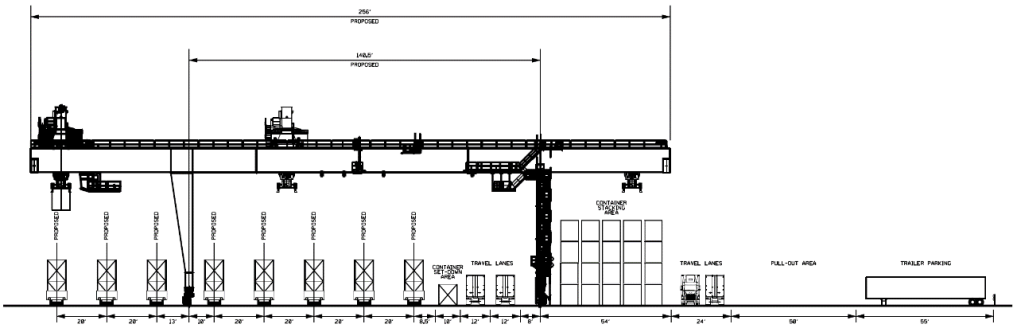
Increasing Terminal Capacity with Yard Crane Equipment Changes



Considering the potential productivity benefits of the above chart, changing from a Reach Stacker yard crane system to a RTG or Rail Mounted Gantry ("RMG") yard crane system could effectively double the intermodal rail terminal practical storage and throughput capacity.

Zero Emission, Electric Drive, Wide Span Cranes & Rail Mounted Cranes

It is clear that the intermodal industry trend in North America for Class I railroads is to more and more turn to zero emission, electric drive, wide span cranes, with a small physical footprint, to maximize intermodal rail terminal throughput capacity on a new or existing intermodal rail terminal. A partial typical cross section of a CSX wide span crane (WSC) also referred to as a RMG crane is illustrated below.



These WSC or RMG/RMC yard crane installations have proven to strikingly reduce air emissions and provide for almost silent terminal crane operations. From an intermodal rail systems standpoint, the WSC/RMG/RMC can dramatically increase terminal throughput and network connections for the railroad while improving facility safety and all while operating in a semi-automated or fully automated operational mode.

The environmental emissions benefits of a WSC/RMG/RMC for an intermodal rail terminal installation are impressive. The following chart is an excerpt from the CSX analysis for the CSX New North Baltimore, Ohio new WSC Integrated Intermodal Logistics Hub project (Northwest Ohio).

Operation	Pollutant (grams/lift)			
	HC	CO	NO_x	PM
WSC	1.8	8.3	23.9	2.1
Reduction vs. conventional	**84%**	**83%**	**84%**	**82%**

HC=Hydrocarbons , CO=Carbon Monoxide, No_x=Oxides of Nitrogen, PM=Particulate Matter, 454g/lb., 2000 lbs/ton

In light of the above, it is apparent that CN does not provide sufficient information regarding the site selection process in relation to BIT as an alternative site. The following information is required in order to understand the alternative means for carrying out the MIT Project:

Information Requests:

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
Alternative Means: Site Selection EIS Guidelines, Part 2, Section 2.2 OPS 2015	CN EIS, Section 2.1 Site Selection Study (App. F)	**IT.8** **Site Selection Documents** Please provide any additional reports, analyses or studies on potential sites and site selection criteria, including under Phase 1 of the Site Selection Study.	Technical deficiency of information. CN does not provide sufficient information regarding how it arrived at its site selection locations. This information is required in order to determine the sufficiency of the alternative means analysis for carrying out the Project.
Alternative Means: BIT as an Alternative Site EIS Guidelines, Part 2, Section 2.2	CN EIS, Section 2.2 Site Selection Study (App. F)	**IT.9** **Information on Site Selection Criteria** Please provide further information on the selection and	CN does not provide sufficient information regarding whether increasing capacity at BIT through sophisticated technology and equipment was considered. This information is required in order to

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
OPS 2015		implementation of criteria used in Phase 1 of the Site Selection Study to assess site locations against each other and whether the approach taken to assess alternative site locations against the criteria, considered using more sophisticated technology and equipment at BIT than what currently exists at BIT to increase capacity. If so, please also provide this background information.	understand the sufficiency of the alternative means analysis for carrying out the Project.

(B) Cushman & Wakefield Reports

CN refers to two reports in the CN EIS Documents that relate to the site selection process that were not disclosed: (i) *Cushman & Wakefield – Valuation & Advisory June 2015;* and (ii) *Cushman & Wakefield 2015 – Economic and Financial Impact of an Intermodal Terminal in Milton. Prepared for Canadian National Railway Company ("Cushman & Wakefield – Economic and Financial Impact of an Intermodal Terminal in Milton 2015"*)

With respect to *Cushman & Wakefield – Valuation and Advisory June 2015*, Section 3.4 of the Site Selection Study states that a land availability review of 44 sectors was evaluated of which many were disqualified. Disclosure of the report is required by the EIS Guidelines as well as to determine the sufficiency of the site selection process under the "alternative means" assessment, including how other sites were selected and disqualified, including BIT.[5]

The *Cushman & Wakefield – Economic and Financial Impact of an Intermodal Terminal in Milton 2015* is referred to in the CN PJR. The CN PJR states that this report concludes that "the western GTA would be most advantageous given its access to CN's national and international networks" and that "Milton has capacity to attract a substantial amount of intermodal oriented development … based on its location, land availability, affordable price levels, proximity to a broad labour supply and access to the Provincial 400 series highways." Disclosure of this report is required by the EIS Guidelines as well as to determine the sufficiency of the site selection process under the "alternative means" assessment, including whether other sites including BIT were evaluated.

As set out in the table above, CN does not provide sufficient information regarding the site selection process and BIT as an alternative site. The following information is required in order to understand

[5] Please see IT.3 above for my information request for *Cushman & Wakefield – Valuation & Advisory June 2015*.

the alternative means for carrying out the proposed MIT Project:

Information Requests:

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
Alternative Means: Economic and Financial Impact EIS Guidelines, Part 2, Section 2.2 OPS 2015	CN EIS, Section 2.2 CN PJR, page 3	**IT.10** **Missing Referenced Document** Please provide the following document: *Cushman & Wakefield 2015 – Economic and Financial Impact of an Intermodal Terminal in Milton. Prepared for Canadian National Railway Company*.	Technical information deficiency. Further, CN references this report to explain the site selection process, but does not provide it. This information is required in order to understand the alternative means proposed.

3.2.2.2 Transportation Corridors (Truck Routes)

Part 2, Section 2.2 of the EIS Guidelines requires CN to include "approved transportation corridors and routes for truck traffic for vehicles owned and operated by the proponent" in its alternative means analysis.

Section 2.2 of the CN EIS and the *BA Group November 2015 Review of Terminal-Generated Truck Traffic* at Appendix E.17 ("BA Group 2015 Report") discuss transportation corridors and truck routes. Furthermore, the CN PJR refers to a BA Group study dated October 2015 (the "BA Group October 2015 Study"), which CN does not provide as part of the CN EIS Documents. Information within the BA Group October 2015 Study, including Figure 16 to the CN PJR (Estimated Proportions of Heavy Truck Trips Utilizing Expected Routes To/From Proposed Logistics Hub), is required in order to understand proposed routes and anticipated volumes of truck traffic at MIT.

In Section 2.2.2 of the CN EIS, CN states that the BA Group was retained to "assess the impact of the truck traffic generated by the development of the proposed terminal." The BA Group 2015 Report generates conclusions based on a number of assumptions and conclusions given to it by CN, including (bolded terms are mine):

Document	Page Reference	Quote
BA Group 2015 Report	1-2 & 10	**CN has determined** that the Terminal: "*is expected to generate approximately 800 trucks per weekday entering and exiting the hub which will include up to 650 inbound and 650 outbound trucks at the beginning and up to 800 trucks each way by 2020. These trucks will enter the hub through the gate, drop off or pick-up a container from the hub and exit the hub."* For the purpose of this assessment, the estimate of up to 800 Terminal-generated heavy-truck 2 trips per day in each direction has been adopted.

Document	Page Reference	Quote
BA Group 2015 Report	2 & 10	**CN has also provided BA Group** with a proportional pattern of hourly ingress and egress movements over the course of a typical 24-hour weekday operation. The pattern was developed through analysis data provided by CN of inbound and outbound gate movements at the Brampton Intermodal Terminal ("BIT") over the course of a year ending in September 2015."
BA Group 2015 Report	6	The directional distribution of Terminal-generated heavy-truck travel to each of the principal points of approach adopted by this assessment is based on information collected through a comprehensive Commercial Vehicle Survey undertaken by MTO at the existing CN Brampton Intermodal Terminal (BIT). Detailed results of the survey were provided by MTO to CN and utilized by BA Group for the purpose of this assessment. Between 2012 and 2014, a total of 790 truck drivers accessing the BIT were surveyed by MTO as part of the Commercial Vehicle Survey. The surveys were based on a random sampling of trucks. The MTO survey data represented a random sampling of trucks currently accessing the BIT and in **CN's opinion** is the best available data to assess the likely origin and destination of truck trips originating from and destined to the BIT. **CN has advised** 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. Consequently, the origin-destination information collected through the MTO survey at the BIT has been adopted as being suitably representative of the distribution of truck trips generated by the Terminal.

Subsequent to the filing of the EIS, CN has included as part of its Information Request Response (IR13-2) in regards to an air quality analysis prepared on September 30, 2016, Traffic Volume Forecasts (2021 and 2031). CN states that the traffic volume forecasts were assembled from "various sources" and is "a reasonable set of volumes".

The BA Group Study 2015 and the September 30, 2016 *Traffic Volume Forecasts (2021 and 2031)* is based on information and assumptions that have been provided to the BA Group by CN. CN does not clearly explain how this traffic data was collected nor where to obtain it. Where CN relies on data collected at BIT, CN does not explain how or why the BIT data can be correlated to the MIT data. This information is therefore requested to be disclosed.

Even where the traffic data can be substantiated with background reports, studies and investigations, the traffic analysis does not sufficiently take into account fundamental factors required to properly assess the sufficiency of the truck traffic used to assess its impact with respect to the development of MIT:

i. **Consistent planning horizon data**:

- Truck traffic analysis was based on 2015 traffic data for a planning horizon of 2020. The September 30, 2016 Volume Traffic Volume Forecasts provided for 2021 and

2031 were for inclusion in the air quality analysis. This information does not seem to be taken into account in the truck traffic analysis.

- Further information in relation to how these 2021 and 2031 forecasts are incorporated into the transportation corridors analysis of the CN EIS (Section 2.2.2) should be provided in order to take into account probable traffic growth in Milton as of these future forecast dates.

ii. **Seasonal traffic data**:

- CN makes statements in relation to the number of trucks entering and exiting MIT. I do not have enough information to understand whether this is a maximum value or average value. Maximum values are required to properly assess peak flows in the traffic and volume analysis.

iii. **Directional distribution of traffic data**:

- CN is relying on a Commercial Vehicle Study by MTO that includes origin and destination data from BIT, as being representative of origin and destination data at MIT, without commenting on how the data can be correlated to MIT or whether there is any uncertainty in doing so or limitations to the conclusions made.

- The MTO Study was not provided as part of the CN EIS Documents and is requested to be disclosed as part of this process.

- However, I was able to access a series of datasets from MTO published in 2015, as listed in Appendix B to this report. If this is the same study that is relied upon by the BA Group, the MTO data appears to be based on a commercial vehicle flow database collected that provides 2006 and 2008 average vehicle daily values. The data is derived from the information collected in the 2006 Ontario Commercial Vehicle Survey, published on April 30, 2015, which was also not provided as part of the CN EIS and is requested to be disclosed as part of this process. Generally, this commercial vehicle survey data is 10 to 12 years old and by the time MIT gets constructed will be even older.

- Further information is required in relation to how and why this origin and destination data can be correlated to MIT including any limitations on the inferences or conclusions that can be drawn from this information, in order to determine the sufficiency of the impact on the traffic analysis presented by CN.

During a May 27, 2015 CN presentation to Halton Regional Council, CN repeatedly referenced an ongoing AECOM in-depth truck traffic study identifying truck traffic impacts associated with the MIT Project. CN does not provide this AECOM truck traffic study. It is required in order to evaluate the truck traffic demands for the Terminal, particularly immediately outside the Terminal gate.

Lastly, I have reviewed the Metrolinx Presentation entitled *Milton Corridor Committee – Meeting #3 – October 7, 2016* and *Correspondence dated February 6, 2017 from Deputy Minister of Transportation (MTO) to Lesley Griffiths, Panel Chair, Milton Logistics Hub Project Review Panel c/o Canadian Environmental Assessment Agency* and note that in relation to sufficiency of

transportation corridor information, CN has not commented on how the new Brampton-Milton freight corridor will affect rail and truck traffic patterns, including whether there will be a shift of rail freight presently destined to Brampton for distribution or whether distribution will move onto the Milton corridor for distribution from there.

As set out in the table above, CN has not provided sufficient information regarding the Transportation Corridors (Truck Routes). The following information is required in order to understand the alternative transportation corridors:

Information Requests:

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
Alternative Means: Truck Traffic EIS Guidelines, Part 2, Section 2.2 OPS 2015	CN EIS, Section 2.2.2 CN PJR, Section 4.4	**IT.11** **Missing Referenced Document** BA Group October 2015 study referenced in the CN PJR.	Technical deficiency of information. Further, CN does not provide sufficient information regarding traffic data and assumptions. This information is required in order to determine the sufficiency of the alternative transportation corridors and the sufficiency of the description of truck operations.
Alternative Means: Truck Routes EIS Guidelines, Part 2, Section 2.2 OPS 2015	CN EIS, Section 2.2.2 BA Group Study 2015 & BA Group September 30, 2016, Traffic Volume Forecasts (2021 and 2031)	**IT.12** **BA Group Background Information** Please provide the origin of all truck traffic data provided by CN to the BA Group including all reports, studies and investigations. Where traffic data is based on BIT, please explain why the assumptions were made and whether there are limitations on the inferences and conclusions that can be drawn.	Technical deficiency of information. Further**,** CN does not provide sufficient information regarding how the traffic data was collected and where the traffic data and assumptions provided to CN were derived. Where CN relies on BIT traffic data, it does not explain how or where these assumptions are made. This information is required in order to determine the sufficiency of the alternative transportation corridors and the foundation and applicability of this information to MIT truck operations.
Alternative Means: Truck Routes EIS Guidelines, Part 2, Section 2.2 OPS 2015	CN EIS, Section 2.2.2 BA Group Study 2015 and BA Group September 30, 2016, Traffic Volume Forecasts (2021 and 2031)	**IT.13** **2021 and 2031 Traffic Volume Forecasts** Please provide further information in relation to whether and how the September 30, 2016 Traffic Volume Forecasts have been incorporated into the transportation corridors analysis of the EIS (Section 2.2.2).	Technical deficiency of information. CN should incorporate the newly generated traffic data reported in the September 30, 2016 Traffic Volume Forecasts into the traffic analysis provided in Section 2.2.2 of the EIS in order to take into account traffic growth in Milton as of these future forecast dates.

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
Alternative Means: Truck Routes EIS Guidelines, Part 2, Section 2.2 OPS 2015	CN EIS, Section 2.2.2 BA Group Study 2015 and BA Group September 30, 2016, Traffic Volume Forecasts (2021 and 2031)	**IT.14** **Seasonal Traffic Data** Please provide detailed information regarding the number of trucks entering and leaving MIT by season and whether the "*800 trucks per weekday entering and exiting the hub which will include up to 650 inbound and 650 outbound trucks at the beginning and up to 800 trucks each way by 2020"* represents an average value or a maximum value.	Technical deficiency of information. There is always a seasonable variability i.e. peaks in October/November timeframe before Christmas, and therefore maximum values are required to properly assess peak flows in the traffic and volume analysis for MIT.
Alternative Means: Truck Routes EIS Guidelines, Part 2, Section 2.2 OPS 2015	CN EIS, Section 2.2.2 BA Group Study 2015 & BA Group September 30, 2016, Traffic Volume Forecasts (2021 and 2031) at page 6	**IT.15** **Missing Referenced Documents** Please provide *MTO Comprehensive Commercial Vehicle Survey* undertaken by MTO at BIT. Please provide *2006 Ontario Commercial Vehicle Survey*, published on April 30, 2015.	Technical deficiency of information. Further**,** CN does not provide sufficient information regarding traffic data and assumptions. This information is required to understand the reliability of the description of truck operations in order to determine the sufficiency of the alternative transportation corridors prescribed.
Alternative Means: Truck Routes EIS Guidelines, Part 2, Section 2.2 OPS 2015	CN EIS, Section 2.2.2 BA Group Study 2015 & MTO Commercial Vehicle Study	**IT.16** **Directional Distribution of Traffic Data** Please provide further information in relation to how BIT traffic data from the MTO Commercial Vehicle Study can be correlated to MIT traffic data, including origin and destination data, and whether there are any limitations on the inferences or conclusions that can be drawn from this Study.	Technical deficiency of information. Further, CN does not provide sufficient information on the applicability of the BIT traffic data from the MTO Commercial Vehicle Study to the MIT traffic data, including origin and destination data. This information is required in order to understand the reliability of the traffic analysis in order to determine the sufficiency of the alternative transportation corridors presented.
Alternative Means: Truck Routes EIS Guidelines, Part 2, Section 2.2 OPS 2015	CN EIS, Section 2.2.2	**IT.17** **Missing Referenced Document** Milton Intermodal Truck Traffic Investigation prepared by AECOM and relied upon by Marie-Therese Houde (former CN Director of Corporate Development).	Technical deficiency of information. During the May 27, 2015 presentation to Halton Regional Council, CN referenced this report to explain the needs of growing customer base at BIT and the potential effects of MIT on truck traffic, but CN does not provide the report. This information is required in order to understand the

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
			truck traffic demands at MIT.
Alternative Means: Metrolinx Freight Corridor EIS Guidelines, Part 2, Section 2.2 OPS 2015	CN EIS, Section 2.2.2	**IT.18** **Information re Brampton-Milton Freight Corridor** Please provide information on the anticipated function of the Brampton-Milton Rail Corridor with respect to the movement of freight to and from the MIT.	CN does not provide sufficient information on how the new Brampton-Milton freight corridor will affect truck traffic patterns, including whether there will be a shift of rail freight presently destined to Brampton for distribution or whether distribution will move onto the Milton corridor for distribution from there. This information is required in order to understand the freight demands at MIT.

3.2.2.3 Key Project Components

Part 2, Section 2.2 of the EIS Guidelines require CN to address the "location of key project components" and "access points to the project site" as part of its alternative means analysis.

Section 1.2.1 of the CN EIS provides CN's list of "key components of the Project", of which many are illustrated in the CN Plans dated April 24, 2015, which form part of the CTA Application ("CN Plans").

However, Section 2.2.3 of the CN EIS only considers the following "key project components" in addressing the alternative means assessment in regard to the location and design of these components:

- truck entrance location;
- gate location;
- Lower Base Line crossing;
- water supply;
- wastewater management;
- SWM;
- utilities; and,
- Indian Creek realignment.

CN does not provide an alternative means analysis with respect to location of all of the key project components it originally defines in Section 1.2.1 of the CN EIS, and therefore does not satisfy the technical requirements of the CN EIS.

With respect to the key project components considered, CN provides its analysis and preferred options in Section 2.2.3 as well as a "Summary of Alternative Means of Carrying out the Project" in Table 2.2 in the CN EIS.

CN considers alternative truck entrance locations in Section 2.2.3.1 of the CN EIS, identifying several potential entrances and assessing them against a variety of criteria identified in Table 2.1. However, CN does not provide sufficient detail with respect to the approach taken to assess the alternative truck locations against the selected criteria and how Britannia Road was considered as the preferred location. For example, CN does not provide any detail regarding why alternative locations failed on "dispersion opportunities", "economic considerations" and "limits potential conflict with existing residences". Further information is required with respect to the "additional upgrades, approvals or engineering design considerations" in relation to the other locations which were not chosen (Step 1 of 4-Step Analysis). CN also does not provide information regarding whether the selection of the preferred Britannia Road entrance will cause significant adverse environmental effects (Step 4 of 4-Step Analysis).

Similarly, CN considers gate location in Section 2.2.3.2 of the CN EIS. CN does not completely satisfy and/or disclose all of the requirements of the 4-Step Analysis, including whether CN selected more than one alternative for the alternative gate location, i.e. inbound and outbound gate locations, the selection of criteria required to determine the technical and economic feasibility of the alternative gate location and whether the preferred option of being setback from the Britannia Road entrance/being adjacent to the work pad will cause significant adverse environmental effects.

CN provides insufficient information in relation to alternative locations and design for the Project's key components and further information is thus requested.

I note that "key project components" have not been defined within the EIS Guidelines. I agree that truck entrance and gate locations are two key project components. However, from my perspective, CN has not labelled or described in the CN EIS Documents, including the CN Plans, many key project components that should have been considered as part of the alternative means analysis with respect to location and design, including dominant equipment operating type and general arrangement of the Project site including yard and container layout and loading track geometry.

The following information is required in order to understand the alternative means analysis for key project components:

Information Requests:

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
Alternative Means: Key Project Components EIS Guidelines, Part 2, Section 2.2	CN EIS, Sections 1.2.1 & 2.2.3	**IT.19** **Alternative Means Analysis for Key Project Components** Please provide an alternative means analysis with respect to location and design of all of the key project components identified in Section 1.2.1 of the CN EIS.	CN has not satisfied the technical requirements of the EIS Guidelines.
Alternative Means: Other Key Project Components EIS Guidelines, Part 2, Section 2.2	CN EIS, Section 2.2.3.2	**IT.20** **Other Key Project Components Not Considered** Further, please provide an alternative means analysis for location and design for other key project components not identified in the CN EIS including dominant equipment operating type and general arrangement of the Project site including yard and container layout as well as loading track geometry.	CN has not identified all key project components. The EIS guidelines requires CN to consider alternative means for the location and design of key project components.
Alternative Means: Key Project Component – Truck Entrance Location EIS Guidelines, Part 2, Section 2.2	CN EIS, Section 2.2.3.1 & Table 2.1	**IT.21** **Alternative Truck Entrance Locations** Please provide information related to the approach taken to assess the alternative truck locations against the selected criteria and how Britannia Road was considered as the preferred location. This request includes information of why alternative locations failed under the criteria selected and information related to the "additional upgrades, approvals or engineering design considerations" of the other truck locations which were not chosen. Additionally, please provide information of whether the preferred location will cause significant adverse environmental	CN has not satisfied the 4-Step Analysis required by OPS 2015 as incorporated into the CN EIS.

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
		effects.	
Alternative Means: Key Project Component – Gate Location EIS Guidelines, Part 2, Section 2.2	CN EIS, Section 2.2.3.2 & Table 2.1	**IT.22** **Alternative Gate Locations** Please provide information required under the 4-Step Analysis, including: whether CN selected more than one alternative for the alternative gate location i.e. inbound and outbound gate locations, the selection of criteria required to determine the technical and economic feasibility of the alternative gate locations and whether the preferred option of being setback from the Britannia Road entrance/being adjacent to the work pad will cause significant adverse environmental effects.	CN has not satisfied the 4-Step Analysis required by OPS 2015 as incorporated into the EIS Guidelines.

3.2.3 Design Information

Part 2, Section 3.1 of the EIS Guidelines requires the CN EIS to include a description of the "project components, associated and ancillary works, and other characteristics that will assist in understanding the environmental effects."

Section 3.2 and 3.3 of the CN EIS describes MIT Project setting, referring to Figures 2 & 3, Appendix B to identify the Project components and the preliminary design of the Terminal and proposed project components, respectively.

While the CN EIS provides some information on Terminal design and project components, it does not provide sufficient information to properly assess the design of the proposed MIT Project that would be need to be provided in order to understand the full picture of environmental effects. Further information requested with respect to the MIT design and layout of project components that have not been provided by CN include:

i. Terminal entrance and exit gate area layouts/plans including container inspection facilities, inbound and outbound truck canopies, Equipment Interchange Report (transfer of custody) booths and drive assistance buildings (roadway station);

ii. Terminal Administration Building description, floor plans and all building elevations;

iii. Terminal refrigerated container operating areas;

iv. Maintenance and repair building/facility floor plans, elevations; and

v. Terminal equipment fueling system

Although the CN Plans illustrate some of these components, they have not been labelled or specifically addressed. A full hardcopy blueprint set of the all of the engineering drawings contained within CN's Project Number 60332275 (and any associated project numbers to MIT) is thus requested, in order to understand all of the design features of MIT.

Further, CN states in Section 3.3 that "as engineering studies progress and consultation continues… some of the details of the Project described in the following sections may be refined". Updated CN plans are thus requested in order to assist in understanding the true picture of environmental effects.

Information Requests:

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
Design: Additional project components EIS Guidelines, Part 2, Section 3.1	CN EIS, Sections 3.1 to 3.3 & Figures 1 to 3 (App. B) CTA Application: CN Plans	**IT.23** **MIT Design and Layout Information** Please provide further information with respect to the MIT detailed design and layout of the following project components that have not been specifically described or labelled in the CN Plans, including: ▪ Terminal entrance and exit gate area layouts/plans including container inspection facilities, inbound and outbound truck canopies, Equipment Interchange Report booths and drive assistance buildings (roadway station); ▪ Terminal Administration Building description, floor plans and all building elevations; ▪ Terminal refrigerated container operating areas; ▪ Maintenance and repair building/facility floor plans, elevations; and ▪ Terminal equipment fueling system	A description of all of the project components, associated and ancillary works, and other characteristics is required in order to assist in understanding whether there are any associated environmental effects.

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
Design: Engineering Drawings EIS Guidelines, Part 2, Section 3.1	CN EIS, Sections 3.1 to 3.3 CTA Application: CN Plans	**IT.24** **Missing Documents** Full hardcopy blueprint copies of CN Plans in Project Number 60332275 (and any associated projects related to MIT)	The engineering drawings are required in order to understand the full design of MIT and to thus understand whether there are any associated environmental effects.
Design: Updated Design of Project Components EIS Guidelines, Part 2, Section 3.1	CN EIS, Sections 3.1 to 3.3 & Figures 1 to 3 (App. B)	**IT.25** **Design of Project Components** Please provide updated information and design of Project components and associated and ancillary works	CN has stated that only a preliminary design has been provided and that project components will be further refined as engineering studies progress and consultation continues. An updated design is required in understanding the true picture of environmental effects.

3.2.4 Construction Information

Part 2, Section 3.2 of the EIS Guidelines require the CN EIS to include "descriptions of the construction… phases associated with the proposed project."

These must include "descriptions of the activities to be carried out during each phase, the location of each activity, expected outputs and an indication of the activity's magnitude and scale" as well as a "schedule including the time of year, frequency, and duration for all project activities."

Section 3.2.1 of the EIS Guidelines require the CN EIS to include a description of the following site preparation and construction activities:

- *site clearing, excavation, and grading activities (location, footprint);*
- *borrow materials requirements (source, quantity);*
- *laying of new track and realignment of existing track (methods, timing);*
- *water course diversion required (location, methods, timing);*
- *erosion and sediment controls to be used during construction.*
- *equipment requirements (type, quantity);*
- *construction laydown areas (location, footprint);*
- *administrative buildings, garages, other ancillary facilities (location, footprint);*
- *number of employees and transportation of employees; and*
- *disruption to train activities on the mainline (duration and volume).*

Section 3.4.1 of the CN EIS sets out the main construction activities. CN has also included as part of its Information Request Response (IR-5) a "Conceptual Project Schedule" which it states reflects the construction timing windows that have been incorporated into the construction schedule to

minimize and avoid potential environmental effects. The Information Request Response (IR-13)also refers to the Technical Data Report Noise Assessment TDR (Appendix E.10) for a further breakdown of construction activities during each phase of construction, including Table 4.3.2, Table 4.6 and TDR Appendix D.

Several vague and incomplete statements have been made throughout the CN EIS Documents with respect to construction activities and therefore do not fully address the threshold required by the EIS Guidelines. These statements include the following:

Document	Section Reference	Quote
CN EIS	3.4.1 Construction	These activities are common to construction projects. Different phases of construction are expected to occur at different times. It is expected that construction equipment will operate in different areas of the PDA at different times during the construction phase
CN EIS	3.4.1.1 Site Clearing and Grading Activities	An erosion and sediment control plan will be prepared for the construction phase of the Project
CN EIS	3.4.1.2 Track Construction and Signals Installation	Disruptions of train activities on the mainline will occur during cutovers of mainline tracks. The construction staging scheme for the Terminal and track work is a process commonly executed by CN. Once construction of the railway grade is complete, ties and rails will be distributed and placed accordingly along the track alignment. Ballasting, final surfacing with mechanized lifting and lifting equipment, termite welding, grinding and destressing will complete track construction. Signals and switching equipment will be installed as required.
CN EIS	3.4.1.3 Terminal Infrastructure	While the final method and materials to be used for the construction of the work pads have not been finalized, likely materials include either asphalt or roller compacted concrete. The type of pavement for the Terminal pads will be determined during detailed design. In the event of a concrete surface, a temporary batch plant will be constructed at or immediately adjacent to the Terminal (within the PDA), in order to construct the work pads… The location of temporary construction offices will be confirmed during detailed design, but will be located on the site within the PDA. Options include using temporary mobile offices or existing buildings within the PDA as construction offices.
CN EIS	3.4.1.5 Utilities	For third party infrastructure, CN will work with other affected parties, including the Town of Milton and Sun-Canadian, to develop methods and timing for construction to keep on CN's schedule for the protection of the environment.
CN EIS	3.4.1.7 Construction Equipment and Operation	Equipment will operate in different areas of the Project at different times during the construction period. Construction is planned to take place between 07:00 and 21:00, with the majority of activities likely occurring between 07:00 and 19:00 (daytime hours). However, periodic night time construction may be required during some components of the Project work….
CN EIS & App. E.10 Noise Effects	4.3.2 & App. D : Major Construction Activities and Equipment	**Table 4.6: Summary of Major Construction Activities** **Phase Major Construction Activities based on Preliminary Schedule** Phase 1: • Britannia bridge construction

Document	Section Reference	Quote
		• Pipeline relocation • Begin grading for mainline track shift/diversion • Begin Lower Base Line Grade Separation • Prepare laydown areas and setup trailers • Full-site clearing (incl. grub/vegetation)o topsoil • Full-site stripping of topsoil • Berm/barrier construction • Begin grading for major site works and tracks • Begin construction of gate and access bridge • Begin building construction Phase 2: • Continue grading for major site works and track • begin drainage for major site works • complete gate and access bridge • pave access road • continue building construction • continue Lower Base Line bridge construction • complete Britannia bridge • construction mainline track and new Ash East Phase 3: • construct yard tracks and pad tracks • paving pads and gate • complete building construction • final roadworks • construction of new Control Locations (Ash) • install gate systems and pad lighting • south-end track work

A detailed description of construction activities and a detailed construction schedule that includes the incomplete information outlined in the above table is required in order to be able to assess whether CN has taken steps to minimize and avoid potential environmental effects during the construction phases.

Information Requests:

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
Construction EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.1 CN EIS Technical Data Report Noise Effects Assessment	**IT.26** **Detailed Description of Construction Activities** Please provide a detailed description of construction activities that were left incomplete in the CN EIS Documents, including:	Further information is needed in relation to construction activities in order to assess is taking steps to minimize and avoid potential environmental effects

	(App. E.10)	▪ An erosion and sediment control plan to be used during construction ▪ duration and volume of disruption to train activities on the mainline ▪ method and timing for laying of new track and realignment of existing track ▪ final method and materials to be used for the construction of the work pads and likely materials to be used ▪ the location of temporary construction offices ▪ Method and timing for construction of third party infrastructure including utility crossings ▪ location and footprint of construction laydown areas ▪ details regarding number of employees and transportation of employees during the construction phase ▪ location and footprint for construction of administrative buildings, garages and other ancillary facilities	
Construction EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.1 CN EIS Technical Data Report Noise Effects Assessment (App. E.10)	**IT.27** **Detailed Construction Schedule** Please provide a detailed construction schedule that includes all components of major construction activities in the Three Phases outlined in Table 4.6 of CN EIS Technical Data Report Noise Assessment (App. E.10).	Further information is needed in relation to construction activities in order to determine whether there is sufficient information to assess whether CN is taking steps to minimize and avoid potential environmental effects

3.2.5 Operations Information

Part 2, Section 3.2 of the EIS Guidelines require the CN EIS to include "descriptions of the… operation phases associated with the proposed project."

Section 3.2.2 of the EIS Guidelines require the CN EIS to include a description of the following operations:

- *on-site logistics and traffic plan (on and off-loading rates, site capacity for trucks, anticipated daily volumes);*
- *anticipated daily, monthly and seasonal schedules for rail transport;*
- *anticipated quantities of transported materials by type;*
- *equipment requirements and maintenance;*

- *infrastructure maintenance;*
- *wastewater and stormwater management on the project site;*
- *reagent requirements for maintenance (volumes, storage, types);*
- *petroleum products (source, volume, storage);*
- *temporary or permanent storage of hazardous materials (source, volume, storage);*
- *contribution to atmospheric emissions, including emissions profile (type, rate and source);*
- *water recycling activities;*
- *waste management and recycling; and*
- *number of employees, transportation of employees, work schedule, lodging requirement on site and off site.*

Under Section 3.4.2 of the CN EIS, CN provides information regarding MIT operations, including:

- truck operations (entrance/exit and movements);
- train operations;
- lift operations; and
- equipment maintenance

Comments with respect to CN's description of Operations will be subdivided into the following three sections: i) railway and truck operations; ii) intermodal terminal operations including lift operations and equipment maintenance; and iii) operations as a satellite to BIT.

3.2.5.1 Railway and Truck Operations

In Sections 3.4.2.1 and 3.4.2.2 of the CN EIS, CN provides a description of truck and train operations respectively.

CN does not provide the following information with respect to railway and truck operations, as required by Section 3.2.2 of the EIS Guidelines. I am therefore requesting the following information from CN:

- on-site logistics and traffic plan (on and off-loading rates, site capacity for trucks, anticipated daily volumes);

- anticipated daily, monthly and seasonal schedules for rail transport; and
- anticipated quantities of transported materials by type.

<u>Truck Operations</u>

With respect to truck traffic, CN refers to the BA Group Study discussed above in Section 3.2.2.2 as its basis for truck traffic. The same information requests made with respect to the BA Group Study above are requested on the basis of determining whether there is sufficient information in relation to truck operations.

CN also states in Section 3.4.2.1 of the CN EIS that "…it is estimated that the majority of truck movements will occur during the daytime. More specifically, it is estimated that approximately 85% of truck movements will occur between 05:00 and 21:00 as identified in the Review of Terminal-

Generated Truck Traffic..." The origin of this data in the BA Group Study is requested in order to determine the foundation and applicability of this information to MIT truck operations.

In Section 3.4.2.1 of the CN EIS, CN has proposed an automated gate system for the MIT entrance facility for trucks. In order to determine the efficiency of this system, descriptive information regarding the CN SpeedGate™ system to reduce the time trucks idle in line both proposed for MIT and currently at BIT is requested.

CN has also publicly indicated[6] that a Terminal Reservation system will be used at MIT to reduce truck times on inbound lanes to MIT. In order to determine the efficiency of this system, descriptive information regarding the Terminal Reservation system both proposed for MIT and currently at BIT is requested.

Lastly, CN has provided the type of truck movements expected to and from the Terminal and states that there will be "a variety of container types". CN has not provided any more detail in relation to the specific types of container types including varied container lengths, anticipated number of container types as well as the anticipated number of types of truck movements in relation to the variety of container types. CN provides illustrations of yard and container layout as part of the CN Plans, but does not clearly identify or describe how the variability of container lengths will be accommodated into the design and operations of the Terminal. This information is required in order to determine whether sufficient information in relation to truck operations has been included, in order to predict related environmental effects.

Railway Operations

CN provides a general description in relation to rail operations in Section 3.4.2.2 of the CN EIS as well as in the Application for an Order Pursuant to Section 98(2) of the CTA for Authorizing Construction, CN, January 22, 2016 (the "CTA Application").

CN states that the Terminal is planned to be served by four intermodal trains per day, including two existing trains that currently operate on the Halton Subdivision. CN does not provide any background information regarding the relationship between adding two new trains to volume forecasts at MIT and how the four trains will operate together to serve market demand. This information is necessary in order to determine whether sufficient information in relation to rail operations has been included to predict environmental effects.

CN provides a basic description of rail operations, from entering the Terminal, loading and unloading railcars, marshalling of trains, fueling of trains, repair of trains and departure of trains from the Terminal. More specific information in relation to daily, monthly and seasonal schedules for rail transport as well as a detailed on-site logistics and traffic plan is required, as earlier requested.

Lastly, I have reviewed two documents with respect to Metrolinx and CN reaching an Agreement-in-Principle ("AIP") to build a new 30km freight corridor between Brampton and Milton which would

[6] Marie-Therese Houde, CN's former Director of Corporate Development, referenced the Terminal Reservation system regarding the proposed MIT Project to Halton Regional Council on May 27, 2015: video available online at: https://www.youtube.com/watch?v=_E3A5EU1OdI.

provide an alternative route, or bypass, for freight rail traffic carried by CN between Brampton and Milton. These two documents are the *Metrolinx Presentation – Milton Corridor Committee (October 7, 2016)* and *Correspondence dated February 6, 2017 from Deputy Minister of Transportation (MTO) to Lesley Griffiths, Panel Chair, Milton Logistics Hub Review Panel c/o Canadian Environmental Assessment Agency.*

These documents explain that the new bybass (the "Brampton-Milton Rail Corridor") would be intended to allow CN to shift its freight traffic from the CN-owned section of the Kitchener corridor to the new bypass line, freeing up capacity for more GO service through Brampton to Kitchener. The Brampton-Milton Rail Corridor concept includes two mainline tracks, initially, and up to six tracks in the longer term.

It is important to be monitoring the effect of the AIP on the Project's design and operations. As such, as part of this process, it will be important to monitor the progress of the Agreement between the Province of Ontario and Metrolinx with CN, including disclosure of the AIP and any information updates to the AIP. It will also be important to understand the anticipated function of the Brampton-Milton Rail Corridor with respect to the movement of freight to and from MIT.

CN has also not provided the anticipated effect of additional freight train traffic in and out of the MIT on the frequency and scheduling of passenger train and commuter rail services for the GTHA. This is an important consideration that will have an impact on railway operations and ultimately, related environmental effects. This information is also in line with a *GTHA Urban Freight Study* produced by Metrolinx, which recognizes that urban freight and commuter traffic demands typically coincide, which compounds peak period congestion. In this study, Metrolinx provides strategic direction and possible actions to increase efficiency of the movement of goods in GTHA.

The following information is required in order to understand railway and truck operations at MIT:

Information Requests:

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
Truck Operations EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.2.1	**IT.28** **Truck Operations Information** Please provide the following information: ▪ on-site logistics and traffic plan (on and off-loading rates, site capacity for trucks, anticipated daily volumes); ▪ anticipated daily, monthly and seasonal schedules for rail transport; and ▪ anticipated quantities of	Technical information specifically required by EIS Guidelines

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
		transported materials by type.	
Truck Operations EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.2.1	**IT.29 SpeedGate System and Truck Reservation System** Please provide descriptive information regarding the CN SpeedGate™ system and the Terminal Reservation system both proposed for MIT and currently at BIT is requested.	This information is needed in order to determine whether sufficient information in relation to truck idle times and truck operations has been included, in order to predict environmental effects.
Truck Movements EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.2.1	**IT.30** **Truck Movement Information** Please provide information related to specific types of container types including varied container lengths, anticipated number of container types, anticipated number of types of truck movements in relation to the variety of container types and how the variability of container lengths will be accommodated into the design and operations of the Terminal.	This information is needed in order to determine whether sufficient information in relation to truck operations has been included to predict environmental effects.
Rail Operations EIS Guidelines, Part 2, Section 3.2 s. 98(2) of CTA	CN EIS, Section 3.4.2.2 CTA Application, page 13	**IT.31** **Added Train Operations Information** Please provide background information regarding the relationship between adding two new trains to volume forecasts at MIT and how the four trains will operate together to serve the market demand at MIT.	This information is necessary in order to determine whether sufficient information in relation to rail operations has been included in order to predict environmental effects.
Rail Operations **Requirements for Railway Operations and Services** EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.2.2	**IT.32** **Effect of Additional Freight Traffic on Passenger Services** Please provide the anticipated effect of additional freight train traffic in and out of the Milton Hub on the frequency and scheduling of passenger train and commuter rail	This is an important consideration that will have an impact on railway operations and ultimately, related environmental effects.

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
s. 98(2) of CTA		services for the GTHA, including any reports, analyses, studies, projections or assessments of this issue.	
Rail Operations **Requirements for Railway Operations and Services** EIS Guidelines, Part 2, Section 3.2 s. 98(2) of CTA	CN EIS, Section 3.4.2.2	**IT.33** **Agreement-in-Principle Between Ontario and Metrolinx** Please provide the Agreement-in-Principle ("AIP") and information updates to the AIP between the Province of Ontario and Metrolinx with CN to build a new, 30km rail corridor between Brampton and Milton ("Brampton - Milton Rail Corridor").	It is important to be monitoring the effect of the AIP on the Project's design and operations.
Rail Operations **Requirements for Railway Operations and Services** EIS Guidelines, Part 2, Section 3.2 s. 98(2) of CTA	CN EIS, Section 3.4.2.2	**IT.34** **Anticipated Function of Brampton-Milton Corridor** Please provide the anticipated function of the Brampton – Milton Corridor with respect to the movement of freight to and from the MIT.	It is important to understand how the Brampton-Milton Corridor will operate in conjunction with MIT in the movement of freight, as it will have an impact on railway operations and ultimately, related environmental effects.

3.2.5.2 Intermodal Terminal operations Including Lift Operations and Equipment Maintenance

In Section 3.4.2 of the CN EIS, CN discusses general operations of the intermodal terminal. In Sections 3.4.2.3 and 3.4.2.4 of the CN EIS, CN provides a description of lift operations and equipment maintenance, respectively.

Although it is required by Section 3.2.2 of the EIS Guidelines, CN does not provide the following information with respect to railway and truck operations. I am therefore requesting the following information from CN:

- a description of infrastructure maintenance; and
- a description of temporary or permanent storage of hazardous materials, including source, volume and storage.

General Operations

In Section 3.4.2 of the CN EIS, CN makes the following statement with respect to volume projections of containers handled by the Terminal:

> *The Project will be designed to allow efficient transfer of containerized cargo between trains and the Terminal. Once completed, the Terminal will operate 24 hours a day, 7 days a week and is projected to handle approximately 350,000 containers annually at the start of operation and is designed for approximately 450,000 containers annually at full operation.*

CN does not provide any background information or foundation of how this projection was reached and thus I require background information in the form of any reports, analyses, data or studies to support this CN statement. This information is required in order to understand MIT's operation requirements.

CN further states in Section 3.4.2 of the CN EIS that some containers are temperature controlled to accommodate products that must be chilled/frozen or heated in the winter and some containers of goods will be categorized as dangerous goods. In order to have an accurate picture of operations at the Terminal, a projection of volume of each of these special container types must be taken into account when developing on-site logistics and design.

With respect to hazardous goods, CN states that they will not handle dangerous goods in bulk and that the hazardous goods will be handled in accordance of the *Transportation of Dangerous Goods Act*. Additional information regarding how these goods will be stored, where they will be stored and how CN will control the movement of bulk hazardous goods not entering the Terminal.

I also note that CN has not provided any information on Terminal emergency response operational procedures, i.e. fire, accident, hazardous spills, deleterious environmental spills and containment. This information is required in order to understand the full picture of MIT's operational requirements and whether these considerations were taken into account when developing on-site logistics and design is requested.

Lift Operations and Equipment Maintenance

CN provides some statements under Sections 3.4.2.3 and 3.4.2.4 of the CN EIS on the type of equipment it will be using at the Terminal, which includes prominent use of mobile reach stackers to lift containers on and off a chassis and on and off a railcar, and the use of yard tractors, light vehicles and maintenance vehicles. CN has also indicated the number of each type of equipment that will be required at the Terminal. I am requesting further background information to understand how the forecasted number of each type of equipment correlates to volume projections at MIT in order to determine whether an adequate amount of each type of equipment has been selected to ensure efficiency of operations at MIT.

Further, given the recent trends in intermodal terminal equipment outlined earlier in my report, it would also be useful to have a brief description from CN of its future terminal planning criteria for deploying terminal equipment automation at MIT and BIT, including CN's plans and commitments for future deployment of higher capacity terminal yard crane equipment, such as a rubber tired gantry crane (RTG), automated bridge cranes or rail mount gantry cranes (RMCs).

CN also provides general information regarding the use of work orders and managing of workload in the yard to track the location of every container through the use of computers. In order to understand the full picture of MIT's operation system, a more detailed description of the intended MIT Operating System (TOS) to be deployed at the Terminal is required, and how it compares to the BIT operating system.

With respect to equipment maintenance, CN has stated that it has a "rigorous maintenance program to ensure its equipment is safe and efficient". Further information in relation to how CN plans to deploy this program at MIT, including an annual schedule of the maintenance program, is required in order to completely understand all of the operations at MIT and how it may impact environmental effects.

Information Requests:

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
General Operations of Intermodal Terminal EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.2	**IT.35** **General Intermodal Terminal Operations** Please provide the following information: • infrastructure maintenance; and • temporary or permanent storage of hazardous materials, including source, volume and storage.	Technical information specifically required by EIS Guidelines
General Operations of Intermodal Terminal EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.2	**IT.36** **Container Volume Projections** Please provide any reports, analyses, data or studies to support the statement: *The Project will be designed to allow efficient transfer of containerized cargo between trains and the Terminal. Once completed, the Terminal will operate 24 hours a day, 7 days a week and is projected to handle approximately 350,000 containers annually at the start of operation and is designed for approximately 450,000 containers annually at full operation.*	Technical information deficiency. Further, this information is required in order to understand MIT's operation requirements.
General Operations of Intermodal Terminal EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.2	**IT.37** **Volume Projection of Special Containers** Please provide a projection of volume of special container types at the Terminal, including those that require temperature control and those that contain hazardous goods.	This information is required in order to understand MIT's operation requirements.
General Operations of Intermodal	CN EIS, Section 3.4.2	**IT.38** **Handling and Storage of**	This information is required in order to understand MIT's operation

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
Terminal EIS Guidelines, Part 2, Section 3.2		**Hazardous Goods** Please provide information on how hazardous goods will be stored, where they will be stored and how CN will control the movement of bulk hazardous goods not entering the Terminal.	requirements.
General Operations of Intermodal Terminal EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.2	**IT.39** **Terminal Emergency Response Operational Procedures** Please provide CN's information regarding emergency response operational procedures in the case of i.e. fire, accident, hazardous spills, deleterious environmental spills and containment.	This information is required in order to understand the full picture of MIT's operational requirements and whether these considerations were taken into account when developing on-site logistics and design.
Lift Operations EIS Guidelines, Part 2, Section 3.2	CN EIS, Sections 3.4.2.3 & 3.4.2.4	**IT.40** **Number of Each Type of Equipment** Please provide further background information of how the forecasted number of each type of equipment correlates to volume projections at MIT.	This information is required in order to determine in order to determine whether an adequate amount of each type of equipment has been selected to ensure efficiency of operations at MIT.
Lift Operations EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.2.3	**IT.41** **Equipment Selection** Please provide a brief description from CN of its future terminal planning criteria for deploying terminal equipment automation at MIT and BIT, including CN's plans and commitments for future deployment of higher capacity terminal yard crane equipment, such as a rubber tired gantry crane (RTG), automated bridge cranes or rail mount gantry cranes (RMCs).	This information is required to determine whether CN has considered using efficient lift equipment at MIT or is planning to implement more advanced technology in the future at MIT
Lift Operations EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.2.3	**IT.42** **MIT Operating System** Please provide a more detailed description of the intended MIT Operating System (TOS) to be deployed at the Terminal and how it compares to the BIT operating	This information is requested in order to understand the full picture of MIT's operating system.

Topic	Reference to CN EIS Documents and Information Responses	Requested Information	Rationale
		system.	
Operations: Equipment Maintenance EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.2.4	**IT.43** **Information on Equipment Maintenance Program at MIT** Further information in relation to how CN plans to deploy its rigorous maintenance program at MIT, including an annual schedule of the maintenance program.	This information is required in order to completely understand all of the operations at MIT and how it may impact environmental effects.

3.2.5.3 Operations as a Satellite to BIT

CN states throughout the CN EIS Documents that it has been determined that a satellite terminal is required and that MIT would act as a satellite facility to BIT. However, the CN EIS is missing information relating to how MIT will operate as a satellite to BIT.

Further, there is conflicting information presented in the CN EIS Documents. For example, the BA Group Study 2015 states: "CN has advised 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."

The CN EIS does not provide sufficient information or data describing the function and operation of MIT as a satellite intermodal terminal operation to BIT. The following questions, which come to mind when reading the CN EIS, are not answered anywhere in the CN EIS Documents:

- What are the MIT satellite operational requirements related to BIT?
- Would segments of intermodal trains be shuttled between MIT and BIT?
- How would truckload cargo be handled and controlled in a satellite intermodal operation?
- Would a single Terminal Operating System (TOS) control both the BIT and the MIT terminal operations with MIT as a satellite terminal?

Accordingly, a description of the intended functions and operations of the MIT in its role as a satellite to BIT is required. A description of the anticipated volumes of freight movements between BIT and MIT, by what mode of transport and on what transportation routes is also requested. This information is required in order to determine the reasonableness of MIT as a satellite hub operating in concert with BIT operations.

Information Requests:

Topic	Reference to CN EIS Documents and Information	Requested Information	Rationale

	Responses		
Operations Information: Satellite Terminal EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.2	**IT.44** **Description of MIT as Satellite to BIT** Please provide a description of the intended functions and operations of the MIT in its role as a satellite to BIT is required.	This information is required in order to determine the reasonableness of the MIT as a satellite hub operating in concert with BIT operations.
Operations Information: Satellite Terminal EIS Guidelines, Part 2, Section 3.2	CN EIS, Section 3.4.2	**IT.45** **Description of Freight Movements Between BIT and MIT** Please provide a description of the anticipated volumes of freight movements between BIT and MIT, by what mode or modes of transport, on what transportation routes.	This information is required in order to determine the reasonableness of the MIT as a satellite hub operating in concert with BIT operations.

3.2.6 Requirements for Railway Operations and Services

I understand that CN also requires approval under Section 98(2) of the CTA. CN submitted a CTA Application, as earlier referenced.

I have been advised that the test for approval under CTA, section 98(2) is set out in the following table:

Document	Section Reference	Legislative Provision
CTA	98(2)	98 (1) A railway company shall not construct a railway line without the approval of the Agency. (2) The Agency may, on application by the railway company, grant the approval if it considers that the location of the railway line is reasonable, taking into consideration requirements for railway operations and services and the interests of the localities that will be affected by the line.

Based on the information provided to me by Gowling WLG, my understanding is that in determining whether the location of the proposed railway line is reasonable under Section 98(2) of the CTA, the CTA Joint Panel member, must consider the “interests of the localities” as well as the “requirements for railway operations and services”.

I have been advised that “requirements for railway operations and services” can include the need for the line, alternative locations for the line, operational requirements and the use of equipment, infrastructure and crews.

It is my opinion that CN provides insufficient information in the CN EIS as well as in the CTA Application to evaluate whether the location of the proposed railway is reasonable, taking into account the views that I earlier presented in this report.

CN has provided insufficient information in relation to all aspects of purpose, alternative means, design, construction and operations, including the: (i) the purpose of MIT and whether BIT could have been selected as an alternative site by upgrading BIT's equipment and technology; (ii) market demand and background traffic volumes; and (iii) operations information including how MIT will act as a satellite to BIT, and the interface of MIT with the proposed Brampton-Milton Freight Corridor and passenger rail services for Halton.

Accordingly, my information requests under the CTA coincide with the information requests presented in this report with respect to the CN EIS.

4.0 CONCLUSIONS

As set out above, in each of the six categories of review under the CN EIS Documents and the CTA Application, there are areas where CN has provided insufficient information in relation to the Project. I have thus requested additional information and data, including missing documents, in order to be able to assess the purpose of and alternative means of MIT as well as significance of adverse environmental effects in relation to the design, construction and operations of MIT.

Generally, on the grounds expressed in this report, I have set out 45 information requests that I suggest be made to CN with respect to the Project.

Signed this 10th day of March, 2017

M. J. Vickerman, P.E., AIA
President, Vickerman & Associates, LLC

M. John Vickerman, AIA, PE

President
Vickerman & Associates, LLC
Principal Architect, Civil Engineer
Port and Intermodal Rail Master Planning and Design

Professional State Registrations (21 States):

Registered Architect: AL, CA, CT, DC, FL, HI, IL, IN, LA, ME, MD, MA, MS, NH, NJ, NC, NY, PA, RI, TX, VA
Professional Engineer: CA, FL, MD, VA, WA

National Professional Registrations:

Review
NCARB No. 32456, 1985 (Registered Architect)

Education:

M.S., Structural Engineering & Structural Mechanics
University of California at Berkeley, California 1976
B.S., Architectural Engineering
California Polytechnic State University, 1971

Years of Transportation Experience: 40 years

Current Professional Affiliations & Memberships:

- American Association of Port Authorities (AAPA)
- American Institute of Architects (AIA)
- Transportation Research Board/National Research Council/National Academy of Science
- Editorial Advisory Board of the Great Lakes/Seaway

- United States Maritime Resource Center, Inc. (USMRC), Maritime Simulation Institute (MSI) Board of Directors, Newport, RI

Employment History:

US Navy Civil Engineer Corps.	(1971-1975)
Jordan, Casper, Woodman, Dobson	(1976-1980)
Vickerman/Zachary/Miller, Inc.	(1980-1995)
TranSystems Corporation	(1995-2008)
Vickerman & Associates, LLC	(2008-Present)

PROFESSIONAL BIOGRAPHY & RELEVANT PROJECT EXPERIENCE:

John Vickerman is the President of Vickerman & Associates, LLC a professional services consulting firm specializing in the planning and design of port, intermodal and freight logistics facilities. John's maritime and intermodal practice has become internationally known for providing innovative solutions to the many operational, planning and design issues confronting the marine and intermodal transportation industry. Much of John's work focuses on assisting ports, railroads, and shipping companies to recognize and prepare for future market and technological changes.

As a specialist in intermodal and maritime terminal design, John has worked on major port projects throughout the United States and the world for more than 35 years. **67 of the 90 North American deep-water general cargo ports have benefited from his personal strategic master planning and design capabilities.** His international practice includes work for many of the Canadian Ports, the Ports of Rotterdam, Hong Kong, Mainland China, Melbourne, Australia, Pecèm, Brazil, Puerto Rico, the Panama Canal Authority, the intermodal freight analysis for Eurotunnel between England and France.

Mr. Vickerman completed three terms as Chairperson for the Intermodal Freight Terminal Design & Operations Committee under the purview of the Transportation Research Board (TRB)/National Research Council (NRC)/National Academy of Science (NAS) and served on many national Policy Committees for the TRB. John has served on the Freight Advisory Roundtable Board and as an Advisory Board Member to the United States Merchant Marine Academy, Global Maritime & Transportation School. He currently is a member of the Editorial Advisory Board of the *Great Lakes/Seaway Review* and serves as a Board of Director Member of the United States Maritime Research Center (USMRC) - Maritime Simulation Institute (MSI) in Newport, Rhode Island.

MARITIME, PORT, INTERMODAL, AND LOGISTICS PLANNING AND DESIGN PROJECT EXPERIENCE:

The following port and intermodal projects are contracts accomplished by Vickerman & Associates, LLC within the last ten years with John Vickerman as the Principal-In-Charge of the project. Specific project references and expanded descriptions are available upon request.

Port of New Orleans Strategic Port & Intermodal Port-Wide Master Plan. Vickerman & Associates was retained in February 2017 as a port and intermodal expert sub-consultant for preparation of the Port NOLA Comprehensive Strategic Port and Intermodal Master Plan by Tetra Tech Corporation, the prime consultant for the Phase II Port of New Orleans Comprehensive Strategic Port Master Plan. At the completion of Phase I work by another consulting team, the Tetra Tech – Vickerman & Associates team was commissioned by the Port of New Orleans to take over the Port-Wide Comprehensive Strategic Port and Intermodal Plan at the conclusion of the I work.

1. Promote the development and growth of the Port by establishing a long-term vision, creating land use principles, and prioritizing capital investments for Port facilities and operations.
2. Adapt Port policies, operations, facilities and infrastructure to changing technology, cargo trends, regulations, natural and man-made disasters, and competition from other U.S. and foreign seaports.
3. Integrate economic, engineering, environmental and community considerations into the Port process for evaluating the impact of development projects and growth scenarios.
4. Create a roadmap for future port development that is consistent with federal, state, and city laws, with the primary mission of increasing waterborne trade and commerce.

Houma Navigation Canal (HNC) Lock Complex (TE-113) Terrebonne Parish, LA Navigational Study. Vickerman & Associates was retained in August 2015 as a shipping and navigational expert sub-consultant by CB&I Coastal, Inc. the prime consultant for the design and project management services for a new $475 million lock, floodgate, and adjacent flood walls for the HNC Lock Complex Project as recommended by the USACE on the west side of HNC in accordance with a PEIS approved for the project to provide long term protection and restoration features recommended in the 2012 Louisiana State Master Plan that aims to stop salt water from intruding up the canal and into Terrebonne Parish. The lock is a part of the USACE Federal Morganza-to-the-Gulf Levee System. Vickerman & Associates (V&A) provided expert commercial navigational advisory services to the CB&I Coastal, Inc. project team. Vickerman & Associates prepared and furnished the following work elements for the Navigation Study:

- Historical, current and future waterway improvement and operational recommendations
- Comprehensive Vessel Navigation Traffic Analysis
- Analyze Typical Tow Sizes and Future Tow Trends
- Analyze Towboat Horsepower Ranges
- Provide Vessel Navigation Computer Simulations

San Diego Unified Port District (Port of San Diego) Tenth Avenue Marine Terminal (TAMT) Strategic Maritime Business Plan Update. The San Diego Unified Port District ("SDUPD" and "the District") commissioned Vickerman and Associates ("V&A") team update the San Diego Unified Port District Maritime Business Plan ("2008 Business Plan") published in December 2008 by the Port of San Diego. The overall objective of the Tenth Avenue Marine Terminal Redevelopment Plan ("Redevelopment Plan" or "the Plan") was to provide the District with a series of market driven port terminal development concepts for the Tenth Avenue Marine Terminal (TAMT). The Plan updated the maximum practical capacities to meet potential 2035 cargo terminal needs and provides an overall flexible strategic market direction. Vickerman & Associates established an overall business framework within which project decisions should be made. The Plan's total maximum practical capacity for the TAMT depends on the overall business framework, and it is estimated to be between 5,000,000 and 6,000,000 metric tons. Vickerman & Associates Redevelopment Business Plan's optimum development concepts recommended that the District's focus on the following key strategic development issues:

1. Improvements need to be market-driven and follow a market forecast (Market Forecast Demand Minus Current Terminal Capacity Equals Justifiable Terminal Needs and Requirements). A Modular Operating Grid System (MOGS) should be used in the planning, design and construction of improvements.

2. Improvements need to maximize cargo throughput capabilities and efficiencies, meet the District's Climate Action Plan policies and procedures, and provide the District with competitive financial return on the District's investment.
3. Successful implementation of any improvement needs to focus on the recommended operating nodes: Multipurpose Dry Bulk Cargo, Containerized Fresh Fruit, Liquid Bulk, and Multipurpose General Cargo Neo-bulk and Containerized Cargoes operations.

San Diego Unified Port District (Port of San Diego) National City Marine Terminal (NCMT) Strategic Maritime Intermodal Marketing & Redevelopment Plan. The San Diego Unified Port District ("SDUPD" and "the District") commissioned Vickerman and Associates ("V&A") to update the December 2008 San Diego Unified Port District Maritime Business Plan ("2008 Business Plan"). The overall objective of the National City Marine Terminal (NCMT) Optimization Study ("Optimization Study") provided detailed market driven port terminal optimization concepts for National City Marine Terminal (NCMT). The NCMT Optimization Study evaluated and analyzed the following topics:

- Identification of key optimization strategies and options
- Short, medium and long market forecast
- Cargo growth options (Domestic Coastwise Traffic ~ lumber and Hawaii, Automobile imports / exports, and Distribution Center services)
- Long term facility growth vision
- Intermodal rail operations recommendations
- Street access and egress options (Centralized Gate Concept)

Navigational Channel Planning, Analysis & Design Recommendations for the Calcasieu Ship Channel Salinity Control Measures Project. Vickerman & Associates was retained in June 2013 as the Navigation Study Expert sub-consultant to the Tetra Tech Corporation, the prime consultant to the State of Louisiana, Department of Natural Resources, Office of Coastal Protection and Restoration (OCPR), in connection with Contract No. 2503-13-11. Traffic in the Calcasieu Ship Channel (CSC) is expected to increase due to the expanded operations of the present channel users and the construction of proposed new LNG port terminals. It is forecasted that the vessel traffic will increase significantly over the next 20 years, with the number of vessel calls expected to double by 2020. This increased traffic could have a significant impact on the operations of the CSC, and changes to channel infrastructure are necessary to avoid critical navigational congestion and vessel delays**.** Vickerman & Associates analyzed the future navigation needs of the rapidly changing CSC as the maritime industries changed and LNG emerged with dramatic growing of import facilities being converted to export. The CSC has been transformed by major LNG terminals along the CSC. Future alternatives were evaluated by Vickerman & Associates based on the impacts to future navigation such as delays, limited passing availability, or overall constraints of vessel movement. Guidelines and design criteria were established based on future navigation needs. Vickerman & Associates assisted the project team with various detailed navigation analyses to support the conceptual design and preliminary planning and engineering phase of the Calcasieu Ship Channel Salinity Control Measures - Planning and Feasibility Phase Engineering Services.

Duluth-Superior Cruise Ship Terminal Facility Study. Vickerman & Associates was retained as an expert cruise terminal planner in September 2012 by Krech Ojard & Associates, P.A. the prime consultant for the Duluth-Superior Cruise Ship Terminal Facility Study. Vickerman & Associates prepared a comprehensive architectural and operational cruise facility based program requirements study for the proposed new Cruise Terminal considering a strategic planning horizon of approximately 10 to 20 years. Lake Superior, the largest of the five Great Lakes, is an emerging market for cruise and ferry passengers. The Port of Duluth-Superior is located at the far western edge of Lake Superior and is the navigational western anchor for the Great Lakes/St. Lawrence Seaway navigational system, being the Number 1 Great Lakes/St. Lawrence Seaway Port by tonnage with over 1,000 vessels calls a year. The navigational season for the Great Lakes is generally March 25 to January 16th each year and is seasonally adjusted. The constraining vessel dimensions for the St. Lawrence Seaway Locks is a maximum length of 740 ft., a beam of 78 ft. and a draft of 26 ft. 9 in. Duluth-Superior Harbor is an ideal naturally protected harbor sanctuary for navigational vessels and has full St. Lawrence Seaway channel (27 feet) depth. Emerging facility trends in the cruise industry throughout North America handling passengers both domestically and internationally was analyzed.

Plaquemines Parish Louisiana – Implementation Services for the Port of Plaquemine - Port and Intermodal Strategic Master Plan. Vickerman & Associates was retained in February 2009 as a port and intermodal expert sub-consultant for preparation of the Plaquemines Parish Comprehensive Strategic Port and Intermodal Terminal Master Plan by Trident Holdings, a Canadian Port Developer, and prime consultant for the Plaquemines Parish Port Strategic Plan. The Master Plan proposed development of over 750 acres of new port terminal development. The implementation multi-year work had a value of $1,162,953 as of April 2016 and continues to increase as active Port marketing and tenant negotiations continue. This Master Plan Implementation terminal parcels have been expanded to 6 parcels. Parcels 2 and 3 have been devoted to a new LNG Terminal valued at $8.5 billion for Venture Global. The implementation work involves an array of prospective tenant marketing activities, conceptual terminal planning and design activities, and detailed terminal lease negotiations. The Port Development Plan has been expanded to include a total of 4,218 acres and 21,620 lineal feet of adjacent riverfront deep water access along the 6 contiguous parcels.

Port Authority of New York & New Jersey (PONYNJ) Demand, Capacity and Infrastructure Analysis Future Port Terminal Intermodal Rail Facility Design Recommendations. Vickerman & Associates was retained in April 2015 by the Port Authority of New York & New Jersey and their project prime consultant, HDR Engineering Inc., to provide a port and intermodal expert advisory services primarily focused on "Future Port Terminal Design Recommendations". Vickerman & Associates participated on all phases of the project (Phases I, II, III and IV). The Demand, Capacity and Infrastructure Analysis was Port wide and involved all PANY/NJ Port Terminals and Real Estate as well as all intermodal rail terminals and the PANY/NJ EXPRESS Rail System. The PANY/NJ Scope of Work included the following Tasks:

Task I - Identify future annual demand for markets served by the Port of NY & NJ over the course of the next 20 years.

Task II - Determine the capacity and ability of the current terminals, rail facilities, cargo handling equipment, and landside connections to meet future demand:

Task III - Determine the most efficient distribution and configuration of container terminals, composition of cargo handling equipment, mix of infrastructure/assets. Recommend improvements, and changes to terminals, equipment/assets and operating practices required to optimize the ability of the Port to meet future demand while generating increased revenues for the agency and increased economic activity for the region.

Task IV - Describe challenges related to implementation of any proposed recommendations.

Port of Providence, RI (ProvPort) Allens Avenue Marine Terminal Development. In August 2015, the Vickerman & Associates was commissioned by ProvPort, Providence Redevelopment Agency (PRA) and Waterson Terminal Services (WTS) to provide ProvPort/PRA/WTS with a market assessment, market growth plan and targeted market opportunities for development of a new greenfield Port Terminal Development. These tasks were delivered on January 2, 2016 and supported expansion of ProvPort. The findings are contained in several terminal development studies during 2016. The proposed new three berth marine terminal with two barge berths designed to meet the requirements for general cargo and provide multipurpose port marine terminal capabilities with an on-dock intermodal rail logistics capability is located in the general vicinity of the Burges Cove and Fox Point Reach area of the Providence River. The marine terminal development is located on the western bank of the Providence River in the general vicinity of the Allens Avenue easterly to the waterfront. The MARAD (Maritime Administration of the USDOT) Port Economic Impact Kit was used to derive the key Economic Development Impact factors using an input-output (I/O) model analysis for the planned Marine Terminal Development. The would encompass approximately 60.4 acres of marine terminal acreage including the Phase I & II acreage. The new marine terminal would have a 2,880 ft. marginal wharf, and multipurpose container terminal improvements.

SLI Logistics Park, Rodman, Panama - Panama Canal - Logistics Consultant Services. Vickerman & Associates was selected as the prime consultant in January 2013 to provide logistics analysis and distribution center conceptual planning for a new inland port logistics center serving the new PSA Panama International Terminal (PPIT) located at the entrance of the Panama Canal, on the pacific side at the former US Rodman Naval Base. PPIT is a new port terminal built at the Pacific western-side entrance of the canal by a Singapore government-owned company. The PPIT

project has completed its first phase of construction with a state-of-the-art 300 meters length container berth equipped with 3 Post Panamax quay cranes and 6 RTGs and began operations in December 2010. Vickerman & Associates will survey existing logistics services in the Canal Zone and develop design requirements for the new logistics park.

Iowa Department of Transportation (DOT) Lock and Dam Modernization and Reconnaissance Study. Vickerman & Associates was retained in 2012 by the Iowa DOT and their project general consultant, HDR Engineering Inc. to provide a Upper Mississippi River commercial market analysis including identification of key shipping and logistics market drivers, future shipping market forecast assessment, and recommended Inland Waterway development strategies and logistics options. The benefits of an improved lock and dam system were described in the study with quantitative evidence compiled illustrating the important economic value of continuing to use the waterway system for both the regional and national economies. The study answered the question: What Can Iowa Do to Stop the Deterioration of the System.

Commonwealth of Virginia - Joint Legislative Audit and Review Commission (JLARC) - Special Report: Review of Recent Reports on the Virginia Port Authority's Operations. Vickerman & Associates was retained in December 2012 to provide support to the JLARC and to convey information from the maritime port industry perspective regarding (1) the position of Virginia Port Authority (VPA) and Virginia International Terminals, Inc. (VIT) in the intermodal market; (2) potential for VPA/VIT market growth; (3) projected future volume of VPA/VIT; (4) recent volume declines experienced by VPA/VIT and recovery from them; (5) validity of cost comparisons of VPA/VIT to other ports; (6) extent to which VPA/VIT institutional structures impede sales and marketing; and (7) the operational reputation of VIT in the shipping community.

Logistics Market Drivers Analysis

Virginia International Terminals (VIT), Virginia Port Authority (VPA) - Port Terminal Operations Evaluation and Due Diligence Study for Maersk Unsolicited Proposal to the Virginia Commonwealth. Vickerman & Associates was retained in July 2012 to provide the VIT with an evaluation of all four of VIT's operational port terminals. The study was to focus on evaluating terminal productivity, operational safety, VIT terminal revenue and expenses, port competition evaluation and prepare a 20 year long range cargo volume forecast for all VIT assets and to prepare due diligence analysis support to VIT in consideration of the April 2012 unsolicited proposal from Maersk/APM Terminals to purchase all of the Port of Virginia's port terminal operations for $4 billion over a 48 year period using the State's Public-Private Transportation Act of 1995.

Port of Providence, RI (ProvPort) - Two Mobile Harbor Crane Procurement Services. Vickerman & Associates was commissioned in July 2012 by ProvPort and the Rhode Island Economic Development Corporation (RIEDC) to provide professional advisory services for technical expert consulting reviewing the RFP procurement process, crane technical specifications and contract proceedings for the acquisition of two mobile harbor cranes and the associated design and construction of two new barges for the Port. The mobile harbor crane acquisition is a component of ProvPort's Tiger II grant award through the US Department of Transportation (USDOT), Maritime Administration (MARAD).

Ohio Statewide Freight Plan - Ohio River Terminal Assessment and River Terminal Strategic Planning. In early 2012 Parson Brinkerhoff commissioned Vickerman & Associates to provide the PB Team with maritime and intermodal transportation consulting services in support of Parsons Brinckerhoff, Inc.'s (PB) contract with the Ohio Department of Transportation to perform a statewide freight study. Vickerman & Associates was responsible for analysis and strategic planning for all Ohio River Ports bordering the State of Ohio and in particular the following Ohio River Terminals: Columbiana, Wellsville, and South Point River Terminals. Vickerman & Associates conducted in-depth interviews

with all Ohio River Terminals and provided a needs assessment and strategic project identification for critical Ohio River terminal infrastructure.

San Diego Unified Port District (SDUPD) Expert Witness Services - Port Terminal Operations Evaluation. Vickerman & Associates was retained in 2012 as an expert witness by the firm Butz Dunn & DeSantis (BD&D), in connection with BD&D's representation of SDUPD in civil litigation action before the Superior Court of the State of California for the County of San Diego referred to as "SDUPD versus San Diego Refrigerated Services Inc. The consulting services provided professional port terminal evaluation services including analysis of port terminal layout, configuration and operational related topics for the Port of San Diego - Tenth Avenue Marine Terminal (TAMT). The focus of this marine terminal evaluation study is the western portion of the TAMT encompassing both the SDRS and the Dole Food Company Inc. - Fresh Fruit Container Terminal, leaseholds and associated terminal operations.

Florida Inland Port (FIP) - Intermodal Logistics Center - St. Lucie County, Florida. Vickerman & Associates was retained in 2011 by Florida Inland Port, LLC (formerly Treasure Coast Intermodal Campus, TCIC) and their project general consultant, HDR Engineering Inc., to provide a strategic master plan and intermodal market and supply chain management assessment for a 4,000 acre, ultimately 29 million sq. ft., Inland Port - Intermodal Container Transfer Facility (ICTF) - Logistics Center serving the South Florida freight market. Located in southwest St. Lucie County, the FIP project will be developed into a major freight logistics hub over the next 30 to 35 years. The FIP will create an entirely new industrial model for Florida, ultimately providing a seamless connection to direct on-dock rail service at Florida's key seaports, along with easy access to all major highways. The FIP warehousing and distribution center will provide a full service logistics environment accommodating a variety of manufacturing and industrial uses.

2012 Ohio Statewide Freight Plan - River Port and Marine Terminals. Vickerman & Associates was retained in February 2012 to provide port, maritime and river terminal consulting services in support of Parsons Brinckerhoff's contract with the Ohio Department of Transportation to perform a Statewide Freight Study and analysis to understand how Ohio's freight transport infrastructure is being utilized. The study will identify and analyze modal freight volumes, commodities, and origins/destinations. Vickerman & Associates provided strategic port terminal evaluations and intermodal market and supply chain evaluations for all of the Ohio State River Terminals.

Wingspan International Inland Port Logistics Center, Port of Moin, Republic of Costa Rica. Vickerman & Associates was retained in 2011 by Wingspan International, LLC to provide a strategic master plan and intermodal market assessment for the new 200 acre Inland Port - Intermodal Container Transfer Facility (ICTF) - Logistics Center serving the Port of Limón/Moin, on the Caribbean coast of Costa Rica. The Inland Port Logistics and Transhipment Center will serve a variety of customers including potentially the new newly announced 33-year concession by APM Terminals, Maersk Line, a $992 million post panamax six berth new container port for the new Moin Container Terminal (TCM) in Costa Rica. The Puerto Limon/Moin port complex currently handles approximately 80 percent of Costa Rica's international fresh fruit trade.

Port of Galveston Expert Witness Services - Port Facilities Evaluation. Vickerman & Associates was retained in March 2012 as an expert witness by the firm Greer, Herz & Adams LLP in connection with representation of the Port of Galveston (POG) before the 212th Judicial District Court of Galveston County, Texas referred to as "Cause No. 11-CV-1330 - POG/Lexington Case" regarding contested Hurricane IKE storm-induced port facility damage. The focus of this port facilities evaluation study was an evaluation of the Port's damage sustained as a result of Hurricane IKE and a review and evaluation of the various storm damage assessments related thereto.

Port of Erie - Erie-Western Pennsylvania Port Authority - Freight Shipping and Master Development Plan. In early 2010 Martin Associates (John C. Martin LLC) and Vickerman & Associates agreed to team and work together for the Port of Erie on the Freight Shipping and Master Development Plan for the Port of Erie. Vickerman & Associates was retained as a port and intermodal rail facilities expert for the project which involved evaluating all port operations, profiling existing port operations, developing a detailed statement of probable cost for expansion/development of the infrastructure necessary for a modern freight terminal facility based on the team's market assessment. A specific

emphasis was placed on assessing the potential for the development of a container feeder service terminal and opportunities afforded for Heavy Lift and project specialty cargo.

Port of Miami On-Dock Intermodal Rail Terminal, Florida East Coast Railway (FEC). Vickerman & Associates was retained in 2010 as one of the General Consultants to the FEC Railway CEO and expert intermodal terminal advisor to the FEC Railway, Rail America and Fortress Investment Group for the planning, design and operation of the new Port of Miami On-Dock Intermodal Rail Terminal. The $52 million program included upgrading the Port Bascule Bridge and improvements to 4.5 miles of rail access to the Port from the FEC Hialeah Inland Port in Miami.

Development of a Florida Statewide Intermodal Development Strategy for Florida East Coast Railway (FEC). Vickerman & Associates was retained in 2010 as one of the General Consultants and intermodal terminal advisors to the FEC Railway, Rail America and Fortress Investment Group for the planning, design and operation of a statewide express intermodal service from Port of Miami and Port Everglades to Jacksonville, FL. The project also included new logistics distribution center planning and design of new central Florida Intermodal rail and distribution center projects.

Port Everglades On-Dock Intermodal Rail Terminal, Florida East Coast Railway (FEC). Vickerman & Associates was retained in 2010 as one of the General Consultants to the FEC Railway CEO and expert intermodal terminal advisor to the FEC Railway, Rail America and Fortress Investment Group for the planning, design and operation of the new Port Everglades On-Dock Intermodal Rail Terminal at Southport. The project includes a new on-dock intermodal rail terminal complex with automated bridge crane design capabilities handling both international and domestic intermodal rail volume.

Port of Longview, Washington - Port and Intermodal Strategic Port Master Plan. Vickerman & Associates was retained in early 2010 as the Port Master Plan Consultant for preparation of the Port of Longview Port and Intermodal Master Plan by HDR Engineering Inc., the prime consultant. The Port Master Plan provided new business opportunities and strategic options for increasing port capacity using the latest sustainable terminal concepts. The Port of Longview is developing the first major Export Grain Terminal in the United States at a cost of over $200 million with an annual capacity of 4.74 million bushels or 130,000 metric tons of corn, soybeans and wheat.

Plaquemines Parish Louisiana - Comprehensive Port and Strategic Master Plan. Vickerman & Associates was retained in 2009 as a port and intermodal expert sub-consultant for preparation of the Plaquemines Parish Comprehensive Strategic Port and Intermodal Terminal Master Plan by Trident Holdings, a Canadian Port Developer, and prime consultant for the Plaquemines Parish Port Strategic Plan. The $551,000.00 Comprehensive Strategic Master Plan included two new port developments one on the East Bank and one on the West Bank of the Mississippi River. The West Bank port development included a state-of-the-art two berth container terminal, an on-dock intermodal rail terminal and adjacent logistics distribution park with a capital construction cost estimate of $441 million and a terminal throughput capability of 700,000 TEUs per year. The East Bank port development included a general cargo container terminal estimated at $332 million with a container throughput of 200,000 TEUs per year and included a Dry Bulk Terminal option estimated at $110 million with an annual throughput of 3,360,000 tons per year. The Master Plan provided a new Public-Private-Partnership (PPP) strategy and positioned the Port in establishing Louisiana as a major logistics distribution leader in national and Gulf Coast maritime and intermodal markets.

Erie Inland Port (EIP) Logistics Center Development for the Economic Development Corporation of Erie County (EDCEC), Erie, Pennsylvania. Vickerman & Associates was selected in early 2009 as the General Consultant and expert intermodal advisor on a major new freight intermodal logistics center for Erie County. Prepared a truly transformational sustainable state-of-the-art intermodal rail inland port and logistics distribution center concept incorporating two Lake Erie Ports integrated into a state-of-the-art multimodal logistics hub serving multiple Class I railroads. The EIP will eventually become a 1,000 acre integrated intermodal terminal and distribution center logistics park with more than 7 million sq. ft. of modern distribution center infrastructure.

Maher Melford International Terminals Inc., Guysborough, Nova Scotia. For the last six years John Vickerman has been commissioned as the General Consultant for the development planning for a state-of-the-art fully automated

three berth container port and adjacent CN intermodal rail terminal with 1500 acres of adjacent integrated logistics Park development. As currently envisioned, Maher Melford will deploy an advanced automated container terminal concept developed by Hamburg Port Consulting GmbH (HPC). The terminal operating system is a high grade form of container automation. In container and intermodal terminal will use advanced horizontal transport system of Automated Guided Vehicles (AGV) in combination with Rail Mounted Gantry Cranes (RMG) with quay parallel orientation in the Container Yard (CY). When successfully deployed, the Maher Melford terminal would be the first container terminal in North America to deploy AGVs.

Great Lakes Commission (GLC) Chicago Area Waterway System (CAWS) – "Envisioning a Chicago Area Waterway System for the 21st Century" Inland Waterway Planning. Vickerman & Associates was retained in early 2011 as the Port and Intermodal Rail Terminal sub-consultant expert on the HDR Engineering Inc. team, the prime consultant for the Great Lakes Commission/Great Lakes & Saint Lawrence Cities Initiative for the "*Envisioning the Chicago Area Waterway System for the 21st Century Project*". The visibility and migration of the Asian Carp movement up the Illinois River and the potential catastrophic impacts on the Great Lakes fishing industry has resulted in the GLC Commissioning a $2 million effort for the ecological separation of the CAWS from various Aquatic Invasive Species (AIS), most notably the Asian Carp. This effort will involve improving Chicago area transportation systems and the potential for developing new port and intermodal rail terminals at separation dam sites along multiple rivers and waterways in the CAWS.

Shipyard Creek Associates LLC (SCA) - Port of Charleston - Macalloy Multimodal Logistics Center, Charleston, SC. For the last four years, the Principal-in-Charge and General Consultant for development planning and design of the 155 acre Macalloy Site CSX Intermodal Terminal adjacent to the SCSPA Three Berth Navy Base Container Terminal. SCA, in a strategic partnership with CSX Railroad, will develop the Macalloy Intermodal Terminal at Shipyard Creek in the Port of Charleston, into a dominant North American East Coast container gateway and a major distribution logistics load center. A privately developed, environmentally sustainable, near-dock intermodal rail terminal adjacent to and directly linked to the new SCSPA Navy Base Container Terminal Development will no doubt change the port and intermodal competitive landscape in the US Southeast.

Shipyard Creek Associates LLC (SCA) - Port of Charleston – Laurel Island Multimodal Logistics Center, Charleston, SC. For the last four years, the Principal-in-Charge and General Consultant for development planning and design of the 240 acre Laurel Island Intermodal Terminal adjacent to the SCSPA Columbus Street Container Terminal. SCA will develop the Laurel Island Intermodal Terminal into a major North American East Coast container gateway and distribution logistics load center. This project is a privately developed, environmentally sustainable, near-dock intermodal rail terminal adjacent to and directly linked to the SCSPA Columbus Street Container Terminal.

Port and Intermodal Security Training for FBI, TSA and NCIS – McMunn Associates. Since July 2008 McMunn Associates Inc. (MAI) has retained Vickerman & Associates as Principal Instructor and Subject Matter Expertise (SME) in support of MAI's Federal Training Courses on Commercial Maritime Shipping and Port Operations (CMSPO) and Maritime Domain Awareness (MDA) program. John Vickerman has been the Principal instructor on day long training courses with the United States Navy (USN), US Transportation Security Administration (TSA), US Naval Criminal Investigative Service (NCIS), US National Maritime Intelligence Center (NMIC) and the US Federal Bureau of Investigation (FBI) in the area of port security, operations and intermodal transportation systems.

Galveston Historic Downtown Seaport Master Plan, Port of Galveston, Texas. Vickerman & Associates was retained in 2009 by H&A Architects & Engineers (Formerly CMSS Architects, PC) as the team's port and maritime planning expert sub-consultant. This comprehensive seaport waterfront master plan was completed in early 2011. The goal of the master plan was to generate a new vision of a more complex, modern economy for the City of Galveston downtown redevelopment effort with particular focus on the "East End" Port of Galveston maritime seaport terminals and operations. The project included consideration for the enhancement and expansion of the Port of Galveston's current cruise terminal operations and the potential of developing new "World Class" cruise terminal linked directly to the historic urban seaport.

Tembec General Partnership and Tembec Industries Inc. Strategic Shipping and Logistics Assessment Study. Vickerman & Associates was commissioned by Tembec Industries in October 2010 to prepare a strategic shipping and logistics evaluation and analysis study of Tembec's current pulp shipment operations from Canada to North Asia (mainly China). Tembec is one of the largest North American wood pulp shippers. Currently Tembec ships approximately 30,000 metric tons monthly from Vancouver, BC and approximately 30,000 metric tons monthly from Eastern Canada via Port Authority of NY/NJ (Port Newark & Port Elizabeth Terminals only). This Strategic Shipping and Logistics Assessment Study included forecasting an evaluation of maritime logistical global shipping trends within the next 5 years and also include strategic recommendations for Tembec to best position and deploy their shipping operations in light of emerging new shipping and logistics trends.

Port Authority of New York & New Jersey Federal Maritime Commission Expert Witness Services. Vickerman & Associates was retained in 2008 and again in 2011 as an expert witness by the firm Weil, Gotshal & Manges LLP., as the chief legal counsel to the Port Authority of New York & New Jersey (PANY/NJ) for the legal defense in the Federal Maritime Commission (FMC) Case No. (08-03). The case rests on a complaint filed by Maher terminals Inc. that alleges the PANY/NJ granted preferential lease terms to a competitor. Vickerman & Associates was retained to provide Defense attorney's with expertise in container and intermodal rail terminal analysis and expert witness revaluation services.

Sparrows Point Automobile Terminal Development, Baltimore, Maryland. Vickerman & Associates was retained in 2008 as the Principal-in-Charge of the planning and design of the Cargo Ventures LLC Sparrows Point Automobile Terminal development.

Port Alberta Inland Port and Logistics Park, Edmonton, Alberta. Vickerman & Associates was retained in 2008 as an intermodal terminal expert sub-consultant by InterVISTAS Consulting Inc. for the development planning of the Port Alberta Inland Port and Integrated Logistics Park for the City of Edmonton Alberta. The work scope included market assessment and conceptual facilities layouts.

Louisiana International Gulf Transfer Terminal, Southwest Passage, Metairie, Louisiana. Vickerman & Associates was retained in 2009 by the State of Louisiana and continues as a port and intermodal expert advisor to the Louisiana International Deep Water Gulf Transfer Terminal Authority for general consulting and advisory services regarding development of a world class container transfer terminal at the mouth of the Mississippi River, for transferring containers from ocean-going vessels to barge and coastal feeder vessels.

Port Strategic Master Development Plan Update 2009 - Port of Port Arthur, Texas. Vickerman & Associates was retained in 2009 by the Port and Tetra Tech Corporation as the project port and intermodal terminal sub consultant expert to Tetra Tech as the prime consultant on the Port of Port Arthur (POPA) 2009 Master Development Plan Update. This $625,000 Port Master Plan Update Project effort included a comprehensive the determination of the best use development of new 500 acre land acquisition. Major elements of this project included data collection; facility assessment, analysis of existing port operations, a Master Port Development Plan which developed alternative scenarios and solutions, assessed potential future business risks, and new business opportunities. The Team also developed a phased Capital Development Improvement Plan and proposed specific scenarios for increases in the operational efficiency and capacity of the facilities to enable it to handle anticipated business growth.

Port of Greater Cincinnati Development Authority General Consultants Advisory Services: Vickerman & Associates was retained in 2010 to provide general consulting and advisory services to the Port of Greater Cincinnati Development Authority (PGCDA) for PGCDA projects involving rail and intermodal improvements in the Mill Creek Corridor and planning related to waterfront industrial development along the Ohio River.

Project Experience Explanatory Note: John Vickerman was a Founding Principal for both Vickerman/Zachary/Miller, Inc. (1980) and TranSystems Corporation (1995). Since 1980, John Vickerman has served as a project Principal-In-Charge or Project Manager, with the project team for the following major port and intermodal projects which highlight his port and intermodal experience and capabilities. The following projects are only a partial listing of Mr. Vickerman's maritime and intermodal industry experience.

Ports of Los Angeles and Long Beach 2020 Master Plan, Los Angeles, California. Project Manager for the *"Cargo-Handling, Operations, Facilities and Infrastructure Requirements Study (OFI)"* sometimes referred to as the **POLA/POLB 2020 Strategic Master Plan**. This strategic port master plan involved a $5.3 billion expansion of the San Pedro Bay Harbor with 38 new port and intermodal terminals. The Master Plan determined facility requirements and water use plans to the year 2020, for the Port of Los Angeles and the Port Long Beach including comprehensive port terminal and intermodal terminal development.

Naval Station Support Function Consolidation Study, Long Beach, California. Principal-in-Charge for the Port of Long Beach Master Plan for consolidation and relocation of Naval Station support functions.

Intermodal Transfer Facility Design, Philadelphia, Pennsylvania. Principal-in-Charge of planning and design for AmeriPort, the 100-acre Regional Intermodal Transfer Facility (RITF), Delaware River Port Authority.

FastShip Feasibility Study, Philadelphia, Pennsylvania. Principal-in-charge of the FastShip Atlantic Terminal Plan Port Facilities Evaluation Study for the Delaware River Port Authority and FastShip Atlantic, Inc.

On-dock Intermodal Rail Facility Design and Construction, New York, New York. Principal-In-Charge of planning, design and construction management services for the $8.5 million ExpressRail Intermodal Transfer Facility at the Port of New York and New Jersey.

Maersk/Sea-Land Conceptual On-dock Intermodal Facility Study, New York, New York. Project Manager for a conceptual study of the on-dock intermodal rail facilities for Maersk Terminals/Sea-Land site at the Port Authority of New York and New Jersey.

Marketing, Operations and Development Plans, Norfolk, Virginia. Principal-in-Charge for preparation of a Marketing, Operations and Development Plan for the Newport News Marine Terminal, the Portsmouth Marine Terminal and the Norfolk International Terminals, all part of the Virginia Port Authority.

Master Development Plan, Richmond, Virginia. Officer-In-Charge for preparation of the Master Development Plan for the Port of Richmond Terminal (PORT).

Pier J Facility Design, Long Beach, California. Principal-in-Charge of design for an on-dock intermodal rail facility for Maersk Line at Pier J, Port of Long Beach.

English Channel Tunnel Rail Schedule Study, England. Principal-in-Charge for a computer simulation study to evaluate operations, including equipment requirements, for intermodal facilities owned by British Railways and serving the English Channel Tunnel.

Strategic Plan for the Redevelopment of the Port of New York. Principal-in-Charge for a major study of the redevelopment of the New York City waterfront to increase maritime cargo handling. Study examined market forecasts for containerized and non-containerized commodities, inland distribution patterns and requirements by mode and commodity, shipper/carrier requirements, site attributes and environmental/community constraints.

Southport Master Plan and Southport Phase VI Terminal Yard Improvements, Port Everglades Department of Broward County. Principal-in-Charge for conceptual plan development of the new Southport Intermodal complex. This study involved analyzing current terminal operations, terminal capacity, and commodity growth forecasts. These analyses were utilized in development of a phased capital improvement plan.

Naval Base Re-Use Plan, Charleston, South Carolina. Principal-in-Charge for marine cargo terminal re-use plan for the Charleston, South Carolina Naval Complex as part of larger maritime and commercial reuse planning strategy. Included facilities inventory of the 1500 acre property, which was made available by base closure, as well as cargo demand forecasting, needs assessment, alternatives analysis, conceptual terminal design, and road/rail improvements planning.

Blair Waterway Master Plan, Tacoma, Washington. Principal-in-Charge of the Port of Tacoma's 2010 Master Plan to develop a ten-year improved-use master plan encompassing dry bulk, neo bulk, break-bulk and containerized cargo for the Blair Waterway, Port of Tacoma.

Marine Terminal Facility Development, Portland, Oregon. Principal-in-Charge of the marine terminal facility master development plan, Terminals 5 and 6, Port of Portland.

Marine Master Plan, Seagirt Marine Terminal, Baltimore, Maryland. Principal-in-Charge of the 264-acre Seagirt marine terminal master plan including the detailed design of the "on-dock" intermodal rail facility for the Port of Baltimore.

Strategic and Master Site Development Plan, Gulfport, Mississippi. Principal-In-Charge of strategic and master site development plan for intermodal cargo facilities, including break-bulk and dry bulk, container storage, rail, truck and ship operations at the Mississippi State Port at Gulfport.

Strategic Master Plan, Freeport, Texas. Principal-In-Charge of Strategic Master Plan for the Port of Freeport which encompasses over 8,000 acres of maritime and non-maritime property, including intermodal cargo handling operations.

Maritime Facilities Renovation, San Francisco, California. General Consultant to the Port of San Francisco for overall program management, development of design criteria, monitoring of design, budget and schedules for projects totaling $42 million to renovate marine facilities and construct an ICTF.

Maritime Master Plan, San Francisco, California. Principal-in-Charge for a conceptual maritime master plan of approximately 640 acres of the Southern Waterfront, Pier 48 to Pier 98, Port of San Francisco and engineering feasibility study for San Francisco Container Terminal, Berth 92 to 96.

Container Terminal Design, San Francisco, California. Engineering design for modernization of Army Street Container Terminal, Port of San Francisco.

Cool Carriers Refrigerated Warehouse Engineering Services, Port Hueneme, California. Principal-In-Charge of project to design Cool Carriers Refrigerated Warehouse at Port of Hueneme. Provided architectural and engineering drawings and specifications for construction of a 142,000 square foot cold storage facility. The largest "on-dock" refrigerated facility on the US west coast.

Conceptual Facility Master Plan, Port Hueneme, California. Officer-In-Charge of Port Hueneme's master plan for recommended capital improvements, circulation plan, centralized gate operation and auxiliary facilities.

Dundalk and Seagirt Marine Terminal Conceptual Designs, Baltimore, Maryland. Principal-in-Charge of the 570-acre Dundalk Marine Terminal master plan.

Daniel Island Conceptual Design, Charleston, South Carolina. Principal-in-charge for Terminal "X" conceptual planning for the Port of Charleston which included preparation of cargo forecasts, analysis of existing terminals, and conceptual design for the Daniel Island Development Plan.

Dames Point Master Plan, Jacksonville, Florida. Principal-in-Charge for master planning the 500-acre Dames Point Marine Terminal, Jacksonville Port Authority.

Aloha Towers Engineering Services, Honolulu, Hawaii. Principal-in-Charge for marine engineering, structural engineering and architectural programming for two cruise ship terminals, pier extensions, a ferry terminal, underground parking and all waterfront features, Aloha Tower Waterfront, Honolulu Harbor.

Cruise Industry Investigative Study, Boston, Massachusetts. Principal-In-Charge of a study to investigate the possibilities for the cruise ship industry at the Port of Boston. This project was performed for the Boston Redevelopment Authority and the Massachusetts Port Authority.

Berth 22 Reconstruction, Oakland, California. Officer-In-Charge for conceptual study through final construction documents for reconstruction of Berth 22 at the Port of Oakland, in order to accommodate Post Panamax vessels.

Wharf Reconstruction and Design, Redwood City, California. Principal-In-Charge for plans, specifications and cost estimates for design of Wharf 4 and reconstruction of Wharf 3, Port of Redwood City.

USGS Marine Facility Design, Redwood City, California. Principal-In-Charge for a conceptual planning and detailed design of U.S. Geological Survey Marine Facility, Port of Redwood City.

Port Performance and Master Plan Study, San Juan, Puerto Rico. Principal-in-Charge of a port performance study and design of a master site development plan to guide the Puerto Rico Ports Authority in future decisions regarding cargo throughput and storage, as well as the possibility for a cruise terminal facility.

NYK Line Administrative Headquarters Building Design, Los Angeles, California. Principal-In-Charge of overall terminal planning and design of five new state-of-the-art buildings at a 134-acre container terminal for NYK Line, Port of Los Angeles.

Cold Storage Facility Design, San Diego, California. Principal-In-Charge for design of Tenth Avenue Marine Terminal cold storage, handling and fumigation facility at the Port of San Diego. The 100,000 square foot facility was California's first on-dock refrigerated warehouse.

Pier J Facility Design, Long Beach, California. Principal-in-Charge of design for an on-dock intermodal rail facility for Maersk Line at Pier J, Port of Long Beach.

Federal Highway Landside Access Course, Washington, D.C. Principal-in-Charge and Principal Investigator to develop and teach a three-day course on passenger and freight intermodal transportation for the United States Federal Highway Administration and the National Highway Institute titled "Landside Access for Intermodal Facilities."

Chatham County Intermodal Freight Study, Savannah, Georgia. Principal-In-Charge for the development of a comprehensive cargo traffic study for the Georgia Department of Transportation. This study encompassed air, river, rail and street traffic in order to determine traffic constraints in each mode of transport for the county.

Appendix B: List of Documents Reviewed

1) EIS Guidelines for the Project

2) EIS prepared by Stantec Consulting Ltd. for CN, dated December 7, 2015 (including cover letter from CN dated December 7, 2015)

3) EIS Technical Appendices:

    a) "Milton Logistics Hub – Technical Data Report, Socio-Economic Baseline (SEB)" (Appendix E.12)

    b) "Terminal Generated Truck Traffic" (Appendix E.17)

    c) "Site Selection Study" (Appendix F)

4) "Planning Justification Report (PJR) In Support of a Logistics Hub Planned in Southwest Milton", December 2015, prepared by Bousfields Inc.

5) Project Description Report (PDR), CN, March 31, 2015

6) Freight Supportive Guidelines, Ontario, 2015

7) "GTHA Urban Freight Study: Technical Backgrounder", prepared for Metrolinx, HDR/iTrans, 2011

8) Application for an Order Pursuant to *Canada Transportation Act*, Section 98(2) for Authorizing Construction, CN, January 22, 2016

9) CN Site plan drawings dated April 24, 2015 provided as part of the *Canada Transportation Act*, Section 98(2) Application

10) "Greater Golden Horseshoe Growth Forecasts to 2041: Technical Report", by Hemson Consulting Ltd., Technical Report November 2012 (and data files)

11) "Greater Golden Horseshoe Growth Forecasts to 2041" by Hemson Consulting Ltd., Technical Report (November 2012) Addendum (and data files)

12) The Operational Policy Statement: "Addressing 'Purpose Of' and 'Alternative Means' under the *Canadian Environmental Assessment Act, 2012*", CEAA, March 2015

13) "Pathways: Connecting Canada's Transportation System to the World - Volume 1" Canada Transportation Act Review prepared by the Minister of Transport, 2015

14) "Building Competitiveness: A Proposed Multimodal Goods Movement Strategy for Ontario" (Consultation Document), Transportation Policy Branch, Ministry of Transportation, July 10, 2012

15) Metrolinx Presentation – Milton Corridor Committee (October 7, 2016)

16) CN additional responses to CEAA information requests (IRs) 1-25

17) Halton Brief 2016 – Role of Halton Planning Framework within CEAA Panel Review of the CN Milton Logistics Hub Project

18) The Operational Policy Statement: Addressing "Need for", "Purpose of", "Alternatives to" and "Alternative Means" under the *Canadian Environmental Assessment Act*, Update November 2007

19) Correspondence dated February 6, 2017 from Deputy Minister of Transportation (MTO) to Lesley Griffiths, Panel Chair, Milton Logistics Hub Project Review Panel c/o Canadian Environmental Assessment Agency

20) 2006 MTO Commercial Vehicle Survey data sets, online at: https://www.ontario.ca/search/data-catalogue?sort=asc