

Memorandum

TO:
Canadian National Railway
Company

FROM:
BA Consulting Group Ltd.

PROJECT:
6071-11
CN Milton Intermodal Hub

DATE:
November 30, 2015

SUBJECT: REVIEW OF TERMINAL-GENERATED TRUCK TRAFFIC

1.0 INTRODUCTION

BA Group was retained by the Canadian National Railway company (“**CN**”) in July 2015 to review the potential change in on-street truck traffic as a consequence of the proposed development of the CN Milton Logistics Hub (“**the Terminal**”) located in the southeast quadrant of Britannia Road and Tremaine Road in the Town of Milton, (“**the Town**” or “**Milton**”), in the Regional Municipality of Halton (“**Halton Region**”), in the Province of Ontario (“**the Province**”). This document is to be read and interpreted in conjunction with documents prepared by others which describe in detail the location, design and operational parameters of the proposed Terminal. In general, the function of the proposed Terminal is to facilitate the transport of shipping containers by rail and truck. The local movement of containers, primarily within the western Greater Toronto and Hamilton Area (“**GTHA**”), is facilitated by truck, while the longer-distance movement of containers is facilitated by rail and ship. The transfer of containers between truck and rail modes occurs within the Terminal.

On March 23, 2015, CN submitted a project description for the Terminal to the Canadian Environmental Assessment Agency (“**CEAA**”). Based on that description, CEAA determined that an environmental assessment (“**EA**”) is required and an Environmental Impact Statement (“**EIS**”) must be submitted by CN in accordance with the July 2015 Project-specific Guidelines for the Preparation of an Environmental Impact Statement (“**the Guidelines**”).

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.”¹ For the purpose of this assessment, the estimate of up to 800 Terminal-generated heavy-truck² trips per day in each direction has been adopted. It should be noted that not all tractors arriving at and/or departing from the Terminal will be hauling a full container. Some tractors may be hauling an empty container, or may be hauling a chassis without a container, or may be “bob-tail” and not hauling any container at all. It is possible that in such cases, some of these vehicles may not strictly meet the definition of heavy-truck. Nevertheless, in order to adopt a conservative position for the purposes of this study, all trucks entering and exiting the Terminal through the main truck gate are considered heavy-trucks.

The purpose of this memorandum is to address traffic related items identified in the Guidelines, in particular:

- assessment of potential heavy-truck capable routes to/from the Terminal;
- identification of the heavy-truck capable routes most likely to be used by Terminal-generated trucks;
- forecast of the volumes of heavy-truck trips at key locations within the vicinity of the Terminal; and
- comparative discussion of the relative impact of the addition of Terminal-generated truck traffic.

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. The hourly average gate volumes at the BIT expressed as a percentage of the total daily volumes was derived. Since container traffic to be accommodated at the Terminal in Milton is to derive from a transfer of container traffic from the BIT, it was concluded that the existing pattern of hourly truck movements would be a suitable proxy for the estimation of future hourly heavy-truck movements at the entry / exit gates of the Terminal proposed in Milton.

CN has specified that the truck entrance/exit for the Terminal is planned to be located on Britannia Road at a location approximately 250 metres west of First Line at the base of the east slope of the new grade separation over the CN Rail line. It is anticipated that the Britannia Road intersection with the Terminal truck entrance will be signal controlled, and configured with an auxiliary westbound left turn lane and an eastbound right turn if required. It is further assumed that the traffic control at the driveway intersection will be operated in an optimal manner to permit sufficient capacity for movements in and out of the entrance and satisfactory traffic operations on Britannia Road. Consideration will be given in subsequent work to identifying specific traffic engineering operational and design measures to ensure that trucks waiting to turn left from Britannia Road at the westbound approach to the Terminal driveway will not exceed the available capacity of the queue storage lane. Detailed design specifications for roads affected by the truck entrance requirements will be provided for the consideration of Halton Region and the Town at a later stage.

In addition to the Terminal-generated heavy-truck traffic discussed in this memorandum, it is acknowledged that employees of the Terminal will also generate traffic as they travel to and from work. This traffic will not comprise heavy-trucks, but will primarily comprise automobiles and light trucks, and will be relatively modest

¹ Canadian Environmental Assessment Agency – Terminal Description Milton Logistics Hub, Project Information, March 31, 2015. Section 2.3.4.2 Operations

² For purposes of this study “heavy-truck” means: any motor vehicle having attached thereto a commercial delivery body operating with a valid commercial license plate and includes buses and tractors used for hauling purposes on the highways having a registered gross weight or actual gross weight in excess of four thousand, five hundred (4,500) kilograms, but does not include ambulances, buses owned and operated by Milton Transit, police services vehicles, fire apparatus, or vehicles owned by or operated for the Town of Milton, Halton Region, the Ministry of Transportation (Ontario), or any utility vehicle.



in volume. Vehicular access for the employees of the Terminal is proposed to be located on Tremaine Road. It is anticipated that this access point will operate under STOP control at the driveway and without traffic control required on Tremaine Road. The detailed traffic engineering required to determine the need for any road improvements associated at the Tremaine Road driveway (i.e., a southbound left-turn lane) will be undertaken at a later stage and provided for consideration by Halton Region.

2.0 HEAVY-TRUCK CAPABLE ARTERIAL ROADS

The Region of Halton Transportation Master Plan³ (“**Halton TMP**”) was published in 2011. Halton Region has indicated the Halton TMP is expected to undergo an update in 2017/18.

Halton Region has developed and is steadily implementing an extensive roads development and improvement program which is funded in large part through the processes of the Development Charges Act of Ontario and is set out in Halton Region’s Budget and Business Plan 10 Year Capital Budget for Transportation⁴. Halton Region has provided to CN a schedule of Roads Capital Projects in Progress (October 1, 2015) and a schedule of the Halton Region Roads Capital Projects (2015-2031). Halton Region has indicated that the Capital Projects Schedule is a planning document which is subject to revision to reflect current circumstances. Not all of the projects on the schedule are fully and finally approved through an EA process and may require permits or other considerations prior to the commencement of construction. A review of the Roads Capital Projects schedule identifies a number of significant road improvements in the vicinity of the Terminal which are currently anticipated by Halton Region to be completed before the year 2020.

Trucking is the primary mode for the movement of goods within the GTHA and within Halton Region and Milton. The Halton TMP indicates that Halton Region: “*does not have a specifically designated truck route network as the purpose of a major arterial is to carry truck traffic.*”⁵ Further, the Halton TMP states that: “*All Regional roads are classified and designed to accommodate truck traffic.*”⁶

Each of the Ministry of Transportation Ontario (“**MTO**”), Halton Region and the Town are responsible and have jurisdiction over roads situated with the vicinity of the Terminal. Within the Town, most truck traffic is currently accommodated on MTO 400 series highways and Halton Region arterial roads. New Halton Region arterial roads are designed with a high degree of access control, intersection spacing and rights-of-way of up to 50 metres. Some as-yet unimproved Halton Region arterial roads in the Town, including Britannia Road and parts of Tremaine Road, are currently restricted from carrying heavy-truck traffic. Such restrictions exist for reasons relating to the design and/or structural capacity of the roadway. For example, Britannia Road operates with a 5 metric tonne load limit during the period between March 1st and April 30th due to the softer soil conditions generally present during the spring thaw. However, the Halton TMP stipulates that, as these roads are upgraded to the current standards of Halton Region, they will be designed to accommodate heavy-trucks and the current heavy-truck restrictions will no longer apply. Halton Region’s current schedule of road

³ “The Road to Change – Halton Region Transportation Master Plan 2031”. September 2011. Halton Region.

⁴ “Halton Region Budget and Business Plan 2015”. 2015. Halton Region.

⁵ Halton TMP, Appendix F4 Goods Movement, Section 3 Official Plan Policies.

⁶ Halton TMP, Appendix F4 Goods Movement, Section 2 Introduction and Background, 2.1 Road



improvements anticipates that, by the time the Terminal is expected to become operational in the year 2020, both Britannia Road (east of Tremaine Road) and Tremaine Road (north of Britannia Road) will have been upgraded to Halton Region's standards for arterial roads.

Figure 1 illustrates the existing heavy-truck capable Halton Region arterial roads in the vicinity of the Terminal.

With the currently scheduled completion of the planned road improvements, the Halton Region arterial road network in the vicinity of the Terminal would by the year 2020 comprise the following heavy-truck capable elements:

- **Tremaine Road** – between Britannia Road and its planned interchange with Highway 401 as a standard basic 4 lane arterial road with sections of bicycle lanes and multi-use paths, with a new grade separation of the CP Rail line and a new bridge across 16 Mile Creek, and the section between Britannia Road and Derry Road as a standard basic 6 lane arterial road;
- **Reginal Road 25 (“RR25”)** – between Dundas Street and its interchange with Highway 401 as a standard basic 4 lane arterial road with an interchange with 407ETR;
- **James Snow Parkway** – between its interchange with Highway 401 and Britannia Road as a standard basic 4 lane arterial road;
- **Trafalgar Road** – between Dundas Street and its interchange with Highway 401 as a standard basic 4 lane arterial road with an interchange with 407ETR, and the section between 407ETR and Dundas Street as a standard basic 6 lane arterial road;
- **Ninth Line** – between Britannia Road and Dundas Street as a standard basic 2 lane arterial road;
- **Dundas Street** – between its interchange with Highway 403 and Tremaine Road as a standard basic 6 lane arterial road;
- **Britannia Road** – between Tremaine Road and its interchange with 407ETR as a standard basic 4 lane arterial road with bicycle lanes and multi-use paths, with a new grade separation of the CN mainline, a new bridge across 16 Mile Creek, and the section between Tremaine Road and RR25 as a standard 6 lane arterial road;
- **Derry Road** – between Tremaine Road and its interchange with 407ETR as a minimum standard 4 lane arterial road with a grade separation of the CN mainline; and
- **Steeles Avenue** – between Tremaine Road and Winston Churchill Boulevard as a standard basic 4 lane arterial road with a new grade separation of the CP railway and widened grade separation of the CN mainline.

The Halton TMP identifies the creation of an interchange between Tremaine Road and Highway 401. Halton Region allocated funds for the construction of the interchange in its 2013 and 2014 budget years. In order to implement the interchange, Halton Region has indicated that certain permits are required and that the construction of the interchange will need to be coordinated with the MTO's ongoing plans for the improvement of Highway 401. Halton Region has indicated that at this time, its schedule for road improvements anticipates the interchange between Tremaine Road and Highway 401 to be complete and operational in 2019. Given that the opening of the Tremaine Road interchange would introduce a new, direct and convenient connection between the Terminal and Highway 401, the distribution of heavy-truck movements along Halton Region arterial roads would be quite different in scenarios with and without the interchange. Accordingly, for the purposes of this study, BA Group has assessed the truck routing and associated volumes under two 2020

scenarios: one the base case, which assumes the completion of the road improvements as anticipated in Halton Region's schedule; and the second sensitivity test scenario, which assumes that the planned interchange between Tremaine Road and Highway 401 has not been completed and opened in the year 2020.

Consideration has been given to the suitability and potential attractiveness of the roads within the jurisdiction of the Town of Milton as heavy-truck capable routes for Terminal-generated heavy-truck traffic. It should be noted that no Town roadways (only Halton Region arterial roadways) actually interchange with the MTO freeway system. The Town employs a system of roads classification which sets out those roads within the Town where heavy-truck traffic is permitted. Unless so designated, roads within the Town are prohibited from use by heavy-trucks with a gross vehicle weight in excess of 5 metric tonnes without a local origin or destination. For the purpose of the designation, the Terminal ought not to be considered a local origin or destination.

One Town of Milton road – Bronte Street – occupies a north-south alignment north from Britannia Road opposite First Line at the first intersection east of the proposed location of the Terminal driveway. Bronte Street between Derry Road and Steeles Avenue is currently designated to permit heavy-truck traffic; however, the section of Bronte Street immediately north of Britannia Road is not designated to permit heavy-truck traffic. Thus, Bronte Street is not currently considered a feasible route for Terminal-generated heavy-truck traffic. However, if Bronte Street were in the future to be designated by the Town to also permit heavy-truck traffic between Derry Road and Britannia Road, it could become a feasible route for Terminal-generated heavy-truck traffic. That being said, the route is not well suited to this purpose, given the location of a hospital at the corner of Bronte Street and Derry Road, the relatively residential and small-scale commercial character of the street, and the abundance of driveways and unsignalized local intersections along the street. Given the convenient availability of a number of better suited Halton Region arterial roads to/from the Terminal, Bronte Street is not required to accommodate Terminal-generated heavy-truck traffic. BA Group does not recommend that the section of Bronte Street north of Britannia Road be designated by the Town as a Heavy Traffic Permitted route in the future, and accordingly has not relied on its use in this assessment.

Based on the foregoing, **Figure 2** illustrates the base case 2020 network of heavy-truck capable Halton Region arterial roads in the vicinity of the Terminal which would be in place at the opening of the Terminal should the current schedule of Halton Capital Road Projects be achieved as planned. **Figure 3** illustrates the second, sensitivity test scenario: the 2020 network of heavy-truck capable Halton Region arterial roads in the vicinity of the Terminal excluding the Tremaine Road interchange with Highway 401 for the assessment of the truck traffic movements that would be experienced in the event that the interchange is not completed by the time of the opening of the Terminal.

3.0 DIRECTIONAL DISTRIBUTION OF TERMINAL-GENERATED HEAVY-TRUCK TRIPS

Trucks servicing the Terminal intending to drop-off or pick-up containers could approach/depart the vicinity of the intermodal terminal via several principal points of access:

- Highway 401 and/or 407ETR east of Halton Region;
- Highway 401 west of Halton Region;
- QEW and/or 407ETR west of Halton Region;
- QEW and/or Dundas Street east of Halton Region;
- Highway 403 east of Halton Region via 407ETR;
- Dundas Street west of Halton Region;
- RR25 and/or Trafalgar Road north of Highway 401; and
- Derry Road and/or Britannia Road east of 407ETR.

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. A significant number of questions were asked of the drivers and other observation-based information was obtained during the survey. Key survey data pertinent to determination of the directional distribution of truck trips for purposes of this study included the origin and destination of the truck trip.

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.

The distribution of the Terminal-generated truck trips at the principal points of approach was determined based on the origin-destination information derived from the MTO survey data and upon an assessment of the most direct available Provincial and Regional road network linking those origins and destinations to the vicinity of the Terminal. The resulting distribution of Terminal-generated truck trips is illustrated in **Figure 4**.



4.0 ASSESSMENT OF THE RELATIVE ATTRACTIVENESS OF ALTERNATIVE ROUTES ON HEAVY-TRUCK CAPABLE ROADS

The relative attractiveness of alternative routes that could be utilized by Terminal-generated trucks travelling between the Terminal entrance and each of the principal points of approach was assessed. In some cases the number of available routes between the Terminal and a principal point of access was limited and in other cases there were several feasible routes. The following summarizes key routes considered for the purpose of this assessment. Heavy-truck trips to/from:

- **Highway 401 and/or 407ETR east of Halton Region could route**
 - via Britannia Road east of the Terminal entrance and RR25 north of Britannia Road to Highway 401;
 - via Britannia Road east of the Terminal entrance and James Snow Parkway north of Britannia road to Highway 401;
 - via Britannia Road east of the Terminal entrance and Trafalgar Road north of Britannia Road to Highway 401;
 - via Britannia Road east of the Terminal entrance to 407ETR and north to Highway 401;
 - via Britannia Road west of the Terminal entrance and Tremaine Road north of Britannia Road to the planned new interchange at Highway 401; or
 - via Britannia Road west of the Terminal entrance, Tremaine Road north of Britannia Road, Steeles Avenue east of Tremaine Road, and RR25 north of Steeles Avenue to Highway 401.
- **Highway 401 west of Halton Region could route**
 - via Britannia Road east of the Terminal entrance and RR25 north of Britannia Road to Highway 401;
 - via Britannia Road west of the Terminal entrance and Tremaine Road north of Britannia Road to the planned new interchange at Highway 401; or
 - via Britannia Road west of the Terminal entrance, Tremaine Road north of Britannia Road, Steeles Avenue east of Tremaine Road, and RR25 north of Steeles Avenue to Highway 401.
- **QEW and/or 407ETR west of Halton Region would route**
 - via Britannia Road east of the Terminal entrance and RR25 south of Britannia Road to 407ETR or the QEW.
- **QEW east of Halton Region would route**
 - via Britannia Road east of the Terminal entrance and RR25 south of Britannia Road to the QEW.
- **Highway 403 east of Halton Region via 407ETR would route**
 - via Britannia Road east of the Terminal entrance and RR25 south of Britannia Road to 407ETR.
- **RR25 north of Halton Region would route**
 - via Britannia Road east of the Terminal entrance to RR25.
- **Trafalgar Road north of Halton Region would route**
 - via Britannia Road east of the Terminal entrance to Trafalgar Road.
- **Derry Road east of Halton Region would route**
 - via Britannia Road east of the Terminal entrance and RR25 north of Britannia Road to Derry Road.
- **Britannia Road east of Halton Region would route**
 - via Britannia Road east of the Terminal entrance.

- **Dundas Street west of Halton Region would route**
 - via Britannia Road east of the Terminal entrance and RR25 south of Britannia Road to Dundas Street.

Based on the above list, **Figure 5** (base case road network) and **Figure 6** (without Tremaine Road interchange at Highway 401) illustrate the routes that could potentially be employed by Terminal-generated heavy-trucks to travel between the Terminal entrance and the principal points of approach.

The routes that could potentially be used by Terminal-generated heavy-trucks were characterized by a variety of relevant factors for purposes of determining their relative attractiveness. Factors considered included route length, posted speed limits, base travel time, possible congestion experience, number of signal controlled intersections, number of roundabouts, number of required right turns, number of required left turns, the presence of bicycle lanes, and the degree of potential friction caused by uncontrolled intersections and driveways.

Based upon a consistent weighting of these factors using the engineering judgement and experience of the authors of the report, the relative attractiveness of the most likely routes was determined and used as the basis to estimate what proportion of the trips made by Terminal-generated heavy-trucks would likely employ each route.

As presented in the previous section, the majority of the heavy-truck trips generated by the Terminal (70 percent or more) is anticipated to be oriented to/from the northeast via Highway 401 to/from Brampton and Mississauga and other destinations north of the City of Toronto. It was observed during the assessment of the relative attractiveness of the candidate routes that numerous routes serve this, the largest single segment of travel. As a consequence of the alignment of Highway 401 through Halton Region (oriented from the northwest to the southeast), the routes that provided the north-south link to Highway 401 in the western portions of Milton (Tremaine Road and RR25) resulted in longer trip lengths with higher average travel speeds (given that a higher proportion of the trips would be made on Highway 401) while the routes that provided the north-south link to Highway 401 in the eastern portions of Milton (Trafalgar Road and James Snow Parkway) had shorter trip lengths and slower average travel speeds (given that a smaller proportion of the trips would be made on Highway 401). The travel time differences amongst the candidate routes alone were not decisive. Other factors such as the potential delay arising from the number of required left-turn movements at signalized intersections and the travel time uncertainty associated with routes with numerous driveways and unsignalized intersections were additional significant factors.

An additional consideration was factored into the assessment of heavy-truck routing amongst the most likely routes. CN has indicated that approximately 20 percent of the Terminal-generated heavy-truck trips would be made by vehicles operated by a subsidiary transport company CN Transport Limited (“**CNTL**”). CN has indicated that it would direct the trucks operated by CNTL to utilize the 407ETR whenever its use would be practical and feasible. Consequently, for the purpose of this analysis, it was determined that CNTL truck trips constituting 20 percent of the total Terminal-generated truck trips would be specifically directed to the principal points of approach on the following subset of the feasible routes. Heavy-truck trips to/from:

- **Highway 401 and/or 407ETR east of Halton Region would route**
 - via Britannia Road east of the Terminal entrance to 407ETR and north to Highway 401;



- **Highway 401 west of Halton Region could route**
 - 1) via Britannia Road east of the Terminal entrance and RR25 north of Britannia Road to Highway 401;
 - 2) via Britannia Road west of the Terminal entrance and Tremaine Road north of Britannia Road to the planned new interchange at Highway 401; or
 - 3) via Britannia Road west of the Terminal entrance, Tremaine Road north of Britannia Road, Steeles Avenue east of Tremaine Road, and RR25 north of Steeles Avenue to Highway 401.
- **QEW and/or 407ETR west of Halton Region would route**
 - via Britannia Road east of the Terminal entrance and RR25 south of Britannia Road to 407ETR.

QEW east of Halton Region would route

- via Britannia Road east of the Terminal entrance and RR25 south of Britannia Road to the QEW. (Note that in the future when a set of ramps connecting Highway 403 with the QEW east of Halton Region is implemented, then CN controlled trucks could be directed to use 407ETR to connect with Highway 403 for this route.)
- **Highway 403 east of Halton Region via 407ETR would route**
 - via Britannia Road east of the Terminal entrance and RR25 south of Britannia Road to 407ETR.

RR25 north of Halton Region could route

- 1) via Britannia Road east of the Terminal entrance to RR25; or
- 2) via Britannia Road west of the Terminal entrance and Tremaine Road north of Britannia Road to 5 Sideroad and RR25.
- **Trafalgar Road north of Halton Region would route**
 - via Britannia Road east of the Terminal entrance to Trafalgar Road.
- **Derry Road east of Halton Region would route**
 - via Britannia Road east of the Terminal entrance and RR25 north of Britannia Road to Derry Road.
- **Britannia Road east of Halton Region would route**
 - via Britannia Road east of the Terminal entrance.

Taking the foregoing factors into account, **Figure 7** illustrates the percentage allocation of Terminal-generated trucks to the available heavy-truck routes given the completion of the scheduled Halton Region road program including the Tremaine Road interchange with Highway 401. **Figure 8** illustrates the percentage allocation of Terminal-generated trucks to the available heavy-truck routes assuming the completion of the scheduled Halton Region road program except for the Tremaine Road interchange with Highway 401.

It is significant to note that in the base case scenario with the Tremaine Road interchange with Highway 401 opened, a greater proportion of Terminal-generated trucks would use the Tremaine Road corridor to Highway 401. It should be noted that Halton Region has indicated, and BA Group's evaluation has confirmed, that the new roundabouts developed at major intersections along the Tremaine Road corridor (Britannia Road, Louis St. Laurent Boulevard, Derry Road, Main Street and Steeles Avenue) are designed to accommodate the movement of full size tractor trailer units safely and expeditiously.

The assessment of alternative routes has indicated that virtually all Terminal-generated heavy-trucks originating from and destined to the west would use the Tremaine Road interchange and a significant portion of the trucks to/from the east would also use the interchange. With the availability of the Tremaine Road



interchange there would be a comparatively lesser use by Terminal-generated heavy-truck traffic of other north/south oriented routes generally as well as a lesser use of the RR25 interchange with Highway 401. There would also be a comparatively lesser use of the Britannia Road corridor east of the Terminal to James Snow Parkway and Trafalgar Road.

5.0 ASSIGNMENT OF TERMINAL-GENERATED HEAVY-TRUCKS TO THE LIKELY ROUTES

CN has determined, and has advised BA Group that the rail service plan for the Terminal is expected to generate sufficient container traffic to require 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 Terminal through the gate, drop off and/or pick-up a container and exit the Terminal. For the purpose of this assessment, the estimate of up to 800 Terminal-generated heavy-truck trips per day in each direction has been adopted. It is recognized that there will likely be variation in the daily container traffic serviced by the Terminal depending on the time of year or the day of the week. CN has indicated that the estimate of 800 truck trips each way per day is likely to be in the order of the 90th percentile of the range of weekday truck volumes.

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 BIT over the course of a year ending in September 2015⁷. The hourly average gate volumes at the BIT expressed as a percentage of the total daily volumes was derived. Since container traffic to be accommodated at the proposed Terminal is to derive from a transfer of container traffic from the BIT, BA Group determined that the pattern of hourly truck movements would be a reasonable proxy for the estimation of future heavy-truck movements at the Terminal.

The resulting estimates of hour-by-hour inbound and outbound Terminal-generated heavy-truck traffic volume are summarized in **Table 1**.

⁷ The pattern of existing inbound and outbound gate movements at the BIT reflects the use of a gate reservation system managed by CN and utilized by its customers to schedule container pick-ups. The reservation system helps to smooth gate activity throughout the day by scheduling a 2-hour window for each container pick-up (container drop-offs are not scheduled). CN has advised that the same reservation system will be utilized at the proposed Terminal to manage container pick-ups.



TABLE 1 FORECAST TERMINAL-GENERATED HEAVY-TRUCK TRIPS

Hour (starting)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL	
Hourly Truck Trips Inbound and Outbound (per BIT volume averages)																										
% of total daily trucks at inbound gate	1.7	1.5	1.6	2.1	3.8	5.6	5.9	4.1	4.7	5.4	5.8	6.2	6.4	6.2	5.6	5.5	5.4	5.3	5.4	3.6	2.8	2.1	1.5	1.8	100%	
Inbound trucks	13	12	13	17	30	45	47	33	38	43	47	50	51	49	45	45	43	43	43	29	22	17	12	14	800	
% of total daily trucks at outbound gate	1.5	1.5	1.5	1.6	2.3	3.8	5.6	5.4	5.0	5.0	5.5	5.9	6.1	6.0	6.0	5.6	5.8	5.7	5.4	4.8	3.7	2.7	2.0	1.8	100%	
Outbound trucks	12	12	12	13	18	30	45	43	40	40	44	47	49	48	48	45	46	45	43	38	30	22	16	14	800	

The hourly pattern of truck movements at the gate indicates that heavy-truck volumes are proportionately lower in the evening and night time and proportionately higher during the day. The volumes reflect what appear to be reasonable expectations of the typical operating hours of CN customers and the schedule for container pick-up and delivery. This hourly pattern has been used as the basis for the estimates of weekday AM and PM peak hour heavy-truck trips forecast to be distributed to the arterial road system in the vicinity of the Terminal.

Figure 9 (base case road network) and **Figure 10** (without Tremaine Road interchange at Highway 401) illustrate the assignments of the AM peak hour (8:00 to 9:00AM) and PM peak hour (4:00 to 5:00PM) Terminal-generated heavy-truck traffic based on the foregoing typical hourly distribution patterns. For the purpose of this assessment, and consistent with standard transportation impact assessment methods, the relative impact of the Terminal-generated heavy-truck traffic has been compared with morning and afternoon peak hour traffic conditions when volumes of background traffic on the arterial road network are generally highest.

6.0 DISCUSSION OF THE TRUCK VOLUME FORECAST

6.1 COMPARISON TO PRIOR (2008) CN PROPOSAL

In 2008, CN proposed to develop an industrial park having direct rail serviced sites within the concession bounded by Britannia Road on the north, Tremaine road on the west, Lower Base Line on the south, and first Line on the east. Within this area were substantial lands earlier acquired by CN with a two-fold initial purpose: to establish a new intermodal terminal and to add to CN's inventory of direct rail serviced industrial sites. At the time of the 2008 proposal, CN determined that an expansion of the existing CN intermodal terminal operations in Brampton could provide sufficient capacity to obviate the need for development of a new intermodal terminal in Milton, and that consequently the lands in Milton could be more effectively deployed as rail serviced industrial lots.



In support of this objective, CN retained BA Group to report on the transportation considerations associated with the proposal, and to prepare traffic volume forecasts associated with the then contemplated initial development phase comprising some 55.4 hectares located south of Britannia Road between First Line and the CN corridor.

BA Group prepared a study report entitled “*CN South Milton Industrial Precinct Transportation Considerations*”, dated September 2008 (herein referred to as the “**2008 BA Group study**”) for the initial (55.4 hectare) development phase. As part of this study, BA Group developed an estimate of the trip generation potential of the proposed mix of rail serviced (80%) and non-rail serviced (20%) industrial lands in this initial phase, based on the Institute of Transportation Engineers (ITE) fitted curve equation for Land Use Code 130 (Industrial Park) with adjustments for local conditions and to reflect an allowance for truck trips based upon the findings of locally conducted traffic generation surveys of comparable land uses.

In the 2008 BA Group study, it was forecast that the initial development phase would generate in the order of 610 vehicle trips inbound and 125 vehicle trips outbound in the AM peak hour. Imbedded in that analysis was a truck conversion factor which stipulated that of these vehicle trips 90 inbound and 45 outbound would be trucks. Based upon the underlying proxy site traffic survey data, BA Group has further estimated, for the purpose of this assessment, that approximately 60 of the 90 inbound trucks and 40 of the 45 outbound trucks would likely be classified as heavy-trucks. Similarly, the 2008 BA Group study forecast that the initial development phase would generate in the order of 265 vehicle trips inbound and 715 vehicle trips outbound in the PM peak hour, and used a factor indicating that of those trips approximately 80 inbound and 110 outbound would be trucks. Of these, BA Group has further estimated, for the purpose of this assessment, that approximately 45 of the 80 inbound trucks and 85 of the 110 outbound trucks would be classified as heavy-trucks.

Although presently zoned as agricultural, the CN lands east of the CN mainline between Britannia and Lower Base Line (including those subject to the 2008 BA Group study) were designated in the adopted Halton Region Official Plan Amendment 38 as Future Strategic Employment Area. A substantial portion of CN lands located west of the CN mainline and south of Britannia Road were designated as an Employment Area within the Urban Area.

In the 2011 Halton TMP, the efficiency and environmental benefits of inter-modal transportation of goods and the potential of the proposed Terminal was recognized:

“Intermodal transportation is becoming increasingly important in goods movement, for reasons of efficiency, best use of the transportation network and the environmental impacts of transportation. The use of multiple modes for goods movement requires efficient and accessible inter-modal facilities.”⁸

“CN also owns land in Milton for which it has a long range plan for an inter-modal facility. It is understood that the current emphasis is on utilizing existing rail infrastructure and facilities; a new facility is considered to be a longer term project. To the east, CN has an inter-modal facility in

⁸ Halton TMP, Appendix 4 Goods Movement, Section 5 Current Issues, Section 5.7 Modal Integration

Brampton. Other facilities in the GTHA include the CP facilities at the Vaughan and Obico intermodal terminals and at the Trafalgar Road-Rail Terminal, and the CN McMillan Yard Road-Rail Terminal. Improved access to inter-modal facilities such as these would also serve to improve the environmental performance of goods movement within Halton Region, facilitating efficient transfer of goods from road to rail.⁹

The 2008 BA Group study reflected the development of 55.4 hectares east of the rail corridor as an initial phase of rail serviced industrial lands which would result the generation of a total of 85 and 125 heavy-truck trips in the AM and PM peak hours respectively. For the currently proposed Terminal, CN has produced an estimate (based on 800 heavy-truck trips in and 800 heavy-truck trips out in a day) of 78 and 89 Terminal-generated heavy-truck trips in the AM and PM peak hour respectively.

In both of these studies, CN has recognized the potential of the development of its lands in Milton to generate considerable volumes of heavy-truck traffic. The two forecasts of heavy-truck trip generation, one developed in 2008 for what was then contemplated as the first phase of rail serviced industrial land, and the current forecast for the proposed intermodal terminal, demonstrate that the two development scenarios would generate roughly comparable volumes of heavy-truck traffic.

6.2 COMPARATIVE IMPACT ON EXISTING TRAFFIC AT KEY INTERSECTIONS

Several intersections of Halton Region arterial roads within Milton were selected for purposes of quantifying what would be the likely impact of the addition of Terminal-generated trucks in the somewhat conceptual scenario where the future developed road network were to carry the existing volumes of traffic at the time of the planned opening of the Terminal in 2020. Clearly, it is anticipated that in 2020 the volumes of traffic on the Halton Region road network in Milton will be greater than they are today due to the anticipated growth in population and employment in Milton. The matter of future traffic volumes and the relative impact of Terminal-generated heavy-trucks will be discussed in the following section. Nevertheless, this comparison of the impact of the Terminal-generated heavy-trucks in relation to existing volumes is provided for reference purposes. Specifically, the following intersections have been assessed:

- Derry Road / Tremaine Road;
- Derry Road / RR25 (Ontario Street);
- Derry Road / Trafalgar Road;
- Steeles Avenue / RR25 (Ontario Street);
- Steeles Avenue / RR25 (Martin Street);
- Britannia Road / Tremaine Road;
- Britannia Road / RR25;
- Britannia Road / James Snow Parkway; and
- Britannia Road / Trafalgar Road.

⁹ Halton TMP, Appendix 4 Goods Movement, Section 2 Introduction and Background, Section 2.2 Rail



The existing traffic volumes and vehicle classifications were derived from two sources. Halton Region provided traffic count data from its own database at the following locations and dates:

- Derry Road / Tremaine Road – November 12, 2014;
- Derry Road / RR25 (Ontario Street) – April 27, 2015;
- Derry Road / Trafalgar Road – April 14, 2014;
- Steeles Avenue / RR25 (Ontario Street) – May 11, 2015; and
- Steeles Avenue / RR25 (Martin Street) – April 22, 2015.

BA Group retained a contractor to undertake and provide traffic counts at the following locations and dates:

- Britannia Road / Tremaine Road – October 7, 2015;
- Britannia Road / First Line – October 7, 2015;
- Britannia Road / RR25 – October 7, 2015;
- Britannia Road / James Snow Parkway – October 7, 2015; and
- Britannia Road / Trafalgar Road – October 7, 2015.

In the above-noted studies, the reported classification of “heavy-vehicle” refers to any vehicle operating on a public street having three axels or more or likely to have a gross vehicle weight in excess of 4500 kilograms. This is a broader classification that includes heavy-trucks as well as other vehicles including transit buses, refuse trucks, large school buses and highway coaches. The results of the comparative assessment are summarized in **Table 2** (AM peak hour) and **Table 4** (PM peak hour) for the scenario including the completion of the currently scheduled Halton Capital Roads Projects as scheduled. As a sensitivity test, **Table 3** and **Table 5** provide the comparative assessment for the scenario where the planned interchange of Tremaine Road and Highway 401 is not opened by 2020.

TABLE 2 CHANGE ARISING FROM THE ADDITION OF TERMINAL-GENERATED HEAVY-TRUCK TRAFFIC AT KEY INTERSECTIONS WITHIN THE PLANNED ROAD NETWORK WITH EXISTING BASE TRAFFIC VOLUMES (AM PEAK HOUR)

Intersection (Survey Date, Source)	Total Vehicles Entering the Intersection	Total Existing Heavy-vehicles Entering the Intersection	Percentage of Existing Heavy-vehicles	Total Terminal-Generated Heavy-trucks Forecast to Enter the Intersection	Resulting Number of Heavy-vehicles Entering the Intersection	Resulting Percentage of Heavy-vehicles	Net Change in Percentage of Heavy-vehicles
Derry / Ontario (April 27, 2015, Region)	4830	178	3.69%	6	184	3.80%	+0.12%
Derry / Trafalgar (April 14, 2014, Region)	5117	132	2.58%	13	145	2.83%	+0.25%
Steeles / Ontario (May 11, 2015, Region)	2736	137	5.01%	3	140	5.11%	+0.10%
Steeles / Martin (April 22, 2015, Region)	3509	245	6.98%	8	253	7.19%	+0.21%
Britannia / RR25 (Oct 7, 2015, BA Group)	2465	79	3.20%	46	125	4.98%	+1.77%
Britannia / JSP (Oct 7, 2015, BA Group)	1654	20	1.21%	32	52	3.08%	+1.88%
Britannia / Trafalgar (Oct 7, 2015, BA Group)	3857	78	2.02%	24	102	2.63%	+0.61%
Tremaine / Britannia (Oct 7, 2015, BA Group)	1144	20	1.75%	32	52	4.42%	+2.67%
Tremaine / Derry (Nov 12, 2014, Region)	2083	87	4.18%	32	119	5.63%	+1.45%
Tremaine / Steeles (Sept 22, 2014, Region)	1062	39	3.67%	32	71	6.49%	+2.82%

TABLE 3 CHANGE ARISING FROM THE ADDITION OF TERMINAL-GENERATED HEAVY-TRUCK TRAFFIC AT KEY INTERSECTIONS WITHIN THE PLANNED ROAD NETWORK WITH EXISTING BASE TRAFFIC VOLUMES (AM PEAK HOUR) EXCEPT WITHOUT THE TREMAINE ROAD INTERCHANGE

Intersection (Survey Date, Source)	Total Vehicles Entering the Intersection	Total Existing Heavy-vehicles Entering the Intersection	Percentage of Existing Heavy-vehicles	Total Terminal-Generated Heavy-trucks Forecast to Enter the Intersection	Resulting Number of Heavy-vehicles Entering the Intersection	Resulting Percentage of Heavy-vehicles	Net Change in Percentage of Heavy-vehicles
Derry / Ontario (April 27, 2015, Region)	4830	178	3.69%	10	188	3.88%	+0.20%
Derry / Trafalgar (April 14, 2014, Region)	5117	132	2.58%	20	152	2.96%	+0.38%
Steeles / Ontario (May 11, 2015, Region)	2736	137	5.01%	7	144	5.25%	+0.24%
Steeles / Martin (April 22, 2015, Region)	3509	245	6.98%	21	266	7.54%	+0.55%
Britannia / RR25 (Oct 7, 2015, BA Group)	2465	79	3.20%	64	143	5.65%	+2.45%
Britannia / JSP (Oct 7, 2015, BA Group)	1654	20	1.21%	46	66	3.88%	+2.67%
Britannia / Trafalgar (Oct 7, 2015, BA Group)	3857	78	2.02%	34	112	2.88%	+0.86%
Tremaine / Britannia (Oct 7, 2015, BA Group)	1144	20	1.75%	14	34	2.94%	+1.19%
Tremaine / Derry (Nov 12, 2014, Region)	2083	87	4.18%	14	101	4.82%	+0.64%
Tremaine / Steeles (Sept 22, 2014, Region)	1062	39	3.67%	14	53	4.93%	+1.25%

TABLE 4 CHANGE ARISING FROM THE ADDITION OF TERMINAL-GENERATED HEAVY-TRUCK TRAFFIC AT KEY INTERSECTIONS WITHIN THE PLANNED ROAD NETWORK WITH EXISTING BASE TRAFFIC VOLUMES (PM PEAK HOUR)

Intersection (Survey Date, Source)	Total Vehicles Entering the Intersection	Total Existing Heavy-vehicles Entering the Intersection	Percentage of Existing Heavy-vehicles	Total Terminal-Generated Heavy-trucks Forecast to Enter the Intersection	Resulting Number of Heavy-vehicles Entering the Intersection	Resulting Percentage of Heavy-vehicles	Net Change in Percentage of Heavy-vehicles
Derry / Ontario (April 27, 2015, Region)	4537	114	2.51%	6	120	2.64%	+0.13%
Derry / Trafalgar (April 14, 2014, Region)	5048	79	1.56%	15	94	1.86%	+0.29%
Steeles / Ontario (May 11, 2015, Region)	3266	144	4.41%	3	147	4.50%	+0.09%
Steeles / Martin (April 22, 2015, Region)	3788	150	3.96%	9	159	4.19%	+0.23%
Britannia / RR25 (Oct 7, 2015, BA Group)	2575	43	1.67%	51	94	3.58%	+1.91%
Britannia / JSP (Oct 7, 2015, BA Group)	2036	33	1.62%	37	70	3.38%	+1.76%
Britannia / Trafalgar (Oct 7, 2015, BA Group)	4248	48	1.13%	29	77	1.80%	+0.67%
Tremaine / Britannia (Oct 7, 2015, BA Group)	1134	8	0.71%	38	46	3.92%	+3.22%
Tremaine / Derry (Nov 12, 2014, Region)	2143	41	1.91%	38	79	3.62%	+1.71%
Tremaine / Steeles (Sept 22, 2014, Region)	1022	34	3.33%	38	72	6.79%	+3.47%

TABLE 5 CHANGE ARISING FROM THE ADDITION OF TERMINAL-GENERATED HEAVY-TRUCK TRAFFIC AT KEY INTERSECTIONS WITHIN THE PLANNED ROAD NETWORK WITH EXISTING BASE TRAFFIC VOLUMES (PM PEAK HOUR) EXCEPT WITHOUT THE TREMAINE ROAD INTERCHANGE

Intersection (Survey Date, Source)	Total Vehicles Entering the Intersection	Total Existing Heavy-vehicles Entering the Intersection	Percentage of Existing Heavy-vehicles	Total Terminal-Generated Heavy-trucks Forecast to Enter the Intersection	Resulting Number of Heavy-vehicles Entering the Intersection	Resulting Percentage of Heavy-vehicles	Net Change in Percentage of Heavy-vehicles
Derry / Ontario (April 27, 2015, Region)	4537	114	2.51%	10	124	2.73%	+0.21%
Derry / Trafalgar (April 14, 2014, Region)	5048	79	1.56%	23	102	2.01%	+0.45%
Steeles / Ontario (May 11, 2015, Region)	3266	144	4.41%	7	151	4.61%	+0.20%
Steeles / Martin (April 22, 2015, Region)	3788	150	3.96%	25	175	4.59%	+0.63%
Britannia / RR25 (Oct 7, 2015, BA Group)	2575	43	1.67%	71	114	4.31%	+2.64%
Britannia / JSP (Oct 7, 2015, BA Group)	2036	33	1.62%	53	86	4.12%	+2.50%
Britannia / Trafalgar (Oct 7, 2015, BA Group)	4248	48	1.13%	39	87	2.03%	+0.90%
Tremaine / Britannia (Oct 7, 2015, BA Group)	1134	8	0.71%	18	26	2.26%	+1.55%
Tremaine / Derry (Nov 12, 2014, Region)	2143	41	1.91%	18	59	2.73%	+0.82%
Tremaine / Steeles (Sept 22, 2014, Region)	1022	34	3.33%	18	52	5.00%	+1.67%

6.3 COMPARATIVE IMPACT AT INTERSECTIONS ON THE BRITANNIA ROAD AND TREMAINE ROAD CORRIDORS IN 2020

For the purpose of assessing the impact of Terminal-generated heavy-truck traffic in Milton in the year 2020, this study has reviewed the likely impact along the Britannia Road and Tremaine Road corridors, which (based on the route assessment discussed above) would likely carry the largest volumes of Terminal-generated heavy-truck traffic under the two scenarios being considered. The base scenario reflects the anticipated completion of all roadwork as currently scheduled by Halton Region. The second scenario assumes that the planned interchange of Tremaine Road with Highway 401 is not opened, and therefore reflects the worst case scenario given the resulting concentration of Terminal-generated heavy-truck traffic along Britannia Road east of the Terminal driveway.

In the year 2020, at the planned commencement of operation of the Terminal, it is anticipated in the current schedule that Halton Region's arterial road network in the vicinity of the Terminal will have been upgraded significantly including the widening of Britannia Road to a minimum 4 lane configuration between Tremaine Road and the 407ETR and including a 6 lane section between Tremaine Road and RR25, and the completion of Tremaine Road to a new interchange with Highway 401. In addition, growth of population and employment in Milton will likely have resulted in significantly higher traffic volumes along the Britannia Road corridor compared to those which exist at this time.

Halton Region was requested to provide, if available, output from its transportation planning model providing forecasts of AM and PM peak hour vehicular traffic on the road network anticipated in the vicinity of the Terminal for a planning horizon year of 2021. Also requested was any information or guidance from the transportation planning model or from other sources that Halton Region may be able to provide regarding future horizon year volumes of bicycles, pedestrians or heavy-trucks on regional roads. With respect to the specific request, Halton Region responded indicating that such information was not available, and provided further guidance indicating that engineering judgement is required and that it is incumbent upon the author of the study to justify any assumptions which may be used to conduct the assessment.

Halton Region provided a Table which set out "PM Peak Hour Link Level Growth Rates" for east-west and north-south Halton Region roads in Milton including: Steeles Avenue, Derry Road, Britannia Road, Tremaine Road, James Snow Parkway, Trafalgar Road and RR25. Halton Region also provided a 2031 Halton TMP Recommended Network Screenline Definition Map. Halton Region indicated that the Growth Rates were derived from the "Halton Transportation Master Plan Model – The Road to Change (approved in 2011) and used for all forecasts."

Other potential sources of forecast future horizon year peak hour vehicular traffic volumes were also investigated for possible reference purposes.

The Environmental Study Report for the Britannia Road Environmental Assessment¹⁰ (herein referred to as the "**Britannia EA**"), prepared for Halton Region in 2014, provides documentation of the traffic volume forecasting for the year 2021 undertaken for that study. BA Group determined that these published traffic

¹⁰ "Environmental Study Report – Britannia Road (Regional Road 6) Transportation Corridor Improvements". April 2014, Revised September 2014. Prepared by Delcan for the Regional Municipality of Halton.



volume projections could form the basis of a set of future non-Terminal-generated traffic volumes along the Britannia Road corridor for the year 2021 which in turn have provided the basis for a comparative assessment of the impact of Terminal-generated heavy-truck traffic along the corridor in the year 2020.

The Environmental Study Report for the Tremaine Road Environmental Assessment¹¹ (herein referred to as the “**Tremaine EA**”), prepared for Halton Region and dated June 2012 provides various approaches to the development of future background traffic volumes within the Tremaine Road corridor. After review of the Tremaine EA, and given inconsistencies in the information presented, BA Group determined that the volumes provided in the ESR could not be used as the basis for the assessment in this study. Consequently, BA Group opted to apply the link level growth rates provided by Halton Region to the most recent available existing AM and PM peak hour traffic volumes to develop a forecast of year 2020 peak hour traffic volumes within the Tremaine Road corridor. It is acknowledged that these estimates, although reasonable under the circumstances, may be inconsistent with volumes that would be derived from the conventional application of a regional transportation planning model to reflect the impact of changes in the transportation network, population and employment and travel behaviour.

In both the Tremaine Road and Britannia Road corridors, the resulting vehicle trip forecasts to the year 2020 were assumed not to include any provision for the future volume of commercial vehicle traffic, including the heavy-vehicle component. Accordingly, the volumes in each corridor were adjusted to include an estimated component of medium and heavy-vehicle traffic. It is anticipated that as the Britannia Road corridor is upgraded to a standard 4 to 6 lane Halton Region arterial road and as the area immediately north of Britannia Road becomes built up, the traffic character of Britannia Road will become less typical of a rural road and more typical of other Halton Region arterial roads in Milton. The existing Halton Region arterial road intersections on Derry Road and Steeles Avenue within the built-up portions of Milton have been shown to exhibit heavy-vehicle volume percentages of in the range of 1.5 to 7.0 percent. The average across the four intersections for which counts are available is 4.35 percent heavy-vehicles in the AM peak hour and 2.92 percent heavy-vehicles in the PM peak hour.

Based on the foregoing, the forecasts of Future Background (not Terminal-generated) heavy-vehicle volumes in both the Britannia Road and Tremaine road corridors were based on an application of a 2.5 percent factor as an approximation of the proportion of heavy-vehicles to be found in the background traffic flow in these corridors. This conservatively selected value is somewhat lower than the observed averages of heavy-vehicle proportions found on the identified Halton Region arterial roads in the built-up portions of Milton during peak periods.

Where Britannia Road and Tremaine Road intersect with Milton roads on which heavy-truck traffic is not permitted, a conservatively selected value of 0 percent heavy-vehicles was applied to the forecast. It is acknowledged that this application of traffic planning judgement represents an imperfect method of forecasting approximate future background volumes of heavy-vehicles. In the state of traffic planning today, no available method produces a particularly reliable forecast of non-site specific heavy-vehicles at this high level of planning. The purpose of the forecast is primarily to provide a reasonable basis for comparison of the

¹¹ “*Environmental Study Report - Tremaine Road (Reg. Rd. 22) from Derry Road (Reg. Rd. 1) to Britannia Road (Reg. Rd. 6), Transportation Corridor Improvements, Class Environmental Assessment Study*”, June 2012. Prepared by MRC for the Regional Municipality of Halton.



future relative impact of Terminal-generated heavy-truck traffic. For this purpose, we believe the method is reasonable.

The following intersections along the Britannia Road and Tremaine Road corridors were selected for the purpose of a comparative assessment of the relative impact of Terminal-generated heavy-trucks weighed against a forecast of future traffic volumes in the corridors:

- Britannia Road at Tremaine Road;
- Britannia Road at First Line;
- Britannia Road at RR25;
- Britannia Road at James Snow Parkway;
- Britannia Road at Trafalgar Road;
- Tremaine Road at Derry Road; and
- Tremaine Road at Steeles Avenue West.

The results of the comparative assessment are provided in **Table 6** (AM peak hour) and **Table 8** (PM peak hour) for the base scenario reflecting the completion of all currently scheduled Halton Region road work and in **Table 7** (AM peak hour) and **Table 9** (PM peak hour) for the scenario reflecting the Tremaine Road interchange with Highway 401 not being opened in 2020.

TABLE 6 CHANGE ARISING FROM THE ADDITION OF TERMINAL-GENERATED HEAVY-TRUCK TRAFFIC AT KEY INTERSECTIONS WITHIN THE PLANNED ROAD NETWORK WITH FORECAST YEAR 2020 BACKGROUND TRAFFIC VOLUMES (AM PEAK HOUR)

Intersection and (Survey Date)	Total Vehicles Entering the Intersection	Total Background Heavy-vehicles Entering the Intersection	Percentage of Background Heavy-vehicles	Total Terminal-generated Heavy-truck Forecast to Enter the Intersection	Resulting Number of Heavy-vehicles Entering the Intersection	Resulting Percentage of Heavy-vehicles	Net Change in Percentage of Heavy-vehicles
Britannia / Tremaine	2950	44	1.49%	32	76	2.55%	+1.06%
Britannia / First Line	2200	31	1.41%	46	77	3.43%	+2.02%
Britannia / RR25	3660	92	2.51%	46	138	3.72%	+1.21%
Britannia / JSP	2530	63	2.49%	32	95	3.71%	+1.22%
Britannia / Trafalgar	4285	107	2.50%	24	131	3.04%	+0.54%
Tremaine / Derry	2570	63	2.45%	32	95	3.65%	+1.20%
Tremaine / Steeles	1446	36	2.49%	32	68	4.60%	+2.11%

TABLE 7 CHANGE ARISING FROM THE ADDITION OF TERMINAL-GENERATED HEAVY-TRUCK TRAFFIC AT KEY INTERSECTIONS WITHIN THE PLANNED ROAD NETWORK WITH FORECAST YEAR 2020 BACKGROUND TRAFFIC VOLUMES (AM PEAK HOUR) EXCEPT WITHOUT THE TREMAINE ROAD INTERCHANGE

Intersection and (Survey Date)	Total Vehicles Entering the Intersection	Total Background Heavy-vehicles Entering the Intersection	Percentage of Background Heavy-vehicles	Total Terminal-generated Heavy-truck Forecast to Enter the Intersection	Resulting Number of Heavy-vehicles Entering the Intersection	Resulting Percentage of Heavy-vehicles	Net Change in Percentage of Heavy-vehicles
Britannia / Tremaine	2950	44	1.49%	14	58	1.96%	+0.47%
Britannia / First Line	2200	31	1.41%	64	95	4.20%	+2.79%
Britannia / RR25	3660	92	2.51%	64	156	4.19%	+1.68%
Britannia / JSP	2530	63	2.49%	46	109	4.23%	+1.74%
Britannia / Trafalgar	4285	107	2.50%	34	141	3.26%	+0.77%
Tremaine / Derry	2570	63	2.45%	14	77	2.98%	+0.53%
Tremaine / Steeles	1446	36	2.49%	14	50	3.42%	+0.94%

TABLE 8 CHANGE ARISING FROM THE ADDITION OF TERMINAL-GENERATED HEAVY-TRUCK TRAFFIC AT KEY INTERSECTIONS WITHIN THE PLANNED ROAD NETWORK WITH FORECAST YEAR 2020 BACKGROUND TRAFFIC VOLUMES (PM PEAK HOUR)

Intersection and (Survey Date)	Total Vehicles Entering the Intersection	Total Background Heavy-vehicles Entering the Intersection	Percentage of Background Heavy-vehicles	Total Terminal-generated Heavy-truck Forecast to Enter the Intersection	Resulting Number of Heavy-vehicles Entering the Intersection	Resulting Percentage of Heavy-vehicles	Net Change in Percentage of Heavy-vehicles
Britannia / Tremaine	3115	43	1.38%	38	81	2.57%	+1.19%
Britannia / First Line	2750	44	1.60%	51	95	3.39%	+1.79%
Britannia / RR25	4465	111	2.49%	51	162	3.59%	+1.10%
Britannia / JSP	3035	76	2.50%	37	113	3.68%	+1.17%
Britannia / Trafalgar	4440	111	2.50%	29	140	3.13%	+0.63%
Tremaine / Derry	2729	68	2.49%	38	106	3.83%	+1.34%
Tremaine / Steeles	1285	32	2.49%	38	70	5.29%	+2.80%



TABLE 9 CHANGE ARISING FROM THE ADDITION OF TERMINAL-GENERATED HEAVY-TRUCK TRAFFIC AT KEY INTERSECTIONS WITHIN THE PLANNED ROAD NETWORK WITH FORECAST YEAR 2020 BACKGROUND TRAFFIC VOLUMES (PM PEAK HOUR) EXCEPT WITHOUT THE TREMAINE ROAD INTERCHANGE

Intersection and (Survey Date)	Total Vehicles Entering the Intersection	Total Background Heavy-vehicles Entering the Intersection	Percentage of Background Heavy-vehicles	Total Terminal-generated Heavy-truck Forecast to Enter the Intersection	Resulting Number of Heavy-vehicles Entering the Intersection	Resulting Percentage of Heavy-vehicles	Net Change in Percentage of Heavy-vehicles
Britannia / Tremaine	3115	43	1.38%	18	61	1.95%	+0.57%
Britannia / First Line	2750	44	1.60%	71	115	4.08%	+2.48%
Britannia / RR25	4465	111	2.49%	71	182	4.01%	+1.53%
Britannia / JSP	3035	76	2.50%	53	129	4.18%	+1.67%
Britannia / Trafalgar	4440	111	2.50%	39	150	3.35%	+0.85%
Tremaine / Derry	2729	68	2.49%	18	86	3.13%	+0.64%
Tremaine / Steeles	1285	32	2.49%	18	50	3.84%	+1.35%

7.0 DISCUSSION OF THE IMPACT OF TERMINAL-GENERATED HEAVY-TRUCK TRAFFIC

Consideration was given to meaningfully characterize the impact of Terminal-generated heavy-truck traffic on the road system in the vicinity of the Terminal. Again, it is acknowledged that there are no stipulated or fixed criteria applicable to undertaking the assessment provided in this study. The criteria applied herein are entirely based on the traffic planning experience and judgement of the authors of the study.

Based on the information presented in the previous section, two criteria were identified.

Firstly, those Halton Region arterial road segments where the volume of Terminal-generated heavy-truck traffic would generate a meaningful increase in the frequency of heavy-vehicle movement were identified. Road segments that are anticipated to experience Terminal-generated heavy-truck traffic were classified as follows:

- **Imperceptible Change** – One trip per direction with an average frequency of less than 6 minutes (i.e. less than 10 additional heavy-truck movements per hour per direction);
- **Noticeable Change** – One trip per direction with an average frequency of more than 6 minutes and less than 3 minutes (i.e. 10 to 20 additional heavy-truck movements per direction per hour); and
- **Considerable Change** – One trip per direction with an average frequency of less than 3 minutes (i.e. greater than 20 additional heavy-trucks per direction per hour).

Secondly, those Halton Region arterial road intersections where the addition of Terminal-generated heavy-trucks would cause an increase in the anticipated proportion of the total approach volume of heavy-vehicles in relation to the volume of other vehicles forecast at the intersection during peak hours in 2020 were classified as follows:

- **Imperceptible Change** – less than 0.75 percent increase in the proportion of heavy-vehicles;
- **Noticeable Change** – greater than 0.75 and less than 1.5 percent increase in the proportion of heavy-vehicles; and
- **Considerable Change** – greater than 1.5 percent increase in the proportion of heavy-vehicles.

Figure 11 (base case road network) and **Figure 12** (without Tremaine Road interchange at Highway 401) illustrate the Halton Region arterial road segments and intersections which are anticipated to experience a noticeable or considerable change during either or both of the weekday AM or PM peak periods under the base scenario and the sensitivity test (worst case) scenario where the planned interchange of Tremaine Road and Highway 401 is not opened in 2020.

In both scenarios, on all sections of Britannia Road and Tremaine Road, including those that are anticipated to experience the considerable change, it is anticipated that reasonable and conventional measures can be implemented to mitigate the changes in roadway operating conditions resulting from the addition of Terminal-generated heavy-truck traffic. Such measures may include:

- Adjustment to traffic signal control timing and phasing plans;
- Provision of advisory and/or regulatory signage;
- Adjustments to the lengths of left turn lanes for added vehicular queue storage length;
- Addition of auxiliary right turn lanes or left turn lanes; and
- Provisions to accommodate and address the safety of pedestrians and cyclists.

APPENDIX A: Figures

FIGURE 1 EXISTING HEAVY-TRUCK CAPABLE REGIONAL ROADS

FIGURE 2 2020 HEAVY-TRUCK CAPABLE REGIONAL ROADS (WITH TREMAINE INTERCHANGE)

FIGURE 3 2020 HEAVY-TRUCK CAPABLE REGIONAL ROADS (WITHOUT TREMAINE INTERCHANGE)

FIGURE 4 2020 TERMINAL-GENERATED TRIPS TO/FROM PRINCIPAL POINTS OF APPROACH

FIGURE 5 2020 POTENTIAL TRUCK ROUTES TO/FROM TERMINAL (WITH TREMAINE INTERCHANGE)

FIGURE 6 2020 POTENTIAL TRUCK ROUTES TO/FROM TERMINAL (WITHOUT TREMAINE INTERCHANGE)

FIGURE 7 2020 HEAVY-TRUCK PERCENTAGES TO/FROM TERMINAL (WITH TREMAINE INTERCHANGE)

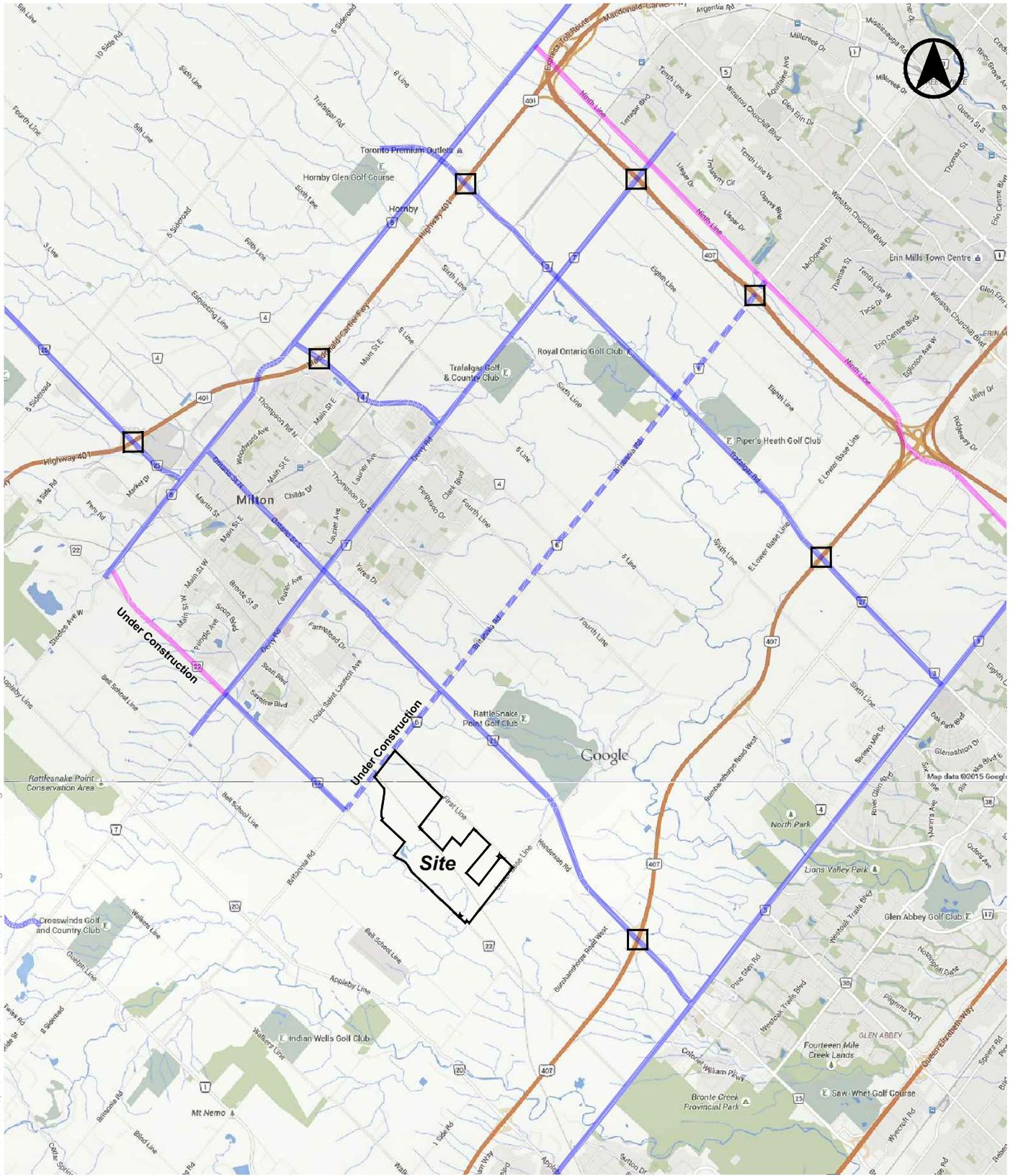
FIGURE 8 2020 HEAVY-TRUCK PERCENTAGES TO/FROM TERMINAL (WITHOUT TREMAINE INTERCHANGE)

FIGURE 9 2020 HEAVY-TRUCK VOLUMES TO/FROM TERMINAL (WITH TREMAINE INTERCHANGE)

FIGURE 10 2020 HEAVY-TRUCK VOLUMES TO/FROM TERMINAL (WITHOUT TREMAINE INTERCHANGE)

FIGURE 11 2020 TRUCK ROUTES WITH NOTICEABLE OR CONSIDERABLE CHANGE IN HEAVY-VEHICLE VOLUMES (WITH TREMAINE INTERCHANGE)

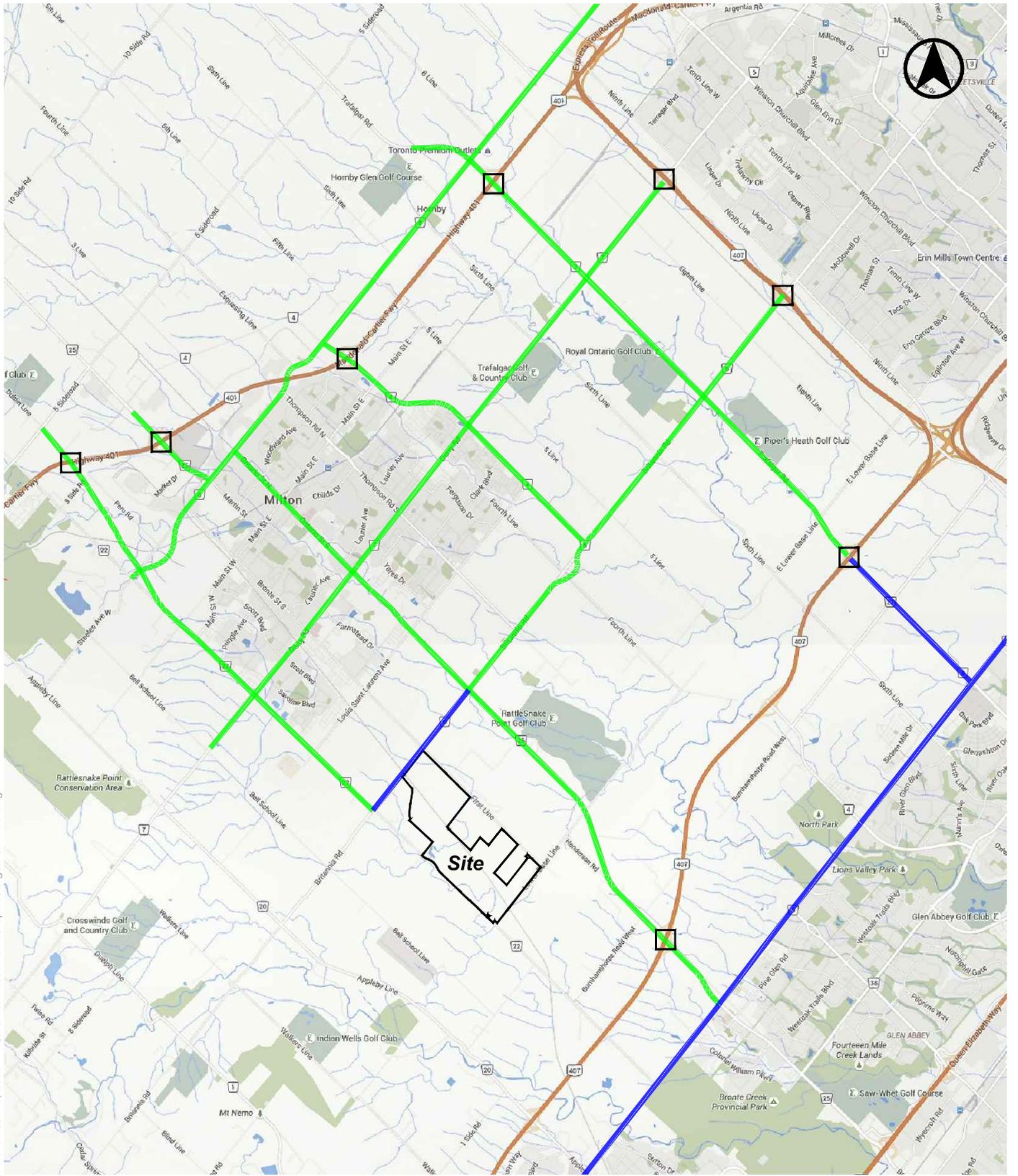
FIGURE 12 2020 TRUCK ROUTES WITH NOTICEABLE OR CONSIDERABLE CHANGE IN HEAVY-VEHICLE VOLUMES (WITHOUT TREMAINE INTERCHANGE)



—— Truck Route
 - - - Seasonal Load Restriction Truck Route
 —— Load Restriction Truck Route
 Highway Interchange

EXISTING HEAVY-TRUCK CAPABLE REGIONAL ROADS

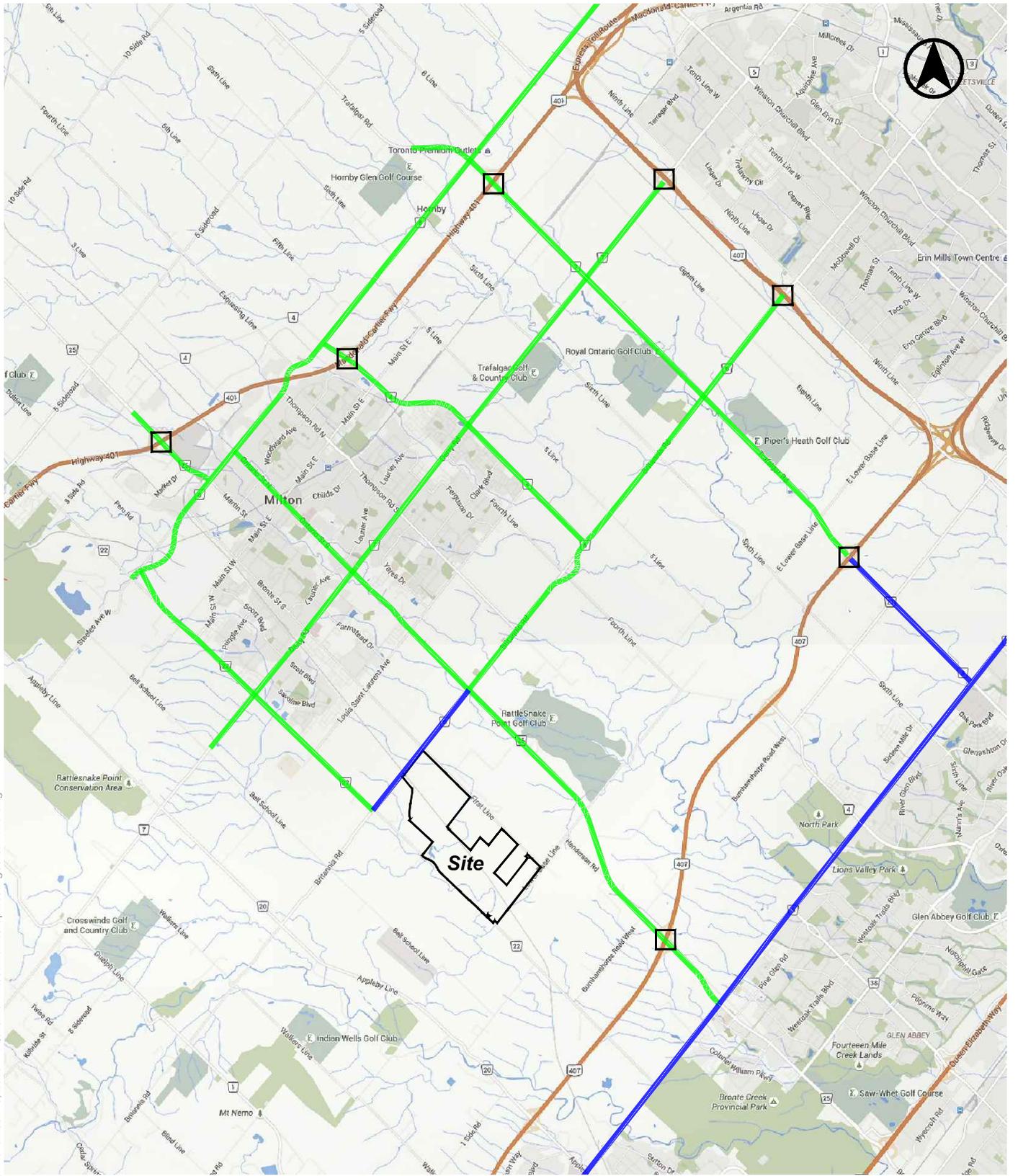
Date Plotted: November 18, 2015 File name: P:\607111\Graphics\Fig01-02-CHT.dwg



Date Plotted: November 18, 2015 File name: P:\607111\Graphics\Fig02-02-HTC.dwg

——— 4 Lanes
 ——— 6 Lanes
 ◇ Highway Interchange

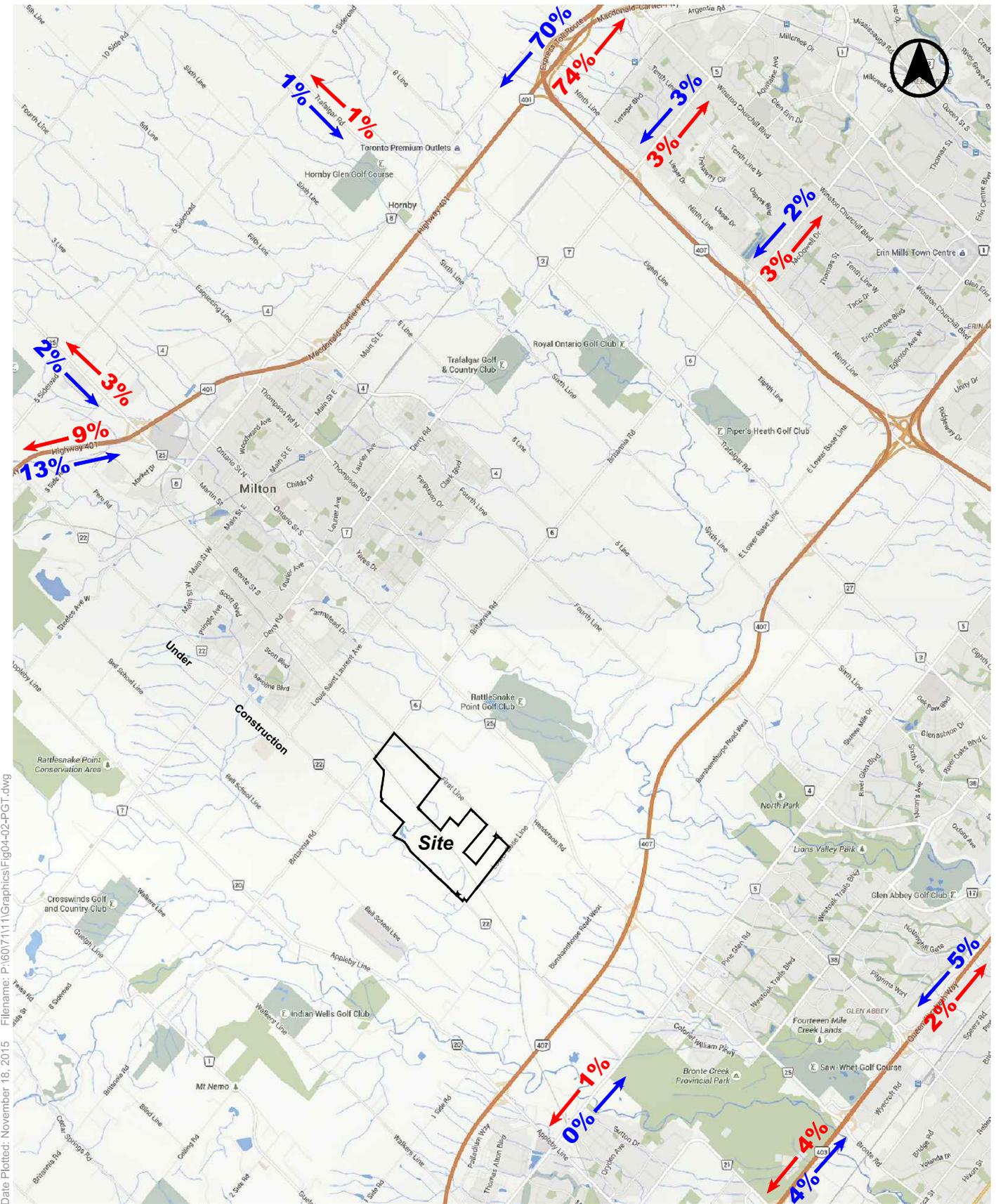
2020 HEAVY-TRUCK CAPABLE REGIONAL ROADS With Tremaine Interchange



——— 4 Lanes
 ——— 6 Lanes
 ◇ Highway Interchange

2020 HEAVY-TRUCK CAPABLE REGIONAL ROADS Without Tremaine Interchange

Date Plotted: November 18, 2015 Filename: P:\6071\11\Graphics\Fig03-02-HTC.dwg



Date Plotted: November 18, 2015 File name: P:\60\7111\Graphics\Fig04-02-PGT.dwg

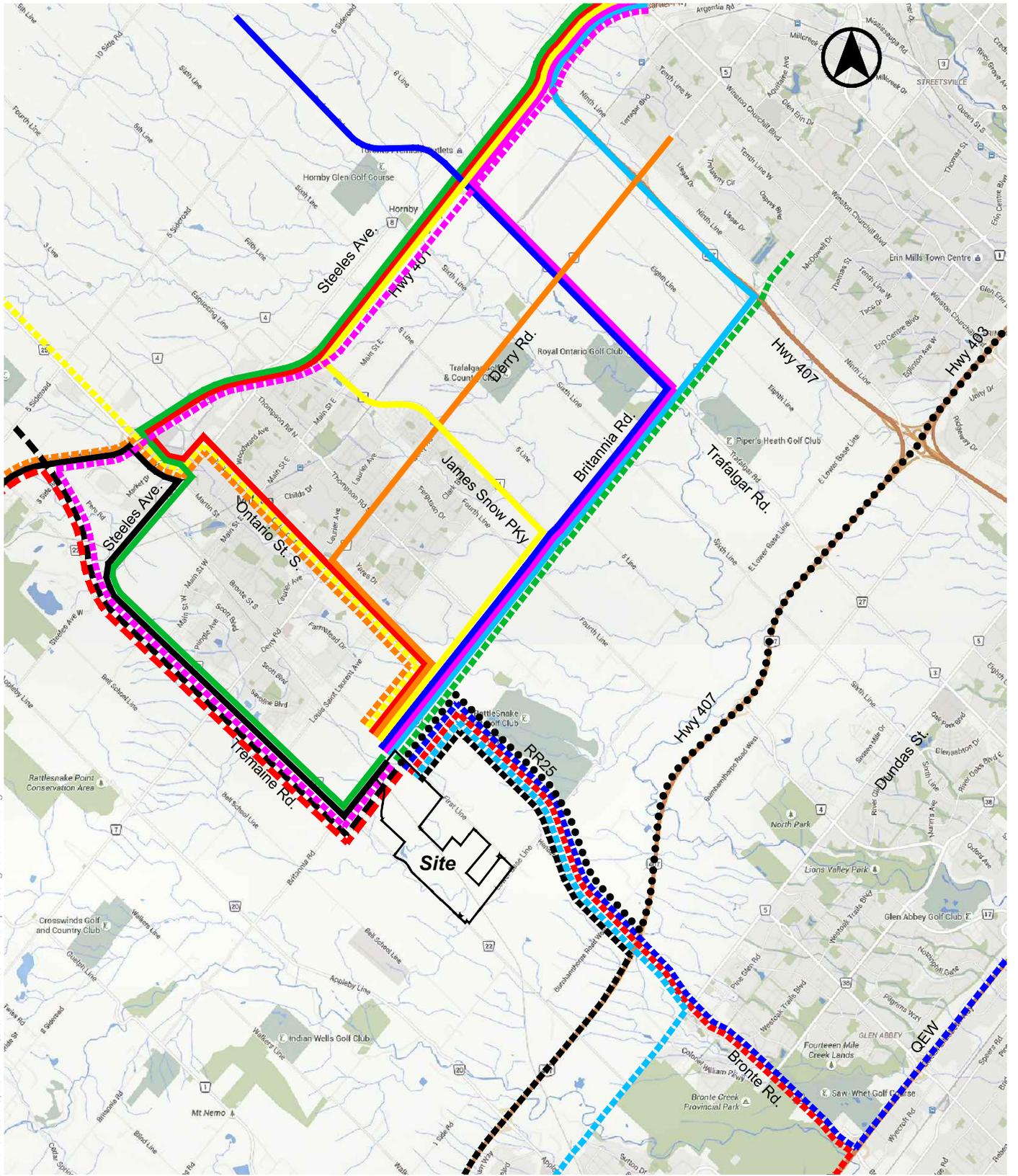
2020 PROJECT-GENERATED TRIPS TO/FROM PRINCIPAL POINTS OF APPROACH

← Outbound → Inbound



Milton Intermodal Terminal
6071-11 November 2015

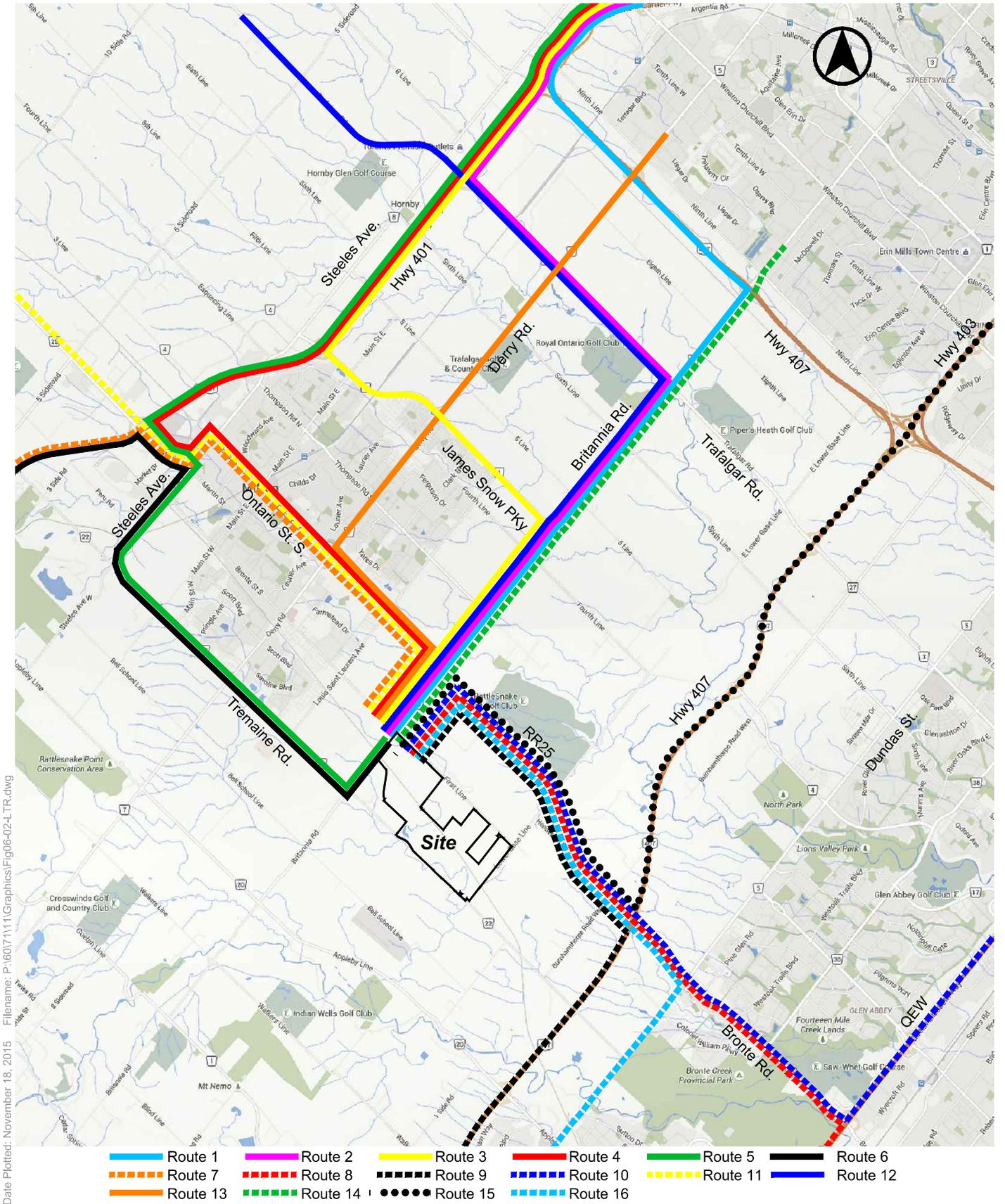
Figure 4



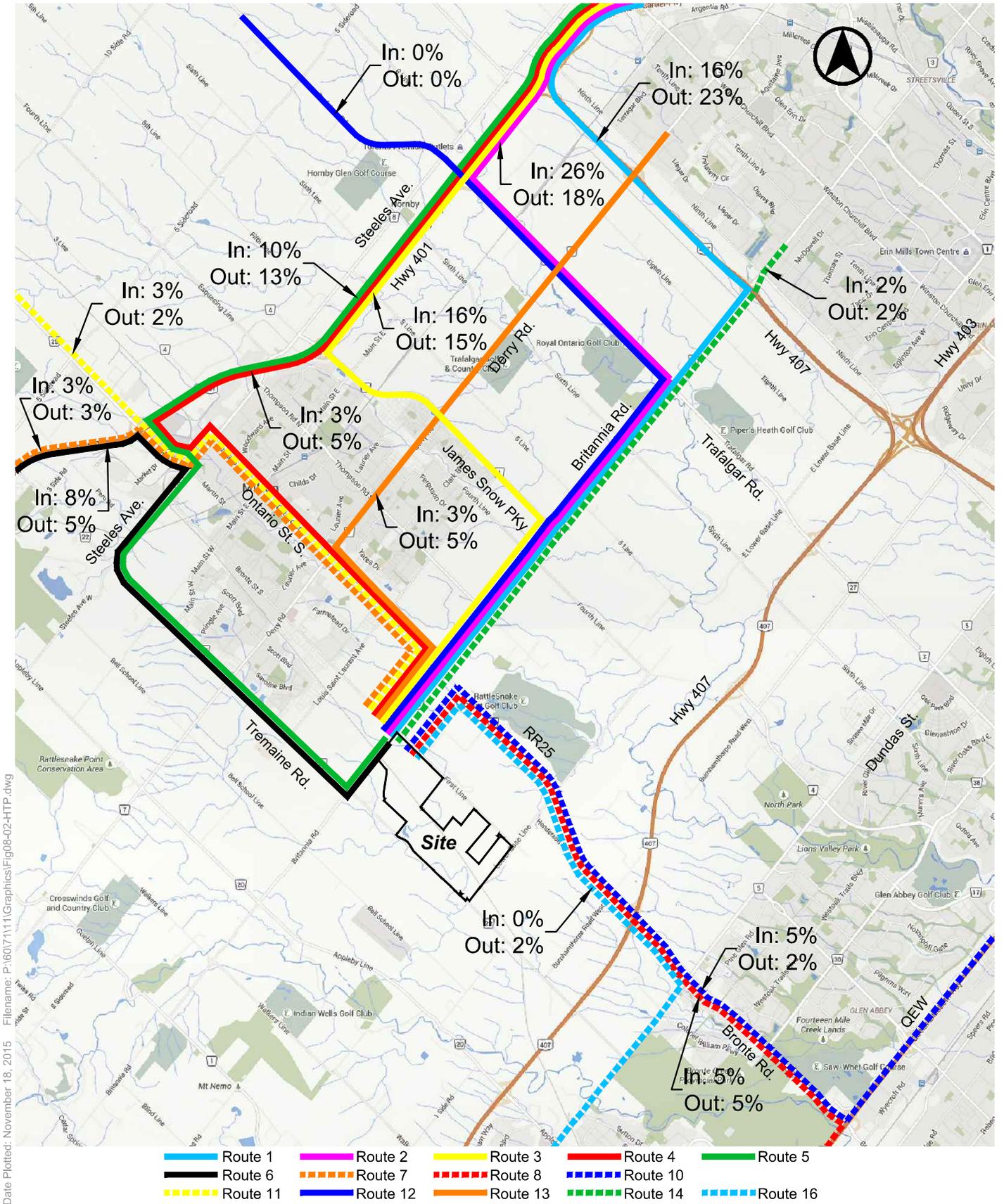
Date Plotted: November 18, 2015
 Filename: P:\607V11\11\Graphics\Fig05-02-LTR.dwg

2020 POTENTIAL TRUCK ROUTES TO/FROM PROJECT With Tremaine Interchange



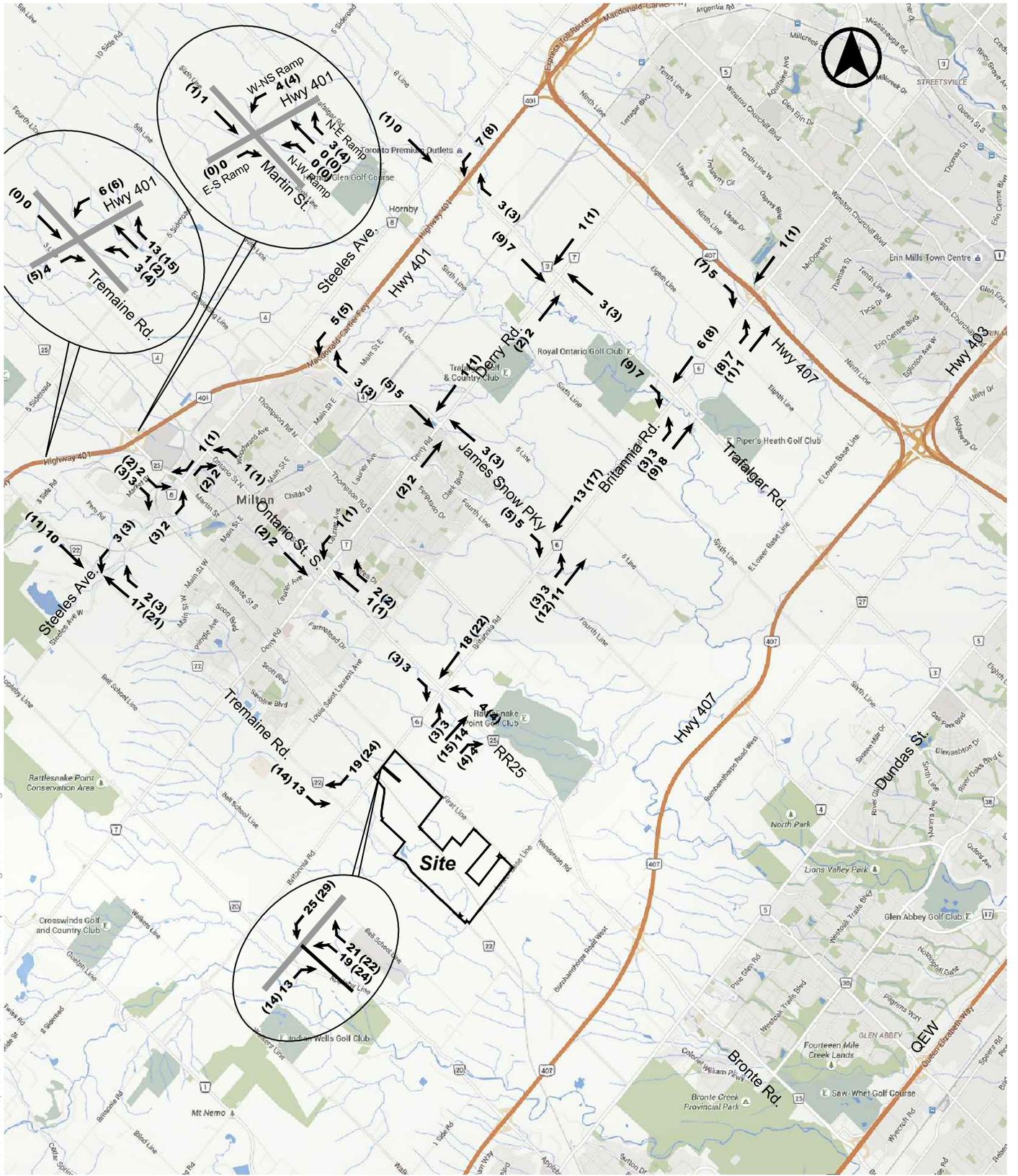


2020 POTENTIAL TRUCK ROUTES TO/FROM PROJECT Without Tremaine Interchange



Date Plotted: November 18, 2015
 Filename: P:\607Y11\Graphics\Fig08-02-HTP.dwg

2020 HEAVY TRUCK PERCENTAGES TO/FROM PROJECT Without Tremaine Interchange



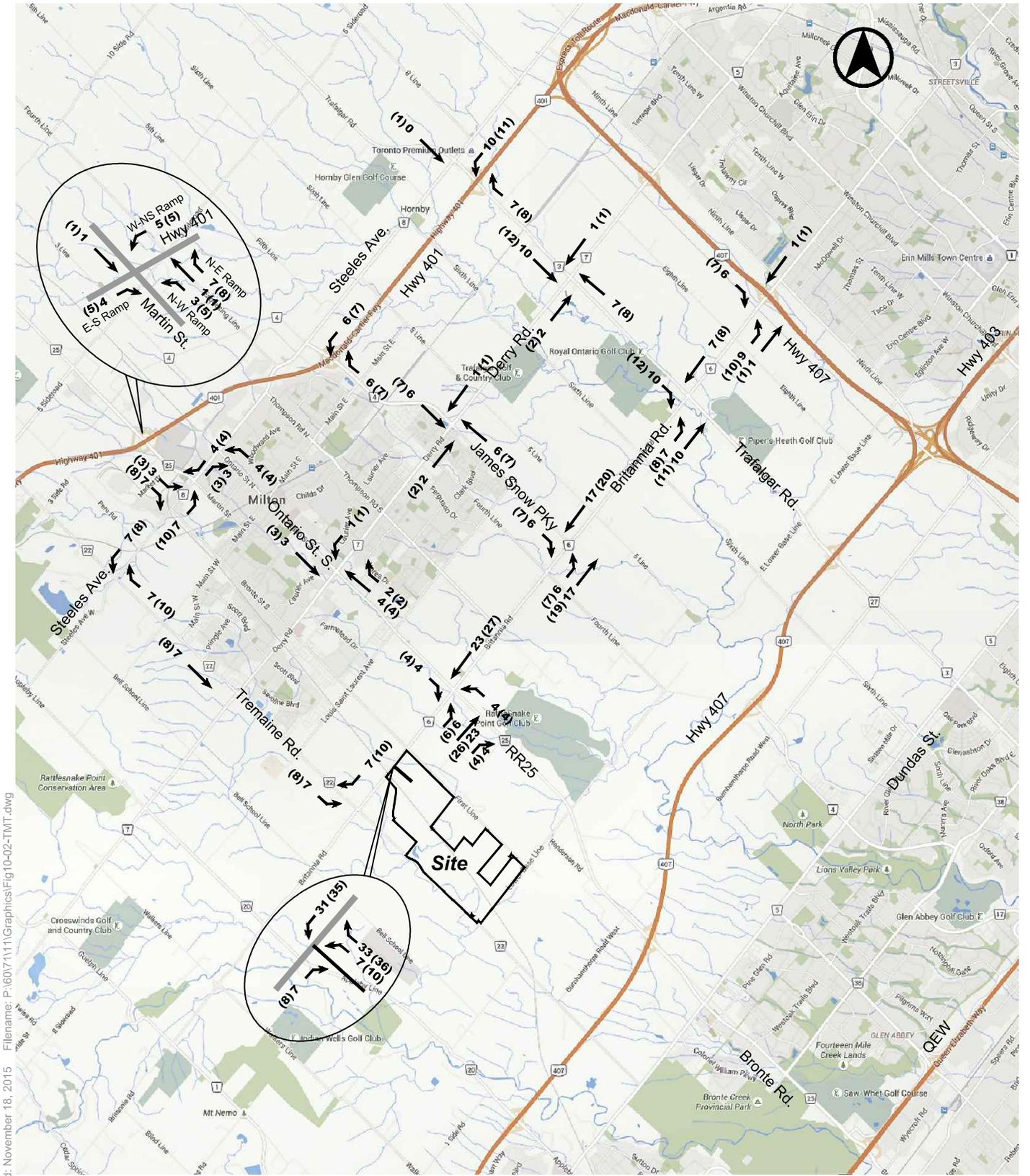
Date Plotted: November 18, 2015 Filename: P:\607111\Graphics\Fig09-02-TWMT.dwg

2020 HEAVY-TRUCK VOLUMES TO/FROM PROJECT With Tremaine Interchange



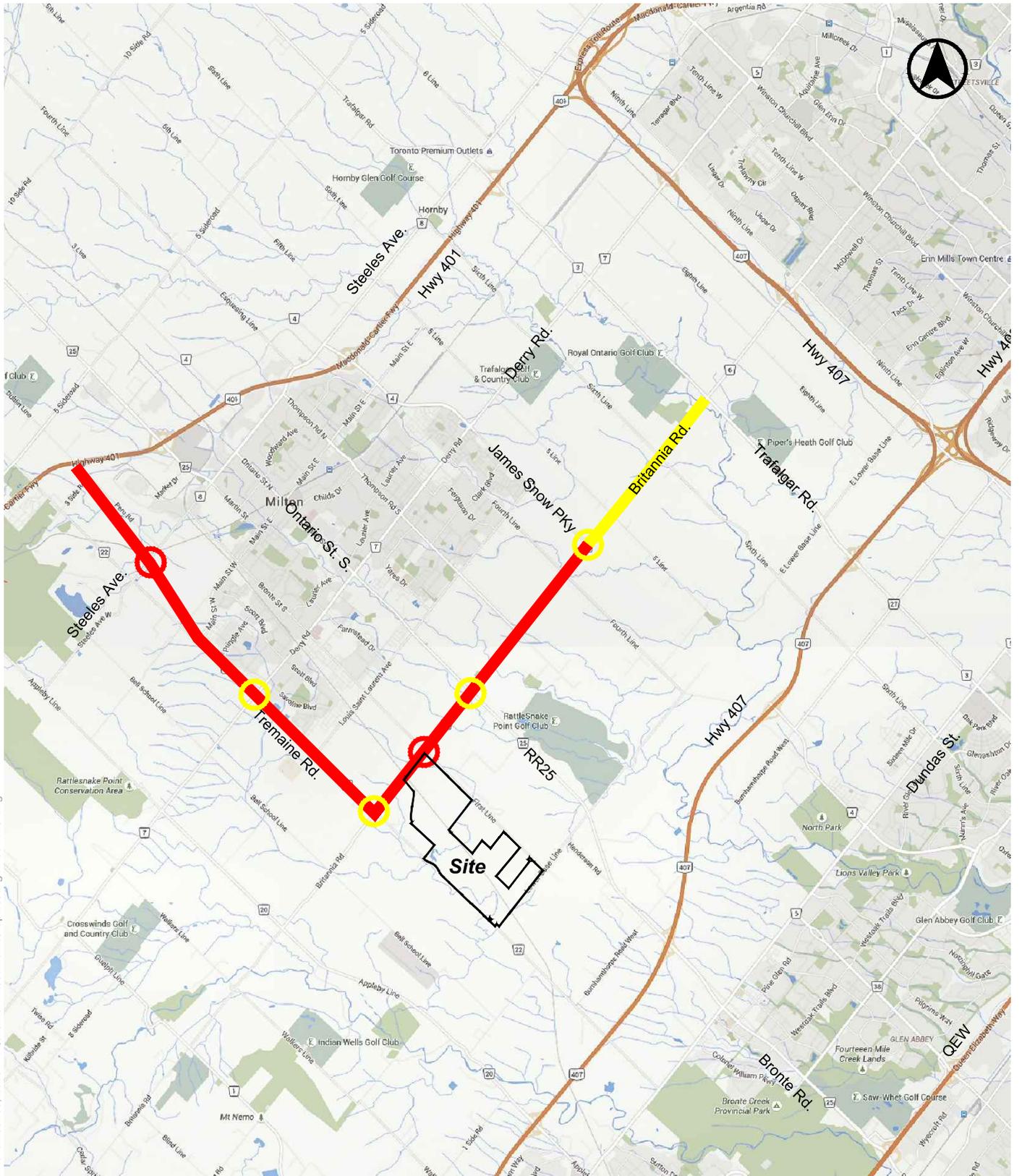
Milton Intermodal Terminal
6071-11 November 2015

Figure 9



00 AM Peak Hour (00) PM Peak Hour

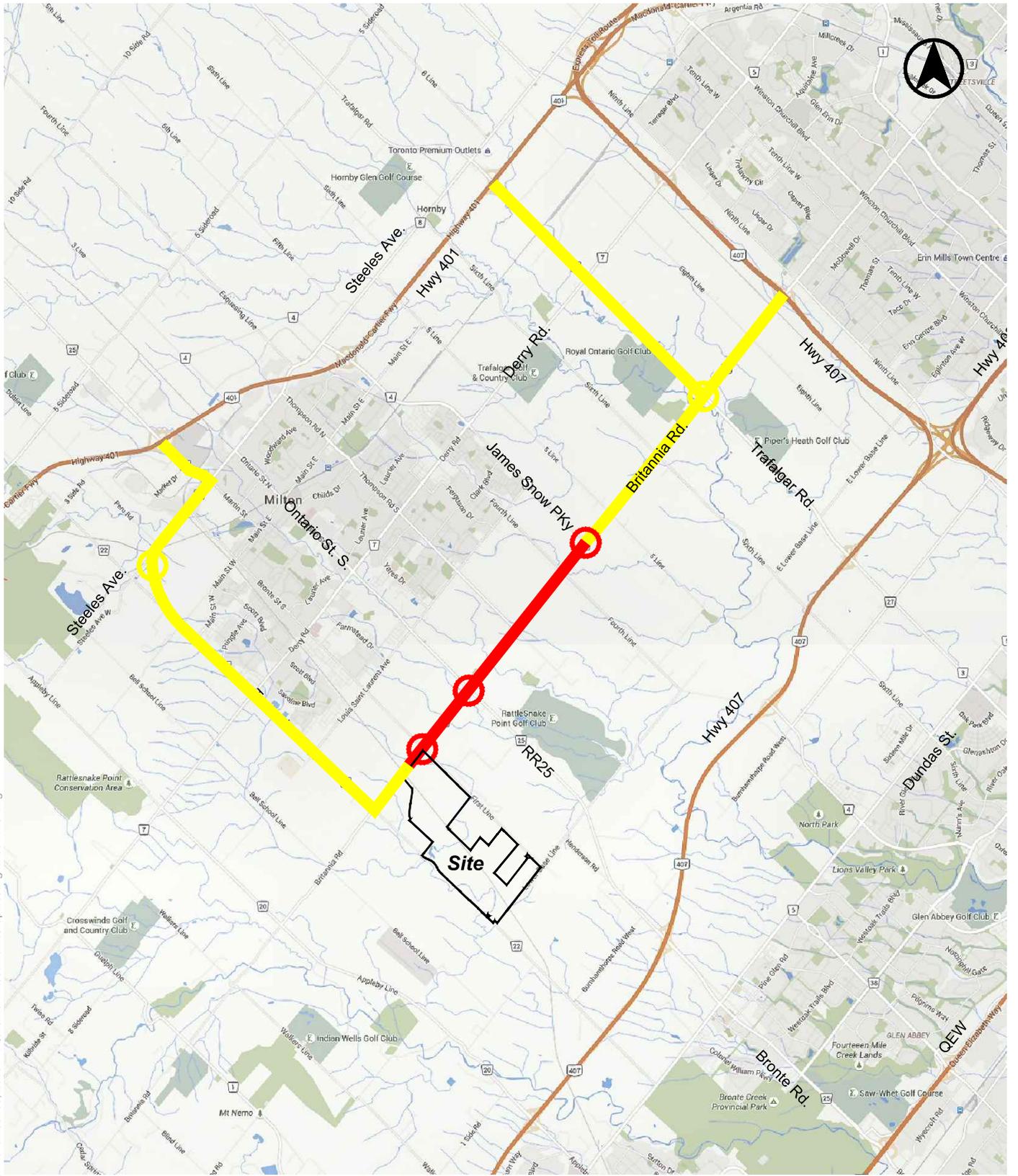
2020 HEAVY-TRUCK VOLUMES TO/FROM PROJECT Without Tremaine Interchange



Date Plotted: November 30, 2015 File name: P:\607111\Graphics\Fig11-03-HTS.dwg

- Noticeable Change (10-20 Heavy-Trucks/Hr./Direction)
- Considerable Change (>20 Heavy-Trucks/Hr./Direction)
- Noticeable Change (0.75-1.5% Increase in Heavy-Truck %)
- Considerable Change (>1.5% Increase in Heavy-Truck %)

2020 TRUCK ROUTES WITH NOTICEABLE OR CONSIDERABLE CHANGE IN HEAVY-VEHICLE VOLUMES With Tremaine Interchange



Date Plotted: November 30, 2015 File name: P:\607111\Graphics\Fig12-03-HTS.dwg

- Noticeable Change (10-20 Heavy-Trucks/Hr./Direction)
- Considerable Change (>20 Heavy-Trucks/Hr./Direction)
- Noticeable Change (0.75-1.5% Increase in Heavy-Truck %)
- Considerable Change (>1.5% Increase in Heavy-Truck %)

2020 TRUCK ROUTES WITH NOTICEABLE OR CONSIDERABLE CHANGE IN HEAVY-VEHICLE VOLUMES Without Tremaine Interchange