# **Executive Summary**

407 TRANSITWAY – WEST OF HURONTARIO STREET TO EAST OF HIGHWAY 400 **MINISTRY OF TRANSPORTATION - CENTRAL REGION** 



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# **E. EXECUTIVE SUMMARY**

## E.1. Background

## E.1.1. 407 Transitway Background and Status

The complete planned 407 Transitway is a 150-kilometre high-speed public transit facility on a separate right-of-way. It will parallel the existing 407 ETR from Burlington (Halton) to the Highway 35/115 interchange (Durham) (**Figure E.1**) The right-of-way is being designed to accommodate Bus Rapid Transit (BRT), however, it will allow the opportunity to convert to light rail transit (LRT) in the future, if needed. To meet rapidly growing transportation demands across the Greater Toronto Area (GTA), this transit facility has been identified as a key element of the future. The Transitway is intended to form a northern spine parallel to the Lakeshore GO corridor that will connect the municipalities in this corridor. The

Transitway will also integrate with north-south transit services by providing stations for quick and convenient transfers.

The Ministry of Transportation (MTO) has been actively planning and protecting the required land for the Transitway for the past 30 years. For the section between Burlington and Markham Road, the Ministry has completed and received TPAP approval from Highway 400 to Kennedy Road (Markham) and is currently undertaking a TPAP from Hurontario Street to Highway 400. For the section between Markham Road and the Hwy 35/115 interchange, the Ministry has received TPAP approval (for the corridor) between Markham Road and Brock Road and EA approval (for the corridor, stations and associated facilities) between Brock Road and the Hwy 35/115 interchange.

This current undertaken is seeking Transit Project Assessment Process approval for the 24-kilometre. runningway, 7 stations and associated facilities between Hurontario Street and Highway 400. The study objectives are explained below.



## FIGURE E.1: FULL 407 TRANSITWAY STUDY LIMITS





## E.1.2. Study Purpose and Objectives

The primary purpose and objectives of the undertaking include the following:

- Enhance east-west cross-regional mobility and increase transit capacity to meet forecast travel demand.
- Offer a viable, cost-effective alternative way of moving people in the 407 Corridor.
- Improve accessibility to existing/planned major urban centres/nodes, post-secondary educational institutions, and other nodes of high demand, such as: Brampton City Centre, Mississauga City Centre, and Pearson International Airport.
- Improve integration with the regional transportation network connecting to the Spadina Subway, the future Yonge Subway Extension, GO Kitchener, Barrie, Richmond Hill and Stouffville rail lines, the future Hurontario LRT, as well as Peel, York and Durham Transit systems.
- Reduce automobile dependence and greenhouse gas emissions, contributing to climate change effects.
- Identify land protection requirements to accommodate the 407 Transitway infrastructure.

To support these objectives, the scope required that the following activities be undertaken:

- Maintain and apply the comprehensive set of approved design standards for the 407 Transitway, created and approved during the design of the Central, Highway 400 to Kennedy Road section;
- Update and develop detailed ridership estimates based on a 2041 horizon year with projections to 2051;
- Gather existing conditions and future municipal plans, identify and evaluate alignment and station alternatives and select the preferred design:
- Conduct detailed field investigations in support of the preliminary preferred option; assess the . environmental effects and develop a mitigation plan for any negative impacts generated by the preferred design;
- Deliver a cost-effective, safe and innovative design and staging plan for this 24-kilometre section of the 407 Transitway for busway technology that allows for conversion to light rail transit (LRT) in the future, promotes transit ridership and optimizes transit operation and integration; and,

Recommend and present a phased implementation strategy.

## E.1.3. Study Area

The study area encompasses the proposed section of the 407 Transitway corridor from west of Hurontario Street in Mississauga in the Region of Peel to east of Highway 400 in the City of Vaughan in the Region of York, as illustrated on Figure E.2.

## **FIGURE E.2: STUDY AREA**



The boundaries in which the environmental effects were identified and assessed; and the reason(s) why these areas were considered sufficient, are described in **Chapter 1** of this EPR.

## E.1.4. Transit Project Assessment Process

This study was conducted following the Transit Project Assessment Process (TPAP) under Ontario Regulation 231/08: Transit Projects and Metrolinx Undertakings. This regulation allows proponents of all public transit projects to proceed with the TPAP process rather than, as traditionally done, through Part II of the Environmental Assessment Act. The TPAP is a fully-prescribed process in which the proponent must follow specified procedures and timeframes. The Minister of the Environment, Conservation and Parks determines if the final transit project can proceed. This integrated TPAP approach is illustrated in Figure E.3.



**FIGURE E.3: STUDY PROCESS** 



## E.1.5. Statutory Requirements

## **PROVINCIAL LEGISLATION - ENVIRONMENTAL ASSESSMENT ACT OF ONTARIO**

This study followed the Transit Project Assessment Process under the Transit Projects and Greater Toronto Transportation Authority Undertakings Regulation, Ontario Regulation 231/08, June 2008. This process formally started concurrently with the publication of the "Notice of Commencement of TPAP".

## **OTHER PROVINCIAL LEGISLATION**

The 407 Transitway project is subject to and will be carried out in accordance with all applicable

provincial legislation including the Planning Act, the Public Transportation and Highway Improvement Act, the Freedom of Information Act, and the Environmental Protection Act.

## FEDERAL LEGISLATION – CANADIAN ENVIRONMENTAL ASSESSMENT ACT 2012

A review of the Canadian Environmental Assessment Act 2012 (CEAA 2012) and its regulation, the "Regulations Designating Physical Activities[gazette.gc.ca]", determined that this project is not identified as a "designated project" that requires an environmental assessment by the Canadian Environmental Assessment Agency.





## **POLICY CONTEXT**

This study has considered the following plans and policies:

- Provincial Policy Statement;
- Places to Grow: Growth Plan for the Greater Golden Horseshoe;
- Move Ontario 2020:
- The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area;
- York Region Official Plan and Transportation Master Plan;
- Peel Region Official Plan;
- City of Toronto Official Plan;
- City of Mississauga Official Plan;
- City of Brampton Official Plan; and,
- MiWay Five: Transit Service Plan 2016 2020

## E.2. Transportation Needs Assessment

## E.2.1. Route Structure, Service and Operating Characteristics

The proposed route structure and service concept was developed considering two types of service: base spine services along the Transitway, and no-transfer services providing access to other parts of the GTA.

Figure E.4 shows the service concept with both route types.

## **BASE SPINE SERVICES**

Base spine services will provide continuous line-haul service on the Transitway with a short effective headway of between 3 to 10 minutes. Spine services are considered oriented mainly towards the Transitway itself with service either end to end on the Transitway or departing for a stop at an offline destination such as Bramalea City Centre. Base spine services developed for the west corridor include:

End-to-end bus service on the Transitway only;

- A route that connects Bramalea City Centre to Bramalea GO station and then to the Transitway via Bramalea Road with service continuing beyond the Jane Street station; and,
- A route connecting Pearson Airport to Highway 50 (via Highway 427) and continuing (no transfer) to the east on the Transitway (westbound from airport would require a transfer).

A spine service from Mississauga Square One to Pickering that was previously identified was removed from the west section of the Transitway following approval of the Hurontario-Main LRT. The LRT will connect Mississauga Square One to the Hurontario Street Transitway Station where riders can transfer to the continuous line haul-service on the Transitway.

These spine routes would be operated as a rapid transit service and vehicles would only stop at Transitway stations, their origin, and final destinations. Spine services could also operate as express runs to provide faster service between major activity centres and would require passing lanes at some Transitway stations. Given the flexibility of buses, spine services could be added or modified based on measured demand and changing development patterns.

## **NO-TRANSFER SERVICES**

No-transfer services would provide direct connections between major activity centres and residential areas across the GTA, generally with lower headways in the order of 10 to 30 minutes. Potential routes using the western section of the Transitway include:

- Hamilton to Richmond Hill Centre;
- Oakville to North York;
- Streetsville to Union Station; and
- Meadowvale to York University.

Similar to the GO 407 Express Bus Service, these routes would serve longer-distance trips and connect to local transit at major transfer points. No-transfer services could be integrated into the regional network by operating on other committed and proposed transit corridors such as the 403 Transitway in Mississauga and the 427 Transitway. Similar to spine services, no-transfer services could be altered and modified to meet demand. These routes would be served by a combination of GO coach buses and local transit buses.





FIGURE E.4: CONCEPTUAL 407 TRANSITWAY ROUTE STRUCTURE

5,500 eastbound a.m. peak period passengers. Demand is highly directional with more than twice as many westbound as eastbound passengers during the a.m. peak period.





## E.2.2. 407 Transitway Ridership Forecasts

The 407 Transitway, from Hurontario Street to Highway 400, 2041 ridership forecasts have been developed using the Greater Golden Horseshoe Model (GGHM) for the 7 selected stations and the conceptual operating strategy shown in Figure E.4. Figure E.5 shows the projected transit volumes on the Transitway between Hurontario Street and Highway 400. The eastern section has a peak point of

# E.3. Existing and Future Conditions

The existing and future conditions of the Study Area, described in Chapter 3 of the EPR, provided a baseline for the generation of alternatives, assessment of environmental impacts and the identification of environmental protection measures and monitoring plans. The identification of the environmental





features (i.e. transportation infrastructure, natural, social and cultural environment) involved the collection of primary and secondary source data including consultation with technical agencies. This was done in two steps: an inventory and analysis of existing conditions and an investigation as to how these conditions might change in the future. In general, the existing and future conditions can be categorized into the following topics and are presented in the associated sections:

- Natural Environment:
- Socio-Economic and Cultural Environment:
- Transportation; and,
- Utilities.

## Rapid Transit Technology Assessment E.4.

A Rapid Transit Technology evaluation for the entire 407 Transitway was conducted as part of the Transit Project Assessment Process (TPAP) of the Central Section (Highway 400 to Kennedy Road) and approved as part of the TPAP Environmental Project Report filed in February of 2011.

Five candidate technology alternatives were considered in developing a response to the need for interregional rapid transit in the ultimate 150-kilometre 407 Corridor: Bus Rapid Transit (BRT); Light Rapid Transit (LRT); Automated Guideway Transit (AGT), Commuter Rail; and Subway.

Each of the above candidate technologies was evaluated against four major criteria reflecting the near and long-term needs and objectives for the 407 Corridor. These included:

- Transit service quality including capacity required, user convenience and comfort, service speed and reliability and network connectivity/interlining;
- Planning considerations addressing infrastructure integration and the system's support of Provincial growth and planning policies;
- Environmental compatibility covering effects on the natural and socio-economic environment and energy consumption; and,
- Implementation considerations including right-of-way property needs, cost-effectiveness and implementation staging.

As a result of the evaluation, BRT was selected as the preferred technology with protection for conversion to LRT in the future, if required, to be able to respond potential major growth in ridership volumes. In addition to significant implementation staging flexibility to transition from operation in mixed traffic on the 407 ETR to higher speed service on a fully exclusive runningway, BRT provides capacity to meet currently projected demand at the desired level of convenience and comfort.

## Corridor Assessment E.5

Both the north and south sides of 407 ETR were assessed to identify the preferred corridor alignment or right-of-way to be carried forward in this study. The south side of the 407 ETR was selected along the entire route from Hurontario Street to Highway 400 based on the following:

- ETR;
- entirely owned by the Province;
- the land is planned to be developed, including at potential station locations; and,
- Maintaining the alignment on one side avoids costly long skewed bridges over 407 ETR.

## E.6. Evaluation of Station Alternatives

## **SCREENING OF STATION NODES**

As an initial step, all 407 ETR crossings of existing and future arterial roads identified in the CPS were considered potential station locations. Each location was individually assessed based on criteria focused on ridership, land availability and presence of environmental features of provincial significance affected by the facility within potential sites. As a result of this initial step, 9 nodes were carried forward to the next stage: Hurontario Street, Dixie Road, Torbram Road, Airport Road, Goreway Drive, Highway 50, Highway 27, Martin Grove Avenue and Pine Valley Drive. The Highway 410 node was not carried forward due to low ridership forecast and significant accessibility issues. The Weston node was not carried forward due to insufficient land availability to accommodate the station platforms and by-pass lanes.

## **EVALUATION OF STATION SITES**

For the 9 nodes carried forward, potential sites were evaluated following the criteria illustrated in Figure E.6.





The 30-metre-wide right-of-way and stations protected by MTO through the 1998 Corridor Protection Study (CPS) described in Chapter 1 of the EPR, were entirely on the south side of 407

The protected corridor is designated in the Parkway Belt West Plan and the property is almost

Most of the properties adjacent to the highway on the north side have already been developed or

## FIGURE E.6: STATION SITE OPTION AND ALIGNMENT ALTERNATIVE EVALUATION APPROACH AND CRITERIA

**STEP 1:** Identify all possible station sites in the areas of the selected nodes, and alignments linking the station site alternatives.

STEP 2: Evaluate all planning alternatives based on Service Quality, Infrastructure Considerations and Environmental Impacts.



As a result of the detailed evaluation of the alternative sites, the following sites were identified:

- Hurontario Street Station: Located south of 407 ETR, west of Hurontario Street, connecting with future HuLRT.
- Dixie Road Station: Located south of 407 ETR. Split Station facilities north and south of Utility Corridor. Partial facility on existing soccer fields; partial facility on Hydro Corridor, on the east side of Dixie Road.
- Airport Road Station: Located south of 407 ETR, north of Steeles Avenue and west of Airport Road.
- Goreway Drive Station: Located south of 407 ETR, north of Steeles Avenue, and west of Goreway Drive.
- Highway 50 Station: Located south of 407 ETR, north of Steeles Avenue between Highway 50 (Albion Road) and Highway 427. Facility integrated with approved Highway 427 Transitway station site.
- Highway 27 Station: Located south of 407 ETR, north of Steeles Avenue, just east of 407 ETR headquarter facilities and west of Highway 27.
- **Pine Valley Drive Station:** Located south of 407 ETR, east of Islington Avenue and north of the

## CNR tracks.

Through this second stage of evaluation, Torbram Road and Martin Grove were eliminated.

The Torbram Road station facility was not carried forwarded due to low ridership, significant vehicular and pedestrian accessibility issues and poor transit connection opportunities.

The Martin Grove station facility was eliminated due to significant accessibility issues from the local road network. Access from Steeles Avenue would require a grade separation from the existing CN track. The facility would not have access from 407 ETR as there is no interchange at this location.

## **PROTECTED SITES FOR ENVIRONMENTAL COMPENSATION**

Three of the sites that were not selected for a station facility through both evaluation stages, Highway 410, Weston Road, and Torbram Road, are being protected for environmental compensation purposes, among other sites within the study area.

**Chapter 4** describes in detail the complete identification and evaluation of Station Alternatives.







## E.7. Evaluation of Alignment Alternatives

## HORIZONTAL ALIGNMENT ALTERNATIVES

Once station site alternatives were evaluated, horizontal alignment alternatives were identified and assessed linking the carried forward station alternatives and following the selected corridor south of 407 ETR, with exception of the GO Bramalea Station area where alternatives crossing to the north side of 407 ETR were also identified to assess the feasibility of connecting to the GO Station.

The evaluation of alternatives was conducted following the criteria included in **Figure E.6**. A detailed description of the evaluation is included in Chapter 4 of the EPR.

## VERTICAL ALIGNMENT ALTERNATIVES

For each selected horizontal alignment, runningway profile options (overpasses and underpasses) crossing arterial roads, highway Interchanges and track lines were evaluated. Aspects considered are included in **Figure E.6**. A detailed description of the evaluation is included in Chapter 4 of the EPR.

## E.8. Final Project Description

As illustrated in **Figure E.7**, the technically preferred Transitway alternative has been planned for the operation of an intermediate capacity, regional rapid transit service provided as BRT using single or double-decker coaches. The alignment design was developed to allow potential conversions to LRT if needed in the future. In both cases, the vehicle's maximum in-service speed will be 100 kilometers per hour. This technology matches with that of the approved Highway 400 to Kennedy Road, and Kennedy Road to Brock Road sections.

The primary component of the Transitway infrastructure is the fully-grade separated runningway which,

for BRT operation, is a two-lane runningway with paved shoulders and additional stopping lanes through station platforms. If the Transitway is converted to LRT system, the runningway will be comprised of a double-track mainline with crossover and storage tracks at regular intervals for operations and maintenance flexibility. The runningway will incorporate access for emergency response vehicles at stations and appropriate intervals between.

In summary, seven stations, spaced on average at 3.5-kilometers, are planned along this section of the 407 Transitway, as illustrated in **Figure E.7**. The stations located beside Hurontario Street, Dixie Road, Airport Road, Goreway Drive, Highway 50/Albion Road, Highway 27, and Pine Valley Drive will consist of weather protected platforms, park and ride lots, passenger pick up and drop off (PPUDO) and bus facilities, all amenities related to active transportation, and special needs associated facilities. Bus, vehicular and pedestrian access from the local road network is also a component of the proposed facilities.

A total of 41 new structures have been identified along the Transitway route. Bridge and underpass widths were defined based on lane and sidewalk widths and side clearances and followed the 407 Transitway Design Standards.

Where applicable, the existing structures of the 407 ETR were used for comparison purposes, as the profile of the Transitway was designed following the profile of the Highway wherever possible. Exceptions were made at specific locations to respond to the presence of major underground utilities or natural features.

Landscape treatments will accomplish a number of functions including slope stabilization, stream crossing restoration, naturalized planting sites, visual/wind buffers while generally improving the aesthetics of the corridor. Landscaping around the station sites and parking facilities will complement the surrounding land uses and present the stations as visual assets to the local area.





## FIGURE E.7: PREFERRED ALTERNATIVE FROM WEST OF HURONTARIO STREET TO EAST OF HIGHWAY 400







## Impact Assessment, Mitigation, and Monitoring E.9.

The Transit Projects and Greater Toronto Transportation Authority Undertakings Regulation, Ontario Regulation 231/08 under the Environmental Assessment Act, Section 9 (2) requires the proponent to prepare an Environmental Project Report (EPR) that contains the following information, among other requirements:

- Description of the environment that will be affected or might reasonably be affected;
- Anticipated potential impacts;
- Proposed mitigation measures to minimize, manage, prevent and avoid environmental effects; and.
- Proposed monitoring and contingency measures, if required.

An impact assessment was undertaken to identify the footprint, construction and operational impacts associated with the implementation of the 407 Transitway.

The impact assessment involved the application of the following steps:

- 1. Identify and analyze activities where the project, as described in **Chapter 5**, may interact with the existing environmental conditions described in Chapter 3 of this EPR.
- 2. Propose mitigation measures that can be implemented during construction or operation of the project.
- 3. Identify the residual environmental effects and their significance, if any.
- 4. Recommend monitoring activities during the construction and operation of the project.

The environmental effects of the undertaking can be classified under three categories:

Footprint Impacts: Long term impacts on the existing environmental features located within the study area that will potentially be displaced or lost through the introduction of the Transitway;

Construction Impacts: These are potential short-term disruption effects resulting from construction of the Transitway; and,

Operation and Maintenance Impacts: These are potential long-term disruption effects resulting from the operation and maintenance of the Transitway.

It is acknowledged that with the implementation of the 407 Transitway the number of buses traveling along this corridor will increase and there will be an addition of vehicles accessing the Transitway stations during the peak periods; however, the reduction of vehicle volumes along Hwy 407 ETR, and other nontolled east-west arterial roads such as Hwy 7, Steeles Avenue, and Highway 401, will more than offset any potential negative effects that the Transitway may cause. For example, assuming that for every three Transitway passengers, one private car has been removed from the corridor, on average the anticipated reduction will be close to 2000 autos during a typical morning peak period (three hours).

Similarly, consideration of any impacts of private vehicles accessing the six Transitway stations for park

and ride and pick-up/ drop-off activities must be balanced with the fact that commuters will no longer be using these vehicles for their work trip, instead, switching to transit at the stations.

Finally, bus technology is rapidly improving and with this, a reduction in emission levels.

## E.10. Implementation Strategy

The presence of 407 ETR provides a unique opportunity to stage the implementation of the Transitway infrastructure, maintaining operation and reliable transit service along the corridor while addressing demand needs, travel time and convenience to the users, and priorities for transit investment in the GGH.

In establishing the objectives for phased implementation of the Transitway, the current availability of the 407 ETR to Metrolinx services is assumed as the baseline phase. Phasing strategies assessed are based on a combination of part or parts of the existing 407 ETR service. From this starting point, the following objectives were adopted in defining candidate phasing strategies:

- lanes to the new Transitway;
- congestion on Hwy 407 ETR;
- the Transitway by all modes (local transit, park and ride, pick up and drop off, walk-in);
- Phase sequence should respond to bus interlining opportunities; and,
- accommodate in annual budgeting.

With a view to meeting the above objectives, potential Phasing Strategies being investigated include:

- A Baseline Strategy: Cross-regional Rapid Transit Service on the 407 ETR in mixed traffic;
- implementation of stations at strategic locations; and,
- service still operating on the 407 ETR.

Approval of this TPAP will enable the MTO to pursue any one or more of the above strategies, or variations of them, within the limits of this TPAP.





Each phase implemented should not result in a significant increase in travel time. Preferably, segment lengths should yield a travel time saving greater than the time penalty to divert buses to and from the 407 ETR. Phase limits selected must minimize the time to transfer from 407 ETR

Ideally, the sequence of implementation should correspond with the likely distribution of traffic

Phase sequencing should respond to the zones with highest ridership potential to maximize benefits and exposure to dedicated Transitway service. Ideally, segment phasing should respond to the timing of adjacent development implementation (particularly UGCs) and provide access to

Phase costs should result in a contract cash flow that MTO (or the funding agency) can

• An Enhanced Baseline Strategy: Cross-regional Rapid Transit Service on 407 ETR with

Rapid Transit Service on newly-constructed 407 Transitway in specific segments, combined with

## E.11. Consultation Process

Consultation was undertaken throughout the study to assist in the planning and impact assessment process for the 407 Transitway. The consultation process was designed to meet the requirements of *Ontario Regulation 231/08, Transit Projects and Metrolinx Undertakings*. Consultation was initiated from October to December 2015, well before the formal declaration of the TPAP, through the mailing of initial contact letters to stakeholders and Indigenous and Métis communities, and the initiation of the project website. The TPAP 120-day consultation and documentation period for this project was initiated in the winter of 2018.

Consultation was conducted with government review agencies, technical agencies, local and regional municipalities, elected officials, the public, landowners and Indigenous and Métis communities.

The consultation process included the following types of consultation activities:

- Public notices;
- Liaison with relevant agencies, members of the public and landowners (residents were notified beyond the required 30 m of the project limits);
- Liaison with Indigenous and Métis communities;
- Public Information Centers (PICs); and,

Project website.

Initial contact letters providing notification of the pre-TPAP study commencement and requesting available background information and/or comments were sent to agencies in October and December 2015. Two Technical Advisory/Resource Group (TRG) meetings were held in November 2016 and December 2017. Meetings with various agencies were held throughout the study.

Two PICs were held in December 2016 and in January 2018.

Indigenous and Métis communities were contacted throughout this study beginning in November 2015.

# E.12. Commitments to Future Action

During the TPAP, MTO worked closely with stakeholders to address and resolve issues or concerns identified. However, not all issues can be addressed within the context of a TPAP since the design of the 407 Transitway has been prepared at a Preliminary Design level and further details are required to be finalized prior to construction and during construction.

Commitments have been made, as outlined in **Chapter 10 of this EPR**, to further address potential impacts during preconstruction and include continued consultation with all affected agencies and the public.



