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## **1 INTRODUCTION**

The proponent proposing the undertaking, public transit improvements in the Markham North-South Link Corridor, is the Regional Municipality of York (York Region). York Region wishes to proceed with the preparation of an individual environmental assessment as set out in Section 6.1 (2) of the Environmental Assessment Act (EAA). Consistent with the requirements set out in Section 6.1 (2) of the EAA, the environmental assessment (EA) for the undertaking will include:

- a description of the purpose of the proposed undertaking;
- a description of and statement of the rationale for the proposed undertaking, alternative methods for carrying out the undertaking and alternatives to the undertaking;
- an assessment of the alternatives to the undertaking;
- a detailed description of the environment to be affected and the actions needed to mitigate the effects;
- a description of the effects that may be caused to the environment; and
- an evaluation of the advantages and disadvantages to the environment; and,
- a description of the public and agency consultation process undertaken during the EA;

The EA will meet the requirements of the Ontario EA Act and, through the preparation of the EA, address the requirements of the Canadian EA Act (subject to final confirmation of CEAA applicability).

### **1.1 PURPOSE AND OUTLINE OF TERMS OF REFERENCE**

The preparation of a Terms of Reference is a requirement of section 6(1) of the EAA. The purpose of the ToR is to describe the characteristics of the EA study. Once approved by the Minister of the Environment, this ToR will both provide the framework for preparing the Environmental Assessment (EA) and serve as a benchmark for reviewing the EA. It is understood that, given the nature of a ToR and the complexity of the EA, it is not intended to present every detail of all the activities that will occur when preparing the EA. However, the ToR sets out the minimum requirements for the EA.

Accordingly, this Terms of Reference (ToR) provides an outline of the work to be carried out as part of the EA. The Terms of Reference includes:

- A preliminary identification and description of the alternatives to the undertaking;
- A preliminary description of the study area and the existing environment;
- A description of the public and agency consultation undertaken during the ToR preparation;
- A work plan that outlines how the EA study will be carried out;
- A description of other approvals; and,
- A description of compliance monitoring.



## **2 PURPOSE OF THE UNDERTAKING**

York Region has had the greatest proportional increase in population and employment amongst the four suburban regions of the Greater Toronto Area over the past 10 years. Within the 2021 planning horizon, the population of the Region is forecast to increase from the current 0.8 million residents to 1.2 million residents, while employment is estimated to increase from the existing 385,000 jobs to 655,000 by the year 2021.

Much of this growth is targeted to live and/or work within the Markham North-South Corridor. This growth will generate a proportionate increase in travel demand. While it is expected there will be a greater segment of the population living and working within the Region itself, north-south travel demand between the Region and the City of Toronto will remain the dominant feature amounting to 35% of total travel demand.

York Region's Official Plan places a strong emphasis on significantly increasing public transit use to accommodate future transportation needs and support the Plan's vision of sustaining the natural environment, optimizing economic vitality and ensuring healthy communities.

The Region's 2002 Transportation Master Plan (TMP) has reaffirmed the need to achieve a balanced transportation system by proposing implementation of rapid transit in four corridors. The TMP incorporates the Government of Ontario's Smart Growth vision for fostering and managing growth.

In the proposed transit network, shown in Exhibit 2.1, three of the corridors comprise north-south transit facilities. These are the Yonge Street Corridor connecting Newmarket Regional Centre to the Yonge Subway, a link from the Vaughan Corporate Centre to the Spadina Subway and a link from the proposed Markham Centre to the Sheppard Subway. Connections with the Sheppard Subway could be made at the existing terminus at Don Mills Station or a future easterly extension. The fourth corridor is an east-west transit facility in the Highway 7 corridor connecting to all three of the north-south rapid transit lines, to the Region of Peel in the west and to the Region of Durham in the east.



## Markham North-South Link Corridor Public Transit Improvements Environmental Assessment Terms of Reference

Exhibit 2.1: Proposed Long Term Transit Network Identified in York Region's Transportation Master Plan (2002)



The purpose of the undertaking will be reviewed and refined in the EA. One of the first steps will be to review the conclusions of the York Region's Transportation Master Plan in the context of the purpose of the undertaking as described below.

The purpose of this "Undertaking" in Markham North-South Link Corridor encompasses two fundamental objectives:

- to respond to growth pressures by providing high a quality improved public transit alternative to reduce automobile dependence, and
- to help make the Region's urban centres more liveable, pedestrian- oriented and economically viable by providing a valuable tool for structuring and achieving land use and social objectives.

In the Markham North-South Corridor, the purpose can be summarized as:

- Providing improved public transit infrastructure and service in this north-south corridor, capable of producing significant increases in transit ridership both within the corridor and across the network and regional boundary. This objective will be supported by interconnection with other corridors and GTA transit systems such as Highway 7/407, GO Transit and the TTC.



## **Markham North-South Link Corridor Public Transit Improvements Environmental Assessment Terms of Reference**

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- Integrating improved transit facilities in a manner that enhances and enriches streetscapes with new amenities by using a holistic urban design approach to support the Region's goals for mixed-use transit-oriented development along the corridor.

### **2.1 RELATIONSHIP TO CITY OF TORONTO**

The Markham North-South Link Corridor EA is somewhat unique in that approximately one-half of the potential improved transit service would be located in the City of Toronto. The City of Toronto Official Plan identifies the introduction of higher-order transit in the Don Mills Road and Markham Road corridors. It also identifies Don Mills Road, Victoria Park Avenue, McCowan Road and Markham Road for improved surface transit priority measures, such as reserved/dedicated lanes for buses and transit signal priority.

The City of Toronto is also currently undertaking the Don Valley Corridor Transportation Master Plan study, to identify and recommend specific road and transit-related improvements for increasing person-carrying capacity in the Don Valley corridor within the City of Toronto.

The City of Toronto and Toronto Transit Commission are key stakeholders in the Markham-North South Link Corridor EA, and are represented on the study's Technical Advisory Committee to provide advice and comments on the study and to coordinate input from other City of Toronto stakeholders.

The issue of the appropriateness of conducting an EA on a potential improved public transit service in the City of Toronto portion of the study area was discussed extensively among project team members and other stakeholders, given that Toronto is not a co-proponent in the development of the EA Terms of Reference. The consensus of the Technical Advisory Committee was that it is appropriate to consider the impacts and benefits of the entire potential service (i.e. from Markham Centre to the Sheppard Subway) rather than constraining the analysis to within York Region boundaries. This approach will also avoid any concerns about "piece-mealing" the EA process for the proposed improved transit link.

The Environmental Assessment Act does not restrict York Region from conducting an EA for a project within the City of Toronto. However, York Region does not have the authority to construct any physical infrastructure within the City of Toronto. Recognizing this limitation, an important aspect of the development of improved public transit alternatives was therefore to consider how potential services could be integrated with the long term planning objectives of the City of Toronto.



### **3 DESCRIPTION OF THE PROPOSED UNDERTAKING AND STUDY AREA**

The basic concept for the Markham North-South Link Corridor Public Transit Improvements, as identified in the York Region Transportation Master Plan, is to connect the Markham Centre (Warden and Highway 7 area) with the Sheppard Subway. Connections with the Sheppard Subway could be made to the existing terminus at Don Mills Station or, if the Subway is extended, to a future easterly station.

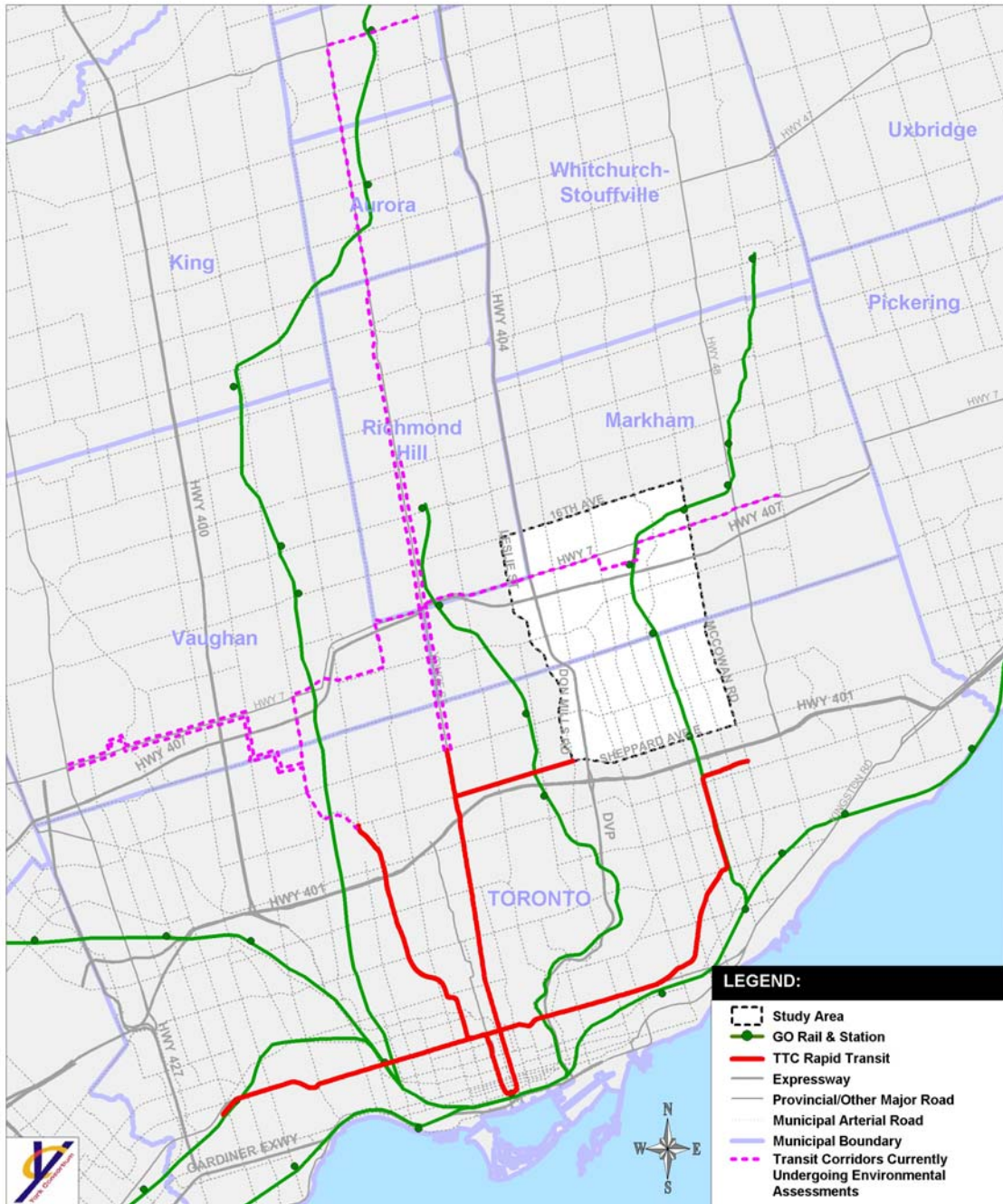
Reflecting the range of possible alignment options for the undertaking, an initial study area was defined to cover the area bounded by Leslie Street/Don Mills Road to the west, McCowan Road to the east, 16<sup>th</sup> Avenue to the north and Sheppard Avenue to the south. This study area, including its context with the Greater Toronto Area, is shown on Exhibit 3.1. The study area includes portions of the Town of Markham and the City of Toronto, as well as a small portion of Richmond Hill in the Beaver Creek Business Park area.

The initial study area will be refined and adjusted, if necessary, during the EA, as various routing options are assessed and screened. The spatial and temporal boundaries of the EA study area may vary by environmental factor under consideration.



# Markham North-South Link Corridor Public Transit Improvements Environmental Assessment Terms of Reference

## Exhibit 3.1: Initial Study Area







## **4 DESCRIPTION OF STUDY AREA**

A preliminary investigation of the study area environmental features, constraints and opportunities was conducted for the purpose of developing this Terms of Reference and the EA Work Plan for more detailed investigations and analyses. The study investigation considered an initial study area generally bounded by Leslie Street/Don Mills Road, McCowan Road, Highway 7 and Sheppard Avenue.

The initial study area was illustrated previously on Exhibit 3.1. The study area will be confirmed in the EA to include any area of potentially significant environmental effects.

As part of the EA Study, the study area inventory will be updated to all known ecosystem features and green lands systems, including the following types of mapped data:

- Information in schedules of the Official Plan of the Regional Municipality of York and draft Official Plan Amendment #37. This includes updated information on rivers, wetlands and forests, green lands areas and wellhead protection areas. Similar planning designations of the Toronto Region Conservation Authority will also be included.
- Updated mapping of wetlands and woodlands in the Regional Municipality of York available from the Ministry of Natural Resources and currently being finalized.
- Wells in the study area – obtained through the MOE.
- Sub-watersheds in the study area and their associated environmental attributes and sensitivities.
- Ecosystems and proposed ecosystem connections/corridors, e.g. Ecological Land Classification, Carolinian Canada Big Picture Mapping.

The EA Study will also incorporate background information on ecosystem features including water quality and quantity, habitats and proposed restoration strategies from the 1991 Rouge River Fisheries Management Plan and the 2001 Rouge North Management Plan.

During the EA study, if a significant net adverse effect is determined to have impact outside of the approximate EA study area, the study area may be expanded for the purpose of evaluating the full impact of the identified significant net adverse environmental effect.

For example, the assessment will identify the nature and level of effect of the undertaking and recommend mitigation measures for environmental factors such as noise, groundwater and vegetation. If the evaluation concludes that an effect extends beyond the approximate study area (as described above) after recommended mitigation measures are identified, the study area will be expanded to encompass the geographic area where the effect is taking place, e.g. where there are changes in level of service of adjacent roads, or in very



specialized cases where the adjacent wetland outside the study area is potentially impacted, or where fragmentation of a forest wooded area necessitates the relocation of a route alignment. Criteria will be developed early in the EA process in consultation with appropriate agencies/parties to determine the necessity to expand the study area. Any future commitments to developing a monitoring program for the construction and operation of an improved transit facility will include expanded area(s).

#### **4.1 DESCRIPTION OF EXISTING BUILT ENVIRONMENT**

The initial study area for the Markham North-South Link corridor is quite large and contains a wide variety of land uses and development patterns as shown on Exhibit 4.1. While the majority of the study area below 14<sup>th</sup> Avenue is generally built-out, much of the northern portion of the study area is under-development or planned for development and presents a significant opportunity to be developed in a manner that supports the vision for transit in the region while also supporting the vision for environmental quality and sustainability. This section highlights the following five main elements of the existing built environment.

**Residential Areas** - Approximately two-thirds of the land area within the initial study area contains low-medium density residential development, plus a few pockets of higher density residential development (apartments and condominiums), most notably along Sheppard Avenue, Finch Avenue and Steeles Avenue.

Most of the residential neighbourhoods are typical of newer suburban areas with houses focusing on local streets that are discontinuous and circuitous. Where residential developments abut arterial roadways, the houses are either facing inwards and accessed by collector and local streets or set back significantly from the street.

**Existing and Newly Developing Employment Areas** - The study area contains both newly developing business parks as well as older industrial areas. Much of the area between Highway 404 and Kennedy, north of Steeles Avenue, consists of light manufacturing and industrial uses. Together, these industrial areas generate a significant amount of employment. The study area also contains a high number of employment nodes with high-density office development. These include:

- The Allstate Parkway Business Park
- Gordon Baker Business Park
- Steeles Technology Campus
- Consumers Road Business Park
- Commerce Valley Drive Business Park

These business parks are the home of several major employers including IBM, Sprint Canada, American Express, Data Mirror and ATI to name a few.

**Regional Centres** - Within York Region, there are four major regional centres: Markham Centre, Langstaff Gateway (Richmond Hill), Vaughan Corporate Centre and Newmarket. It is the intention that the Markham Centre would be the



## ***Markham North-South Link Corridor Public Transit Improvements Environmental Assessment Terms of Reference***

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northern focal point of the Markham North-South link. It is envisioned that Markham Centre will be the new downtown for Markham. It will consist of high density residential and employment uses which will be developed in a manner that is supportive of transit.

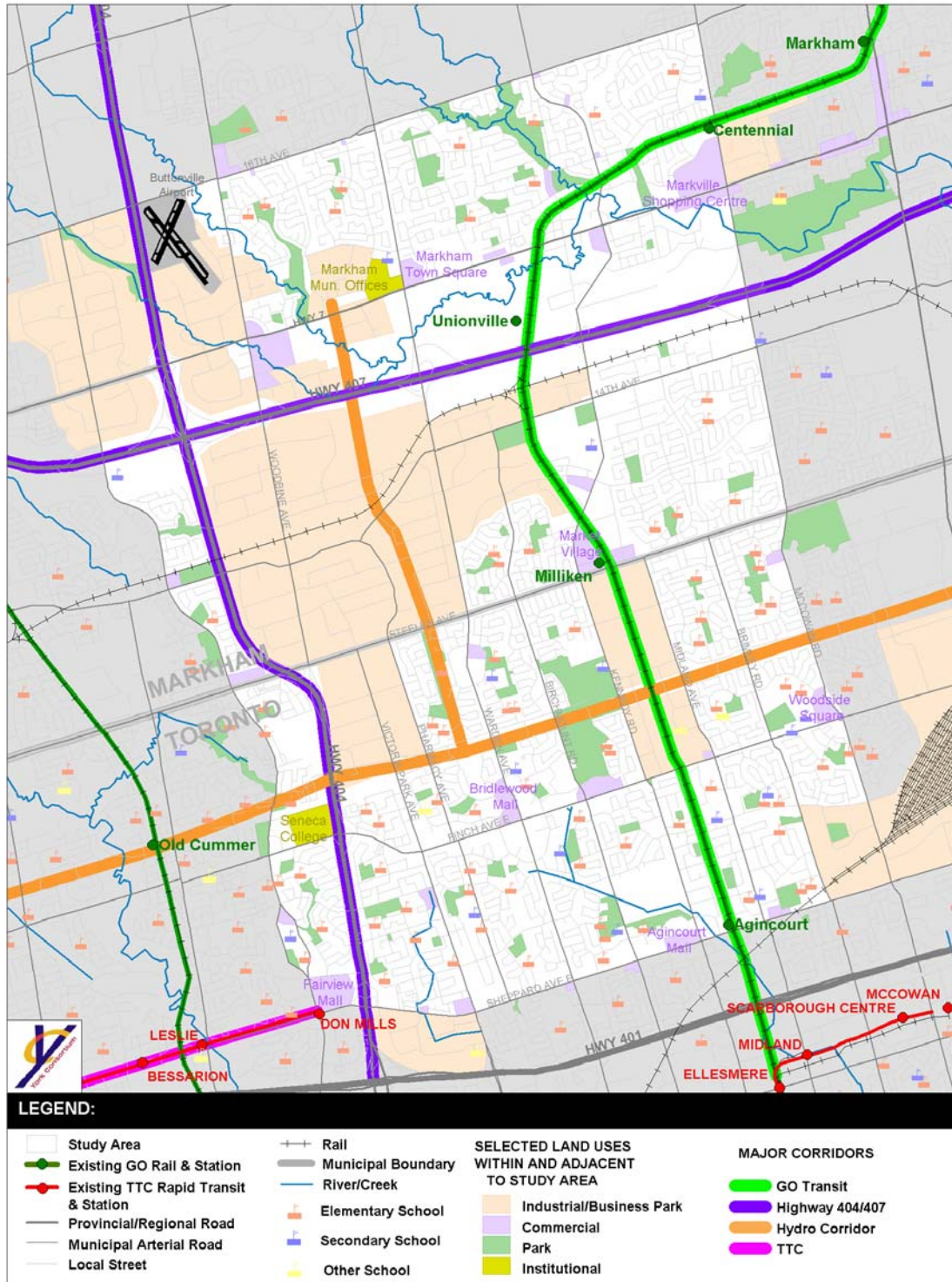
In addition to the formally defined regional centres, the corridor contains a number other major activity nodes including:

- Don Mills Station/Fairview Mall, the present terminus of the Sheppard Subway and a major shopping destination;
- Markville Mall;
- The Markham Civic Centre;
- Pacific Mall;
- Bridlewood Mall;
- Seneca College (Newnham); and,



# Markham North-South Link Corridor Public Transit Improvements Environmental Assessment Terms of Reference

Exhibit 4.1: Study Area Land Use





## **Markham North-South Link Corridor Public Transit Improvements Environmental Assessment Terms of Reference**

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**Development Corridors** - The Official Plan for the Region of York calls for a series of development corridors that are intended to help facilitate the intensification of development and services in a mixed use form that creates support for efficient, regular transit service. The two main corridors in the initial study area are Highway 7 and a north-south corridor between Markham Centre and the Sheppard Subway.

In addition to these major regional corridors, the study area contains several important corridors that have been or are planned to be developed with higher density-mixed use development. These include Enterprise Drive through Markham Centre and the Sheppard Subway Corridor. The Sheppard Subway corridor is identified as an "Avenue" in the Toronto Official Plan. Avenues are corridors along major arterial streets where transit-supportive reurbanization can create new employment and housing and improve local streetscape, infrastructure and amenities.

**Transportation/Utility Corridors** - There are several major transportation corridors and utility corridors in the study area, as described below. ( See Exhibit 4.1)

- **North-South Hydro Corridor:** A key feature of the study area is a north-south hydro corridor extending from the Finch hydro corridor just south of McNicoll Avenue to north of Highway 7.
- **Stouffville GO line:** GO Transit operates the Stouffville GO Rail service on the Uxbridge subdivision, which extends northerly from Scarborough. Through the study area, this rail corridor is quite narrow at approximately 15 m in width.
- **Highway 407 corridor:** Highway 407 was constructed in a parkway belt and follows an east-west alignment through the study area. The corridor includes the 6 lane toll highway as well as a utility corridor. GO Transit is planning for a bus rapid transit facility in this corridor. To accommodate the transitway and associated facilities, MTO undertook a Transitway Corridor Protection Study in 1998
- **Finch hydro corridor:** The Finch hydro corridor presents opportunities for potential east-west connections. Through the study area, the Finch hydro corridor follows an alignment just south of McNicoll Avenue. The Finch hydro corridor has been identified in the City of Toronto Official Plan as a Higher Order Transit corridor.
- **Sheppard Subway:** Opened in November 2002, the new Sheppard Subway runs from Yonge Street to Don Mills Station. The Official Plan for Toronto identifies the Sheppard Subway corridor east of Don Mills Road as a Higher Order Transit Facility and all expectations are that the subway will eventually be extended to the Scarborough Civic Centre in the longer term.
- **Highway 404 corridor:** Through the study area Highway 404 is a major provincial highway facility. Highway 404 is identified as an integral part of GO Transit's longer term BRT network.

**Institutional Uses** - There are a number of elementary and secondary schools within the study area, as shown on Figure 4.1. Secondary schools in particular



represent a potential market for public transit, as does Seneca College located at Don Mills Avenue and Finch Avenue

During the Environmental Assessment, the existing built environment and planned development will be inventoried in more detail.

## **4.2 DESCRIPTION OF THE NATURAL ENVIRONMENT**

The initial inventory of the existing natural environment was conducted by LGL Limited and was based on a review of information available from the Ministry of Natural Resources (MNR), the Toronto and Region Conservation Authority (TRCA), the Regional Municipality of York, the Town of Markham, the Town of Richmond Hill and the City of Toronto. No field investigations were conducted as part of the development of this ToR. Field investigations will, however, be conducted as part of the Individual Environmental Assessment for this project. A list of factors to be included in the natural environment inventory is provided in Section 5.4.

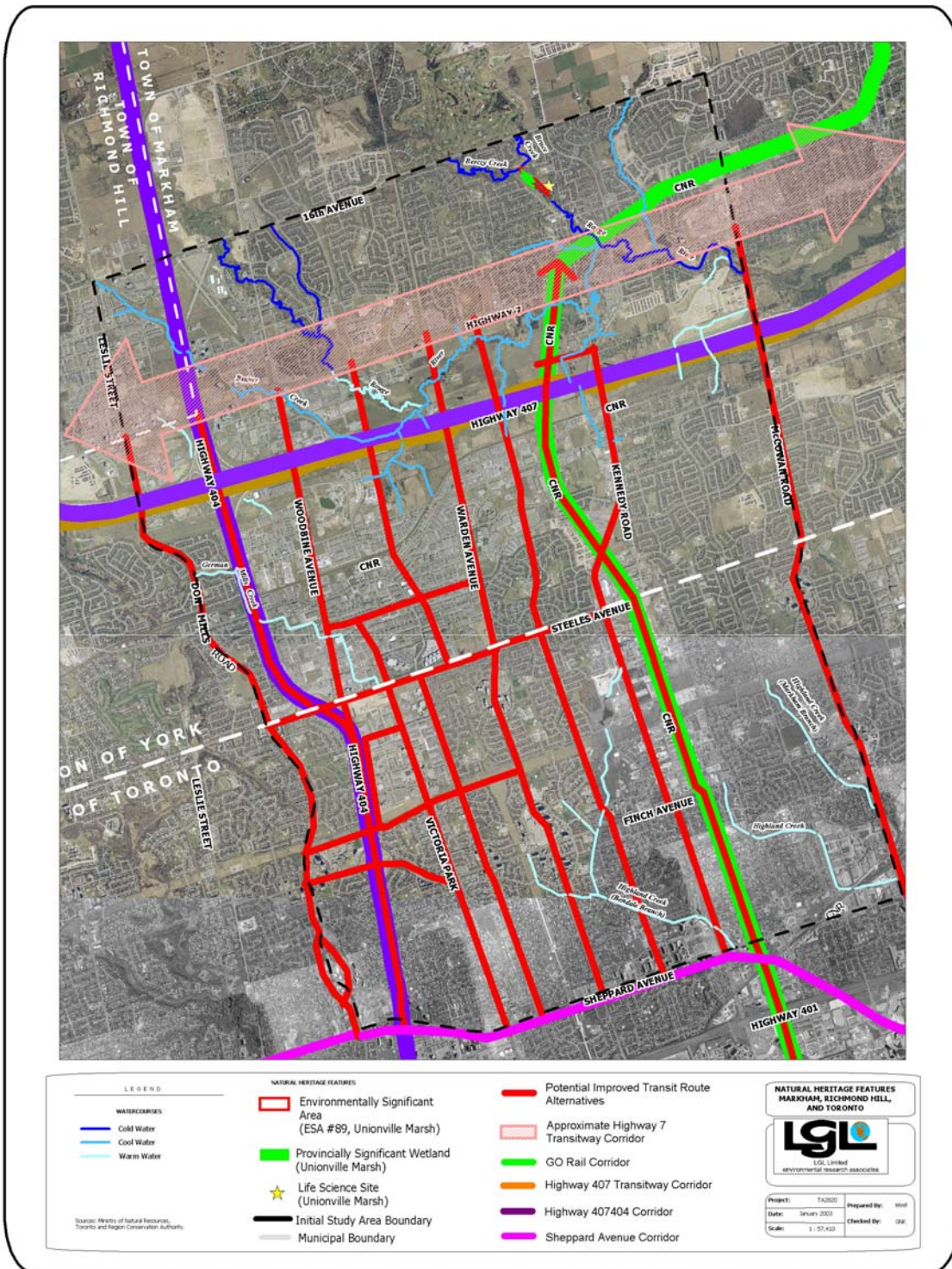
Information for the entire study area is plotted on an air photo base map and shown on Exhibit 4.2 and described below

**Abiotic** - The study area is located primarily in the South Slope and Peel Plain physiographic regions. The South Slope is a till plain that was formed by retreating glaciers. The slope in the study area is smooth to gently rolling with low drumlins. The soils of the South Slope are relatively impermeable which results in extensive run-off to local watercourses. The Peel Plain is a level to undulating tract of clay soils. The dominant soil is Peel Clay which is fine and poorly drained. As a result, infiltration is low and groundwater supply is limited as more precipitation ponds on the surface or is lost through evaporation or surface runoff. The underlying geological material of the Peel Plain is a till or boulder clay which contains large amounts of Palaeozoic shale and limestone. The general elevation of the Peel Plain is from 500 to 750 feet above sea level and there is a gradual and fairly uniform slope towards Lake Ontario.



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## Exhibit 4.2: Natural Heritage Features





The study area lies within the Don River, Rouge River and Highland Creek watersheds, although the majority of the study area lies within the Rouge River and Highland Creek watersheds. Located within the study area is German Mills Creek (a tributary of the East Don River); the Rouge River and a number of associated tributaries including Beaver Creek; and, the Bendale Branch and Markham Branch of the Highland Creek. These watercourses flow generally in a north to south direction from their headwaters in the Oak Ridges Moraine and South Slope to their mouths at Lake Ontario. All watercourses fall within the jurisdiction of the TRCA and MNR Aurora District.

**Aquatic Ecology** - Watercourses located within the study area that directly support fish habitats are identified as cold, cool and warm water. Several of the watercourses have been urbanized through channelization, realignment and enclosure. The Rouge River and several of its tributaries within the study area support reddsides, a fish species of special concern nationally.

**Terrestrial Ecology** - Designated natural areas within the study area include one evaluated wetland, Unionville Marsh, which has been designated a provincially significant wetland by the Ministry of Natural Resources, and one environmentally significant area (ESA), Unionville Marsh, which has been designated an ESA by the TRCA. Unionville Marsh is also designated a Life Science Site by the MNR. One other ESA, Milne Woods, is located immediately adjacent to but just outside the study area (east of McCowan Road between Highway 407 and Highway 7). Many of the valley and stream corridors surrounding the watercourses within the study area are designated natural heritage features by York Region, the Town of Markham, the Town of Richmond Hill and the City of Toronto.

Federal, provincial and local legislation, regulations and policies seek to protect the natural environment during urban development. Efforts should be made in siting the potential undertaking to avoid the natural heritage features to the extent possible.

A full description and inventory of the natural environment within the study area will be provided within the EA.





## **5 ENVIRONMENTAL ASSESSMENT WORK PLAN**

This chapter describes the work plan that will guide the Environmental Assessment study.

### **5.1 GENERAL REQUIREMENTS**

The EA study will be consistent with the approach and requirements set out in Section 6.1 (2) of the Environmental Assessment Act. The EA will have the following components (as prescribed in the EAA):

- (a) a description of the purpose of the undertaking;
- (b) a description of and a statement of the rationale for,
  - (i) the undertaking,
  - (ii) the alternative methods of carrying out the undertaking, and
  - (iii) the alternatives to the undertaking;
- (c) a description of,
  - (i) the environment that will be affected or that might reasonably be expected to be affected, directly or indirectly,
  - (ii) the effects that will be caused or that might reasonably be expected to be caused to the environment, and
  - (iii) the actions necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment,  
  
by the undertaking, the alternative methods of carrying out the undertaking and the alternatives to the undertaking;
- (d) an evaluation of the advantages and disadvantages to the environment of the undertaking, the alternative methods of carrying out the undertaking and the alternatives to the undertaking; and
- (e) a description of any consultation about the undertaking by the proponent and the results of the consultation.

The activities to be carried as part of the EA are described in the following sub-sections. The proposed schedule for review of the findings and their documentation is as follows:

- A 30-day public and agency review of the Environmental Assessment Terms of Reference
- 12 weeks for review and approval of the Environmental Assessment Terms of Reference by the Ministry of the Environment
- Up to 30 weeks for Ministry of the Environment review and approval of the Environmental Assessment Documentation



## **5.2 DESCRIPTION OF EXISTING LAND USES**

As background to the rationale for the undertaking, the EA will provide a detailed description of the existing land uses and context on urban development trends, key corridor constraints and opportunities and a historical chronology of planning activities that established a need for the undertaking.

## **5.3 DESCRIPTION OF AND STATEMENT OF RATIONALE FOR THE UNDERTAKING, ALTERNATIVE METHODS OF CARRYING OUT THE UNDERTAKING AND ALTERNATIVES TO THE UNDERTAKING**

### **5.3.1 Identification of Problems and Opportunities**

In general terms, the proposed Undertaking can be described as enhancements to public transit services generally between Markham Centre and the Sheppard Subway in the City of Toronto.

Building on the analysis and recommendations of the 2002 York Region Transportation Master Plan and other subsequent transportation planning studies, the rationale for the Undertaking will be established and documented. Factors used to establish the rationale for the undertaking will include, but not be limited to:

- Response to deficiencies in transportation system performance (e.g. demand/capacity analyses);
- Consistency with the overall Vision for the Region and City of Toronto;
- Effects on Socio-economic Environment;
- Effects on Urban Form;
- Effects on Natural Environment features, including air quality;
- Direct costs; and travel time delay costs.

### **5.3.2 Alternatives to the Undertaking**

As part of the EA Terms of Reference, an initial list and description of alternatives to the undertaking have been developed. The EA will include a final list and description of all reasonable alternatives to the undertaking. Alternatives to the undertaking are those alternatives that are functionally different, such as addressing the corridor transportation problems by road widening or by non-transit undertakings. The alternatives to the undertaking will be subject to an analysis and evaluation in the EA (as described further in Section 5.5).

Alternatives to the undertaking, or 'Alternative Strategies', that have been identified for assessment in the EA Study in terms of their ability to address



existing and future problems and needs in the study corridor include, but are not limited to, the following:

- The **Do Nothing** strategy including approved or committed road improvements only as well as minor improvements to existing YRT transit services;
- A **Road Expansion** strategy includes all committed road and transit improvements identified in the Do Nothing option, plus additional road widenings or new road construction such that future demand across the east-west screenlines are met;
- **Priority Transit with Transportation Demand Management** combines measures to enhance existing bus travel times and capacity as well as reduce peak period auto driver trips through Travel Demand Management (TDM) strategies, including introduction of High-Occupancy Vehicle (HOV) lanes on several north-south arterials;
- **Enhanced Stouffville Commuter Rail Service** (from Union Station to Stouffville) using existing GO Rail technology, including additional peak period trains as well as higher frequency reverse peak direction service;
- **Rapid Transit** is assessed described here as a generic alternative, without specifying detailed routing options or technology, and would generally extend from Markham Centre to the Sheppard Subway at Don Mills Station, or potentially an easterly location.

### **5.3.3 Alternative Methods of Carrying out the Undertaking**

There are a wide range of options that could be explored to implement the undertaking, including physical infrastructure alternatives, alternative technologies and alternative routes.

#### **Alternative Service Quality**

One possible method of improving public transit service in the corridor may include changes to service quality of one or more modes. Examples of options that could be assessed include:

- Increasing the frequency or coverage of transit services;
- Changing traffic control to provide improved transit times;
- Providing incentives for more efficient travel

#### **Physical Infrastructure Alternatives**

Physical Infrastructure alternatives will differ by technology, however, the following provides an indication of the range of options that may be assessed in the EA.

- Exclusive Lanes In Segregated Rights-Of-Way



## **Markham North-South Link Corridor Public Transit Improvements Environmental Assessment Terms of Reference**

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- Exclusive Lanes in the Median or Centre of Arterial Streets
- Reversible Contra Flow Lanes in Centre Median
- Exclusive Curb Lanes
- Interior or Off-set Exclusive Bus Lanes
- Priority Measures in Mixed Flow

### ***Technology Alternatives***

Public Transit Improvements may involve the development of networks and systems using one or a combination of the range of transit technologies currently available in the industry. These are listed below starting with the conventional buses currently operated in the Region.

**Conventional Bus:** Conventional buses would be an integral part of any enhanced transit system, either serving to feed a rapid transit system or as an integral part of a bus-based system.

**Bus Rapid Transit (BRT)** - Bus Rapid Transit is a flexible form of rapid transit that combines transit stations, vehicles, services, running way, and ITS elements into an integrated system.

**Light Rail Transit (LRT)** - Light Rail Transit (LRT) is a flexible transportation mode that can operate in a variety of settings. LRT is a relatively low cost form of rail technology, usually obtaining electric power from overhead wires.

**Diesel Multiple Units (DMU)** - This technology is a modern form of a diesel-powered rail car. DMU's are self-propelled and distinguished from current commuter rail equipment with each vehicle motorized rather than pushed or pulled by a heavy diesel engine. This type of technology operates on conventional rail tracks.

**Automated Guideway Transit (AGT)** – this technology uses fully automated driverless trains, with fully grade-separated operations, typically on an elevated guideway.

**Heavy Rail:** - this technology would consist of high capacity rail cars operating in trains of two or more cars on fixed rails in separate rights-of-way (ROW). This concept is used to serve very high volume corridors with capacities requirements in the order of 30,000 to 50,000 peak hour passengers per direction.

### ***Routing Alternatives***

The basic concept for the Markham North South Link Corridor, as identified in the York Region Transportation Master Plan, is to provide improved public transit in the Markham Centre (Warden and Highway 7 area) to Sheppard Subway corridor. Connections with the Sheppard Subway could be made at Don Mills Station or, if the Subway is extended, a future easterly station. While the timing of the Sheppard Subway extension is not known, it is possible that it could be extended to Victoria Park with 10-15 years.



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For the purpose of this ToR, several potential routes were identified, as shown on Exhibit 5.1. Other routes could also be considered. For discussion purposes, route segments can be classified in terms of routes north of Steeles Avenue, routes south of Steeles Avenue and east-west connection routes.

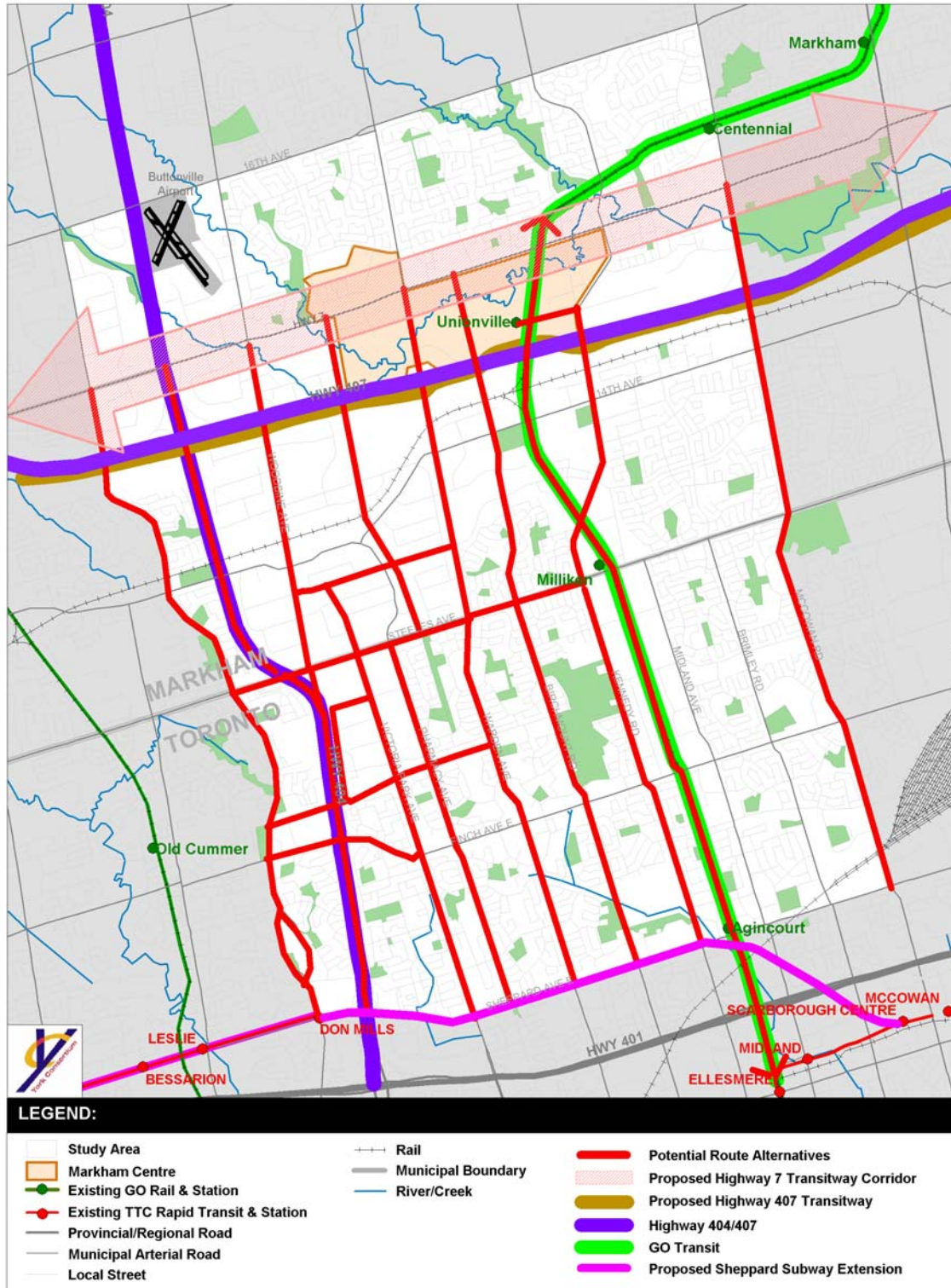
<b>North-South Routes (North of Steeles Avenue)</b>	<b>North-South Routes – South of Steeles Avenue</b>	<b>East-West Connections</b>
Leslie Street/Don Mills Rd	Leslie Street/Don Mills Rd	Highway 7
Highway 404	Highway 404/Gordon Baker Rd	Steeles Avenue
Woodbine Avenue	Victoria Park Avenue	Denison St
Victoria Park Avenue	Warden Avenue	Finch Hydro Corridor
Hydro Corridor/Rodick Rd	Birchmount Road	Finch Avenue
Warden Avenue	Kennedy Road	
Birchmount Road	Stouffville GO Line	
Kennedy Road	McCowan Road	
Stouffville GO Line		
McCowan Road		

The Environmental Assessment will include a full description of and statement of the rationale for alternative routing options as a means of carrying out the undertaking.



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**Exhibit 5.1: Potential Route Options to be Considered in EA Study**





## **5.4 DESCRIPTION OF EXISTING ENVIRONMENT**

A detailed inventory of transportation, natural, social and economic environment conditions in the study area will be undertaken as part of the EA. The purpose of this exercise will be to establish the baseline conditions and any anticipated changes to these conditions that may occur as a result of the undertaking, alternative methods of carrying out the undertaking and alternatives to the undertaking.

The existing conditions inventory will build upon the information collected during the preparation of the Terms of Reference and the Need and Justification Study.

As part of the EA Study, field investigations will be undertaken to further detail existing conditions including aquatic habitats and communities, vegetation and vegetation communities, and wildlife and wildlife habitat. The provincial Ecological Land Classification Framework will be used as guidance in describing existing environmental conditions.

The EA will detail and map the existing conditions inventory of the environmental elements listed below.

### **Transportation:**

- Pedestrian and bicycle network in the corridor
- Transit services and infrastructure (municipal, GO, intercity, rapid transit)
- Intermodal transit stations
- Roadway network
- Railway network
- Transit demand
- Traffic volumes
- Railway traffic

### **Natural Environment:**

- Aquatic features
- Terrestrial features
- Rare, Vulnerable, Threatened or Endangered (RVTE) species
- Rare vegetation communities
- Wildlife habitat including migratory birds (Consult with appropriate agencies to obtain recommendation on timing of inventory e.g. outside of breeding season)
- Watercourses
- Valley corridors
- Erosion prone areas



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- Regional Storm Floodplain
- Existing drainage patterns in the vicinity of stations
- Delineation of aquifers that may be impacted by the undertaking
- Known contaminated sites
- Geotechnical conditions (vibration)
- Ambient noise
- Air quality
- Water quality and quantity (i.e. baseflows, peak flows)
- Tributaries and streams including Order 1 and 2 streams and any groundwater upwelling in the study area
- Earth and Life Science Areas of Natural and Scientific Interest (ANSIs)
- Environmentally Significant Areas (ESAs)
- Provincially and locally significant wetlands
- Natural corridors or linkages
- Natural heritage system linkages
- Municipally-designated core areas, including green space
- Significant woodlands
- Other natural heritage features

### **Social Environment**

- Land ownership patterns (including existence of any federal lands)
- Current planning designations in the corridor and any planned modifications
- Areas of residential development
- Existing commercial areas
- Business and agricultural areas
- Plans and development proposals for residential, commercial, industrial, and community, recreation and cultural uses
- Areas of recreation and tourism
- Major utilities corridors
- Aesthetic features and characteristics

### **Cultural Environment:**

- Major cultural or religious institutions and sensitive features, such as churches, synagogues, mosques, cemeteries
- Plans and development proposals for cultural uses
- Any areas of likely archaeological features





The EA Report will provide supporting technical studies, tests and surveys to provide a more detailed description of the environment as listed above such as noise, air quality and vibration, as described further in Section 5.5.2.

## **5.5 POTENTIAL ENVIRONMENTAL EFFECTS**

The EA will describe and assess the environmental effects for the proposed undertaking and alternatives. The study of effects will increase in detail as the study progresses to identify a preferred alternative. Potential environmental effects to be studied include: but are not limited to those listed below. Appendix A provides a more detailed description of potential environmental effects.

### **PLANNING OBJECTIVES**

- effects on Regional goals and policies
- impact on approved urban structure plans

### **NATURAL ENVIRONMENT**

- effect on fisheries and aquatic habitat
- effect on wildlife habitat
- effect on vegetation and wetland resources
- effect on quality and quantity of groundwater
- effect on quality and quantity of surface water
- effect on inter-relationships of factors that are part of local or regional ecosystem
- changes to local and global air quality
- effects to humans and environment from disruption of contaminated materials

### **SOCIAL ENVIRONMENT**

- impact on navigation
- effects of traffic infiltration
- changes to accessibility
- effects of property loss
- effects of changes in noise and vibration levels due to operation of facility
- effects of noise and vibration during construction



- safety impacts

#### **ECONOMIC ENVIRONMENT**

- effects on businesses and other land uses
- effects on access
- effects on capital and operating costs
- effects on ability to move goods

#### **CULTURAL ENVIRONMENT**

- disruption and/or destruction of archaeological resources
- effects on built heritage features and cultural landscapes

#### **TRANSPORTATION SERVICE**

- effects on service to existing or planned developments and major activity generators
- effects on intermodal connectivity and connections to other regional transit facilities

An ecosystem approach to environmental assessment will be applied to examine the relationship between the natural environment and human activities. The ecosystem approach recognizes existing inter-relationships and the health of the ecosystem over time, biophysical boundaries such as watersheds, and constraints and opportunities to protecting the ecological integrity of natural functions. The principle of assessing natural environment goals at the same time as economic goals is consistent with the requirements of the EA Act.

It is important to recognize the various ecosystems present in the study area, such as watersheds and sub watersheds, and the stress thresholds of these ecosystems. Criteria and indicators for identifying and assessing these ecosystems will be developed early in the EA process and will be incorporated into the identification of appropriate methods for mitigation of effects.

The Environmental Assessment will detail the effects on the community of the construction and operation of the Undertaking and identify appropriate mitigation measures to reduce or eliminate impacts. Net effect will be assessed and documented. For CEAA purposes (to be determined), it is required that the significance of net effects be assessed, including any cumulative effects.

During the Environmental Assessment, the Proponent will work closely with the affected agencies and the public to refine issues/concerns and to develop acceptable measures for resolving concerns. Mitigation measures will be identified and clear mechanisms will be developed to ensure that they will be carried forward into design and construction.



## **5.6 ANALYSIS PROCESS**

### **5.6.1 General Approach**

For the Undertaking, alternative methods of carrying out the Undertaking and the Alternatives to the undertaking, the EA Study will provide the following:

- A description of the environment that will be affected or might reasonably be affected;
- A description of potential effects;
- A description of mitigation measures;
- An evaluation of advantages and disadvantages to the environment;

The level of detail will depend on the elements being analysed (i.e. Alternatives to the undertaking, alternative methods of carrying out the Undertaking and the Undertaking). While the same primary categories of effect identified below will be used for all elements, the analysis of alternatives to the undertaking will rely on broader measures whereas analysis of alternative methods would involve more specific assessments of local effects. The effects of each alternative on the environment will be compared in a traceable and objective manner and used to identify the preferred alternative at each stage. An evaluation methodology that allows for the comparison of quantitative and qualitative data will be selected. The methodology and analysis results will be presented to the public and documented in the EA Report.

Directions on the general methodology for assessing environmental effects, developing mitigation measures and evaluating alternatives is provided in the sections below.

Further details on the development of alternatives and evaluation of advantages and disadvantages for each stage of the development of the preferred alternative design are presented in Section 5.6.4.

### **5.6.2 Assessment of Environmental Effects**

A detailed assessment of the environmental effects of the Undertaking and its alternatives will be conducted relying on the relevant criteria, data sources and studies. This detailed analysis will consider effects in the following general areas including, but not limited to: planning objectives, natural environment, social environment, economic environment, cultural environment and transportation service/other technical requirements.

In general the assessment of environmental effects will include an inventory or profile of existing conditions, a prediction or assessment of the effects for each alternative, identification of impacts and mitigation measures and an evaluation of alternative design concepts.

An ecosystem-based approach will be used to guide the environmental effects assessment. In taking this approach, the ecosystem is defined broadly to include



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environmental, social and economic components and the respective interactions between these components. Impacts to significant ecosystem features and linkages will be avoided and the design for the undertaking will incorporate measures to protect and enhance the functions of these ecosystem features and linkages.

The following is a general description of environmental effects to be assessed:

- **Planning Objectives** – the extent to which the Undertaking and its alternatives will support the goals and policies of the York Region Official Plan and the City of Toronto Official Plan as well as the York Region Vision for improved transit with respect to the development of the Regional Centres and the development of the corridor into a higher-density, mixed use urban street.
- **Natural Environment** – includes consideration of the potential for both displacement of and/or disruption to: terrestrial and aquatic features; fish habitat; habitat of rare, vulnerable, threatened or endangered species; wildlife habitat and wildlife corridors; surface and ground water quality and quantity; soil contamination; erosion; and air quality.
- **Social Environment** – includes consideration of: the potential for disruptive effects on people due to noise, vibration or air quality changes; the displacement of community/recreation features, residences, institutions; loss of property; the potential for barrier effects created by the Undertaking and its alternatives; the potential for impact on community character; the effects on urban green space and open space; the impact on existing water courses; the extent of displacement or disruption of heritage or archaeological sites; the potential for impacts on future development; and the ease of cycling and pedestrian access to stations and across corridors.
- **Economic Environment** – includes consideration of: the extent of displacement or disruption of existing businesses; impact on private accesses; impact on agricultural operations; potential economic benefits, and capital, operating and maintenance costs.
- **Cultural Environment** – includes consideration of the extent of displacement or disruption of heritage or archaeological sites; and the potential for impacts on future development.
- **Transportation Service and Technical Requirements** - Detailed traffic analysis to determine the effects of potential reductions in road capacity on traffic level of service and traffic infiltration.

### 5.6.3 Mitigation

As part of the assessment process, mitigation measures will be identified that offset predicted environmental effects that have been identified for the undertaking and its alternatives. The identification of mitigation measures will be developed in the context of relevant review agency guidelines. As the impact assessment process will be iterative as alternatives are developed and evaluated, opportunities to avoid or minimize impacts will be integrated wherever feasible.



Appropriate technical and economically feasible mitigation measures will be developed for specific character and sensitivities of the environmental features and the related significance (e.g. magnitude, duration, certainty) of the potential impact. Such measures may include, but are not limited to:

- “avoidance” measures i.e. design options to minimize impacts to or caused by construction and operations noise and aesthetics;
- protection of water quality and quantity through appropriate facility routing and drainage design; and,
- identification of the recommended construction timing windows, staging of work, etc.

Mitigation measures will be developed in consultation with appropriate agency staff and stakeholders to confirm the environmental analyses, issues and impacts, and subsequently to review the impact assessment and mitigation measures. Mitigation measures will also include recommendations for a monitoring program.

#### **5.6.4 Advantages and Disadvantages**

The EA process will include an evaluation of the advantages and disadvantages to the environment of the undertaking, alternative methods of carrying out the undertaking and alternatives to the undertaking. This evaluation may include but is not limited to:

Advantages to the environment:

- Ability to respond to current road and transit system deficiencies and future growth in travel demand;
- Provision of an efficient and balanced transportation network;
- Promotion of the principles of the Region of York Official Plan which promotes future urban growth and mixed use development in areas that are serviced effectively by transit;
- Contribution to better management of increasing levels of undesirable emissions from the transport sector;
- Potential for ecosystem restoration of degraded areas (e.g. tributaries of the Don and Rouge Rivers);
- Ecosystem connectivity restoration opportunities.

Disadvantages to the environment:

- Potential impact to local natural features such as woodlands, ANSIs, PSWs, etc.
- Potential impact on water quality and water quantity relationships and water supplies;



- Noise and dust impacts from construction and/or operation;
- Property impacts;
- Disruption of existing traffic access and circulation patterns along proposed route alternatives;
- Temporary disruption/congestion on local road network from construction activities.

Conclusions will be made as to how the advantages and disadvantages affect the purpose of the undertaking and the Region's ability to provide an environmentally and economically solution to the corridor needs and problems.

## **5.7 ANALYSIS AND EVALUATION OF ALTERNATIVES**

### **5.7.1 Development of Evaluation Criteria**

Comments received from the public, agencies and other stakeholders will be used to prepare and confirm the detailed criteria for the analysis of the impacts of the alternatives. The criteria will be used to assess the magnitude and extent of effects on the environment from each alternative.

The EA will provide the rationale for the analysis criteria, along with their specific indicators (performance units of measurement). The indicators will have a combination of quantitative and qualitative measures. In all cases, they will be used in an objective and traceable manner.

### **5.7.2 Analysis and Evaluation of Alternatives to the Undertaking**

Potential Alternatives to the undertaking, described previously in Section 5.3.3, will be developed to a level of detail sufficient to determine potential effects on the environment. Criteria that may be used to evaluate alternative methods will include, but not be limited to:

- Impact on transportation system performance (e.g. demand/capacity analyses);
- Consistency with the overall Vision for the Region and City of Toronto;
- Impact on Socio-economic Environment;
- Impact on Urban Form;
- Impact on Natural Environment features;
- Impacts on air quality objectives;
- Direct costs; and,
- Travel time delay costs.



Evaluation of alternatives at this stage with respect to these criteria will be largely done on a qualitative basis, drawing on the results of the inventory of the existing environment and incorporating quantitative information where appropriate.

### **5.7.3 Analysis and Evaluation of Alternative Methods**

Alternative methods would be comprised of alternative technologies and alternative locations (i.e. alignments), and combinations thereof.

#### ***Analysis and Evaluation of Alternative Technologies***

Alternative technologies, outlined in Section 5.3.2, will be evaluated using the following criteria:

- **Service Quality:**
  - user comfort
  - speed
  - reliability
  - continuity of service
- **Strategic Considerations:**
  - consistency with overall YRTP
  - ability to enhance acceptance of transit
  - impact on land use objectives
- **Environmental Compatibility:**
  - socio-economic impact
  - natural environment impact
  - cultural and heritage impact
- **Cost Efficiency:**
  - Property requirements
  - operating and capital costs
  - lifecycle costs

#### ***Analysis and Evaluation of Alternative Locations for the Undertaking***

In response to this basic concept for the Undertaking, the EA Study will develop initial options for improved public transit facilities.

Options will be prepared at a level of detail sufficient for detailed analysis and evaluation. For any guideways or running ways associated with the proposed transit improvements, alignments and cross-sections will be prepared. If adjacent roadways are affected, the conceptual designs will include changes to existing roads and intersections for detailed analysis.

A detailed analysis of the full range of environmental effects of each alternative alignment and station locations will be carried out in the EA. The analysis will



consider mitigation measures and the resulting net effects on the environment. Comments from the public, key agencies, and stakeholders will be incorporated in the analysis of the alternatives, resulting in the refinement of the analysis as required.

The effects of each alternative alignment on the environment will be compared in a traceable and objective manner and used to identify the preferred alternative. An evaluation methodology that allows for the comparison of quantitative and qualitative data will be selected. The methodology and analysis results will be presented to the public and documented in the EA Report.

#### **5.7.4 Analysis and Evaluation of the Undertaking**

The potential undertaking may consist of transit vehicles operating in designated or shared right of ways, or combinations thereof. Options may also consist of widening existing facilities, or converting existing traffic lanes to transit lanes.

The Undertaking will be developed to a level of detail so that effects on the environment are known and can be documented as part of the EA Study. Once the detail of the effects are known, mitigation measures can be identified.

The Undertaking will be developed in sufficient detail to identify the following:

- Horizontal and vertical alignment
- Sectional details, including pavement width, turning lanes, boulevard treatments, etc.
- Structures (Preliminary General Arrangements)
- Property Requirements;
- Access to adjacent properties;
- Impacts on cycling and pedestrian facilities;
- Station details (see below);
- Retaining walls;
- Drainage;
- Illumination;
- Utility Impacts and relocations;
- Preliminary costs.





### **Refine and Select Preferred Infrastructure Locations**

Following public and agency review of the alternatives to the undertaking, and the analysis and evaluation of the alternatives, the locations and conceptual designs of the proposed Undertaking will be refined and finalized.

In addition, the EA study will address comments received on the preferred locations and designs of the any guideways and stations that are associated with the proposed transit improvements.

## **5.8 EA STUDY CONSULTATION PLAN**

The EA Study will include an extensive public consultation program. The purpose of the program will be to ensure that all concerns and issues are brought forward early and addressed appropriately.

The consultation plan for the Environmental Assessment will build on the initial consultation conducted as part of the preparation of this Terms of Reference as described in the following section.

Input received from the initial consultations was taken into consideration to develop the proposed consultation plan for the subsequent Individual EA and also was factored in to the development of the scope of the project and associated issues to be addressed in subsequent work.

The consultation plan for the Markham North-South link corridor was developed to reflect the consultation requirements outlined in the Ministry of Environment's Draft Guidelines for the Preparation of Terms of Reference. Other considerations that guided the consultation plan included:

- Conclusions from current or prior studies, including the Highway 7 Transitway EA, the Yonge Street Transitway EA, the York Region Transportation Master Plan, the Don Valley Corridor Transportation Master Plan Study, and work related to the development of Markham Centre;
- The large study areas and diversity of land uses resulting in a range of potential issues;
- The desire to provide potentially interested stakeholders with the opportunity to be involved and provide input; and,
- The basic principles of effective consultation.

### **5.8.1 Elements of Public Consultation Program**

The key elements of the public consultation program will consist of:

- Public consultation centres held at key stages of the study
- Advertisements for the public consultation centres, and to announce the study initiation and stages



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- Project website on the York Region website
- Individual meetings with agencies, municipalities, and other interest groups

The mailing list from the Need and Justification Study, and from the Terms of Reference preparation, will also be maintained and updated throughout the EA study.

During the Environmental Assessment Study, the Technical Advisory Committee (TAC) will continue in its current role. Participating technical agencies will continue to be involved during the EA Study and will be actively involved in developing and assessing alternative alignments and station locations, and determining mitigating measures for unavoidable impacts. Additional consultation with agencies will be held through individual meetings and/or workshops and correspondence. The TAC and other technical agencies to be consulted through the EA process were listed in the previous section.

The public, including the general public, communities, interest groups, institutions, property owners, and other stakeholders (as listed in Section 6.6.1) will continue to be provided with opportunities to review study findings and provide input. A Notice of Commencement of the EA Study will be placed in local newspapers and on the York Region website, and mailed to the study mailing list prepared as part of the current study as well as to those located within the area in which alternative alignments may be developed. The public will have two formal opportunities, in addition to consultation for the ToR, to participate in the EA Study through Public Consultation Centres (PCCs) as follows:

- First set of PCCs – to review and provide input regarding the collection of background data, present detailed analysis criteria, discuss evaluation methodologies, present information and preliminary assessments on alternatives to the undertaking and alternative methods of carrying out the undertaking.
- Second set – to present the outcome of the analysis and public consultation from the first PCC, to review and provide input regarding the comprehensive analysis of the alternatives, the comparative evaluation of the alternatives, and determination of the preferred Undertaking, potential environmental effects and proposed mitigating measures. The comments received will then be taken into consideration to revise and finalize the Undertaking for which EA approval will be sought.

Measures should be taken to ensure that the public has sufficient time to review materials and become informed in advance of the Public Consultation Centres.

There will be other opportunities for public consultation through:

- Individual meetings – as required, individual meetings with representatives of municipalities, public agencies, interest groups, community associations, business associations, heritage groups, environmental groups, and other stakeholders.
- Website – on the York Region website and the YRTP project website, to show updated information on the EA study through the duration of the study.



A List of Issues will be prepared and updated throughout the study. It will document issues raised by the public, agencies, and other stakeholders, and how the issues were addressed.

## **5.8.2 Agencies and Stakeholders**

### ***Technical Advisory Committee (TAC)***

For the EA Study, the Technical Advisory Committee formed during the preparation of the ToR will be retained and will continue its present role.

The following technical agencies will be consulted through the EA process either through participation on the TAC or by direct consultation:

- York Region
- Town of Markham
- City of Toronto
- Toronto and Region Conservation Authority
- GO Transit
- TTC
- Ministry of Natural Resources (MNR)
- Ministry of Transportation (MTO)
- Ministry of Culture
- Ministry of Environment (MOE)

In addition to the key agencies with direct participation in the EA, a broader list of technical agencies with a prospective interest in the study will be contacted at key points during the EA and requested to supply technical input and comments on the study findings. The proposed list of technical agencies is shown in the following table.



<b>Federal Departments</b>	<b>Provincial Ministries</b>	<b>Local Municipalities</b>
<ul style="list-style-type: none"> <li>• Fisheries and Oceans Canada</li> <li>• CEAA</li> <li>• Environment Canada</li> </ul>	<ul style="list-style-type: none"> <li>• Ministry of Environment</li> <li>• Ministry of Natural Resources (TAC)</li> <li>• Ministry of Transportation (TAC)</li> <li>• Ministry Economic Development and Trade</li> <li>• Ontario Realty Corporation</li> <li>• Ministry of Culture</li> <li>• Ministry of Tourism and Recreation</li> <li>• Ministry of Health and Long Term Care</li> <li>• Ministry of Education</li> <li>• Ministry of Municipal Affairs</li> </ul>	<ul style="list-style-type: none"> <li>• Region of York (TAC)</li> <li>• Town of Markham (TAC)</li> <li>• City of Toronto (TAC)</li> </ul>
<b>Agencies and Authorities</b>	<b>Utilities</b>	
<ul style="list-style-type: none"> <li>• Toronto and Region Conservation Authority (TAC)</li> <li>• GO Transit (TAC)</li> <li>• CP Rail</li> <li>• CN Rail</li> <li>• York Regional Police Department</li> <li>• 407 ETR Concession Company</li> <li>• Toronto Transit Commission (TTC)</li> </ul>	<ul style="list-style-type: none"> <li>• York Region District School Board</li> <li>• York Region Catholic District School Board</li> <li>• Toronto District School Board</li> <li>• Toronto Catholic District School Board</li> </ul>	<ul style="list-style-type: none"> <li>• Markham Hydro</li> <li>• Central Ontario Electric Commission</li> <li>• Enbridge Consumers Gas</li> <li>• Consumers Gas</li> <li>• Bell Canada</li> <li>• Rogers Cable</li> <li>• Shaw Cable Systems</li> <li>• Trans Canada Pipelines Ltd.</li> <li>• Hydro One Networks</li> </ul>

**Interest and Community Groups**

A public advisory committee is in the process of being assembled for the purpose of advising on the YRTP project as a whole as well as commenting on each of the Environmental Assessments as appropriate.

The following is a preliminary list of interest and community groups that may be asked to participate in the consultation program:

- York Federation of Agriculture
- 407 Action Group and Better Transportation
- CAA of Central Ontario
- Environmentalists Plan Transportation
- CUTA
- Urban Development Institute
- Pollution Probe
- Better Roads Coalition



- Catholic Community Services of York Region
- Chinese Seniors Support Services Association – York Region Office
- Markham Board of Trade
- Markham, Town of Libraries
- Markham Conservation Committee
- Heritage Markham (LACAC) Committee
- Main Street Markham Committee
- OGTA-MMAH
- Toronto District School Board
- York Central Hospital Community Outreach
- York Region Health Services
- York Region Neighbourhood Services Inc.

## **5.9 COORDINATION WITH MTO AND CITY OF TORONTO**

As noted in the Introduction and throughout this report, there is a need to coordinate planning activities with those of the Ministry of Transportation and the City of Toronto. Specifically, the Ministry of Transportation has stated their interest in this EA because the undertaking may have impacts on Highway 404 and Highway 407, and respective transit services on these facilities. The City of Toronto also has an interest in this EA not only because part of the service would operate in the City of Toronto, but also because of the current Don Valley Corridor Transportation Master Plan.

In addition to being participants on the Technical Advisory Committee, close coordination is required with the MTO and City of Toronto, as well as GO Transit and the TTC. The primary means of coordination will be through special consultations, which will allow these affected agencies to identify the impacts of any preferred alternative or alternative methods that may affect their legislative mandate, and to discuss options or mitigation measures on how to address these effects.

## **5.10 COMPLETE EA REPORT**

An EA Report will be prepared that fully meets the requirements of the provincial and federal EA processes. The Report will thoroughly document the EA process, data collected, alternatives that were considered, the analysis of the impacts of the alternatives, evaluation of the alternatives, mitigation strategy, monitoring program, and the recommendations on the preferred improved transit facilities. It will also document the results of the public consultation process.

The preparation of the EA Report will involve the following steps:

1. Prepare Draft EA Report in accordance with the requirements outlined in Section 5.1 of this ToR:
2. Review Draft EA Report with affected agencies and interested stakeholders



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3. Finalize EA Report with comments from affected agencies and interested stakeholders
4. Submit the EA Report to MOE and any federal responsible authorities for approval
5. Notify municipal clerks that the EA Report has been submitted; and
6. Post a public “Notice of Submission” of the EA Report.



## **6 CONSULTATION DURING PREPARATION OF TERMS OF REFERENCE**

As part of the development of the Terms of Reference two Public Consultation Centres (October 25<sup>th</sup>, 2002 and January 9<sup>th</sup>, 2003) and four Technical Advisory Committee meetings were held. The content and results of the public consultations are summarized in a background document (attached).

Based on comments received from the general public, there appears to be a strong public interest in the Markham North-South Link Corridor, as well as the York Rapid Transit Plan as a whole. There is some concern about the cost of the facility and impacts on taxes as well as the (perceived) potential for the facility to promote higher development densities and associated traffic problems.

Also provided as a background document is a summary of the comments received during the review of the Draft Terms of Reference. From agencies only those comments related to the EA Process and Terms of Reference are presented in this ToR. Comments related to the assessment of the Need and Justification for the Undertaking will be carried forward for consideration in the EA Study.

The most significant concerns raised during the Development of the Terms of Reference were from the City of Toronto and GO Transit. Concerns pertained to the underlying need for 'rapid' transit in the study area as well as the methods by which transit demand in the corridor should be accommodated. The EA Study will include a full assessment of the Need and Justification for the Undertaking.

### **6.1 RE-SUBMITTED TERMS OF REFERENCE CONSULTATION**

The draft revised ToR were initially reviewed with the Region technical staff for input and comment. Thereafter, the draft ToR was revised and made available as follows:

- The contents of the draft ToR were published on the Region's "York in Motion" website for a period of two weeks with an invitation to submit comments in either written or electronic form.
- A notice explaining the reason for submission of a revised ToR and requesting comment on the draft revised document was published in two issues of Regional newspapers at the end of February 2004.
- The above notice was mailed to all those members of the public and other stakeholders who had asked to be included on mailing lists from the public consultation opportunities.

A copy of the draft ToR was made available to agencies and the public for comment at York Region's Richmond Hill offices.

No comments on the draft ToR were received from the public or other stakeholders consulted.



## **7 OTHER APPROVALS**

It may not be possible to address all approval requirements at the time of seeking EA Act approval. A number of subsequent approvals may require detailed design and information not available at the time of the EA Act approval. However, The Regional Municipality of York is committed to obtaining all necessary approvals at the appropriate time in the implementation phase.

Other post-EA approvals may be required during or after the EA Study. The agencies responsible for issuing these approvals will be consulted during the EA Study as early as possible, to ensure that their interests and requirements are properly addressed. This will minimize complications at the time of approval and provide reasonable assurance that approvals will be obtainable in a timely manner. The following post-EA approvals may, but not necessarily, be required, and will be confirmed during the EA Study:

- Municipal Official Plan amendment and zoning bylaw changes if needed
- Permit to Take Water (MOE)
- Sewage and water approvals, under the Ontario Water Resources Act, for stations and maintenance facilities
- Municipal Noise bylaw amendments/exemptions if required during construction
- Environmental Protection Act approvals for wastes generated at stations and maintenance facilities
- CEAA (see detailed description below)
- Detailed building and site plan approvals for individual stations
- TRCA approvals (“Fill, Construction, Alteration to Waterways” permit and DFO authorization)
- MNR approvals under the Lakes and Rivers Improvements Act
- MTO approvals would be required where the undertaking impacts the MTO right-of-way or is within a permit control area. This includes areas where the transitway would intersect and/or impact Highway 404 and Highway 407 and the Highway 407 Transitway.

### **7.1 REGIONAL APPROVAL**

The EA Study findings (including the results of the public consultation process) and recommendations will be presented and submitted to the Regional Rapid Transit Steering Committee and Council of the Regional Municipality of York for approval.





During the EA Study, interim findings will be presented to the Steering Committee for the York Rapid Transit Plan and the Regional Transportation and Works Committee. The study findings may also need to be presented to the municipal councils of the Town of Markham and City of Toronto.

## **7.2 CEAA APPLICABILITY**

The Canadian Environmental Assessment Act (CEAA) states that “an environmental assessment of a project is required before a federal authority exercises one of the following powers or performs one of the following duties or functions in respect of a project, namely, where a federal authority:

- Is the proponent of the project and does any act or thing that commits the federal authority to carrying out the project in whole or in part;
- Makes or authorizes payments or provides a guarantee for a loan or any other form of financial assistance to the proponent for the purpose of enabling the project to be carried out in whole or in part, except where the financial assistance is in the form of any reduction, avoidance, deferral, removal, refund, remission or other form of relief from the payment of any tax, duty or impost imposed under any Act or Parliament, unless that financial assistance is provided for the purpose of enabling an individual project specifically named in the Act, regulation or order that provides the relief to be carried out;
- Has the administration of federal lands and sells, leases or otherwise disposes of those lands or any interests in those lands, or transfers the administration and control of those lands or interests to Her Majesty in right of a province, for the purpose of enabling the project to be carried out in whole or in part;
- under a provision prescribed pursuant to paragraph 59(f), issues a permit or license, grants an approval or takes any other action for the purpose of enabling the project to be carried out in whole or in part.”

If a federal EA is required, York Region will work with CEAA Agency and MOE to prepare an EA accordance with the “Draft Environmental Assessment Coordination Process for Proponents”, dated June 12, 2001, attached as Appendix C.



## **8 COMPLIANCE MONITORING**

The Regional Municipality of York is committed to the preparation of a compliance monitoring strategy and schedule during the preparation of the EA Study, to measure potential impacts such as noise, water quality and air quality effects associated with the construction of the Undertaking. The monitoring strategy will be developed in consultation with the Environmental Assessment and Approvals Branch of the MOE. The proponent must comply with the terms and conditions as well as the commitments identified in the EA and report to MOE on how the compliance has been achieved.

The framework for the monitoring strategy may include, but not be limited to, the following elements:

- compliance monitoring and effects monitoring;
- a plan for implementation of mitigation and contingency measures;
- long-term post construction monitoring and contingency measures and agreed upon triggers for employing contingency plans
- provisions for monitoring water quality and quantity, air quality, and soils;
- provisions to ensure compliance with EA commitments (e.g. an independent environmental inspector, compliance committee, contract specifications) to ensure that all environmental standards and commitments for both construction and operation work are met;
- details on monitoring and reporting relationships.

Baseline information on existing environmental conditions is a critical part of the monitoring strategy and will therefore be emphasised in the environmental assessment.

The EA will describe how the proponent will achieve compliance (e.g. technical agencies approval and satisfy public interest) and how the compliance will be reported. The proponent or its contractor will be required to obtain all permits from regulatory agencies (e.g. MOE, TRCA, MNR, DFO, Navigable Waters Protection) prior to construction and will ensure compliance with all permit conditions throughout the work.



**APPENDIX A**  
**POTENTIAL ENVIRONMENTAL EFFECTS**



**Exhibit A.1: Identification of Potential Environmental Affects**

FACTOR	AGENCY	ISSUE/CONCERN	ACTION
<b>GENERAL</b>			
Compliance	MOE	Ensuring that Contractors and Sub-contractors comply with environmental protection measures.	The commitments made during the preparation of the EA will be implemented through various means including contractual requirements placed on contractors and sub-contractors and dedicated construction inspectors. The Region will commit to examining the feasibility of establishing a community liaison group involving agencies and community representatives or environmental inspectors to ensure compliance with EA commitments
Compliance	CEAA	CEAA may be triggered/Federal agency approvals may be required (see Section 7.1 and Appendix B)	Ensure the preparation of the EA and implementation of the undertaking complies with CEAA requirements.
<b>NATURAL ENVIRONMENT</b>			
Fisheries and Aquatic Habitat	MNR, DFO, MOE, TRCA, EC	The nature/extent of any aquatic habitat that may be disrupted, altered or indirectly affected by the undertaking (such as interference with fish passage, alteration/loss of streamside cover, changes in water quality due to erosion and sedimentation, storm discharges, temperature changes, implications to base flows as a result of dewatering) including Harmful Alteration, Disruption or Destruction of Fish Habitat (HADD).  Tributaries/creeks in the Rouge Watershed, Don River Watershed and Highland Creek Watershed are within the EA Study Area. The TRCA has a Level 3 Agreement with the Department of Fisheries and Oceans.	Aquatic habitat information will be collected through field surveys, agency consultation, and review of background documentation. Potential effects on aquatic habitat will be assessed, mitigation measures identified, and a strategy for addressing the Fisheries Act (through preliminary and detailed design) will be provided in the EA document.
Wildlife Habitat	MNR, TRCA, CEA Agency, EC	The proposed undertaking can adversely impact wildlife (e.g. through disturbances that may prevent them from breeding or raising young successfully or mortality) or wildlife habitat (including breeding, staging/migration and over-wintering habitat), including impacts to migratory birds and RVTE species.	The majority of the corridor is already heavily urbanized or is planned for urbanization. It is anticipated that the majority of the facility will be incorporated within the existing roadway infrastructure or utility corridors. Potential impacts on wildlife habitat and a determination of the significance will be undertaken during the EA study. The objective will be to maximize habitat protection and minimize disturbance.

See end of table for list of acronyms



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FACTOR	AGENCY	ISSUE/CONCERN	ACTION
		Linear facilities can fragment wildlife habitats and provide a barrier to wildlife travel corridors.  The transit route(s) selected may impact large habitat blocks within a wildlife corridor. The cumulative effects of forest habitats may be of particular concern.	Areas where wildlife movement opportunities can be maintained or improved will be reviewed during the EA study.  The route sections process will seek to avoid any impacts on large habitat blocks, woodlots, particularly forest interior habitat areas.
Vegetation and Wetlands	MNR, MOE, TRCA, EC	Direct (intrusion) and indirect (noise, sediments, contaminants) affects on vegetation and wetland resources in the EA Study Area. These resources are important in providing wildlife and plant habitat, stabilizing slopes and soils, providing forest cover and filtering runoff.	Vegetation and wetland areas will be identified and mapped during the EA with detailed fieldwork focusing on areas of potential intrusion/impact. Potential impacts on vegetation and wetland areas and a determination of the significance of those impacts will be undertaken during the EA study. Consideration of potential impacts on forest cover will be considered as well (if applicable). Environmental protection and mitigation measures will be developed during the EA for implementation at preliminary and detailed design. Studies and appropriate methodologies to determine ecosystem relationships and impacts, e.g., connectivity, will be reviewed.
Surface Water Resources	MOE, MNR, TRCA	Surface water quantity and quality can be adversely affected by storm drainage, release of contaminants (i.e., sediments, chemicals), the loss of groundwater flow into surface features and obstruction of flow.	The EA Study Area encompasses 3 watersheds (Don, Rouge and Highland Creek). Watercourses will be identified and mapped, field assessment will be completed during the EA as described under Fisheries above. Watercourses have been identified and mapped in the Need and Justification Study. Further field assessment will be completed during the EA as described under Fisheries above. The assessment will include the use of applicable standards and technical protocols, i.e., Provincial Water Quality Objectives/Guidelines, MOE Guidelines for Evaluating construction Activities Impacting on Water Resources, MOE Storm Water Management Practices Planning and Design Manual. The EA will document measures to protect surface water quality and quantity during planning, design, construction and operation of the facility. Storm water management relationships will be assessed and documented. A Storm Water Management Report would be required at the Detailed Design Stage along with erosion and sediment control strategies, and hydraulic analyses which address conveyance concerns.
Ecosystem Planning	MOE, EC, TRCA	Not only is it important to consider the individual environmental factors, but it is also important to consider the inter-relationships of factors that are part of the local or regional ecosystem.	An ecosystem approach has been initiated in the Need and Justification Study by identifying and mapping inter-related features including wetlands, ANSIs, ESAs, permanent and intermittent watercourses. These features were considered in the evaluation of alternative corridors as part of the Need and Justification report. These inter-relationships need to be expanded on and pursued further in the EA planning by incorporating available watershed level information, documenting ecological relationships, and identifying projection/mitigation measures to maintain ecological functions from the perspective of environmental effects on natural features, including potential cumulative effects as appropriate. This will include the mapping and description of appropriate ecological land classification units.
Air Quality & Energy	MOE, EC	Transportation facilities can adversely affect both local and global air quality predominantly due to the burning of fossil fuels.	Air quality, emissions and energy consumption will be considered in the EA when assessing route alternatives and technologies in the corridor. Recommendations will also be made concerning the need for proponent monitoring (pre-during and after construction).
Contaminated Soil	MOE	Contaminated materials may be discovered during construction. If not properly handled they can cause adverse effects to humans and the	Potential contaminated sites will be identified during the EA building on closed landfill site information available from MOE. Where these sites cannot be avoided, a management strategy consistent with MOE's Guidelines for the Management of Contaminated Sites will be developed. A contingency plan will



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FACTOR	AGENCY	ISSUE/CONCERN	ACTION
		environment.	be developed for addressing contaminated materials encountered during construction of the facility.
<b>SOCIAL ENVIRONMENT</b>			
Navigation	CEA Agency, DFO	The undertaking may require crossing of navigable waterways.	All crossings of navigable waterways need to be assessed. The EA will conduct an analysis of the effects of the project on the public right to navigation. Where new structures are proposed, an assessment of navigability will be conducted and appropriate approvals need to be obtained.
Traffic Nuisance	MOE, Municipal Agencies	Traffic infiltration in neighbourhoods.	Estimate of traffic infiltration will be prepared for each option and included in evaluation.
Improved Accessibility	Municipal agencies, Stakeholders	The undertaking should enhance accessibility for the elderly and persons with disabilities.	Level of accessibility will be considered in the EA when assessing technology options and in the planning and design of the facility.
Effects on Homes	MOE, Municipal Agencies	Dislocation created by property acquisition.	Possible mitigation through compensation and relocation program.
Noise and Vibration	MOE	Increased noise and vibration levels during construction and operation can adversely affect the quality-of-life of those living and working in proximity to the route.	The ambient noise level in the urban sections of the corridor, particularly along Highway 404, is relatively high due to the existing high traffic levels. The effects of the undertaking on noise levels will be considered in the EA when assessing alignments and developing construction staging plans. A qualified acoustical consultant shall develop a framework for dealing with noise and vibration assessment, mitigation, compliance reporting, complaint response and monitoring in consultation with and to the satisfaction of the Environmental Assessment and Approvals Branch of MOE prior to the start of any noise and vibration studies on this project. The framework shall deal with the methodology and procedure which will be used in the analysis of the transit design alternatives from the noise aspect and with the methodology and procedure which will be used in the analysis and evaluation of the noise and vibration impacts associated with the construction and operation of the facility. It shall take into account not only the noise and vibration impacts which will be generated by the transit vehicles but also the noise impacts from ancillary facilities such as parking lots and service facilities. As part of this pre-consultation process, the proponent shall address the noise concerns expressed by the Environmental Assessment and Approvals Branch of MOE with regard to the Draft ToR.
Safety	Municipal Agencies	The public transit improvements will be operating in a high traffic area. It will be important to ensure that the public is protected from injury from any new facility. In addition, emergency access to the vehicles, right-of-way and adjacent lands must be maintained.	Safety and emergency access will be a prime consideration in the EA when assessing technology options and in planning, designing, constructing, operating and maintaining the facility.
<b>ECONOMIC ENVIRONMENT</b>			
Effects on Business & Other Land Uses	Private Sector, Municipal Agencies,	The location of public transit facilities can have positive and negative effects on businesses and adjacent land uses. (Loss of parking, restriction of	Business and property owners will be closely involved in the planning of the undertaking during the EA to ensure that economic community benefits are maximized and property impacts are minimized.



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FACTOR	AGENCY	ISSUE/CONCERN	ACTION
	Ratepayers	access, limitation on commercial traffic circulation, business displacement.)	
Level of Accessibility	Private Sector, Municipal Agencies, Ratepayers	Construction of any new transit facilities may create discontinuity in local pedestrian, traffic patterns.	The current circulation patterns will be established. Possible mitigation include additional road, pedestrian grade separation structures.
Goods Movement	Private Sector, Municipal Agencies, Ratepayers	Construction may restrict access and/or reduce road capacity.	Assessment will inventory major truck routes, loading areas, manufacturing operations to measure degree of impact.
Support of Approved Urban Structure	Private Sector, Municipal Agencies, Ratepayers	Location of improvements may support/encourage development through changes in accessibility. Also degree of impact is a function of existing/planned adjacent land use.	Subjective assessment based on detailed corridor land use inventory developed in association with Regional/local planning agencies.
<b>CULTURAL ENVIRONMENT</b>			
Archaeological Resources	Ministry of Culture, Municipal Agencies, Municipal Heritage Planners, TRCA	Significant archaeological resources may occur in any areas and need to be inventoried. There is the potential for impacts to significant archaeological resources.  Note: TRCA undertakes all archaeological investigations on TRCA's property.	To deal with the potential for impacts, at the appropriate point within the process of development of any part of the transitway, a licensed consulting archaeologist will be retained to undertake an archaeological assessment and to identify any archaeological resources that may be present. Where necessary, appropriate measures will be undertaken to ensure the mitigation of impacts to those archaeological resources determined to be significant. No soil disturbance shall take place in any part of the project area prior to receiving a letter from the Ministry of Culture recommending that there are no further concerns for impacts to archaeological resources within that part.
Heritage Resources/Cultural Landscapes	Ministry of Culture, Municipal Agencies, Municipal Heritage Planners, Local Architectural Conservation Advisory Committees, Experts in Built Heritage	The EA Study Area includes built heritage features and cultural landscapes. These must be carefully considered in the planning, design and construction of any public transit facilities.	The identification and mapping of Built Heritage Features, Heritage Conservation Districts, and Cultural Landscapes are required in the EA. The EA will complete that assessment in further detail following the requirements of the Ministry of Culture. The work will also identify potential impacts and required mitigation measures satisfactory to the Ministry of Culture to ensure that cultural heritage features are identified and protected in the planning and design of the facility and as part of any post EA processes.  Heritage impact statements will be prepared where any transit facilities will be constructed through Heritage Conservation Districts. Through the EA process, York Region will commit to examining how the interpretation of the historic nature of the area will be implemented. If necessitated by the level of impacts to heritage resources, recommendations for a Cultural Heritage Management Plan will be developed for the EA Study Area. The Plan will address potential impact and mitigation that might arise during the study.



**Glossary:**

MOE – Ministry of the Environment  
MNR – Ministry of Natural Resources  
DFO – Department of Fisheries and Oceans  
TRCA – Toronto and Region Conservation Authority  
EC – Environment Canada  
CEA Agency – Canadian Environmental Assessment Agency  
RVTE – Rare, Vulnerable, Threatened or Endangered species





## **APPENDIX B**

### **METHODOLOGIES TO ASSESS ENVIRONMENTAL EFFECTS**



## **Markham North-South Link Corridor Public Transit Improvements Environmental Assessment Terms of Reference**

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The following summarizes the scope of the key studies or tasks that will be undertaken to inform the evaluation process, development of the preferred alternative design and mitigation measures.

### ***Planning Objectives***

Official Plans and related documents for both York Region and the City of Toronto will be used as the basis for assessing the impacts of alternatives on the achievement of planning objectives. Some of these objectives were described in Section 2 of this ToR. In the EA Study there will be an on-going need to ensure that development of alternatives are consistent with the long term planning objectives of both York Region and the City of Toronto.

### ***Natural Environment Impacts***

The existing conditions in the study area related to natural sciences, including physiography and soils, geology/hydrogeology, aquatic habitat and communities, vegetation and vegetation communities, wildlife and wildlife habitat and designated natural areas will be described in the EA Study. Field investigations will be conducted during the appropriate seasons in order to obtain existing conditions data and will be of sufficient scope to gain all necessary and required approvals. The identification of environmental features and relevant mapping of environmental constraints and deficiencies will be presented.

Following the analysis of existing conditions, the potential environmental effects resulting from the undertaking and its alternatives will be described and environmental protection/mitigation measures to avoid/prevent, control/mitigate, or compensate for adverse effects, or enhance positive effects will be identified. Specific environmental/mitigation measures will be identified for all environmental disciplines (i.e. physiography and soils, geology/hydrogeology, aquatic habitat and communities, vegetation and vegetation communities, wildlife and wildlife habitat and designated natural areas).

Among the environmental effects that should be assessed are construction effects on migratory birds. The migratory Birds Act requires that any project work and activities that may affect migratory bird habitat should be timed to occur outside of the breeding season to avoid incidental takes. The proponent shall provide information on proposed works, and activities, habitats to be altered/removed and birds using the project site to the appropriate agencies. Timing of works (construction, maintenance, operation) shall be scheduled to avoid significant environmental effect on migratory birds. If the breeding season cannot be avoided, specific surveys for breeding birds should be conducted as part of the EA to identify species and breeding sites.

In addition to the natural sciences effects assessment, detailed studies of air quality and water quality and quantity will be undertaken as described below.

### **Air Quality Assessment**

Air quality effects will be addressed and included in the Environmental Assessment along with mitigation plans to ensure that residences within the project study area are not adversely affected by the undertaking. Identified effects will be discussed in the context of Regulation 346 of the Environmental Protection Act and related guidelines.



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Air quality monitoring data and meteorology data from MOE monitoring stations and other secondary sources will be used to determine the ambient air quality. The potential for changes in air quality due to operation of the Undertaking will be assessed for above-grade conditions, taking into account future changes in ambient air quality with and without the Undertaking.

A protocol for predicting air quality dispersion effects will be developed in consultation with MOE. The approach that has been used for the Yonge Street Transitway and the Highway 7 Transitway will be used as a basis for assessing air quality effects for the Markham North-South link. Emissions of carbon monoxide (CO), nitrogen oxides (No<sub>x</sub>), total suspended particles (TSP) and particulate matter (PM<sub>10</sub>) will be compared to provincial Ambient Air Quality Criteria (AAQC) to assess the potential for adverse effects. Respirable particulate matter (PM<sub>2.5</sub>) will also be assessed in comparison with the proposed Canada Wide Standard of 30 ug/m<sup>3</sup>.

Short-term odour effects will be predicted using a combination of odour emission rates available in literature. Assessment of potential odour emissions may incorporate available dispersion modelling techniques to evaluate the incremental change in air quality impacts of the transit facilities.

In those instances where the MOE air quality monitoring data and other secondary sources material is not sufficient to establish a baseline upon which to assess air quality effects, an independent air quality monitoring program and modelling of existing and proposed traffic flows will be undertaken to quantify impacts and net effects. This data will be used to supplement MOE data. The monitoring program will be developed in consultation with the MOE.

### Water Quality and Quantity

The construction of transit facilities and related infrastructure could require the excavation of stream or river beds, or shorelines which can result in changes to sediments and aquatic habitat, as well as terrestrial flora and fauna.

The Environmental Assessment will outline an approach for water quality and quantity monitoring before, during and after the construction of any infrastructure.

At the Detailed Design Stage, the proponent will prepare a stormwater management report to address impacts on storm water quality and quantity associated with the increase in the percentage of impervious surfaces (e.g. commuter parking lots, roadways, stations, etc.) throughout the project limits. This plan will take into account existing background information (e.g. sub-watershed information, wetland information, existing drainage conditions and future drainage conditions. The stormwater management plan will evaluate a variety of stormwater management control options to maintain, and potentially enhance, existing water quality and quantity within the project limits. Impacts from the potential use of road salt during the winter season will also be considered and appropriate mitigation measures will be identified. The stormwater management plan will be prepared in the context of the March 2003 *MOE Storm Water Management Practices Planning and Design Manual* and the *MOE Guidelines for Evaluating Construction Activities Impacting on Water Resources*.



### **Social Environment Impacts**

An assessment of socio-economic effects and proposed mitigation measures that includes information on potential conflicts over incompatible land uses, business interruptions and property impacts (if any) will be prepared and included in the environmental assessment.

The EA Study will provide a detailed inventory of existing land use and economic activity within the study area. The potential effects on existing land use and economic activity, both negative and positive, will be described. Potential conflicts within the immediately adjacent residential communities, future residential/commercial development, recreational use of the valley lands, along with any existing utilities, will be key considerations in the selection of the preferred design alternative.

Detailed assessments of noise and vibration will be conducted as described below.

#### Noise Assessment

To establish baseline noise conditions in the Study Area, noise monitoring will be undertaken to measure the ambient (existing) noise environment. This noise monitoring will be used to demonstrate the accuracy of the more reliable prediction models. A monitoring location will be selected for each section of the roadway exhibiting a major change in the type or volume of traffic and the monitoring will be conducted for at least 2 continuous 24 hour periods. The traffic should closely reflect AADT volumes on the days selected for monitoring. Noise prediction modelling of existing road traffic noise using Ontario Ministry of the Environment (MOE) modelling procedures will be undertaken. The potential noise effects of the Undertaking will also be assessed using data available from other studies, considering potential transit technology options including Bus Rapid Transit and Light Rail Transit.

The significance of noise effects will be assessed with respect to relevant guidelines including those used in other transit environmental assessments, Ministry of the Environment, Canada Mortgage and Housing Corporation (CMHC), and U.S. guidelines. The potential noise effects based on human response to sound exposure will also be examined. Where relevant, the study will refer to the experience of other transit systems in Canada.

The evaluation of noise impacts will take into consideration the changes in future ambient noise levels due to increases in vehicular traffic, and the mix of traffic, with and without the proposed Undertaking.

#### Vibration Assessment

To determine baseline vibration conditions, a vibration monitoring program will be conducted. This program will involve measurement of the ambient (existing) vibration at each section of the roadway where a major change in vibration levels is expected (due to factors such as the proximity of nearby industries, a significant change in the volume of truck traffic, a change in road design or possible impact due to nearby rail traffic).



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Vehicle vibration and off-site vibration levels, as a function of technology, distance and speed, will be estimated using the following:

- Procedures that have been or will be used to measure vibration levels for similar transit EA's.
- Vibration propagation efficiencies
- Vibration characteristics for the alternative transit technologies
- Available data from other transit systems with similar transit technologies

The potential for adverse vibration impacts will be assessed by comparing predicted off-site vibration levels to relevant guidelines used on other transit projects within the Province of Ontario. The evaluation of vibration effects will consider the changes in future ambient vibration levels due to increases in vehicular traffic, and changes in the proportions of bus and truck traffic, with and without the proposed Undertaking.

### ***Economic Environment***

Analysis of economic environment impacts will focus on potential changes (both positive and negative) to businesses located along potential routes including changes to accessibility, visibility, market potential and goods movement.

The assessment will also discuss the relationship between new transit services and development potential, and the resulting changes to municipal costs and revenues.

### ***Cultural Environment***

Cultural heritage resources including built heritage features and cultural landscape features will be inventoried and described as part of the EA Study. This will include secondary source investigations such as previous cultural heritage reports compiled for the area as well as field surveys to supplement the existing secondary source and cultural heritage information. The investigations will be undertaken by a qualified consultant.

It is expected that there will be an increased level of detail and collection of field data as the EA progresses from initial route evaluation to the design of the preferred alternative.

Extensive consultation will be required with local municipalities as well as built heritage and cultural heritage landscape experts.

### ***Transportation Service and Technical Requirements***

The transportation service analysis will build on the work carried out in the Need and Justification Study, updating analysis were required. The multi-modal travel demand forecasting model developed for the York Rapid Transit Project will be used to evaluate alternative routes and technologies.

Detailed traffic analysis will be undertaken to determine the effects of potential reductions in road capacity on traffic level of service and traffic infiltration. Mitigation strategies will be developed to minimize the effects of changes to traffic capacity.



## ***Markham North-South Link Corridor Public Transit Improvements Environmental Assessment Terms of Reference***

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The transportation analysis will also include an analysis of the impacts of the improved transit service(s) on other existing and/or proposed transit services. Specifically, the analysis will consider:

- An appropriate staging of the implementation of the service in the final corridor or corridors.
- The impacts of the improved transit service on other services such as GO Transit, TTC and existing YRT services.

The EA Study will also consider, in the refinement of alternatives, the need to integrate any improved transit services with other inter-regional transit services such as the Highway 407 BRT service. This could occur at major transit nodes such as Unionville GO station.

It is noted that the Ministry of Transportation is currently undertaking a study to examine the protection for transit on existing and proposed new 400-series highways. Accordingly, any transit initiatives proposed along the Highway 404 corridor must be coordinated with the Ministry's on-going study.

In addition, the EA Study will need to address issues that are specific to the crossing of Highway 407 including whether the existing structures are able to support a wide cross-section, the implications on traffic of not widening structures if widening is not possible, the capacity of structures to accommodate heavier transit vehicles and clearance for transit vehicles.