Transportation Improvements in the Markham Bypass Corridor South of Highway 407 Environmental Assessment

TERMS OF REFERENCE

and

Supporting Document

McCormick Rankin Corporation

Approved with amendments by the Minister of the Environment July 13, 2004

Regional Municipality of York

TRANSPORTATION IMPROVEMENTS IN THE MARKHAM BYPASS CORRIDOR SOUTH OF HIGHWAY 407

Environmental Assessment

TERMS OF REFERENCE

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1. THE PROPONENT

The proponent for the Undertaking is the Regional Municipality of York (York Region). York Region wishes to proceed with the preparation of the 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 Undertaking;
- a description of and a statement of the rationale for,
  - the Undertaking
  - the alternative methods of carrying out the Undertaking
  - the Alternatives to the Undertaking;
- a description of,
  - the environment that will be affected or that might reasonably be expected to be affected, directly or indirectly,
  - the effects that will be caused or that might reasonably be expected to be caused to the environment, and
  - 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;
- 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
- a description of any consultation about the Undertaking by the proponent and the results of the consultation.

The EA will be conducted in consultation with the affected agencies, stakeholder groups and the general public.

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 existing environment;
- A description of the public and agency consultation undertaken during the TOR preparation in addition to the Public Consultation Record provided as a separate supporting document;
- A description of how the EA Study will be carried out.

1.1 The Current Study

An Individual Environmental Assessment is completed in two parts, which includes the Environmental Assessment (EA) Terms of Reference (Part 1) and the EA Study (Part 2). The EA Terms of Reference is to provide certainty to all stakeholders that the Individual EA will be undertaken in an acceptable way. An EA Terms of Reference requires approval by the Minister of the Environment (MOE). The EA Terms of Reference has been undertaken in a manner that fully co-ordinates the requirements of both the *Ontario Environmental Assessment Act* and the *Canadian Environmental Assessment Act.*

The second part of the study is the EA during which Alternatives to the Undertaking and alternative methods of carrying out the Undertaking (alternatives) are developed, analyzed and evaluated, and the recommended alternative is selected. The EA is prepared in accordance with the approved EA Terms of Reference.

The focus of this study is to develop alternatives to address the increase in demand including the additional capacity that will be required across the York-Toronto Boundary in the vicinity of the Study Area. The initial Study Area developed in conjunction with this Terms of Reference is shown on Exhibit 1-1.

York Region has recognized the complexities associated with this study and is carrying out an Individual Environmental Assessment. The objectives for the study include the following:

Part 1 [EA Terms of Reference]

- to develop a detailed and comprehensive Terms of Reference for an Individual Environmental Assessment for Transportation Improvements in the Markham Bypass Corridor South of Highway 407.
- to identify preliminary Alternatives to the Undertaking.

Part 2 [EA Stage]

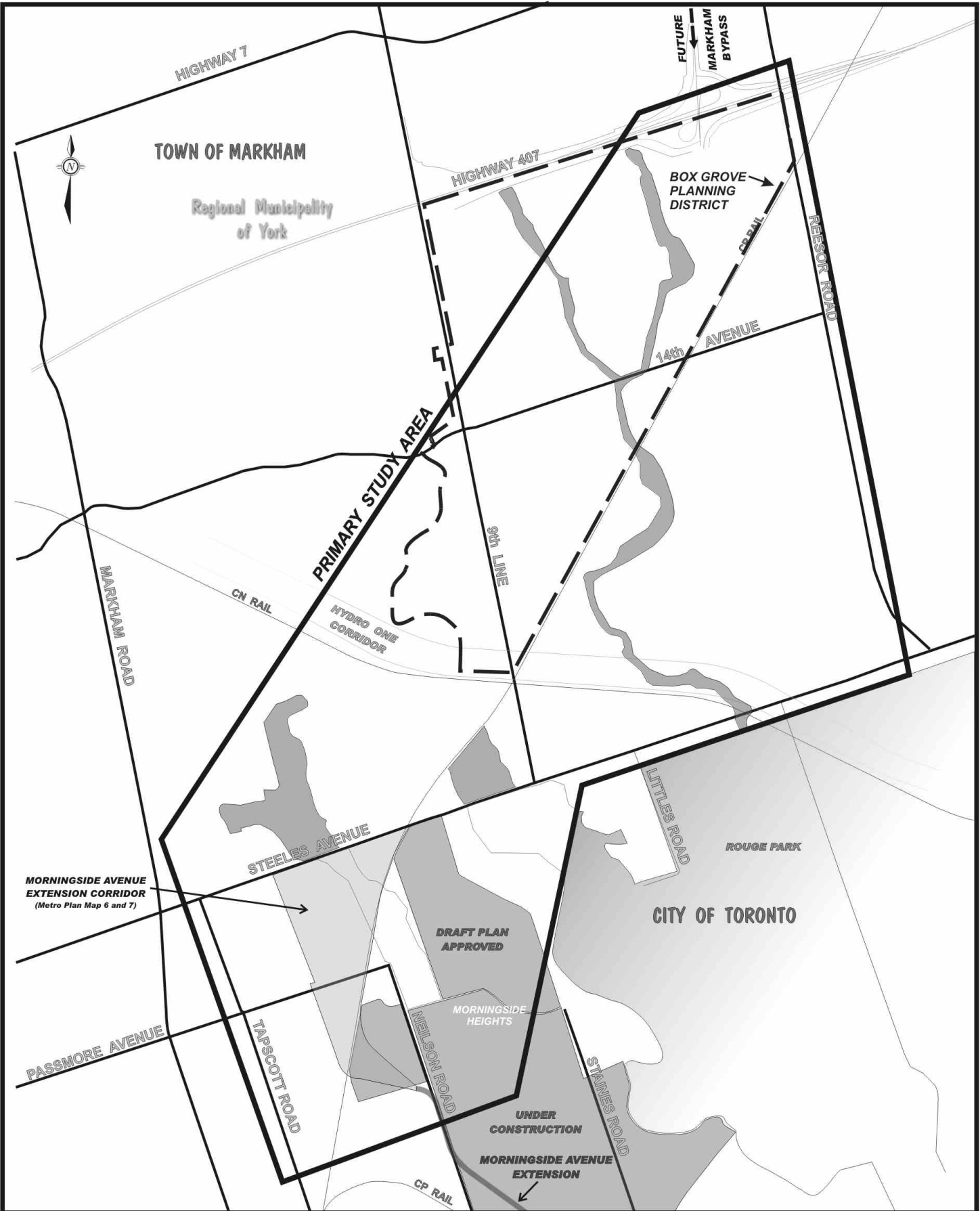
- to carry out a mini Transportation Master Plan for the Study Area.
- to assess Alternatives to the Undertaking
- to carry out the Individual Environmental Assessment of Transportation Improvements in the Markham Bypass Corridor South of Highway 407 as set out in the approved Terms of Reference, and
- to develop a detailed Construction Staging Plan.

1.2 Previous Studies

The transportation planning history in this corridor extends back to the early 1970's. The most recent studies completed which concern or make mention of transportation improvements in this corridor are listed below:

- Decision with respect to Subsection 17(34) of the Planning Act by the Ministry of Municipal Affairs and Housing with respect to the City of Toronto Official Plan, April 2003
- York Region Transportation Master Plan (York Region , June 2002)

- Markham Transportation Planning Study (Town of Markham, June 2002 and 1994)
- Finch Avenue / Morningside Avenue / CPR Grade Separation Class Environmental Assessment (City of Toronto, 2001)
- Rouge North Management Plan (2001)
- Rouge Park Management Plan (1994)
- Markham East Transportation Study – Draft (Town of Markham, 1999)
- 401 – 407 Link Route Alternatives Study (York Region and Durham, 1999)
- Markham / Scarborough Transportation Link Environmental Assessment Proposal (Town of Markham and City of Scarborough August, 1995)
- Morningside Corridor Transportation Alternative Study (Ministry of Transportation, 1995)
- Morningside Transportation Corridor Review (Ministry of Transportation, 1994)
- York Region Official Plan, July 13, 1999
- Town of Markham Official Plan, January 1999
- City of Toronto Official Plan, November 2002 (At its meeting of November 26-28, 2002, City Council adopted the new Official Plan for the City of Toronto. The Minister of Municipal Affairs and Housing approved the new Plan in part, with modifications. The Minister's decision has been appealed in its entirety. The Official Plan is now before the Ontario Municipal Board. No hearing date has been set.)
- City of Toronto Council Resolution: "At its meeting on July 8, 9, 10, 1998, City of Toronto Council endorsed the position taken by the Scarborough Community Council that it does not support any road connection between Highway 407/the Markham By-pass and Highway 401 as it is detrimental and negative to the proper planning of the Morningside Heights area."
- Box Grove Secondary Plan, Town of Markham, June 2002
- Morningside Heights Secondary Plan, City of Toronto, March 2000 (OMB No. 0318)



TRANSPORTATION IMPROVEMENTS
IN THE MARKHAM BYPASS CORRIDOR
SOUTH OF HIGHWAY 407
ENVIRONMENTAL ASSESSMENT

PRIMARY STUDY AREA

EXHIBIT
1-1

2. THE PURPOSE OF THE UNDERTAKING

The purpose of the Undertaking is to address existing and future transportation deficiencies across the boundary of the southeastern areas of the Town of Markham and the developed areas and the proposed to be developed areas of northeastern City of Toronto. Therefore, as a part of the study a reasonable range of alternatives will be considered in order to address the need within the corridor. The EA will address the requirements of both the *Ontario Environmental Assessment Act* and the *Canadian Environmental Assessment Act* (subject to confirmation of CEAA applicability). The Study Area as shown on Exhibit 1-1 is within the area bounded by Markham Road to the west, Reesor Road to the east, Finch Avenue to the south and Highway 407 to the north, and is here after referred to as the Markham Bypass Corridor south of Highway 407. The boundaries of the Markham Bypass Corridor reflect the fact that portions of Toronto east of the intersection of 9th Line and Steeles Avenue are not proposed to be developed.

There has been a long recognized travel demand for trips crossing the York-Toronto Boundary (Steeles Avenue). According to the *York Region Transportation Master Plan* (YTMP), June 2002, approximately 47 % of the work trips generated in the AM peak hour by York Region residents are destined to Toronto. With this significant flow of traffic into Toronto many of the arterials in the southern portion of York Region are congested during the peak periods.

The southeast quadrant of York Region in the Town of Markham is particularly congested. Examination of any road or transportation system map of the GTA will clearly show that there is a network of continuous arterial road links connecting York Region and Toronto at 2 km intervals, except within the Study Area. From Markham Road to the York –Durham boundary, there is no arterial link between York Region and Toronto, a distance of about 6.7 km. This lack of a continuous transportation corridor link is creating a congested transportation network in the Study Area during the peak travel peak periods and limits opportunities with regard to development of effective transit services.

There are also no north-south freeway links in York Region, City of Toronto or Durham Region east of Highway 404 (Don Valley Parkway). Numerous previous studies have concluded that there is a need for a transportation corridor link connecting York Region, and in particular southeast Markham to northeast Toronto. This work dates back to the 1950's with the most current work being completed in 1998.

The purpose of the EA will be to address the capacity deficiencies between southeast Markham and northeast Toronto. The interaction of travel demand between York Region and Toronto is anticipated to grow as population and employment levels increase in York Region, Toronto and Durham Region. The existing and forecast population and employment growth from 1991 to 2021 is summarized in Tables 2-1 and 2-2.

Table 2-1 Population Growth

Year	Population		
	York	Toronto	Durham
1991	504,800	2,276,000	409,000
2001	772,000	2,594,200	527,000
Cumulative Growth Rate 1991 to 2001	1.53	1.14	1.29
2021	1,195,000	2,914,700	850,000
Cumulative Growth Rate 2001 to 2021	1.55	1.12	1.61

Table 2-2 Employment Growth

Year	Employment		
	York	Toronto	Durham
1991	248,000	1,146,200	156,000
2001	386,000	1,453,500	166,000
Cumulative Growth Rate 1991 to 2001	1.56	1.27	1.06
2021	655,000	1,719,500	311,000
Cumulative Growth Rate 2001 to 2021	1.70	1.18	1.87

Source: Census Canada and York/Durham/Toronto estimates

As can be seen from the above projections, significant increases in population and employment within and surrounding the Study Area are anticipated over the next 20 years. A significant amount of this population and employment is within the Town of Markham. The Town of Markham population was 205,000 in 2001 and is projected to increase to 300,000 by the year 2021. Employment is expected to increase by 60% to 184,000 by 2021 (*Markham Transportation Planning Study*, June 2002). This growth will generate a proportionate increase in travel demand.

Recently, both York Region and the Town of Markham have completed an investigation of the transportation system which includes the YTMP and the *Markham Transportation Planning Study* (MTPS). Both of these studies have confirmed that improvements to the transportation network are required to accommodate the future demand. Travel demand across the York-Toronto boundary is particularly significant within the Study Area. As noted, approximately 47% of all a.m. peak period work trips are destined to the City of Toronto. Currently, 79% of these trips are auto, resulting in the congestion of the north-south network. According to the MTPS, more of a balance between trips travelling north from Toronto across the Steeles Avenue border is occurring, which is leading to congestion in both the north and south directions. For every 70 trips travelling north from Toronto there is almost 100 trips travelling south from York Region.

The YTMP has concluded that road improvements alone cannot address the future increase in travel demand, and a significant increase in transit use will be required. The provision of a Markham Bypass transportation corridor into the City of Toronto is recommended as a major network improvement initiative.

A review of existing conditions has indicated that a number of roads within the Study Area are already operating at, or beyond practical capacity. The existing transit mode

split crossing into the City of Toronto is in the range of 12%. The need for additional capacity within the transportation network already exists.

The YTMP and MTPS note that the transit mode split must increase in order to address future demand. By 2011 and 2021, road improvements and transit improvements alone/separately would not address the transportation deficiency in the Study Area.

In the early 1970's and the 1980's the Ministry of Transportation (MTO), began planning for a north-south transportation link in the southeast Markham/northeast Scarborough/southwest Pickering area. This link was originally known as the East Metro Transportation Corridor (the "EMTC"). York Region supported this initiative. The EMTC was contemplated as a Freeway standard facility.

Although planning and transportation studies conducted in the 1970's and 1980's by MTO and the upper and lower tier municipal jurisdictions in the area continued to recognize the need for the EMTC as a freeway, no action was taken to complete the necessary formal planning and EA work to secure approval for the facility and protect a corridor from development pressures.

In 1994, the Province undertook a study entitled the "Morningside Transportation Corridor Review". This study concluded that:

- A six lane major arterial road is required in the Morningside Corridor to support the anticipated development in West Durham and Southeast York by the year 2011; and,
- A four lane facility would be required in the short term in conjunction with development in the Northeast Scarborough area.

The study also concluded that any facility should be a "municipal" roadway and not a "provincial" facility.

In 1995, the Province initiated a further study regarding the Morningside Corridor. The *Morningside Corridor Transportation Alternative Study*, examined transportation alternatives associated with linking Highways 401 and 407. The study concluded that construction of a six-lane freeway (highway) within the Morningside Corridor was justified however, it was also recognized that a six-lane high standard (major) arterial linking Highways 401 and 407 might be a more practical solution than a freeway given potential environmental and social impacts. It was also concluded that a six-lane high standard arterial would be necessary to support the levels of development proposed in both York, Durham and northeast Toronto A high degree of transit usage was also identified as a key component of overall transportation service in the area.

The most recent work was completed in 1998 as part of the OMB Hearing for the Morningside Heights Secondary Plan. The hearing led to the adoption of Scarborough OPA 974, the Morningside Heights Secondary Plan, and the associated amendments to Schedule 'C', the Roads Plan, and to Metropolitan Toronto Official Plan (MetroPlan). The fan shape protecting for transportation corridor improvements is delineated in the amended Maps 6 and 7 of the MetroPlan. The Morningside Heights Secondary Plan provides for an alignment in the Buffer Reserve south of the CP rail line and contains the policies in Section 4.34.2.25 which permit York Region to carry out this EA Study as a proponent for the Undertaking. The corridor area is shown in Exhibit 1-1.

Since the need and justification work completed in 1998, existing and future population and employment forecasts have been updated within the Greater Toronto Area (Table 2-1 and 2-2). There has also been a decision by the Oak Ridges Moraine Task Force to allow development on the Seaton lands in north Pickering. The Greater Toronto Airport Authority (GTAA) has also initiated feasibility work on a possible Pickering Airport. Therefore, with all the changes within and surrounding the Study Area, an update of the need and justification was required.

A need and justification analysis will be undertaken at the start of the EA to assess the existing and future operating conditions within and adjacent to the Study Area and will include demand modelling and transportation analysis for the 2011, 2021 and 2031 planning horizons. The demand modelling and transportation analysis will consist of a screenline analysis of the Study Area.

Without improvements to increase the capacity and flexibility of the north-south transportation system, the following transportation/traffic related impacts can be anticipated with some certainty:

- Peak period congestion will continue to increase in severity over time within the Study Area including along sections of Markham Road, 9th Line and Townline Road;
- Increased congestion on the surrounding road system will decrease the "capacity life" and accelerate the need for upgrading/widening improvements of other arterial facilities, such as Markham Road north of Highway 407;
- Increased congestion will limit the development of effective transit services.
- Increased congestion on the surrounding road system will compromise the safe traffic operations on the road network, for not only vehicles, but for pedestrians and cyclists as well;
- Increased congestion on the surrounding road system will increase the likelihood of motorists "short cutting" through adjacent residential communities;
- Increased congestion and lack of north-south network flexibility may affect emergency service response times. This should be of particular concern given the significant planned residential development in and around the Study Area.

The purpose of the Undertaking is to address existing and future transportation deficiencies in the Study Area. The Environmental Assessment will consider a range of transportation corridor improvements to address the need within the proposed Study Area. The recommendations of the previous studies have been provided in order to explain the history of the corridor, not to identify a potential preferred alternative. The determination of a preferred Alternative to the Undertaking, alternative methods to carrying out the Undertaking, and the Undertaking will be determined as part of the EA Study.

3. THE ALTERNATIVES

3.1 Alternatives to the Undertaking

As part of the EA Terms of Reference process, Alternatives to the Undertaking have been identified. A wide range of Alternatives to the Undertaking must be considered in order to ensure that all potential opportunities within the corridor will be considered as part of the EA Study.

Alternatives to the Undertaking are those alternatives that are functionally different, such as addressing the needs by transit or by road. Alternative transportation strategies have been identified to address existing and future problems and needs in the network. The Alternatives to the Undertaking will be subject to an analysis and evaluation in the EA. The Alternatives to the Undertaking for Transportation Improvements in the Markham Bypass Corridor South of Highway 407 include the following:

- Do Nothing
- Widen Existing Roads (Base Case)
- Widen Existing Roads beyond Base Case
- Base Case plus dedicated transit facility
- Base Case plus Transit Initiatives
- Base Case plus Transportation Demand Management
- Base Case plus Transit Initiatives and Transportation Demand Management (TDM)
- Base Case, plus a New Road Alignment (Markham Bypass Corridor South of Highway 407)
- Base Case, plus Transit Initiatives, TDM plus a New Road Alignment (Markham Bypass Corridor South of Highway 407)

Each of the Alternatives to the Undertaking is briefly described in the following sections. A full description of the alternatives will be provided in the EA. It should be noted that the above list of Alternatives to the Undertaking is not considered to be a complete list of all alternatives and that other reasonable alternatives may be brought forth as the study proceeds into the EA. Therefore, if there are other reasonable Alternatives to the Undertaking identified during the EA, as a result of agency or public comment, the additional Alternatives to the Undertaking will be included in the assessment.

3.1.1 Do Nothing

"Do Nothing" is considered to be 'status quo', where the road network would remain as it is today. (This alternative will be considered for comparison purposes only.)

A review of existing conditions has indicated that a number of the roads within the Study Area are currently operating at or beyond practical capacity. Therefore the need for additional capacity in the network already exists.

3.1.2 Widen Existing Road (Base Case)

Widening of the existing road network is the provision of additional lanes in order to meet travel demand. The Base Case for the 2011 and 2021 transportation network includes planned infrastructure improvements to both the north-south and east-west road network.

3.1.3 Widen Existing Roads beyond Base Case

The Base Case described in Section 4.1.2 would represent road widenings that are planned in municipal Official Plans. The Widen Existing Roads beyond Base Case will consider infrastructure improvements beyond what is currently planned in municipal Official Plans.

This Alternative to the Undertaking would typically include arterial roads with eight lanes or more. Although arterial roads with more than six lanes are discouraged by municipalities, this alternative to the Undertaking will show how many additional road widenings would be required to address the demand.

3.1.4 Base Case plus dedicated Transit Facility

This Alternative to the Undertaking would typically include a dedicated transit corridor either as a stand alone facility or a transit way along a road corridor. Improved transit services and increased transit usage are significant components of the long-term transportation plan for both York Region and the Town of Markham. As a part of the Region's Transportation Master Plan a number of dedicated transit corridors are currently being planned within the Region to link Regional Centres and to link to the TTC Subway network. In and around the Study Area, the Region has identified a Regional Rapid Transit corridor for Highway 7 from the York / Peel Boundary to the York / Durham Line as well as a proposed corridor from the Markham Centre to the Sheppard Subway. The City of Toronto Official Plan (November 2002) Map 4 indicates Higher Order Transit Corridors on the CP Havelock Line, Markham Road and the Finch Hydro Corridor. This Alternative to the Undertaking will determine the type and size of corridor needed to address demand within the Study Area. GO Transit has completed the Inter Regional Bus Rapid Transit (BRT) Study. As a part of the study, the Markham Bypass to Morningside Avenue Corridor Study Area was identified as a possible corridor for the inter-regional BRT facility. Therefore, this option could consider inter-regional BRT Service.

3.1.5 Base Case plus Transit Initiatives

This Alternative to the Undertaking would typically include local bus service, railway, subway, Light Rail Transit (LRT), etc. Both York Region and the Town of Markham are currently undertaking significant transit initiatives to serve the future transportation demand in both the Town and Region. Therefore this Alternative to the Undertaking will determine the additional transit initiatives that would be required to address the demand within the Study Area. These additional transit initiatives would be implemented in support of Smart Growth initiatives for the Region.

3.1.6 Base Case plus Transportation Demand Management

Transportation Demand Management are measures that will reduce, shift or eliminate transportation demand and provide more opportunities for live-work communities. These measures could include:

- Planning for High Occupancy Vehicle (HOV) Lanes;
- Providing car-pool lots;
- Park 'n' Ride Facilities;
- Ridesharing programs; and
- Planning more transit accessible communities by municipalities.

Transportation Demand Management measures such as car pool lots and transit routes that will have transit priority measures such as either High Occupancy Vehicle (HOV) lanes or Reserved Bus Lanes (RBL) have been identified as part of the York Region's long term transit plan. This Alternative to the Undertaking will determine the type of Transportation Demand Management needed to address the additional demand within the Study Area that cannot be supported by the Region's current plans.

3.1.7 Base Case plus Transit Initiatives and Transportation Demand Management (TDM)

Improved transit services and increased transit usage are significant components of the long-term transportation plan for both York Region and the Town of Markham as noted earlier. This Alternative to the Undertaking includes both transit initiatives and TDM with the Base Case.

York Region has completed extensive planning to develop a transit network (YTMP), which maximizes the opportunity for transit mobility throughout the Region. As a part of the plan, a wide range of services are to be provided. The rapid transit network component would be comprised of the following four major corridors:

- Yonge Street from Steeles Avenue to Newmarket
- A corridor parallel to Jane Street form Steeles Avenue to Highway 7
- A corridor linking the Markham Centre to the Sheppard Subway
- Highway 7 across the entire Region.

Both the Yonge Street and Highway 7 corridors will form the major north-south and east-west spines of the transit network. The rapid transit corridors will be fed by a grid of network bus services. Many of the routes will have transit priority measures that would include either High Occupancy Vehicle (HOV) lanes or Reserved Bus Lanes (RBL).

Improvements to GO Transit Service have also been identified as a transit initiative, which includes improvements to the existing Bradford GO Line, Richmond Hill GO Line and Stouffville GO Line. As part of the 2031 transit network expansion of GO Service has been identified for the CP Havelock Line through the Study Area. Other improvements to the transit network would include: freeway express bus service, commuter parking lots, rural bus routes, community transit and specialized services (for those groups unable to access conventional transit services).

3.1.8 Base Case, plus a New Road Alignment (in the Markham Bypass Corridor South of Highway 407)

This Alternative to the Undertaking would be the Base Case and a new road alignment. The new road alignment will initially be assumed as a four-lane facility located in the Markham Bypass to Morningside Avenue Corridor.

3.1.9 Base Case, Transit Initiatives and TDM, plus a New Road Alignment (in the Markham Bypass Corridor South of Highway 407)

This Alternative to the Undertaking would be a combination of the Alternatives to the Undertaking discussed in Section 3.1.7 and Section 3.1.8. The new road alignment will initially be assumed as a four-lane facility.

As discussed in section 3.1.7, York Region is undertaking numerous transit initiatives to achieve a high transit mode share within the Region. There would be opportunities for the Region to provide additional transit initiatives, such as HOV lanes, RBL or a separate right–of-way specifically for transit adjacent to any new road alignment. These additional transit initiatives would not change the transportation demand; however, they would provide additional opportunities for the Region to achieve its desired transit mode share.

3.2 Assessment of Alternatives to the Undertaking

As noted above, each of the Alternatives to the Undertaking generally build on each other to form transportation network options. The improvements to the network have been based on the recommendations of the York Region Transportation Master Plan for both transit and the road network.

Each alternative will be assessed based on the following criteria:

- Socio-Economic Environment Effects – addresses the effects on the components of the environment that are ‘man-made’ and is a measure of the effects on community features.
    - Property Effects
    - Land Use
    - Impacts to Future Development
- Cultural Environment Effects – address the effects or extent of displacement or disruption of known archaeological or built heritage sites.
    - Archaeological Resources
    - Built Heritage Resources / Cultural Landscapes
- Natural Environment Effects – addresses the effects of the alternatives on the natural environmental features including the disruption and / or displacement of the following:
    - Fisheries and Aquatic Habitat
    - Surface Water Quality and Quantity

  - Wetlands
  - Vegetation
  - Wildlife

- Transportation Benefits – identifies the extent to which the alternatives can provide a reasonable transportation service.
  - Network Compatibility
  - Flexibility for Future Expansion
  - Safety (for example, design criteria and typical accident rates)
- Cost – identifies the cost to build or implement the alternative, and maintain / operate

Each of the Alternatives to the Undertaking discussed previously will be carried forward to the EA Study. A pre-screening of Alternatives to the Undertaking will be carried out as part of the EA to determine which alternatives may not be given full examination and evaluation, because they are considered unreasonable or do not address the purpose of the Undertaking. Any pre-screening will be based on key criteria determined during the EA Study based on the evaluation criteria currently provided in the Terms of Reference.

Using the groupings (Socio-Economic Environment, Cultural Environment, Natural Environment, etc.) and factors (property effects, archaeological resources, wetlands, etc.) identified above, a multi-disciplinary analysis and evaluation will be conducted to identify the preferred Alternative to the Undertaking. Prior to the analysis and evaluation the Project Team will review the analysis framework prepared as part of the EA Terms of Reference to confirm and update or refine as necessary. In addition, the Ministry of Environment and other agencies as necessary will be consulted during the analysis and evaluation process in order to obtain their insight and perspective.

As required by the Environmental Assessment Act the Alternative to the Undertaking with the greatest overall benefit will be selected. In order to select an Alternative to the Undertaking, the mitigation measures for the identified impacts of each Alternative to the Undertaking would need to be identified. In addition, the determination of "net effects" (i.e. the effects of an alternative with the mitigation measures implemented) would also be considered in the selection of a preferred Alternative to the Undertaking.

The public will have the opportunity to comment on the analysis and provide input as part of the Public Consultation Centres.

4. ENVIRONMENTAL ASSESSMENT STUDY AREA, THE ENVIRONMENT AND POTENTIAL EFFECTS

As part of the EA Study, the Study Area will be reviewed and confirmed to determine whether or not any revisions would be necessary. The Study Area will be used to determine the potential effects of the Alternatives to the Undertaking, alternative methods to carrying out the Undertaking, and the preferred Undertaking on the environment.

4.1 Study Area Development

At the beginning of the Terms of Reference component of the study, an Initial Study Area was established. The Initial Study Area is shown on Exhibit 1-1 and is within the area bounded by Markham Road to the west, Reesor Road to the east, Highway 407 to the north and Finch Avenue to the south.

The Morningside Avenue extension corridor as delineated in the amended Maps 6 and 7 of the MetroPlan (not included in the Terms of Reference) is included as part of the Study Area. The Morningside Heights Secondary Plan provides for the Buffer Reserve south of the CP Rail Havelock Subdivision.

The rationale for the geographic limits of the initial Study Area to describe the environment that would most likely be affected by the Undertaking and its alternatives was identified using the following guidelines:

- The constraints and opportunities with the Study Area as identified through an inventory of the existing and planned environment.
- The concept of transportation improvements in the Markham Bypass Corridor south of Highway 407 as outlined in York Region's Transportation Master Plan.

The Primary Study Area was presented to the public in December 2002 for review. Comments were received at the Public Consultation Centre, which noted that the Study Area should be extended to include a connection to Meadowvale Road in the City of Toronto through the Rouge Park, an area of Toronto not proposed for development. The inclusion of Meadowvale Road into the Study Area was reviewed by the Project Team in terms of the socio-economic environment, natural environment, agriculture, transportation and cost. The Meadowvale Road corridor analysis was presented to the public at Public Consultation Centres held June 12 and 17, 2003. At an early stage in the EA Study, the Study Area and the inclusion of the Meadowvale Road corridor as an alternative method will be assessed in order to determine whether or not the Meadowvale corridor should be included in the Study Area. This assessment will be carried out using those evaluation criteria for the alternatives to the undertaking and alternative methods of carrying out the undertaking (as set forth in Section 6.5) which are most applicable at an appropriate level of detail.

During the EA, if an adverse environmental effect is determined to have impact outside of the EA Study Area; the Study Area will be expanded for the purpose of evaluating the full impact of the identified adverse environmental effect. In addition, it should be noted that should a federal assessment be required, the scope of the assessment may differ from the EA Study Area as a federal assessment will be required to assess cumulative and trans boundary effects.

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 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. Criteria will be developed early in the EA process in consultation with appropriate agencies/parties to determine the necessity to expand the Study Area.

The Study Area will be confirmed by the EA such that the study boundaries will include all of the alternatives.

4.2 Description of the Existing Environment

As part of the EA Terms of Reference a preliminary review of the existing conditions within the Study Area was carried out. The existing conditions are described based on the broad groupings of:

- Socio-Economic environment
- Cultural Environment
- Natural environment
- Agriculture
- Transportation (road and transit network)
- Contaminated Materials
- Utilities

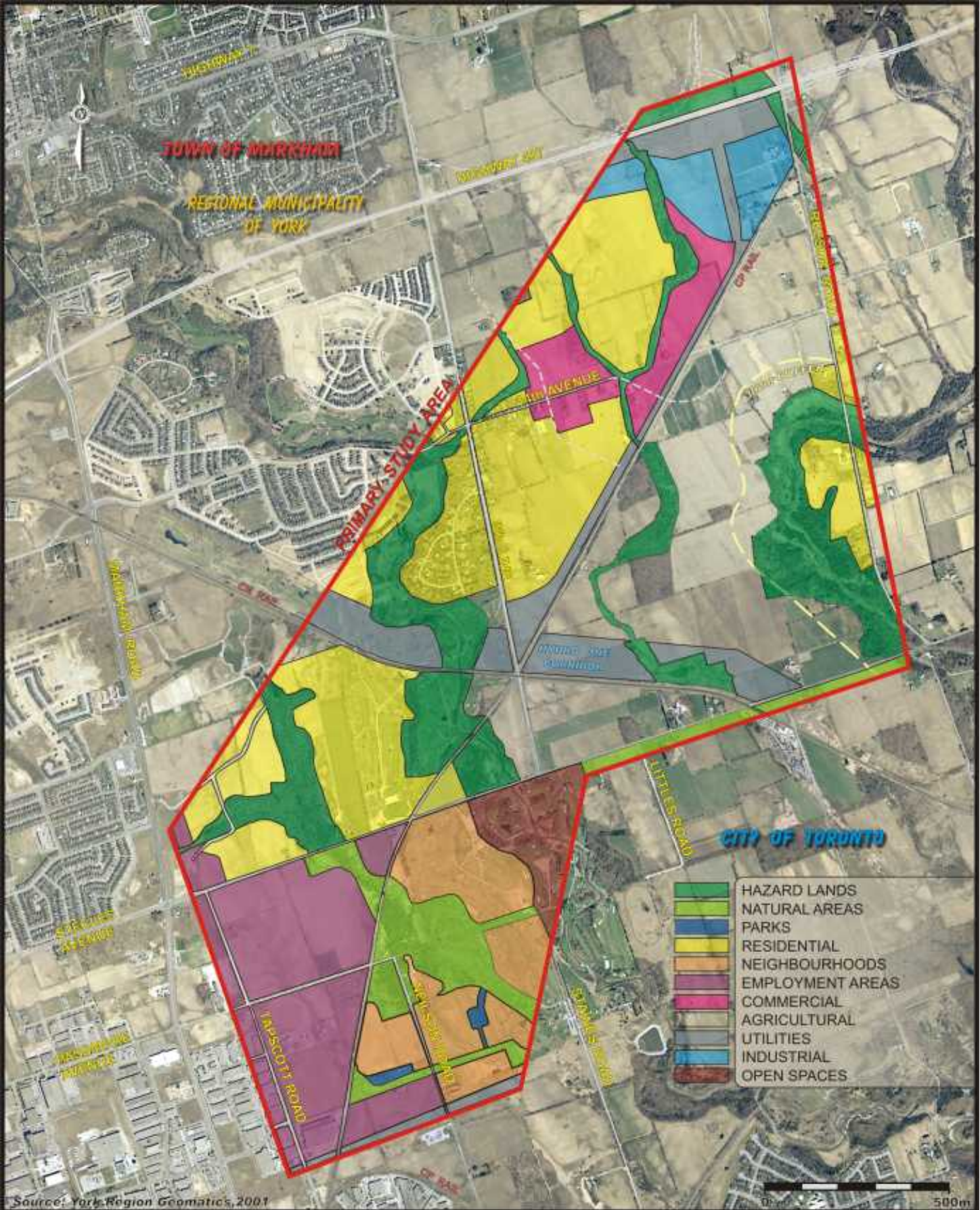
4.2.1 Socio-Economic Environment

The socio-economic environment is the component of the environment that is 'man made'. The following provides a brief overview of the socio-economic environment within the Study Area, including existing and future land use, and heritage features.

4.2.1.1 Existing and Future Land Uses

The Study Area includes a mix of land uses that are shown on Exhibit 4-1.

In the City of Toronto, the land use west of the CP Rail Havelock Subdivision is designated mainly as an employment area with a small natural area. Within this area is the Morningside Avenue extension corridor as delineated in the amended Maps 6 and 7 of the MetroPlan. The Morningside Heights Secondary Plan provides for the Buffer Reserve south of the CP Rail Havelock Subdivision. South of the CP Rail Havelock Subdivision, Morningside Heights is designated as neighbourhood, and open space, which includes the Cedarbrae Golf and Country Club and a number of natural areas and parks. The Morningside Heights area immediately south of Steeles Avenue is draft plan approved for residential development.



TRANSPORTATION IMPROVEMENTS IN THE MARKHAM BYPASS CORRIDOR SOUTH OF HIGHWAY 407 ENVIRONMENTAL ASSESSMENT	PLANNED LAND USE	EXHIBIT 4-1

In the Town of Markham the land use west of 9th Line includes residential, utilities and hazard lands. The area designated as utilities is the Hydro One Corridor and the area designated as hazard lands includes the Rouge River and the Morningside Tributary. The golf course is within the area designated as residential.

East of 9th Line the existing land uses are predominantly agriculture / open space with some rural residential. Hazard lands include the Little Rouge Creek and one of its tributaries. The Hydro One corridor continues through this section of the Study Area. The future land use includes the Box Grove Planning District. The proposed land uses within this area include; residential, industrial, commercial, transportation and utility, Hazard Land, and Environmental Protection Area. The Secondary Plan for the Box Grove Planning District is shown conceptually on Exhibit 4-1.

4.2.2 Cultural Environment

A field survey was carried out within the Study Area to identify the Built Heritage Features and Cultural Landscapes. Table 4-1lists the Built Heritage Features (BHF) and Table 4-2 lists the Cultural Landscapes Unit (CLU) identified.

Table 4-1 Built Heritage Features

No.	Feature Type	Feature Category	Location/Description
1.	BHF	Residence	No. 7885 Reesor Road, east side, listed on *Markham Inventory of Heritage Buildings* and within the proposed Cedar Grove HCD boundaries.
2	BHF	Residence	No. 7765 Reesor Road, northeast corner of 14th Avenue and Reesor Road. Listed on *Markham Inventory of Heritage* Buildings and within the proposed Cedar Grove HCD boundaries.
3.	BHF	Residence	No. 7273 14th Avenue. Set at a distance from the road, partially visible. Listed on Markham Inventory of Heritage Buildings and within the proposed Cedar Grove HCD boundaries.
4.	BHF	Residence	No. 7277 14th Avenue. Set at a distance from the road, partially visible. Listed on Markham Inventory of Heritage Buildings and within the proposed Cedar Grove HCD boundaries.
5.	BHF	Residence	No. 7166 14th Avenue, 19th century residence with an associated poured concrete silo behind. Listed on Markham Inventory of Heritage Buildings.
6.	BHF	Residence	No. 7124 14th Avenue, dichromatic brick house, 19th century. Listed on Markham Inventory of Heritage Buildings.
7.	BHF	Residence	No. 7181 Reesor Road, east side. Listed on Markham Inventory of Heritage Buildings and within the proposed Cedar Grove HCD boundaries.
8.	BHF	Residence	No. 7218 Reesor Road, west side, Ontario government owned property set at a distance from road, visible from Steeles Avenue east in late Fall. Winter. Double set of stone gateposts on Reesor Road. And Within the proposed Cedar Grove HCD boundaries.
9.	BHF	Residence	No. 7107 Reesor Road, east side, within the proposed Cedar Grove HCD boundaries.
10.	BHF	Railway Viaduct	CN Viaduct over Rouge River, west of 9th Line, north of Steeles Avenue, Town of Markham.
11.	BHF	Railroad Bridge	CN, construction date on bridge 1963. Included in Rouge Valley Park Project Inventory (September 1991).
12.	BHF	Residence	No. 6351 Steeles Avenue east, south side, Demond – Ingleton House 1844 to 1890 residence. City of Toronto (Scarborough). Listed on the City of Toronto's Inventory of Heritage Properties.
13.	BHF	Silo Ruin	Tapscott Road, east side. City of Toronto (Scarborough).

No.	Feature Type	Feature Category	Location/Description
14.	BHF	Residence	No. 1051 and 1021 Tapscott Road, Scarborough Historical Society plaque, stone house built 1861 by James Weir. Designated Part IV, OHA. Listed on the City of Toronto's Inventory of Heritage Properties.

Table 4-2 Cultural Landscape Units

No.	Feature Type	Feature Category	Location/Description
1.	CLU	Roads cape	Reesor Road, between Highway 407 and Steeles Avenue east. Documented between Hwy. 7 and 14th Ave. as a cultural landscape for Highway 407 East Partial extension (2001) as requested by MCL.
2.	CLU	Farm Complex	No. 8119 Reesor Road, east side. Listed on *Markham Inventory of Heritage Buildings*, evaluated as Group 2 (of significance and worthy of preservation).
3.	CLU	Farm Complex	No. 8042 Reesor Road. Listed on *Markham Inventory of Heritage Buildings*, evaluated as Group 2 (of significance and worthy of preservation).
4.	CLU	Farm Complex	No. 7960 Reesor Road. Listed on *Markham Inventory of Heritage Buildings*.
5.	CLU	Farm Complex	No. 7939 Reesor Road. Listed on *Markham Inventory of Heritage Buildings*.
6.	CLU	Railscape	CN, this line crosses Reesor Road, 14th Avenue and 9th Line above Steeles Avenue east, and Steeles Avenue east.
7.	CLU	Farm Complex	No. 7833 Reesor Road. Listed on *Markham Inventory of Heritage Buildings* and within the proposed Cedar Grove HCD boundaries.
8.	CLU	Farm Complex	No. 7784 Reesor Road. Listed on *Markham Inventory of Heritage Buildings* and within the proposed Cedar Grove HCD boundaries.
9.	CLU	Historical Settlement/ Proposed Heritage Conservation District	Historical settlement of Cedar Grove, proposed HCD boundaries from just north of 14th Ave. south to Steeles Avenue east. It includes farm complexes and individual residences, Lapp's Cider mill (designated Part IV, *OHA*), the Rouge River water crossing, Rouge Valley Mennonite Church and cemetery, Cedarena, Cedar Grove Park at Steeles Avenue east. Numerous properties are listed on *Markham Inventory of Heritage Buildings*.
10.	CLU	Waterscape(s)	Rouge River at Reesor Road (within the proposed Cedar Grove HCD boundaries) and tributaries that cross 14th Ave. within Study Area.
11.	CLU	Farm Complex	No. 7551 Reesor Road, main complex out of Study Area but agricultural lands within and within the proposed Cedar Grove HCD boundaries.
12.	CLU	Roadscape	14th Avenue from just east of intersection with Reesor Road west to eastern limits of Box Grove.
13.	CLU	Historical Settlement/ Proposed Heritage Conservation District	Box Grove, crossroads of 9th Line and 14th Avenue including residences, water crossing, church and cemeteries.
14.	CLU	Farm Complex	7447 and 7449 9th Line, 19th century, two farmhouse, 1 stone, 1 frame, large gambrel barn. Listed on *Markham Inventory of Heritage Buildings*
15.	CLU	Farm Complex	No. 6741 Steeles Avenue east, south side, City of Toronto (Scarborough). 19th century farmhouse and barn with outbuilding. Designated under Part IV *OHA*. Included in *Rouge Valley Park Project Inventory* (September 1991).
16.	CLU	Farm Complex	No. 6742 Steeles Avenue east, north side, large farmhouse with 19th century and 20th century sections, large barn complex. Listed on *Markham Inventory of Heritage Buildings*.
17.	CLU	Waterscape	Little Rouge River at crossing of Steeles Avenue east, west of 9th Line and within Study Area.

No.	Feature Type	Feature Category	Location/Description
18.	CLU	Farm Complex	No. 6545 Steeles Avenue east, south side, City of Toronto (Scarborough), Hamill House 19th century, farmhouse, barn, silo and outbuilding. Included in *Rouge Valley Park Project Inventory* (September 1991). Listed on City of Toronto's Inventory of Heritage Properties.
19.	CLU	Farm Complex	Nos. 6470 and 6472 Steeles Avenue east, north side. Both addresses listed on *Markham Inventory of Heritage Buildings*. Two farmhouse, large barn complex and outbuildings.
20.	CLU	Farm Complex	No. 6461 Steeles Avenue east, City of Toronto (Scarborough), Menno-Reesor House early 20th C. farmhouse, barn. Included in *Rouge Valley Park Project Inventory* (September 1991). Listed on City of Toronto's Inventory of Heritage Properties.
21.	CLU	Farm Complex	No. 6350 Steeles Avenue east, farmhouse, barn and outbuilding. Listed on *Markham Inventory of Heritage Buildings*.
22.	CLU	Roadscape	Passmore Avenue, east from Tapscott to south turn in road. Rural gravel road with grassy shoulders and ditches, hedgerows and treeline. Passmore Avenue has been recently upgraded to better serve the Morningside Heights Community. The road right-of-way is open but no longer travelled, continues east of Neilson Road to the Pickering Townline and a section will become a walkway with Morningside Heights. It is named for Frederick F. Passmore, an early surveyor.
23.	CLU	Agricultural land	Agricultural land and remnant agricultural land within the Study Area.

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (O.A.S.D.), maintained by the Ministry of Culture. Nine archaeological sites have been registered within the initial Study Area, which includes the following:

- The Fairty Ossuary - The site is a Middle Iroquoian (ca. 1300AD-1400AD) burial ground.
- The Robb site - The site features the remains of a Middle Iroquoian (ca. 1300AD-1400AD) village.
- The Faraday site - The site features the remains of a Middle Iroquoian (ca. 1300AD-1400AD) village.
- The New site - The site has been registered as a Middle Iroquoian (ca. 1300AD-1400AD) campsite.
- The Drudge site (AlGt-37) - The site represents an isolated finding of a precontact Aboriginal lithic artifact.
- The Sim Reesor 2 site - The site represents a campsite dating to the Archaic period (ca. 7,000 BC to 1,000 BC).
- The Reading site (AlGt-39) - The site represents a campsite dating to the Archaic period (ca. 7,000 BC to 1,000 BC).
- The Garnet site (AlGt-176) - The site represents a precontact Aboriginal campsite of undetermined cultural and temporal affiliation.
- The Morningside Creek site - A small number of ceramic fragments were identified at the site, possibly indicating an Iroquoian cabin site or other activity area.

In addition, eight other archaeological sites were identified in close proximity to the Study Area.

The Rouge River watershed is the known location of the alternative carrying route to the Humber Valley carrying route and has been acknowledged by the National Historic Sites and Monuments Board as a national historic site.

4.2.3 Natural Environment

The predominant natural environmental features within the Study Area are associated with aquatic systems, which include the Rouge River, Little Rouge Creek and the Morningside Tributary.

In broader terms the Study Area is located at the northern limits of the Carolinian Life Zone, near the transition into the Great Lakes – St. Lawrence Lowlands Life Zone. The Carolinian Life Zone is predominantly deciduous forest, while the Great Lakes – St. Lawrence Lowlands Life Zone is a very broad transitional area that includes elements of the deciduous forest to the south and conifer-dominant boreal forest to the north. The southern limit of the Oak Ridges Moraine is approximately 5 to 6 km to the north. The key natural areas within the Study Area are mapped on Exhibit 4-2.

4.2.3.1 Fisheries and Aquatic Habitats

As noted above, the aquatic systems are the most prominent features within the Study Area and are a mix of coldwater, migratory coldwater, warmwater urbanized, warmwater baitfish and intermittent systems. The Little Rouge Creek includes both resident coldwater and migratory coldwater fisheries. Tributaries A, B, C and D of the Little Rouge Creek are Level 2 intermittent or warmwater baitfish systems. The Rouge River system is classified as a warmwater productive zone with migratory coldwater characteristics. Also within the Study Area, the Morningside Tributary is a warmwater system with some coldwater attributes. Downstream of Morningview Trail, Morningside Tributary is a coldwater system. The 9th Line tributary is an intermittent creek that discharges into the Rouge River. Stream status / classification will reflect the most up to date information from the MNR and TRCA. Management objectives for the Rouge River watershed will be incorporated in the EA Study. All tributaries in the study area will be evaluated as part of the EA Study.

The Rouge River Fisheries Management Plan, Redside Dace Recovery Strategy (when it becomes available to the public) and Phase II Morningside Creek Subwatershed Study will be incorporated as part of the EA Study review process and documented as part of the EA Study.

4.2.3.2 Surface Water Quality and Quantity

Surface water features form an integral part of the natural landscape in this area. The most prominent watercourses, Little Rouge Creek, the Rouge River, Morningside Tributary and several small tributary creeks vary in their degree of disturbance, amount of riparian forest/shrub cover and overall ecological integrity – from relatively undisturbed, with contiguous valley forest to open, channelized reaches with very little associated natural vegetation.

Storm water management (SWM) measures will be required to protect the surface water features. The TRCA will review the proposed measures as documented in the draft EA Study and will provide details where appropriate.

4.2.3.3 Wetlands

There are no Provincially Significant Wetlands (PSWs) in the Study Area. Results from any updated or new wetland evaluations by the MNR will be incorporated into the EA review and study report.

Other wetlands are present within the Study Area. They are associated with riparian zones, floodplains and woodland blocks, most notably the Box Grove Forest. These wetlands are either unevaluated or evaluated and not provincially significant. They include small meadow marsh, cattail marsh or thicket areas as well as floodplain/slope swamps. All wetlands and aquatic features will be included in the field investigations and documented as part of the EA Study. Wetlands will be classified using the Ecological Land Classification (ELC) system for southern Ontario, by qualified and experienced staff. A thorough evaluation of all wetlands will be conducted based on ecological significance, sensitivity and function within the landscape. This will include a three-season botanical inventory, in-season wildlife surveys and a suite of evaluation factors such as connectivity, species and habitat significance (local, regional, provincial and national significance), size, level of disturbance and wildlife usage / potential etc.

All field data and wetland analyses will be made available to the MNR for their consideration in evaluation/re-evaluation of wetlands.

4.2.3.4 Vegetation

Box Grove Forest, a large woodland block associated with Tributary B of the Little Rouge Creek valleylands and tablelands south of the CP Havelock Subdivision, is the predominant natural feature in the Study Area. It is a mosaic of different habitats including deciduous swamp, mixed swamp, deciduous / mixed forest, cultural meadow and successional forest.

The Little Rouge Creek corridor in the east is a diverse, steep valley system with relatively contiguous woody vegetation cover and a diversity of habitat types.

The middle reaches of the Rouge River that flow through the Study Area are characterized by intermittent woody vegetation cover. Further downstream beyond the Study Area, the Rouge River Valley has been identified as one of 36 critical unprotected areas in Carolinian Canada.

The Morningside Tributary riparian corridor has a diverse array of associated vegetation communities including swamp, marsh, meadow marsh and forest. Immediately downstream of the former Brookside Golf Course, the creek is more disturbed and has very little woody vegetation cover.

All vegetation resources will be evaluated as part of the EA review process, with a discussion included in the EA report. All treed areas meeting the definition of woodlands under the Forestry Act (i.e. by density) will be evaluated as woodlands. All other treed areas (i.e. hedgerows, very small stands) will also be reviewed during the EA Study. Vegetation communities will be classified using the Ecological Land Classification

System. A multi-season botanical inventory will be completed for the study area as part of the EA study.

4.2.3.5 Wildlife

The landscape mosaic within the Study Area likely provides habitat for a range of common, generalist wildlife species that are tolerant of urban and semi-urban conditions. Aquatic and riparian areas provide habitat for waterfowl, herons and other water-using species.

The watercourses and associated valley / riparian zones likely provide opportunities for wildlife movement, depending on the degree of vegetation cover and presence of barriers (e.g. roads). Of these systems, the Little Rouge Creek valley likely provides the best opportunities for wildlife usage and movement, given its breadth and moderate to dense woody vegetation cover.

One provincially / nationally significant wildlife species has been identified within the Study Area: Redside Dace is considered of Special Concern nationally (Committee on the Status of Endangered Wildlife in Canada (COSEWIC)) and Threatened provincially (Committee on the Status of Species at Risk in Ontario (COSSARO)). This species was recorded in Morningside Creek downstream of the Study Area and is likely also present in the Rouge River. Habitat for this species may also be present in the Morningside Tributary and Little Rouge Creek.

There is a limited amount of habitat for forest-dependent or forest interior bird species, restricted to Little Rouge Creek and Morningside Tributary valley / associated woodland habitat.

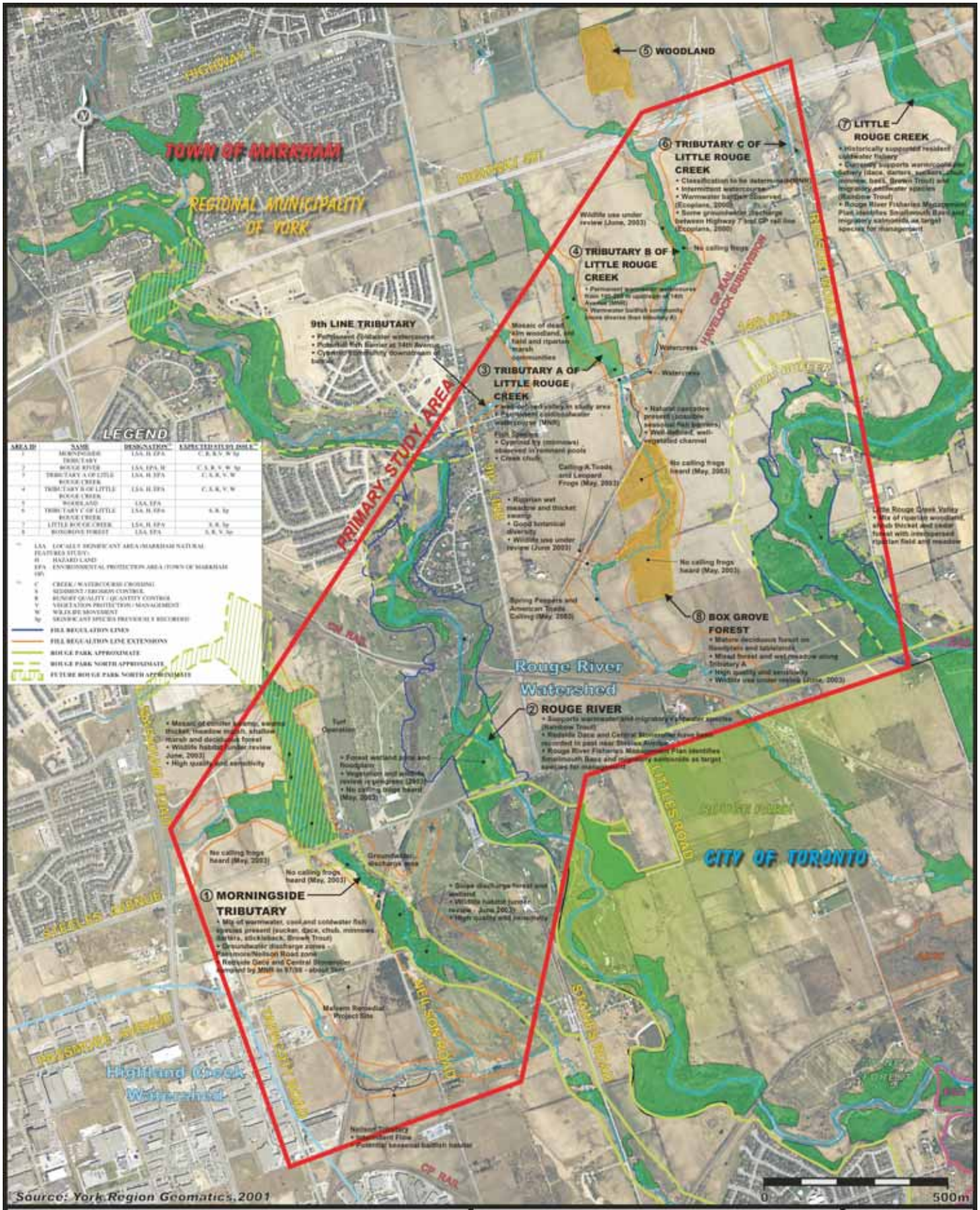
All records of locally, regionally, provincially and nationally significant wildlife species will be included within the EA analysis.

Detailed wildlife surveys will be completed as part of the EA study. These include late spring/early summer breeding bird surveys, spring amphibian surveys (calling frogs, salamander/breeding pond searches) and recording any wildlife observations during all field surveys (i.e. vocalizations, tracks, browse, scat, dens/nests etc.). Breeding bird and amphibian surveys will be conducted by qualified, experienced staff using accepted protocols and under appropriate conditions (i.e. in-season, appropriate time of day). An evaluation of wildlife habitat and wildlife movement will also be completed as part of the EA analysis.

4.2.3.6 Groundwater and Hydrogeology

A preliminary review of background information suggests that there are areas of groundwater recharge and groundwater discharge in the Study Area, often associated with aquatic systems. Much of the upper Rouge River watershed is supported by ground water discharge.

A previous study of lands to the south (in the vicinity of Finch Ave. / Morningside Ave.) identified predominantly dense silty sand overlying bedrock at depth and a shallow aquifer at greater than 4.5 m. In that study, groundwater recharge was considered to be relatively insignificant due to dense surficial soils. Moreover, there was a very limited



TRANSPORTATION IMPROVEMENTS IN THE MARKHAM BYPASS CORRIDOR SOUTH OF HIGHWAY 407 ENVIRONMENTAL ASSESSMENT	NATURAL ENVIRONMENTAL FEATURES	EXHIBIT 4-2

contribution of groundwater discharge to baseflow in Morningside Creek. In addition, detailed field investigations that have been conducted in other parts of the Study Area and secondary source information will be thoroughly reviewed as part of the EA Study.

Groundwater relationships will be an important component of the EA review process. Well record analysis and field observations will be supplemented by a secondary source review of relevant reports from Box Grove Secondary Plan / Morningside Heights Secondary Plan, as well as the York-Durham Sewage System Southeast Collector Class EA, Rouge River Highland Creek Study Area Report and the City of Toronto Wet Weather Flow Management Master Plan.

4.2.3.7 Environmentally Designated Areas

No provincially significant wetlands or provincially significant Areas of Natural and Scientific Interest – ANSIs) have been identified within the Study Area. However, any changes to the status of existing environmentally designated areas, or creation of new areas, will be incorporated into the EA Study.

A number of the natural environmental features are classified as locally significant areas (LSAs), hazard lands (HL) and Environmental Protection Areas (EPAs) that are predominantly aquatic system components and associated woodlands within the Study Area. The environmentally designated areas include the following:

- Little Rouge Creek (LSA, EPA, HL)
- Rouge River (LSA, EPA, HL)
- Tributaries A, B, C and D that discharge into the Little Rouge Creek ((LSA, EPA, HL)
- Morningside Tributary (LSA, EPA, HL)
- Box Grove Forest (LSA, EPA Regionally Significant Forest)

4.2.3.8 Special Spaces

Special Spaces are considered to be areas that have special or unique value by resource agencies, municipalities, government and/or the public. The Rouge Park North is considered to be a Special Space. The Little Rouge Creek corridor is part of the Rouge Park North. A major objective for the corridor has been identified as establishing a terrestrial corridor with interior forest conditions. The Morningside Tributary is included within Rouge Park.

4.2.3.9 Water Wells

There are approximately 79 wells located between Highway 7 and Steeles Avenue and 9th Line to Reesor Road. Well information is obtained from the Ministry of the Environment Water Well Database, which is the most comprehensive data source for groundwater information for the area. The information it provides for each well includes: location, surface elevation, depth to water found (below ground surface), static water level and stratigraphy. This information has been gathered from previous studies in the area and will be confirmed during the EA Study. Results of the previous studies have indicated that the groundwater is closest to the surface east of 9th Line between Highway 7 and 14th Avenue. As a part of the

EA Study water wells both north and south of Steeles Avenue within the Study Area will be investigated and documented.

4.2.4 Soils and Agriculture

The lands bound by the CP Havelock Subdivision / Steeles Avenue / Reesor Road / 9th Line are designated as Agriculture 3 according to the Town of Markham Official Plan (January 1999). The predominant and primary use of this land is for agricultural purposes. The majority of this land is owned by the Province of Ontario. According to the Official Plan, studies will be undertaken to determine the long term suitability for agriculture or other uses.

Based on a review of soils capability mapping, the Study Area is dominated by Class 1 soils with no limitations for crop use. There are smaller pockets of Class 1 (70%) / Class 2 (30%) soils, with moderate limitations due to adverse topography. There are occasional small areas of Class 3 soils, with moderately severe limitations due to excess water.

Based on a review of The Soil Survey of York County (1990), soils in the Study Area include several different types. Well-drained Milliken loam is widespread and dominant. Well-drained Woburn loam is prevalent along watercourses, with smaller associated pockets of poorly drained Lyons loam.

4.2.5 Transportation

The existing transportation network as shown on Exhibit 1-1 includes both the road network and the transit network. The major Roads within the Study Area are 9th Line, 14th Avenue, Steeles Avenue, Highway 407, Morningside Avenue and Reesor Road. The transit corridors within the Study Area include both CN and CP Rail.

4.2.5.1 Road Network

Both 9th Line and 14th Avenue are designated as arterial roads under the jurisdiction of York Region. Ninth Line has a 2-lane rural cross-section and is a north-south arterial road. The *Secondary Plan for the Box Grove Planning District* (June 2002) includes the realignment of 9th Line to the CP Havelock Subdivision where it would meet the proposed Town Arterial Road and continue south to where it would reconnect with existing 9th Line at the Hydro One Corridor. Existing 9th Line would be redesignated as a minor collector road. The Secondary Plan notes that the proposed Town arterial and realigned 9th Line alignment from the CP Havelock Subdivision could be used for the Markham Bypass Corridor South of Highway 407, and if so, 9th Line will terminate at the CP Havelock Subdivision as a collector or local road. The realignment of 9th Line is being planned as a four lane facility in a 36 metre right-of-way.

Existing 14th Avenue is an east-west arterial with a two lane rural cross-section. The *Secondary Plan for the Box Grove Planning District* (June 2002) includes the realignment of 14th Avenue to the south at the CP Havelock Subdivision including a potential grade separation. The maximum right-of-way width is 36 m (*York Region Official Plan, November 2002*) and according to the *Secondary Plan for the Box Grove Planning District (June 2002)* the ultimate alignment and grading of 14th Avenue at the

CP Havelock subdivision will be part of the environmental assessment for the Transportation Improvements to the Markham Bypass Corridor South of Highway 407.

Reesor Road is a north-south local road under the jurisdiction of the Town of Markham with a two lane rural cross-section. Schedule 'G' of the *Town of Markham Official Plan* (January, 1999) indicates a future road widening requirement of 26 m and Schedule 'C' shows intersection improvements at 14th Avenue.

Steeles Avenue is an east-west arterial road under the jurisdiction of the City of Toronto with a two lane rural cross-section. Steeles Avenue is located within a 36 m right-of-way which could accommodate a basic six-lane cross-section. A Class EA for Steeles Avenue was approved in 1992 for the widening to 4 lanes with a provision for bicycles. An urban cross-section was approved from McCowan to just west of 9th Line and a rural cross-section to the east. The City of Toronto has indicated that this project is in the Capital Works Program for post 2008. During the EA Study available site plans for the Morningside Heights Community will be reviewed to determine the location of additional intersections.

Morningside Avenue is an urban arterial road (36m right-of-way) under the jurisdiction of the City of Toronto, which begins just north of Lake Ontario at Guildwood Parkway to Finch Avenue. Morningside Avenue has an interchange with Highway 401. Morningside Avenue is currently 4 lanes north of Sheppard Avenue to Old Finch Ave. A Class Environmental Assessment for the Finch/ Morningside / CPR grade separation was filed in March 2002. As part of the Class EA Study, it was recommended that Morningside Avenue be widened to four lanes north of Halfway Avenue and realigned north of Old Finch Avenue to curve north across the CPR tracks. From the CPR tracks the alignment would then curve to connect to the alignment for the extension of Morningside Avenue as part of the Morningside Heights development. The EA Study was approved in the Spring of 2002. Morningside Avenue will be built to four lanes through the Morningside Heights development by developers.

The Morningside Avenue Extension corridor is delineated in the amended Maps 6 and 7 of the MetroPlan. The Morningside Heights Secondary Plan provides for an alignment in the Buffer Reserve south of the CP rail line. As part of the Morningside Heights Secondary Plan both Neilson Road and Passmore Avenue will be closed and their function replaced by Morningside Avenue.

Highway 407 is a toll highway, which extends from the QEW in Burlington to east of Brock Road in the City of Pickering. Within the Study Area, the highway has a 4-lane divided cross-section and is the most northern boundary of the Study Area. The portion of the Markham Bypass north of Highway 407 was approved in 1997 with construction of the Markham Bypass north of 16th Avenue having commenced in 2002. Construction of the section of the Markham Bypass from Highway 407 to Highway 7, including the new interchange with Highway 407 is scheduled to begin in 2004.

The overall road network is shown on Exhibit 1-1.

4.2.5.2 Transit Network and Freight Rail

The Study Area is crossed by both the CN York Subdivision and the CP Havelock Subdivision. The CN York Subdivision extends from the north-west and crosses over both 9th Line and Steeles Avenue. The main function of the railway is the movement of freight through the GTA. According to CN, the frequency of trains on the York Subdivision is an average of 55 trains per day and is one of CN Rails busiest lines (currently at full capacity). Future plans for the York Subdivision would include the requirement to double track the existing single track territory.

The CP Havelock Subdivision extends from the south-west and crosses at-grade with Steeles Avenue, 9th Line, 14th Avenue and Reesor Road. The major function of the CP Havelock Subdivision is a branch line for freight movements. According to CP Rail, the frequency of trains on the Havelock Subdivision is 2 trains per day. The *York Region Transportation Master Plan* (June 2002) has shown GO Rail service on the CP Havelock Subdivision as part of the proposed 2031 transit network within the Region with a possible GO Station in the vicinity of Locust Hill. According to CP Rail, there is a possibility for resumption of VIA service to Peterborough or commencement of GO Service to Peterborough or a destination nearer to Toronto. Timing of these services being implemented is dependent on federal and provincial government initiatives.

York Region Transit currently operates the Route 2A - 14th Avenue service along 14th Avenue into the Legacy Community (via Legacy Drive, Rouge Bank Drive and Russell Jarvis Drive) and along 9th Line to the Markham-Stouffville Hospital. It is proposed that this service will be extended east into the Box Grove community in a phased approach, based on development. This service will provide transportation opportunities for residents and businesses in the Box Grove community.

Currently, YRT Route 2 Milliken extends into the Fairtree Development. The route extension operates along Elson Street, Eastvale Drive and Steeles Avenue during weekday peak periods. As the street network continues, Route 2 will be expanded to operate along Denison Street and Steeles Avenue. TTC provides bus service on Steeles Avenue to Markham Road (Route 53 E / B), on Markham Road (Route 102 D) Neilson Road (Route 133 C) and Tapscott Road (Route 134 B).

According to the YTMP, Steeles Avenue would be part of the proposed transit priority network in 2011. The Highway 407 corridor would accommodate the proposed Highway 407 BRT, and Regional Rapid Transit is shown crossing the northeast corner of the Study Area. Currently York Region is conducting Environmental Assessment Studies for the Yonge Street and Highway 7 corridors as well as north – south rapid transit links from the Vaughan Corporate Centre to the Spadina Subway and from the Markham Town Centre to the Sheppard Subway. The Markham Town Centre corridor is the closest north-south link to the Study Area.

GO Transit has recently completed the Inter-Regional Bus Rapid Transit (BRT) Study. As a part of the Study, the Markham Bypass to Morningside Avenue corridor was identified as a potential corridor.

The *City of Toronto Official Plan* (November 2002) also indicates a future higher order transit corridor into the Study Area from the possible future GO/TTC interchange north of Finch Ave at Markham Road on Map 4 – Higher Order Transit Corridors.

4.2.6 Contaminated Materials

Within the Study Area, there is one known area of contaminated soils which is part of the Malvern Remedial Project Site. In 1995, the Low-Level Radioactive Waste Management Office (LLRWMO) of Atomic Energy of Canada conducted the Malvern Remedial Project. This project removed approximately 16,000 cubic metres of radium contaminated soil from more than 60 residential and commercial properties in the former City of Scarborough. The storage site is located adjacent to Passmore Avenue in the Tapscott Employment District, which is located within the Morningside Avenue extension corridor. These soils are managed in a secure storage area that is monitored and inspected regularly to ensure there are no adverse effects on the environment. The guidelines applicable to the Malvern Remedial Project Site would be the Canadian Environmental Quality Guidelines, (Canadian Council of the Minister of the Environment, 2002).

4.2.7 Utilities

The main utility within the Study Area is Hydro One corridor that crosses through the Study Area from east to west adjacent to the north side of the CN Rail corridor. A second Hydro One corridor is located south of Steeles Avenue through the Morningside Heights community. The following utilities are also located within the Study Area:

- York-Durham Sewage System transmission infrastructure
- Parkway Belt West Utility Corridor
- Bell Canada underground facilities
- Markham Hydro Distribution Inc. facilities
- Enbridge Consumers Gas

4.3 Potential Environmental Effects

Potential environmental effects include those effects caused by the construction and operation of an Undertaking. The EA will describe and assess the environmental effects for the Alternatives to the Undertaking, the alternative methods of carrying out the Undertaking and the Undertaking. The study of effects will increase in detail as the study progresses to identify a preferred 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.

In addition, should a federal EA be required, the EA will need to address additional issues as outlined in the *Canadian Environmental Assessment Act.*

An ecosystem approach will be carried out in the environmental assessment that considers inter-relationships between the natural and the socio-economic environment. This approach considers the following:

1. Watershed (Rouge River) and subwatershed (Little Rouge Creek, Morningside Creek) biophysical boundaries, features and functions;

2. The Socio - Economic and Cultural environment as a component of the ecosystem - modifying and modified by the existing natural environment setting;

3. Ecosystem health and changes over time, through both natural processes and modifications from existing and future urban development;

4. Landscape connectivity (or lack thereof) and the role of the Undertaking in facilitating or affecting such connectivity (such as maintenance of aquatic and terrestrial functions, avoidance of features that are not physically linked with other natural areas, imposition of a potential barrier / filter for terrestrial wildlife movement opportunities);

5. Identifying constraints and opportunities based on the above review in the assessment of alternatives and in the mitigation review of the Preferred Alternative.

The elements of the environment that will be considered in the assessment of effects include but are not limited to:

Socio-Economic Environment – addresses the effects of the alternatives on the components of the environment that are 'man-made' and is a measure of the effects on community features. The effects measured include: the displacement of community / recreation features, residences, businesses, industries and institutions; the effects of potential noise increases on noise sensitive areas; impacts to air quality; and the potential impacts on future development.

Cultural Environment – addresses the effects of the alternatives on the built heritage features and cultural landscape units of the cultural environment. The effect to be measured would be the extent of displacement or disruption of known historical or archaeological sites.

Natural Environment – addresses the effects of the alternatives on the natural environmental features, which includes both the disruption and / or displacement of fisheries and aquatic habitat, vegetation, wildlife, landscape connectivity, wetlands, groundwater, and water wells.

Agriculture – addresses the effects of the alternatives on agriculture features which include the loss of agricultural land and soil capability and effects on farm operations.

Transportation – identifies the extent to which the alternatives can provide a reasonable transportation service which includes the proposed level of service, identification of geometric features, navigable waters and how the alternative would meet the transportation needs as part of the future transportation network.

Cost – identifies the cost to build the alternatives including the cost of property requirements as well as the cost to operate and maintain the undertaking.

4.4 Potential Construction Effects

The construction and operation of the Alternatives to the Undertaking, alternative methods for carrying out the Undertaking, and the preferred Undertaking may result in effects on the environment. Therefore, the analysis of the environmental effects should consider the new infrastructure associated with all alternatives. Potential construction effects could include but are not limited to the following:

- Effects on fisheries (construction timing guidelines are species dependent and will be included as part of the recommendations)

- Effects on the migratory birds and their nests and eggs. Avoidance measures are to be determined based on the species potentially affected and the nature and schedule of the activity. These measures may include timing restrictions and/or buffers around sensitive areas.
- Wetland area and function due to filling, draining and fragmentation
- Woodlot and grassland habitat due to reduction, removal, fragmentation or introduction of non-native invasive species
- Surface water due to releases of sediment and spills or leaks
- Groundwater contamination
- Construction noise
- Generation of dust
- Sediment generation and release
- Disruption to local traffic / road network

The environmental effects noted in this section are only a few of the effects to be considered as part of the EA Study. Additional effects relating to the preferred Undertaking selected during the EA will be considered. These include: achieving the objectives of the City of Toronto Wet Weather Flow Management Master Plan; assessing noise emission from construction equipment (MOE Publication NPC – 115); and the management of excess soils generated during construction, in compliance with Ministry of the Environment legislation.

Another potential environmental effect is interference with recharge areas and the release of contaminants during construction. Therefore, it may be necessary to develop a strategy which deals with the supply of drinking water from water wells in the vicinity of construction activities.

4.5 Operation of the Undertaking

The potential effects associated with the operation of the Alternatives to the Undertaking, alternatives methods of carrying out the Undertaking and the preferred Undertaking could include but are not limited to:

- Increased traffic
- Barriers to wildlife movement
- Disruption of existing land uses
- Additional inputs of stormwater (quality , quantity)
- Assessment, monitoring and maintenance of stormwater management facilities
- Impacts to vegetation, surface water and groundwater from runoff
- Potential for spills associated with haulage activity
- Potential for noise and vehicle emissions on adjacent landowners

The Environmental Assessment will detail the effects on the community for the operation of all alternatives and identify appropriate mitigation measures to reduce or eliminate impacts.

4.6 Advantages and Disadvantages

The EA process will include an evaluation of the advantages and disadvantages to the environment (i.e. Natural, Socio-Economic, Cultural) that might reasonably be expected to be affected, directly or indirectly, by the Alternatives to the Undertaking, alternative methods of carrying out the Undertaking, and the preferred Undertaking. This evaluation may include but is not limited to:

Advantages to the Environment

- ability to respond to current road deficiencies and future growth in travel demand
- provision of an efficient balanced transportation network
- supportive of the York Region Official Plan which promotes future urban growth and mixed use development
- potential for ecosystem restoration of degraded areas

Disadvantages to the Environment

- potential impact to local natural features and functions associated with the Rouge Park, woodlands, LSAs and EPAs etc.
- potential impact on water quality and water quantity relationships and water supplies
- potential impact to recharge / discharge zones, wetlands
- potential impacts to cultural heritage features.
- potential property impacts on landowners
- potential disruption or displacement of household and/or businesses.
- noise and dust impacts from construction and/or operation
- temporary disruption/congestion on local road network from construction activities
- increased traffic flow in the surrounding communities

Conclusions will be made as to how the advantages and disadvantages affect the purpose of the Undertaking and the Region's ability to provide additional capacity across the Town of Markham / east City of Toronto boundary. In assessing advantages and disadvantages, potential mitigation measures will be identified for the environment that might reasonably be expected to be affected, directly or indirectly as noted above. Therefore, the "net benefits" of those mitigation measures will also be determined.

5. ASSESSMENT AND EVALUATION OF POTENTIAL ENVIRONMENTAL IMPACTS

In order to identify the specific potential environmental affects that might reasonably be expected, an Environmental Opportunity and Constraints map has been prepared as part of the Terms of Reference (Exhibit 6-1). This map will be used to guide the development and evaluation of Alternatives to the Undertaking, alternative methods for carrying out the Undertaking, and the preferred Undertaking. Refinements to the alternatives identified will be developed on the basis of the selected transportation objectives and the need to minimize the potential environmental impacts and the ability to provide suitable mitigation measures.

The impact assessment methodology and the mitigating strategies for addressing unavoidable environmental impacts will be developed in consultation with the affected stakeholders as an integral component of the consultation process.

Table 5-1 provides an outline of the potential factors to be assessed by the agencies, the likely areas of concern and the proposed response to be provided as part of the Environmental Assessment investigation. The alternatives will be evaluated on the basis of the effects.

Table 5-1 Potential Environmental Effects

FACTOR	AGENCY	ISSUE / CONCERN	ACTION
GENERAL			
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 EA Study will document that any spills or adverse effects resulting from mitigation failures will be immediately reported to the Spills Action Centre of MOE.
Compliance	CEA Agency	CEAA may be triggered / Federal agency approvals may be required	Functions as the Federal Environmental Assessment Coordinator (FEAC) and facilitates coordination between the Provincial and Federal environmental assessment processes.
SOCIO-ECONOMC ENVIRONMENT			
Property Effects	MOE Municipal Agencies	Loss of property and value of land	Possible mitigation through compensation and relocation program.
Noise	MOE	Increased noise levels during construction and operation of the undertaking can adversely affect the quality of life of those living and working in proximity to the Undertaking.	As part of the EA Study, a noise analysis will be carried out in accordance with the MTO / MOE Noise Protocol. It should also be noted that York Region has developed a policy / guideline entitled "*Noise Attenuation Regional Roads*", March 1995, which is consistent with the MTO / MOE Noise Protocol. The consideration of noise mitigation will be undertaken according to the MTO / MOE Noise Protocol. The noise analysis will be reviewed with the public and MOE and will be documented in a Noise Report, which will be appended to the EA Report The EA document will also note that noise emissions from construction equipment are subject to the limits set out in the MOE Publication NPC – 115.

FACTOR	AGENCY	ISSUE / CONCERN	ACTION
Impact to Land Use / Future Development	Private Sector, Municipal Agencies	The location of the Undertaking can have positive and negative effects on adjacent land uses (e.g. restriction of access, encourage or discourage development)	This will be assessed based on the Study Area land use inventory.
Effect on the Safety of Residents	Private Sector, Municipal Agencies MOE	Increased congestion and lack of flexibility in the network may affect emergency response times, and safety of pedestrians and cyclists.	Safety will be a prime consideration in EA Study. In addition, it will be ensured that requirements of the Ontarians with Disabilities Act are met.
Traffic Nuisance	MOE Municipal Agencies	Traffic infiltration in neighbourhoods.	Estimate of traffic infiltration will be prepared for the alternatives where applicable.
Air Quality	MOE	Transportation facilities can adversely affect both local and global air quality predominantly due to the burning of fossil fuels.	Air Quality monitoring data and meteorology data from MOE monitoring stations and other secondary sources such as independent monitoring may 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 at-grade conditions, taking into consideration 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. Emissions of carbon monoxide (CO), nitrogen oxides (NO_x), total suspended particles (TSP) and particulate matter (PM_{10}) will be compared to provincial Ambient Air Quality Criteria (AAQC) and $PM_{2.5}$ to the proposed Canada Wide Standard to assess the potential for adverse effects. Short-term odour effects will be predicted using a combination of odour emission rates available in literature. Identified effects will be discussed in the context of Ontario's EPA Regulation 346 – Loss of Enjoyment.

FACTOR	AGENCY	ISSUE / CONCERN	ACTION
CULTURAL ENVIRONMENT			
Archaeological Resources	MoC, Municipal Agencies First Nations	Potential areas of archaeological resources will be investigated as part of the EA.	The EA will review all available background archaeological information including consultation with MoC. All affected Aboriginal Organizations and First Nations will be consulted for information during the EA Study. A licensed archaeologist will undertake an archaeological assessment to identify any archaeological resources that may be present. Appropriate mitigation measures will be undertaken to ensure the mitigation of impacts to those archaeological resources impacted.
Built Heritage Resources / Cultural Landscapes	MoC Municipal Agencies Municipal Heritage Planners LACAC	Built heritage features and cultural landscapes have been identified within and around the Study Area.	The EA will assess the heritage resources in further detail following the requirements of the MoC. The work completed will identify potential impacts and required mitigation measures to ensure cultural heritage features are identified and protected in the planning and design of the Undertaking. Municipal Heritage Planner, municipal heritage committees, municipal planning departments and Local Architectural Conservation Advisory Committee (LACAC) will be consulted throughout the EA. Experts in built heritage and cultural heritage landscapes will be involved in the EA and as appropriate in design phases to ensure best practices, cultural heritage conservation and sympathetic design.
NATURAL ENVIRONMENT			
Fisheries and Aquatic Habitat	MOE, MNR, TRCA DFO EC	The nature/extent of any aquatic habitat that may be disrupted, altered or indirectly affected by the undertaking (such as interference with fish movement, alternation/loss of streamside cover, changes in water quality due to erosion and sedimentation, storm discharges, temperature changes, etc.) including Harmful Alteration of Fish Habitat (HADD). The Rouge River, Morningside Tributary, Little Rouge Creek and tributaries of the Little Rouge Creek are located within the Study Area.	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 detail design) will be provided in the EA documentation, as such it is possible that a harmful alteration, disruption or destruction of fish habitat may be prevented.

FACTOR	AGENCY	ISSUE / CONCERN	ACTION
Surface Water Quality and Quantity	MOE, MNR, TRCA, Municipal Agencies EC	Surface water quantity and quality can be adversely affected by storm drainage, release of contaminants (i.e. Sediments, chemicals) and obstructions of flow.	Surface water quantity and quality can be adversely affected by impacts of water crossings, storm drainage, release of contaminants (i.e. sediments, chemicals) and obstructions of flow.
Wetlands	MOE, MNR TRCA EC	Direct (intrusion) and indirect effects on wetland resources in the Study Area. These resources are important in providing for example, wildlife and plant habitat, and filtering runoff.	All wetlands within the study area will be assessed as part of the EA process. There are no Provincially Significant Wetlands in the Study Area. Other wetlands are present within the Study Area that are associated with riparian zones, floodplains and woodland blocks, most notably Box Grove Forest. These areas will be further investigated during the EA Study, in particular those areas of potential intrusion/impact as well as an analysis of wetland functions and linkages. Potential impacts will be evaluated during the EA Study. Environmental protection and mitigation measures will be developed and documented during the EA Study.
Vegetation	MOE, MNR TRCA EC DFO	Direct (intrusion) and indirect effects on remaining vegetation resources in the Study Area. These resources are important in providing wildlife habitat, stabilized slopes and soils and forest cover.	Vegetation resources, including wetlands, woodlands and culturally derived features will be surveyed and evaluated as part of the EA study. This includes a multi-season botanical inventory, habitat classification using the ELC system and analysis of ecological function within the landscape. Potential impacts will be determined during the EA. Environmental protection and mitigation measures will also be developed and documented during the EA Study.

FACTOR	AGENCY	ISSUE / CONCERN	ACTION
Wildlife and Wildlife Habitat	MOE, MNR TRCA EC	The proposed Undertaking can adversely impact wildlife (e.g. through disturbances that may prevent them from breeding or raising young or mortality) or wildlife habitat (including breeding, staging/migration and over-wintering habitat) including impact to migratory birds and RVTE species. Linear facilities can fragment wildlife habitats and provide a barrier to wildlife movements	Potential impacts on wildlife and wildlife habitat and a determination of the significance will be undertaken during the EA. The objective will be to maximize wildlife and habitat protection and minimize disturbances Areas where wildlife movement opportunities can be maintained or improved will be reviewed during the EA. The alternatives will be developed to avoid impacts on large habitat blocks, woodlots, particularly forest interior habitat areas. The EA Study will also include an assessment of the migratory bird habitats to be altered / removed as a result of the undertaking and of the associated effects on migratory bird populations. Identification of mitigation measures to avoid the incidental take of migratory birds, damage or disturbance to their nests and eggs, and significant loss or alteration of their breeding habitat.
Groundwater and Hydrogeology	MOE, TRCA	Interference with recharge areas and release of contaminants can adversely affect the quantity and quality of groundwater. Interference with groundwater flow can adversely affect ecosystem components dependent on groundwater discharge and groundwater users.	A Preliminary review of background information suggests that there are areas of groundwater recharge and groundwater discharge in the Study Area, often associated with aquatic systems. These areas will be further investigated in the EA Study, mapped on natural environment existing conditions figures and considered in the evaluation of alternatives. A water well survey will be carried out within the area of influence (to be determined as part of the EA Study).This will include obtaining all water well records from the MOE Water Well Record Database, and carrying out a site inspection to confirm the presence and location of all wells. In addition, information on existing water quality and quantity will be studied along with information from recently constructed infrastructure and development activities in the Study Area. Depending on the preferred Undertaking, if trenching, grading, deep cuts or water taking is required, an assessment of the impact on wells, streams or any known contaminant plumes would be carried out.

FACTOR	AGENCY	ISSUE / CONCERN	ACTION
Environmentally Designated Areas	MOE, MNR, TRCA, Municipal Agencies EC	Direct (intrusion) and indirect affects on Environmentally Designated areas.	No provincially significant PSWs or Areas of Natural and Scientific Interest – ANSIs have been identified within the Study Area. Environmentally Designated areas have been identified within the Study Area, which includes: • Little Rouge Creek (LSA, EPA, HL) • Rouge River (LSA, EPA, HL) • Tributaries A, B, C and D that discharge into the Little Rouge Creek ((LSA, EPA, HL) • Morningside Tributary (LSA, EPA, HL) • Box Grove Forest (LSA, EPA Regionally Significant Forest) Environmental protection and mitigation measures will be developed and documented during the EA Study.
Special Spaces	MOE, MNR, Municipal Agencies, Interest Groups, Private Sector	Direct (intrusion) and indirect affects on special spaces. Special spaces are considered to be areas that have special or unique value by resource agencies, municipalities, government and/or the public. Such areas may have a variety of ecological, recreational and/or aesthetic features and functions that are highly valued.	The Rouge Park has been identified as a special space. Environmental protection and mitigation measures will be developed and documented during the EA Study. Mitigation strategies will include salt spray, nature of watercourse crossings and lighting. Both the Rouge North Management Plan (2001) and the Rouge Park Management Plan (1994) will be referenced when dealing with park boundary criteria. In addition, any other relevant documentation with regard to the Rouge Park will also be reviewed as a part of the study.

FACTOR	AGENCY	ISSUE / CONCERN	ACTION
Ecosystem Planning	MOE EC TRCA	Not only is it important to consider the individual environmental factors, but it is also important to consider the ecological inter-relationships of factors and maintenance of ecological functions that are part of the local or regional ecosystem.	An ecosystem approach will be carried out in the environmental assessment that considers inter-relationships between the natural and the socio-economic environment as well as the ecological inter-relationships between the various natural environmental factors outlined above (i.e. the components of the overall natural heritage system) that are part of the local or regional eco-system. The assessment will also focus on maintaining or, if feasible, enhancing the ecological functions of the overall natural heritage system and linkages (a landscape approach). As part of the EA, the following sources relevant to the Study Area will be reviewed: • The Wet Weather Flow Management Policy, 2003 • The City of Toronto Natural Heritage Study, 2002 • The Rouge North Management Plan, 2001 • The Carolinian Canada Big Picture Project, 2001 • The Morningside Heights Subwatershed Plan Phase II Report, 1997 • The Rouge Duffins Natural Heritage Strategy, 1997 • The Rouge Park Management Plan, 1994
Contaminated Soils	MOE EC CNSC	Contaminated materials may be discovered during construction. If not properly handled they can cause adverse effect to humans and the environment.	Potential contaminated sites will be identified during the EA Study. Where these sites cannot be avoided, a management strategy consistent with MOE's Guidelines for the Management of Contaminated sites will be developed for addressing contaminated materials encountered during construction of the facility. There is one known area of contaminated soils, which is part of the Malvern Remedial Project Site. The applicable federal guidelines will be applied to this site.
AGRICULTURE			
Agricultural Land Use	Private Sector, OMAF	Loss of viable agricultural land	During the EA Study an assessment of the area of agricultural land required by each alternative developed will be determined. Mitigation measures will be identified and documented during the EA Study.
Soil Capability	Private Sector, OMAF	Loss of soil capability.	Assessment of the quantity of soil removed by class from agricultural production. Mitigation measures will be identified and documented during the EA Study.

FACTOR	AGENCY	ISSUE / CONCERN	ACTION
Effect on Farm Operations	Private Sector, OMAF	Impacts to inter-farm movement, fragmentation, access and farm viability.	During the EA Study the impacts to inter-farm movement, fragmentation, access and farm viability will be assessed. Mitigation measures will be identified and documented during the EA Study.
Effects on the Farm Community	Private Sector, OMAF	Potential for farm community disruption based on travel route modification and characteristics of farm communities.	During the EA Study the potential for farm community disruption based on travel route modification and characteristics of farm communities will be assessed. Mitigation measures will be identified and documented during the EA Study.
TRANSPORTATION			
Type of Technology	Municipal Agencies	This factor would apply to transit alternatives and would determine a suitable type of technology. This factor would only be used if Alternatives to the Undertaking involving transit or TDM are selected as the preferred Alternative to the Undertaking and would only be applied to alternative methods of carrying out the Undertaking.	The review of transit alternatives would include Light Rail Transit, Heavy Rail Transit, Bus Rapid Transit, Reserved Bus Lanes, High Occupancy Vehicle Lanes, local bus service etc. How each of the alternatives addresses the Regions ability to meet demand within the study area will be assessed. For Transportation Demand Management different types of technology will be considered, for example, planning for High Occupancy Vehicle (HOV) Lanes; providing car-pool lots; and Ridesharing programs. How each of the alternatives addresses the Regions ability to meet demand within the Study Area will be assessed.
Level of Service	Private Sector, Municipal Agencies	Level of Service of the Undertaking.	A level of service analysis including a description of the Undertakings operation will be completed during the EA Study.
Design Criteria	Municipal Agencies	Design Criteria for the Undertaking	The design criteria will be identified as part of this factor for the Undertaking.
Network Compatibility	Municipal Agencies	Construction of the Undertaking may not be compatible with the existing regional and local road network creating a loss of connectivity in the network.	Compatibility of the alternatives with the existing network will be assessed during the EA Study.
Flexibility for Future Expansion	Municipal Agencies	The Undertaking should be planned with the ability to accommodate future expansion.	Alternatives developed during the EA Study will include provision for future expansion.

FACTOR	AGENCY	ISSUE / CONCERN	ACTION
Navigable Waterways	DFO TC	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.
Railway Crossings	TC CTA	The undertaking may require crossing a railway.	All railway crossings will need to be assessed. The effects of the undertaking as a result of railway crossings will be reviewed as part of the EA Study.
Safety	Municipal Agencies	Emergency access to adjacent lands must be maintained.	Safety and emergency access will be a prime consideration in EA Study.

Regulatory Agencies
MOE – Ministry of the Environment
CTA – Canadian Transportation Agency
EC – Environment Canada
TC – Transport Canada
DFO – Fisheries and Oceans Canada
TRCA – Toronto and Region Conservation Authority
CNSC – Canadian Nuclear Safety Commission

Advisory Agencies
CEA Agency – Canadian Environmental Assessment Agency
MoC – Ministry of Culture
OMAF – Ontario Ministry of Agriculture and Food
MNR – Ministry of Natural Resources
Municipal Agencies – York Region, Town of Markham and City of Toronto

5.1 The Canadian Environmental Assessment Act

The proponent's undertaking is subject to the requirements of the Ontario Environmental Assessment Act. The requirements of the Canadian Environmental Assessment Act (CEAA) may also apply. The proponent intends to work in a coordinated way with provincial and federal governments, both governments having informally agreed to coordinate their respective EA processes established by the applicable environmental assessment legislation.

5.1.1 Coordinated EA Process

The proponent will be guided by the federal/provincial coordination process chart outlined in the supporting documentation of this Terms of Reference document. This proposed approach is designed to address the information requirements of both federal and provincial environmental assessment Acts.

5.1.2 Application of the Coordinated EA Process to the Proposed Project

It is recognized by both the Canadian Environmental Assessment Agency (on behalf of the federal authorities), and the proponent, that ongoing dialogue on the information requirements is required throughout the EA process as more is learned about the specifics of the undertaking. As such, it may be necessary for the proponent to provide additional or more detailed information as the EA process proceeds. The intent is to produce a single EA body of documentation on environmental effects to meet all of the information needs of both the federal and provincial governments. To the extent practical, federal/provincial information requirements regarding potential factors to be assessed in the context of this study have been integrated. General information requirements under CEAA can be found in the supporting documentation of this terms of reference document.

6. ENVIRONMENTAL ASSESSMENT WORK PLAN

6.1 Overview

This Environmental Assessment (EA) Work Plan will identify and outline the scope of work that must be undertaken during the EA Study. The Terms of Reference is Part I of the overall study and the EA Study is Part II, therefore, the EA Study will carry forward from the Terms of Reference Study and will include the following:

- pre-screening of the Alternatives to the Undertaking identified;
- analysis and evaluation of the Alternatives to the Undertaking based on the environmental effects after mitigation measures ("net effects");
- selection of the preferred alternative to the Undertaking;
- generation of alternative methods of carrying out the Undertaking;
- pre-screening of alternative methods of carrying out the Undertaking;
- analysis and evaluation of alternative methods of carrying out the Undertaking based on the environmental effects after mitigation measures ("net effects");
- the identification of mitigation measures and monitoring programs to reduce the negative effects of the Undertaking on the environment; and
- selection and refinement of the preferred Undertaking.

+The purpose of the EA Work Plan is to guide the EA Study. This report outlines the following:

- existing conditions known within the Study Area;
- inventory of existing conditions to be collected during the EA Study; and
- commitments to determine the preferred Undertaking.

The EA Work Plan forms part of the EA Terms of Reference as required under the *Environmental Assessment Act.*

6.2 Confirmation of the Study Area

The Primary Study Area developed during preparation of the Terms of Reference will be further reviewed and refined during the EA to reflect:

- the latest constraints information
- development of alternatives
- potential environmental effects

6.3 Inventory of Existing Conditions

As part of the EA, the existing conditions within the Study Area will be examined in more detail and will include an inventory of the socio-economic environment, cultural environment, natural environment, agriculture and the transportation network. The purpose of this exercise is to establish a baseline of conditions and to identify any planned changes to these conditions that are known at the time the EA is conducted. The

existing conditions inventory will build upon the information collected during the development of the Terms of Reference. The existing conditions to be further investigated are outlined in the following sections.

6.3.1 Socio-Economic Environment

The following components of the socio-economic environment will be further investigated during the EA Study.

- Inventory of land ownership
- Inventory of existing land uses
- Future land use based on current approved Official Plans for the City of Toronto and the Town of Markham
- Current applications submitted regarding land use changes
- Land use implication recommendations from recent management plans and watershed plans in the Study Area
- Identify potential Noise Sensitive Areas in accordance with MOE / MTO Noise Protocol
- Inventory of future development plans
- Identify populations that may be sensitive to air quality impacts
- Navigable Waters

6.3.2 Cultural Environment

As part of the review of the cultural environment an inventory of the following will be carried out:

- archaeological resources
- cultural heritage features

The inventory will ensure that all research carried out to date is complete and accurate. All work completed for the inventory of archaeological and cultural / heritage features will comply with the expectations and requirements of the Ministry of Culture.

6.3.3 Natural Environment

The following natural environmental features will be further investigated during the EA Study.

- Fisheries and aquatic habitats
- Surface Water Quality and Quantity (e.g. Regional Storm Floodplain and existing drainage patterns)
    - Wells within the area of influence (to be determined during the EA Study)
    - Seepage area and springs
    - Areas currently subject to de-watering issues
- Wetlands and “adjacent land” (It should be noted that the concept of “adjacent lands” in the Planning Act Provincial Policy Statement and Natural Heritage Reference Manual apply to provincially significant wetlands (PSWs). Currently, there are no

PSWs in or adjacent to the study area (i.e. within "adjacent lands"). If any PSWs are identified by agencies during the course of the EA process, adjacent lands will be reviewed as part of the EA process and incorporated into the report.)

- Vegetation resources
- Wildlife (e.g. habitat, corridors, migratory bird species, species that are listed as being "at risk" federally, provincially, regionally and/or locally, and Rare Vulnerable, Threatened or Endangered(RVTE) species)
- Groundwater and Hydrogeology (e.g. water wells)
- Environmentally Designated Areas and Natural Heritage Features
    - 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 areas
- Special Spaces
- Impacts to Air Quality

Field investigations will supplement existing secondary information where data gaps occur, as refinements to areas are needed or as requested by regulatory agencies, the public, municipalities or other planning organizations. A significant amount of secondary source information has been gathered for previous studies in the area, including secondary plans, natural features overviews and environmental impact assessments. For example, the City of Toronto Natural Heritage Study, Morningside Tributary Subwatershed Study and City of Toronto Ravine Bylaw as well as many other studies and policies will be reviewed and addressed where appropriate as part of the EA Study. The scope of field studies will be based on the level of existing information, landowner access permission and sensitivity of the community being considered. A three-season botanical inventory will be conducted, listing all species recorded (by vegetation community) and their associated provincial S-ranks and TRCA L-ranks. Significant flora and habitat types will be evaluated according to applicable provincial, regional and local ranking lists. The evaluation of significance will be based on clearly stated criteria that synthesize various evaluation frameworks (e.g. PPS, city or regional woodland evaluation approaches etc.) and function within the landscape. Input from the MNR regarding evaluation of significance will be included. The need for an increased level of detail and collection of field data is expected through the progression of the EA Study. As alternatives are developed and refined, and particularly as a preferred Undertaking is selected, it is expected that focused field mapping and inventories and an assessment of potential impacts will be completed for significant / sensitive environments. Existing floodplain mapping available from TRCA will be utilized in the review.

In addition, as part of the alternative development, it may be necessary to complete flood conveyance and fluvialgeomrophology studies for the Rouge River and the Morningside Tributary.

All natural environmental mapping created as part of the EA Study will be updated as the study proceeds. This mapping will include a synthesis of previous work, database information from agencies (MNR, TRCA) and updated field-based information.

6.3.3.1 Air Quality

Air Quality monitoring data and meteorology data from MOE monitoring stations and other secondary sources such as independent monitoring may 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 at-grade conditions, taking into consideration 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. Emissions of carbon monoxide (CO), nitrogen oxides (NO_x), total suspended particles (TSP) and particulate matter (PM_{10}) will be compared to provincial Ambient Air Quality Criteria (AAQC) and $PM_{2.5}$ to the proposed Canada Wide Standard to assess the potential for adverse effects. Short-term odour effects will be predicted using a combination of odour emission rates available in literature. Identified effects will be discussed in the context of Ontario's EPA Regulation 346 – Loss of Enjoyment.

6.3.4 Agriculture

During the EA Study the status of the Agricultural area will be confirmed as well as the type of farm operations within the area.

6.3.5 Transportation

The following components of the transportation network will be further reviewed during the EA Study

- Existing and future roadway network
- Existing and future transit network
- Existing and future traffic volumes and demand
- Existing and future transit demand
- Pedestrian and bicycle demands in the vicinity of the corridor
- Existing and future rail service
- Existing and future railway traffic
- Existing and future Transportation Demand Management Strategies

6.3.6 Contaminated Materials

The Study Area will be reviewed to determine the geotechnical conditions and the presence of any other contaminated sites that would impact the development of alternatives in addition to the Passmore Avenue storage site. The investigation will include:

- Review of published geological reports and soil maps
- Review of geotechnical information from previous work

- Walk-over survey of the corridor to note landforms, exposed soils and any apparent geotechnical constraints
- Possible drilling of a limited number of boreholes
- Preparation of a geotechnical report describing the geotechnical conditions and discussing feasible geotechnical solutions and constraints.

6.3.7 Utilities

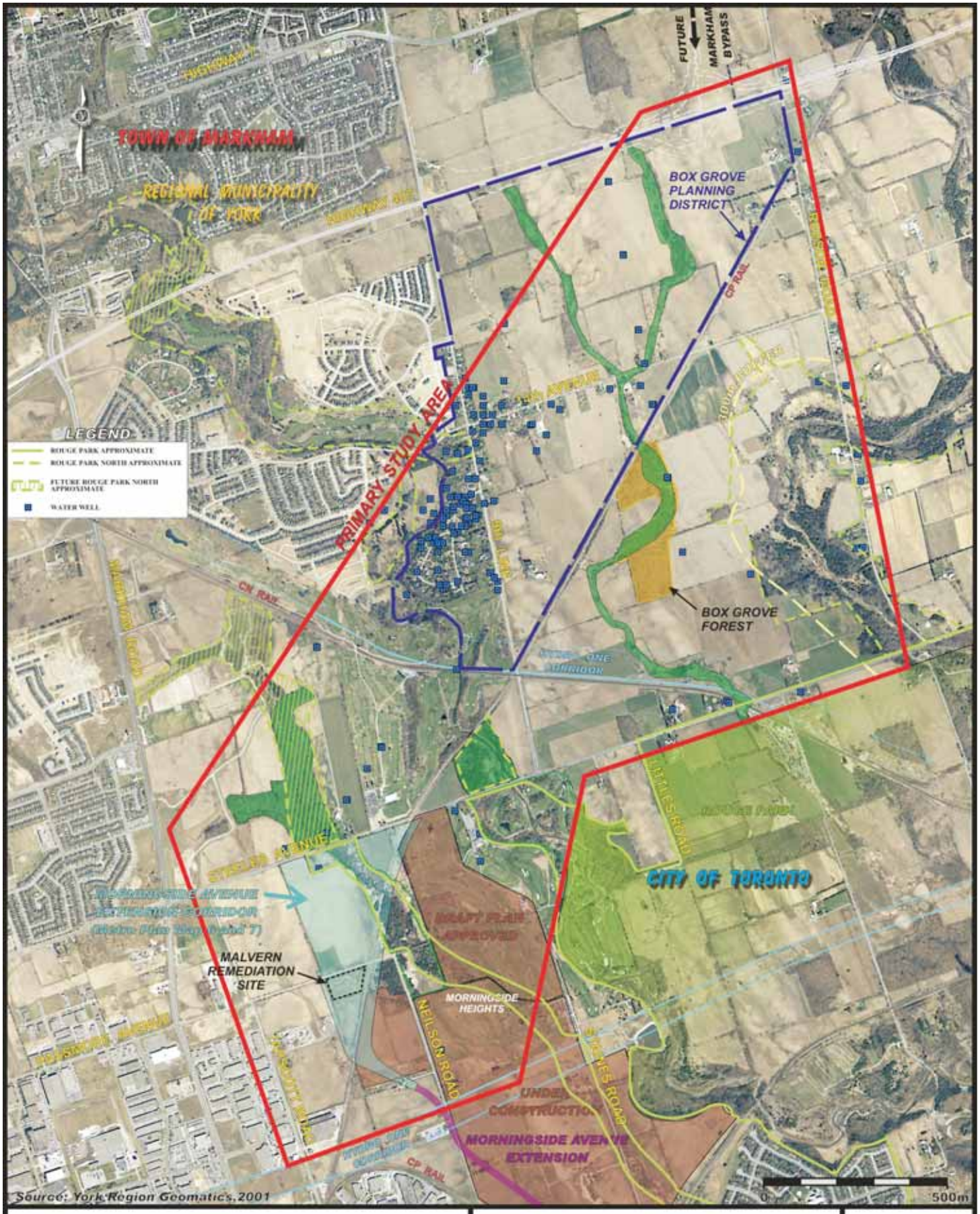
Information regarding the location of existing or proposed utilities within the Study Area will be reconfirmed if necessary.

6.4 Constraints Mapping

Where appropriate, the information collected during the inventory of existing conditions will be mapped for use during the development of alternative methods to carrying out the Undertaking, and the preferred Undertaking. The constraint mapping will allow alternatives to be developed that seek to avoid significant / sensitive resource features and other constraint areas to the extent possible. Typical constraints would include the following:

- Land use
- Existing and proposed community features
- Watercourses
- Wetlands
- Significant / sensitive habitat areas
- floodplains
- Utilities
- Approved Plans of Subdivision
- Areas serviced by wells

A preliminary constraints map was developed during the Terms of Reference. The preliminary constraints map is shown on Exhibit 6-1. This map will be updated as additional information is collected during the EA study.



TRANSPORTATION IMPROVEMENTS IN THE MARKHAM BYPASS CORRIDOR SOUTH OF HIGHWAY 407 ENVIRONMENTAL ASSESSMENT	**CONSTRAINTS MAP**	**EXHIBIT 6-1**

6.5 Analysis and Evaluation Framework

Judgement of the Project Team regarding the potential effects associated with the project and comments received from the public were used to develop a master list of groupings, factors and indicators for the analysis. These factors were developed to assist in the identification of the magnitude of the effects and will be used to comparatively evaluate the alternatives to the undertaking and the alternative methods of carrying out the undertaking. The general groupings for the factors will be:

- Socio-Economic Environment
- Cultural Environment
- Natural Environment
- Agriculture
- Transportation
- Cost

The preferred Alternative to the Undertaking will not be determined until during the EA Study. Therefore, the factors described in Section 6.5.1 to 6.5.6 are generic and applicable to all of the Alternatives to the Undertaking. As part of the EA Study both the factors and the indicators will be revisited to confirm their applicability to the alternative methods to carrying out the Undertaking.

The EA will describe and assess the environmental effects of the proposed undertaking and alternatives. The study of effects will increase in detail as the study progresses to identify a preferred alternative. Potential effects to be studied include, but are not limited to, those described in Section 6.5.1 to 6.5.6.

6.5.1 Socio-Economic Environment

The Socio-Economic Environment addresses the effects of an alternative on the components of the environment that are 'man-made' and is a measure of the effects on community features. The effects measured include: the impacts / property requirements of residential, commercial, industrial, institutional and recreational properties; the effects of potential noise increases on noise sensitive areas; the potential impacts on future development; and the effect on the safety of residents and workers.

6.5.1.1 Property Effects

Identifies the residential, commercial, industrial, institutional and recreational property effects which will be determined using the property maps provided by York Region. Measured by the number of properties displaced for each of the land use types impacted and the area (ha.) of property required for each. The type of impact will also be determined for each of the land uses, which include:

- Full removal
- Frontage
- Backlot
- Severance

- Loss of access.

The unit of measure will be the number of properties impacted for each type of impact and land use.

6.5.1.2 Noise

This factor identifies the effects of predicted noise increases on existing noise sensitive areas / land uses. Based on the MTO / MOE Noise Protocol, the following land uses, with an outdoor living area associated with them are considered NSAs:

- private homes such as single family residences,
- townhouses
- multiple unit buildings such as apartments with outdoor living areas for use by all occupants
- hospitals, nursing homes for the aged, where there are outdoor living areas for the patients

Existing noise sensitive areas within the Study Area will be identified during the EA Study when the alternatives are assessed.

As part of the EA Study, a noise analysis will be carried out in accordance with the MTO / MOE Noise Protocol. It should also be noted that York Region has developed a policy / guideline entitled "*Noise Attenuation Regional Roads*", March 1995, which is consistent with the MTO / MOE Noise Protocol.

The consideration of noise mitigation will be undertaken according to the MTO / MOE Noise Protocol.

The noise analysis will be reviewed with the public and MOE and will be documented in a Noise Report, which will be appended to the EA Report.

6.5.1.3 Impacts to Future Development Plans

This factor identifies the effects of the alternatives on lands approved or proposed for development (e.g. future school sites). The assessment will determine which of the alternatives has the potential to impact approved development indicated in the Official Plan for York Region, Town of Markham or City of Toronto. For impacts to the Official Plans the unit of measure used will be descriptive and noted as major, moderate or minor.

6.5.1.4 Effect on the Safety of Residents

This factor will identify the effects of the alternatives on emergency response times, and safety of pedestrians and cyclists, which includes school students. The unit of measure used will be descriptive and noted as major, moderate or minor.

6.5.1.5 Traffic Nuisance

This factor will identify the effects of traffic infiltration estimated in neighbourhoods.

6.5.1.6 Air Quality

This factor will identify the potential for changes in air quality due to operation of the undertaking. This will be assessed for at-grade conditions, taking into consideration future changes in ambient air quality with and without the undertaking.

6.5.2 Cultural Environment

Identifies the extent or displacement or disruption of known archaeological or heritage sites.

6.5.2.1 Archaeological Resources

The effect of the alternatives on archaeological resources within the Study Area will be determined. Affected Aboriginal Organizations and First Nations will be consulted for information and for their assessment of the potential impacts. A Stage 1 Archaeological assessment of the Study Area will be completed as part of the EA Study. A Stage 2 assessment as necessary will be carried out for the preferred Undertaking.

The archaeological assessment will be undertaken by a licensed archaeological consultant and the report will be submitted to the Ministry of Culture for review and approval.

6.5.2.2 Heritage Resources / Cultural Landscapes

This factor would identify the impact of the alternatives on Built Heritage Features and Cultural Landscape Units within the Study Area. The unit of measure will be the number of features and landscapes impacted. The significance of the impact will also be measured descriptively as low, moderate or high.

6.5.3 Natural Environment

6.5.3.1 Fisheries and Aquatic Habitats

MNR resource mapping, watershed and subwatershed studies, air photos, field observation and agency contacts will be used to describe surface water, aquatic and fisheries characteristics within the Study Area and to evaluate potential effects of each alternative.

A watercourse has been defined as flowing water, though not necessarily continuous, within a defined channel and with a bed or banks and usually discharges itself into some other watercourse or body of water (Source: Toronto Region Conservation Authority Valley and Stream Corridor Management Program 1994).

Water body types are defined as follows:

Rivers: Permanently flowing major watercourse capable of supporting coldwater or warmwater communities but are generally larger than streams and directly draining to a larger water body (lake). Rivers are generally considered navigable watercourses.

Permanent Creeks/Streams: Capable of supporting coldwater or warmwater sport fish or baitfish fishery. Contains perennial year round flow and includes direct river tributaries and large agricultural drainage canals. These watercourses may be navigable.

Ponds: Natural or constructed permanent surface water feature, which may or may not be hydrologically connected to another watercourse. Ponds may be considered potential habitat for species that have colonized from a connecting watercourse or have been introduced by some other means (birds, human introduction). Ponds may be considered to be fish habitat if there are seasonal connections to a watercourse with an opportunity for the exchange of fish, seasonal usage by fish, or use as a commercial and/or recreational fishery.

Intermittent Streams: An intermittent stream contains flowing water for less than 9 months of the year and may or may not contain fish on a seasonal basis. Intermittent systems are connected to the water table at certain times of the year. Ephemeral systems rely solely on runoff events.

Other: This designation includes field swales, roadside and smaller agricultural drainage ditches. They are generally ephemeral or intermittent in nature.

Wetlands: Include evaluated or un-evaluated wetland areas which may or may not be hydrologically connected to other surface water systems but are potentially capable of supporting fish habitat directly or indirectly.

The following criteria will be used to evaluate the potential impacts of watercourse crossing locations:

- Presence of a Coldwater Community: a stream that possesses the physical characteristics capable of supporting coldwater species such as trout or salmon. Coldwater streams usually have sufficient groundwater discharge to maintain year round flow and relatively low water temperatures. A watercourse or wetland that presently or potentially supports coldwater fisheries (trout, salmonids, mottled sculpin) is counted as one coldwater community for each crossing.
- Presence of a Warmwater Community: a stream that supports warmwater fish communities. Fish species commonly designated as warmwater species include Largemouth Bass, Smallmouth Bass Rock Bass, Sunfish, Bullhead, Carp, Northern Pike, Walleye and Yellow Perch. Common warmwater baitfish includes Blacknose Dace, Creek Chub, Common Shiner and Bluntnose Minnow. A permanent or intermittent watercourse or wetland that potentially supports a fish community of typical warmwater species is counted as one warmwater community for each crossing.
- Riparian vegetation removal. Measures the length (m) of riparian vegetation affected, where riparian vegetation is defined as part of or on the bank of the watercourse.
- Implications for identified rare/VTE fish species and other fish species. This is a qualitative assessment based on the number of watercourses crossed providing documented known habitat for rare, vulnerable, threatened or endangered (VTE) species and other fish species as identified by MNR, CA, or other resource groups. Field observations of habitat conditions in identified areas will also be used to supplement this assessment where required.

- Implication on habitat rehabilitation programs. Measures the number and nature (such as MNR, CA, interest group, municipal) of watercourse fisheries rehabilitation programs identified and potentially affected by the alignment.

6.5.3.2 Surface Water Quality and Quantity

Within the Study Area, there are five watercourses that may require crossings depending on the Alternative to the Undertaking; as a result the evaluation will consider the minimization of the total number of watercourse crossings. These include permanent (coldwater migratory and warmwater) and intermittent streams. The following measures will be used to evaluate potential crossing locations:

- Length of Floodplain Crossed (i.e. width of valley).
- Encroachment on sensitive headwater areas. Measures the length (m) of the alternative crossing headwater areas as well as an identification of the number/name/of the headwater areas affected. Where watershed studies exist, the cumulative impact on the watershed will be examined.
- Channel alterations anticipated. Measures the number of watercourses (permanent and intermittent) where channel alteration/realignment may be required based on available engineering information. Watercourses will be identified by name, if available and approximate lengths of potential alteration will be estimated based on available engineering information and consideration of channel meander belt conditions.
- The meander belt width of the watercourses at the potential crossing locations will be determined as well as channel stability and the expected magnitude of channel migration. Crossings should span the meander belt width of the affected watercourse and should avoid areas of active channel migration.
- Implications for watercourse management programs. Measures the number and nature (such as MOE, Conservation Authority, interest group, municipal) of watercourse management or other environmental resource programs identified and potentially affected.
- Stormwater management considerations: availability of suitable technologies and locations for stormwater management facilities to minimize contaminant loading to water bodies from stormwater inputs.

6.5.3.3 Wetlands

Wetland information will build on background information already available, and will integrate any additional information available from agencies, municipalities, resource groups, mapping (aerial and topographic), updated MNR wetland evaluation work, and ground truthing wherever appropriate.

The indicators below deal with effects on wetland area.

- Encroachment on or loss of Provincially Significant Wetland (PSW) – area and function. Measures the area of PSW crossed by the alternative and function

including lands within 120 metres of wetlands and wetland complexes, and identifies the PSW complexes affected.

Note: there are currently no identified PSWs in the study area. This criterion would apply in the event that PSWs are identified by agencies during the course of the study.

- Loss of other wetlands – area and function. Measures the area of wetlands that are impacted by the alternative, and implications on wetland function.

6.5.3.4 Vegetation

Vegetation resource information will be based on secondary sources (agency/municipal files and mapping), consultant reports, topographic mapping, aerial photography, and field surveys.

The following criteria will be used to evaluate impacts to vegetation resources:

- Degree of encroachment in/severance of woodlots or forest areas. Measures the number and area of woodlots/forest habitat crossed. Degree of impact (edge or fragmentation) is also summarized for each alternative.
- Significant flora/communities. Measures the potential effect on significant flora/communities based on the number of documented sites either severed, encroached on, or within 50 metres of the alternative (adjacent land area within which direct impacts might be expected).
- Implication on forest management/research programs, if identified by agencies. Measures the number and nature (such as MNR, Woodlot Improvement Act Agreement Forests, Conservation Area land holdings, plantation, research plots) of forest management and/or research sites that have been identified and that are potentially affected by the alternative (intrusion or within 50 m of the management area).

6.5.3.5 Wildlife and Wildlife Habitat

The EA will include an assessment of potential effects of alternatives on wildlife species and habitat, including migratory birds. Indirect indicators evaluate the terrestrial wildlife component. The disruption and fragmentation of potential wildlife habitat is measured. The concept of corridor movements of wildlife will also be integrated.

A full suite of information sources will be reviewed to assess wildlife presence/habitat in the Study Area. These will include agency/municipal files and mapping, topographic and aerial photo mapping, Natural Heritage Information Centre databases, Bird Studies Canada databases, agency and local naturalist contacts, and field surveys.

The following criteria will be used to evaluate potential impacts to wildlife:

- Loss of wildlife habitat. Measures the area of wildlife habitat (forested vegetation and non-forested successional areas, wetlands, meadows etc.) removed by an alternative. Includes an assessment of significance and sensitivity of wildlife habitat potentially impacted.

- Encroachment on or severance of ecologically functional wildlife movement areas. These will be identified during the EA on the basis of documented information, discussion with agency staff, review of mapping and aerial photography, field surveys and professional judgment. An overall qualitative assessment of potential barriers/filters to wildlife movement is provided based on the following scale:
    - High: The encroachment on, or severance of, movement areas is extensive, unavoidable, and mitigation (such as through avoidance) is not feasible.
    - Moderate: The encroachment on, or severance of, movement areas is less extensive, somewhat avoidable, and mitigation is more feasible.
    - Low: The encroachment on, or severance of, movement areas is least extensive, more likely avoidable, and mitigation is most feasible.
- Encroachment on, or severance of, important wildlife habitat areas. Important wildlife habitat areas are features with specific wildlife attributes identified during field surveys or by municipalities, agencies or local naturalist groups. Although they may include habitat for VTE or otherwise designated species (i.e. regionally rare species), use by rare species is not required for identification of an important wildlife area. Important wildlife habitat areas may include heronries, winter dear use area, migratory bird habitat etc. Measure of the number of such areas affected by an alternative, based on the consideration of the wildlife species using those areas and an expected impact zone as determined during the EA. Comments are also provided on the type of area potentially affected and sensitivity of any target wildlife species.
- Loss or encroachment on habitat of known rare or VTE species or Species At Risk. Measures the number of habitat areas supporting documented presence of rare or VTE (Vulnerable, Threatened, Endangered) wildlife species that are either crossed or within 50 m of the alternative. Where found necessary the species under consideration, an encroachment criterion greater than 50 m will be utilized in the assessment and developed in consultation with Environment Canada and MOE. In all cases, the full effects on such species and their habitat will be assessed and measures will be proposed to mitigate negative impacts even if the species and their habitat is beyond the 50 m (or higher) encroachment distance used for the assessment of alternatives.

6.5.3.6 Groundwater and Hydrogeology

Effect on groundwater resource areas (such as identified/mapped areas of high water table, recharge areas, significant overburden aquifers, groundwater protection areas). Measured by the length (m) of the facility crossing such areas, providing an indirect indication of potential effects on groundwater quality/quantity.

Effect on groundwater discharge. Measured by the number of locations where the alternative crosses identified/mapped discharge zones and/or requires deep cuts that could intercept/interfere with groundwater discharge.

Municipal and private water supply (wells within the area of influence to be determined as part of the EA Study). Number and type of wells (such as Municipal, private, shallow

[<15 m], deep) within the area of influence (to be determined as part of the EA Study). This is based on MOE well records and any additional information on wells compiled during the study. It is assumed that each rural dwelling will have at least one well associated with it even if no well record exists.

In addition, the assessment will also consider potential impacts to fish and fish habitat, such as the impacts of groundwater discharge and recharge or groundwater interception.

6.5.3.7 Environmentally Designated Areas

Evaluates potential impacts on natural features, including LSAs, EPAs, PSWs or ANSIs, based on consideration of ecological factors such as habitat type and disturbance tolerance (e.g. susceptibility to edge effects, hydrological changes etc.), component species and other measures.

6.5.3.8 Special Spaces

Implications for special spaces. Special spaces are considered to be areas that have special or unique value by resource agencies, municipalities, government and/or the public. Such areas may have a variety of ecological, recreational and/or aesthetic features and functions that are highly valued. Examples might include designated natural areas, Conservation Authority lands, Land Trust / Stewardship Lands or the Rouge Park North. This criterion measures the degree of access to, encroachment on, or severance of identified special spaces. The numbers of directly or indirectly affected sites are counted for each alternative. A qualitative assessment of the nature of effects, edge, severed, or proximate to and aesthetic effects is also provided.

6.5.3.9 Ecosystem Planning

An ecosystem approach will be carried out in the environmental assessment that considers inter-relationships between the natural and the socio-economic environment as well as the ecological inter-relationships between the various natural environmental factors outlined above (i.e. the components of the overall natural heritage system) that are part of the local or regional eco-system. The assessment will also focus on maintaining or, if feasible, enhancing the ecological functions of the overall natural heritage system and linkages (a landscape approach).

6.5.3.10 Contaminated Soils

Potential contaminated sites will be identified during the EA Study. Where these sites cannot be avoided, a management strategy consistent with MOE's Guidelines for the Management of Contaminated sites will be developed for addressing contaminated materials encountered during construction of the facility. There is one known area of contaminated soils, which is part of the Malvern Remedial Project Site. The applicable federal guidelines will be applied to this site. This factor will provide an assessment of the nature of the impact and the effects.

6.5.4 Agriculture

This grouping addresses effects of the alternatives on agricultural features.

6.5.4.1 Agricultural Land Use

This factor will assess the area of agricultural land required by each of the alternatives developed. The unit of measure would be the area required in hectares and the number of farms impacted.

6.5.4.2 Soil Capability

This factor will assess the quantity of soil removed by class (Class 1-3) from agricultural production. The unit of measure would be the area required from each soil class in hectares including the number of farms impacted per class.

6.5.4.3 Effect on Farm Operations

Assessment of each alternative's impact to inter-farm movement, fragmentation, access and farm viability. Operations are also considered affected if farm buildings are removed. The unit of measure will be the number of properties, number of farm buildings affected and nature of severed parcels. The unit of measure will also be descriptive and indicate whether or not the impact is considered to be Major, Moderate or Minor.

6.5.4.4 Effect on the Farm Community

Assessment of each alternative's potential for farm community disruption based on travel route modification and characteristics of farm communities. The unit of measure will be descriptive and indicate whether or not the impact is considered to be Major, Moderate or Minor.

6.5.5 Transportation

This grouping identifies the extent to which an alternative can provide reasonable transportation service and safety.

6.5.5.1 Type of Technology

This factor would apply to the development of transit alternatives and Transportation Demand Management only, in order to determine a suitable type of technology. This factor would only be used if Alternatives to the Undertaking involving transit or TDM are selected as the preferred Alternative to the Undertaking and would only be applied to alternative methods of carrying out the Undertaking. The review of transit alternatives would include Light Rail Transit, Heavy Rail Transit, Bus Rapid Transit, Reserved Bus Lanes, High Occupancy Vehicle Lanes, local bus service etc. How each of the alternatives addresses the Regions ability to meet demand within the study area will be assessed.

For Transportation Demand Management different types of technology will be considered, for example, planning for High Occupancy Vehicle (HOV) Lanes; providing car-pool lots; and Ridesharing programs. How each of the alternatives addresses the Regions ability to meet demand within the Study Area will be assessed.

6.5.5.2 Level of Service

This factor identifies the level of service at which the alternative is proposed to operate. Levels of Service 'A' through 'D' reflect acceptable traffic operating conditions, 'E'

reflects increasing traffic congestion and 'F' reflects severe traffic congestion or intersection failure. The unit of measure will be the level of service and a description of the transportation network operation.

6.5.5.3 Design Criteria

The design criteria will be identified as part of this factor. The unit of measure will be whether or not the criteria are met by the alternative.

6.5.5.4 Network Compatibility

Existing Transportation Network

This will include an assessment of connectivity/compatibility of the alternative with the existing regional and local transportation network. The assessment will identify the significant changes in traffic patterns, both positive and negative. The unit of measure will be a descriptive and indicate whether or not the connectivity/compatibility is good, fair or poor.

Future Transportation Network

This factor will assess how each of the alternatives meets the transportation needs as part of the future network for York Region, Town of Markham and City of Toronto. The future network would be additional roads or transit services / infrastructure within the network that are planned in the long term. The impact on future operation of the alternatives would be assessed. The unit of measures used to analyze the alternatives will be descriptive and will indicate whether or not the connectivity/compatibility is good, fair or poor.

6.5.5.5 Flexibility for Future Expansion

This factor will assess the ability of the alternative to be upgraded as required due to future demands as well as how the alternatives relate to future initiatives planned for York Region, Town of Markham and the City of Toronto. The unit of measure will be descriptive and will indicate whether or not the alternative has a good, fair or poor ability to accommodate future expansion.

6.5.5.6 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.

6.5.5.7 Railway Crossings

All railway crossings will need to be assessed. The effects of the undertaking as a result of railway crossings will be reviewed as part of the EA Study.

6.5.5.8 Safety

This factor will assess the impact of the alternative on emergency access to adjacent lands as well as typical accident rates. The unit of measure will be descriptive and will indicate

whether or not the alternative has a minor, moderate or major impact on emergency access.

6.5.6 Cost

This grouping identifies the cost required to build and maintain the alternatives.

6.5.6.1 Construction Costs

The dollar value associated with the construction of each alternative.

6.5.6.2 Property Cost

The total cost of property required for each of the alternatives. A separate cost will be associated with each of the land use types (i.e. residential or commercial).

6.5.6.3 Maintenance Cost

The maintenance cost will be identified for each of the alternatives and will be used as the unit of measure.

6.6 Development of Alternatives to the Undertaking

In Section 3.1 a list of Alternatives to the Undertaking has been provided. This list is not considered to be a complete list of all alternatives and that other reasonable alternatives may be brought forth during the EA. Therefore, the purpose of this phase is to confirm if there are other reasonable Alternatives to the Undertaking identified during the EA, as a result of agency or public comment. The additional Alternatives to the Undertaking would be included in the assessment. The public will be provided with the opportunity to provide comments on the development of alternatives to the Undertaking as part of the Public Consultation Centres.

The alternatives to the Undertaking will be developed based on the deficiencies identified and how a reasonable alternative to the Undertaking would be able to address the deficiency. Once the alternatives to the Undertaking have been fully developed they will be brought forward to the analysis and evaluation process of the EA Study.

6.7 Analysis and Evaluation of the Alternatives to the Undertaking

For 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 the advantages and disadvantages to the environment; and,
- A determination of "net effects" of the Alternatives to the Undertaking on 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 (broad groupings) identified will be used for all elements, the analysis of

Alternatives to the Undertaking will rely on broader measures. The effects of each alternative to the Undertaking 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.

Therefore, using the groupings and factors identified in Section 6.5, a multi-disciplinary analysis and evaluation will be conducted to identify the preferred alternative to the Undertaking. Prior to the analysis and evaluation the Project Team will review the analysis framework prepared as part of the EA Terms of Reference. If necessary, based on the additional data and constraints identified as part of the EA Study collection of background data the factors would be updated or refined. The Ministry of the Environment and other agencies as necessary will be consulted during the analysis and evaluation process in order to obtain their insight and perspective.

The analysis will be conducted to determine the effects that each Alternative to the Undertaking will have. As required by the Environmental Assessment Act the alternative with the greatest overall benefit will be selected. In order to select an alternative, the mitigation measures for all the identified adverse impacts of each Alternative to the Undertaking would need to be identified. In addition, the determination of "net effects" (i.e. the effects of an alternative with the mitigation measures implemented) would also be considered in the selection of a preferred Alternative to the Undertaking. The advantages and disadvantages of the alternatives will also be identified as part of the analysis and evaluation process.

The public will have the opportunity to comment on the analysis and provide input as part of the Public Consultation Centres.

6.8 Development of Alternative Methods of Carrying Out the Undertaking

The purpose of this phase will be to develop a reasonable set of alternative methods of carrying out the Undertaking (alternative methods). Criteria for the development of alternative methods will be established during the EA Study and will generally follow existing design criteria for horizontal and vertical alignment and cross-section. At this time it would not be possible to determine the criteria for the development of alternative methods due to the range of Alternatives to the Undertaking being considered. The public will be provided with the opportunity to provide comments on the development of alternatives as part of the Public Consultation Centres.

The alternative methods will be developed based on the constraint mapping and will where possible avoid as much of the significant / sensitive environmental features as possible. Once the alternatives have been fully developed they will be brought forward to the analysis and evaluation process of the EA Study.

6.9 Analysis and Evaluation of the Alternative Methods of Carrying Out the Undertaking

As noted in Section 6.7: 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 the advantages and disadvantages to the environment; and,
- A determination of "net effects" of the Undertaking on 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 (broad groupings) identified will be used for all elements, the 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.

Therefore, using the groupings and factors identified in Section 6.5 a multi-disciplinary analysis and evaluation will be conducted to identify the preferred alternative method. Prior to the analysis and evaluation the Project Team will review the analysis framework prepared as part of the EA Terms of Reference. If necessary, based on the additional data and constraints identified as part of the EA Study collection of background data the factors would be updated or refined. The Ministry of the Environment and other agencies as necessary will be consulted during the analysis and evaluation process in order to obtain their insight and perspective.

The analysis will be conducted to determine the effects that each alternative method will have in the various factor areas. Each of the factors will be further defined by the use of indicators as outlined in Section 6.5. Wherever possible, indicators were used which will provide a quantitative measure. If this is not possible, qualitative indicators will be used. Qualitative indicators will be labelled as subjective.

As required by the Environmental Assessment Act the alternative with the greatest overall benefit will be selected. In order to select an alternative, the mitigation measures for all the identified impacts of each alternative method of carrying out the Undertaking would need to be identified. In addition, the determination of "net effects" (i.e. the effects of an alternative with the mitigation measures implemented) would also be considered in the selection of a preferred Undertaking as well. The advantages and disadvantages of the alternatives will also be identified as part of the analysis and evaluation process.

The public will have the opportunity to comment on the analysis and provide input as part of the Public Consultation Centres.

6.10 Refine the Preferred Undertaking

Following public and agency review, the Preferred Undertaking will be refined and finalized. The purpose of the alternative refinement will be to address comments received on the Preferred Undertaking.

6.11 Preliminary Design

The purpose of this task is to develop the Preferred Undertaking to a level of detail so that all of the detailed effects 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 including the "net effects". The Preferred Undertaking depending on the preferred Alternative to the Undertaking will be developed in plan and profile to identify the following:

- Horizontal and vertical alignment
- Pavement/ lane layout / section
- Intersection layout
- Structures (Preliminary General Arrangements)
- Property requirements
- Access to Adjacent properties
- Noise Wall
- Cycle and pedestrian facilities
- Transit facilities
- Level of Service
- Technology
- Natural environment impacts and any required mitigation measures
- Foundations / Geotechnical
- Drainage / SWM/ Backwater analysis
- Urban design and Aesthetics
- Illumination
- Utility impacts and relocations
- Preliminary cost estimate

6.11.1 Development of Recommended Mitigation Strategy

A recommended mitigation strategy will be developed and will rely on the best available technology that is economically feasible. The strategy will help to offset the environmental effects of the Preferred Undertaking. In addition, the mitigation strategy will be consistent with all applicable government Acts, regulations and guidelines.

6.12 Public Consultation

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 EA Study will build on the extensive consultation carried out to date during the preparation of the EA Terms of Reference. The Technical Advisory Committee (TAC) will continue in its role and participating technical agencies will continue to be involved during the EA Study. The agencies will be actively involved in identifying the issues, developing and assessing alternatives, and developing mitigating measures for unavoidable impacts.

The public, including the general public, communities, interest groups and property owners (residential/business/other) will continue to be provided with opportunities to review the study findings and provide input. A Notice of Commencement of the EA Study will be placed in the local papers and on the website. Notices will also be mailed to those on the study mailing list that was prepared as part of the Terms of Reference including property owners within the Study Area. The Public will have two formal opportunities to participate in the EA Study through Public Consultation Centres. The 1-800 Number (1 - 866 - Y LINK EA) will also continue as a resource for the public. Affected Aboriginal Organizations and First Nations will be consulted for information on archaeological resources by direct mailing or another direct method of communication during the preparation of the EA.

If during the course of the study, it is deemed necessary to conduct additional meetings with specific interest groups to deal with localized issues, these meetings will also be arranged.

In addition to the Public Consultation Centres, the Draft EA Report will be provided to the Ministry of the Environment, Government Review, TAC, other Agencies, affected Aboriginal Organizations and First Nations, and the public for review and comment prior to submitting the Final Report to the Ministry of the Environment. The Notice of the draft EA Study will be mailed to the study mailing list which includes agencies, landowners and other interested parties. For the final submission of the EA Report a Notice of Completion of the EA will be placed in the local papers and on the project website. Notices will also be mailed to those on the mailing list (to be updated as the study proceeds). The final EA will also be directly circulated to Government Review agencies and affected Aboriginal Organizations and First Nations and comments will be requested from each.

6.13 Regional Approval

The study finding and recommendations will be presented and submitted to the Regional Transportation and Works Committee and Council for approval.

6.14 Complete EA Report

An EA Report will be completed that addresses the requirements of the Environmental Assessment process. The report will fully document the data collected, the analysis and evaluation of alternatives and the recommendations of the study. The Public Consultation Centres and any other events will be documented in the report. The following steps will be carried out in preparation of the EA Report:

- Prepare draft EA Report;
- Review draft EA Report with affected agencies and interested stakeholders;
- Finalize EA Report;

- Submit EA Report for approval;
- Notify municipal clerks that the EA Report has been submitted; and
- Post a public notice of the submission of the EA Report

The proposed schedule for the EA Study is provided as Exhibit 6-2.

TASK	TASK DESCRIPTION	2004												2005											
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	
1-1	Submit Terms of Reference to Minister of the Environment				★																				
1-2	Terms of Reference Review																								
1-3	Complete Existing Conditions Review																								
1-4	Complete 'Alternative To' Development																								
1-5	PCC #1								★																
1-6	Identify, Analyse and Evaluate Alternatives																								
1-7	Identify Preffered Alternative																								
1-8	PCC #2											★													
1-9	Refinements / Mitigation / Preliminary Design																								
1-10	Prepare EA Report																								
1-11	Submit Draft EA Report to Ministry of the Environment														★										

TRANSPORTATION IMPROVEMENTS IN THE MARKHAM BYPASS CORRIDOR SOUTH OF HIGHWAY 407 ENVIRONMENTAL ASSESSMENT

EA STUDY SCHEDULE

EXHIBIT 6-2

7. MONITORING STRATEGY FOR THE ENVIRONMENTAL ASSESSMENT STUDY

A monitoring strategy and schedule will be developed at the start of the Environmental Assessment to confirm that EA Terms of Reference is followed and to identify any areas which may require modification as the study proceeds.

8. OTHER APPROVALS

It may not be possible to address all approval requirements at the time of seeking EA approval. A number of subsequent approvals may require detailed design and information not available at the time of 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 obtained in a timely manner.

9. COMPLIANCE MONITORING

The Regional Municipality of York is committed to the development of a monitoring strategy and schedule during the preparation of the EA to measure construction and operational impacts such as noise, and water quality. The framework for this 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, and soils
- Provisions to ensure compliance with EA commitments (eg. an environmental inspector, compliance committee, contract specifications) to ensure that all environmental standards and comments for both construction and operation work are met

The monitoring strategy will be developed in consultation with the Environmental Assessment and Approvals Branch of the Ministry of the Environment.

10. POTENTIAL AMENDMENTS TO THE UNDERTAKING

As part of the EA Study an amendment process will be determined that is appropriate for the preferred Undertaking.

Transportation Improvements in the Markham Bypass Corridor South of Highway 407 Environmental Assessment Study

SUPPORTING DOCUMENT

June 2004

TABLE OF CONTENTS

1. Introduction

York Region is carrying out an Environmental Assessment for Transportation Improvements in the Markham Bypass Corridor south of Highway 407 in the Town of Markham.

Part 1 of the study is the development of a detailed Terms of Reference and Part 2 is the Environmental Assessment.

This report documents the supporting documentation to the Draft Terms of Reference. Supporting documentation is information that is supplementary to the Terms of Reference that is not subject to approval from the Minister of the Environment. Supporting documentation includes the results of public consultation, other approvals, and Canadian Environmental Assessment Agency (CEA Agency) requirements.

2. Environmental Assessment Requirements Unique to CEAA

Under *CEAA*, the following information needs to be provided in an environmental assessment conducted as a screening (paraphrasing):

- a description of the existing environment;
- any change the project may cause in the environment including: land, water, air, organic and inorganic matter, living organisms, and the interaction of natural systems;
- any changes to a listed wildlife species, its critical habitat or residences of individuals of that species;
- the effects of a project-related environmental change on: health and socio-economic conditions; physical and cultural heritage; the current use of lands and resources for traditional purposes by aboriginal persons; and any structure, site or thing that is of historical, archeological, paleontological or architectural significance;
- any such project change or effect occurring both within or outside Canada;
- all environmental effects that may result from the various phases of the project (construction, operation, modification, abandonment and decommissioning);
- the environmental effects of accidents and malfunctions;
- the effects of the environment on the project;
- the cumulative environmental effects of this project that are likely to result from the project in combination with other projects or activities that have been or will be carried out[1];
- the likelihood of significant adverse environmental effects;
- the need for and requirements of a follow-up program;
- comments from the public obtained in accordance with *CEAA*;
- any measures to be taken that would mitigate identified environmental effects;
- any other matter that the responsible authority deems to be necessary including those required for a comprehensive study, mediation or panel.

Additional factors to be considered for a comprehensive study, mediation or panel include:

[1] For more information on cumulative effects assessment please refer to the Canadian Environmental Assessment Agency's operational policy statement on cumulative effects, http://www.ceaa-acee.gc.ca/013/0002/cea_ops_e.htm

- the purpose of the project;
- alternatives means of carrying out the project;
- design of a follow up program;
- the capacity of renewable resources affected by the project to meet the needs of the present and those of the future.

If the decommissioning and abandonment phases are not currently part of the proposed project, the proponent may explain this in its EA document, and the responsible authority under *CEAA* may decide not to require further analysis on these phases of the project as part of the current assessment.

Nothing in this document will limit the prerogative of federal authorities to seek additional information as more is learned about the specifics of the projects and its potential effects. Responsible authorities will be making a judgment about the likelihood of significant adverse environmental effects after mitigation, and they have the discretion to determine what information they require before making such a judgment.

3. Federal / Provincial Coordination

The proponent's undertaking is subject to the requirements of the *Ontario Environmental Assessment Act.* The requirements of the *Canadian Environmental Assessment Act* (CEAA) may also apply. The proponent intends to work in a coordinated way with provincial and federal governments, both governments having informally agreed to coordinate their respective EA processes established by the applicable environmental assessment legislation.

Coordinated EA Process

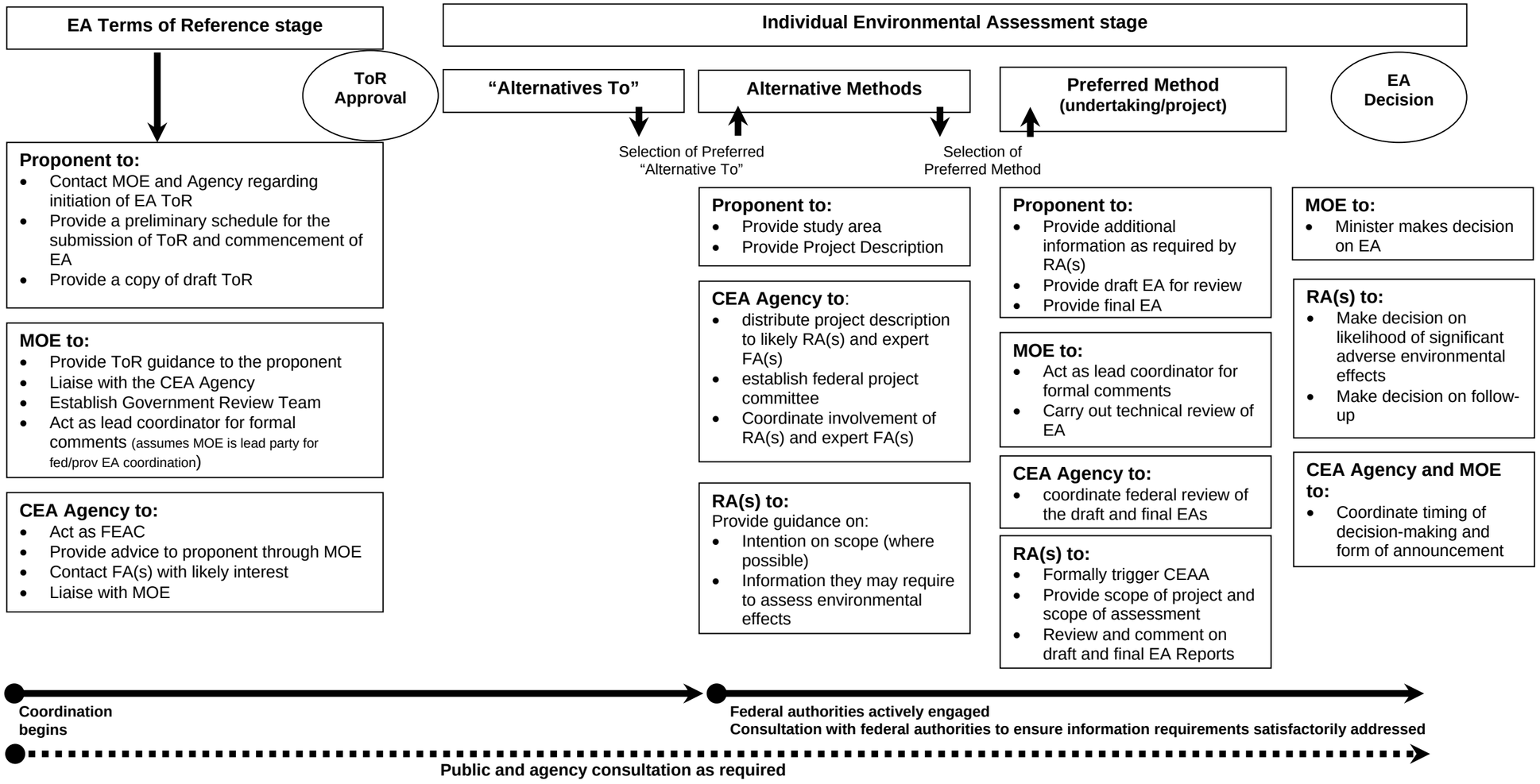
The proponent will be guided by the federal/provincial coordination process chart outlined on Exhibit 1. This proposed approach is designed to address the information requirements of both federal and provincial environmental assessment Acts.

Application of the Coordinated EA Process to the Proposed Project

It is recognized by both the Canadian Environmental Assessment Agency (on behalf of the federal authorities), and the proponent, that ongoing dialogue on the information requirements is required throughout the EA process as more is learned about the specifics of the undertaking. As such, it may be necessary for the proponent to provide additional or more detailed information as the EA process proceeds. The intent is to produce a single EA body of documentation on environmental effects to meet all of the information needs of both the federal and provincial governments. To the extent practical, federal/provincial information requirements regarding potential factors to be assessed in the context of this study have been integrated.

EXHIBIT 1

DRAFT
Federal/Provincial Coordination Process for Individual EAs/Screenings
Key Steps



4. Other Approvals

Other Approvals as noted by the Government Review Team include the following:

- **Navigable Waters Protection Act (NWPA)** – The purpose of this Act is to protect the public right of navigation by prohibiting the building or placement of any "work" in, upon, through, or across a navigable water without the Authorization of the Minister of Fisheries and Oceans.

- **Lakes and Rivers Improvement Act** – The purposes of this Act is to provide for,
    a. the management, protection, preservation and use of the waters of the lakes and rivers of Ontario and the land under them;
    b. the protection and equitable exercise of public rights in or over the waters of the lakes and rivers of Ontario;
    c. the protection of the interests of riparian owners;
    d. the management, perpetuation and use of the fish, wildlife and other natural resources dependent on the lakes and rivers;
    e. the protection of the natural amenities of the lakes and rivers and their shores and banks; and
    f. the protection of persons and of property by ensuring that dams are suitably located, constructed, operated and maintained and are of an appropriate nature with regard to the purposes of clauses a to e.

- **Public Lands Act** – The purpose of this Act is to manage the land base for the people of Ontario in an ecologically sustainable manner. The construction of all buildings or structures on Crown land would require approval by the Ministry of Natural Resources.

- **Ontarians with Disabilities Act** - The purpose of this Act is to provide for persons with disabilities with an improved opportunity for their involvement in the identification, removal and prevention of barriers to their full participation in the life of the province.

- **Ontario Water Resources Act** – The purpose of this Act is to protect Ontario's water resources such as approval for any sewage works / stormwater management facilities or permits to take water.

- **Endangered Species Act** – The purpose of this Act is to conserve, protect, restore and propagate species of fauna and flora of the Province of Ontario that are threatened with extinction.

- **Environmental Protection Act** - The purpose of this Act is to provide for the protection and conservation of the natural environment.

- **Canadian Environmental Quality Guidelines** – These guidelines provide recommended numerical or narrative limits for a variety of substances and environmental quality parameters in order to protect the health of the Canadian Ecosystems.

- **Canada Transportation Act** – This Act applies to transportation matters such as providing viable and effective transportation services and making use of all available modes of transportation.

- **Fisheries Act** – The purpose of this Act is to protect fisheries and fish habitat.

- **Canadian Environmental Protection Act** – This Act provides environmental quality objectives, guidelines and codes of practice for pollution prevention and waste management.

- **Department of Environment Act** – The purpose of this Act is to advocate, preserve and enhance the environment.

- **Species at Risk Act** – The purpose of this Act is to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened.

- **National Accord for the Protection of Species at Risk** – The purpose of this Accord is to commit Canada and the Provinces to recognize species at risk as designated by the Committee on the Status of Endangered Wildlife in Canada and to work together to protect these species.

- **Canada Wildlife Act** – The Act provides information on species at risk as designated by the Committee on the Status of Endangered Wildlife in Canada.

- **A Wildlife Policy for Canada** – This policy aims to maintain and restore ecological processes and the diversity of ecosystems, species and genetic variability within species.

- **Migratory Birds Convention Act** – This Act prohibits the taking or killing of migratory birds and their nests and eggs.

- **Nuclear Safety and Control Act** – regulates almost all uses of nuclear energy and nuclear materials in Canada. The purpose of the Act is to:

  "(*a*) to regulate the development, production and use of nuclear energy and the production, possession and use of nuclear substances, prescribed equipment and prescribed information in order to

  (i) prevent unreasonable risk, to the environment and to the health and safety of persons, associated with that development, production, possession or use,

  (ii) prevent unreasonable risk to national security associated with that development, production, possession or use, and

  (iii) achieve conformity with measures of control and international obligations to which Canada has agreed; and

(*b*) to disseminate objective scientific, technical and regulatory information to the public concerning the activities of the Commission and the effects, on the environment and on the health and safety of persons, of the development, production, possession and use referred to in paragraph (*a*)."

Please note that other approvals may be identified as part of the EA Study. The above list is not considered to be complete.