

TORONTO TRANSIT COMMISSION REPORT NO.

MEETING DATE: AUGUST 26, 2009

SUBJECT: REQUEST FOR APPROVAL OF THE
SCARBOROUGH-MALVERN LRT
ENVIRONMENTAL ASSESSMENT STUDY

ACTION ITEM

RECOMMENDATION

It is recommended that the Commission:

1. Approve the recommendation, of the joint City/TTC Scarborough-Malvern Transit Project Assessment Study, for a Light Rail Transit (LRT) line from Kennedy Station to Sheppard Avenue East along Eglinton Avenue, Kingston Road, Morningside Avenue, Ellesmere Road, and Military Trail, as outlined in this report;
2. Forward this report to the City of Toronto, requesting that City Council, at its meeting on September 30, 2009, approve the recommendations of the Scarborough-Malvern LRT Transit Project Assessment Study and authorize submission of the Environmental Project Report (EPR) to the Ministry of Environment;
3. Note that City Planning is proceeding to amend Map 5 of the Toronto Official Plan to identify Morningside Avenue (from Kingston Road to Sheppard Avenue East) and sections of the roadways in the general vicinity of the University of Toronto Scarborough Campus (portions of Military Trail and Ellesmere Road) as part of the Official Plan's "Surface Transit Priority Network", in support of this project;
4. Note that City Planning is proceeding to amend the Right-of-Way widths shown on Map 3 of the Toronto Official Plan for a section of Morningside Avenue, north of Kingston Road to 36 metres (from 30m) and Military Trail between Ellesmere Road and Morningside Avenue to 36 metres (from 27m).

FUNDING

Funding for the Scarborough-Malvern LRT Preliminary Planning and Environmental Assessment was included in the TTC 2009-2013 Capital Program as approved by City Council on December 10, 2008. No further funding for the Scarborough-Malvern LRT is being requested at this time.

BACKGROUND

At its meeting of March 21, 2007, the Commission endorsed the *Toronto Transit City Light Rail Plan* as the basis and priority for rapid transit expansion in the City of Toronto. This plan included the Scarborough-Malvern LRT line as one of seven lines forming a network of fast, reliable, environmentally-sustainable light rail transit throughout the City.

Subsequently at its meeting of November 14, 2007, the Commission received the staff report entitled, *Transit City Light Rail Plan – Evaluation and Ranking of Routes*, which assessed all seven of the light rail lines which comprise the Transit City plan, and confirmed the earlier staff conclusion that the Sheppard East, Etobicoke-Finch West, and Eglinton-Crosstown LRT lines are good choices for the start of implementation of the plan.

Funding had already been approved to complete the environmental assessments (EA) for all the Transit City lines to ensure a state of readiness for all projects.

This report provides a summary of the results of the Transit Project Assessment Study and the rationale supporting the various elements of the recommended preferred design for the Scarborough-Malvern LRT line.

On June 15, 2007, the Province of Ontario announced the *MoveOntario 2020* rapid transit plan for the Greater Toronto and Hamilton area (GTHA). *MoveOntario 2020* includes the TTC-City of Toronto *Transit Light Rail Plan*, which includes the proposed Scarborough-Malvern LRT line.

In Spring 2009 the Province announced funding for Etobicoke-Finch West, SRT and Eglinton Crosstown and the Province/Federal Government announced funding for the Sheppard Avenue East LRT. As no funding from the Province or Federal Government has been announced for the Scarborough-Malvern LRT, further design and engineering work will not be proceeding at this time.

DISCUSSION

Purpose of the Scarborough-Malvern LRT Project

The objective of the Scarborough-Malvern LRT is to provide LRT service in the Eglinton Avenue / Kingston Road / Morningside Avenue corridor, in a manner that is affordable, that makes transit more attractive compared to the private automobile, and that supports other important City objectives in the corridor, such as more dense, transit-oriented development, and an improved walking and cycling environment.

Study Area

The *Toronto Transit City Light Rail Plan* originally proposed that the Scarborough-Malvern LRT line operate between Kennedy Station and the Malvern Area north of Sheppard Avenue East. However, based on projected ridership beyond Sheppard Avenue East and the planned SRT extension to Malvern Town Centre, it was decided to terminate the Scarborough-Malvern LRT at Sheppard Avenue East.

The Process to Date

The process to date has involved a number of study phases to develop a preferred LRT alignment and to assess the impacts of its construction and operation. These phases have included:

- A Feasibility Study was completed to assess the implementation of an LRT line within the defined Scarborough Malvern corridor. It identified key issues to be analyzed during the transit project assessment process.
- Data collection and analysis on transportation facilities, the natural environment, and the social environment was completed for the full corridor.
- For those areas where issues had been identified, alternative solutions were developed and analyzed. The preferred option was incorporated into the preferred project design.
- Environmental issues were identified and alternative elements were selected for the alignment to minimize and/or mitigate adverse impacts.
- At the beginning of the process, various agencies and stakeholder groups were canvassed to determine interest in the project. Meetings were held with City departments, interested stakeholders (e.g., University of Toronto, Scarborough Campus), and utility companies.
- A comprehensive public consultation program was developed to allow the general public to review the proposed project, provide comments and outline any objections. Three series of public consultation open houses were conducted. Information was posted on the City and TTC websites. Opportunities were provided for the public to comment verbally, by email or by fax. In addition, meetings arranged by local Councillors provided additional opportunities for the public to receive and respond to detailed information similar to the open houses. Responses to questions to individuals have been provided where requested and a summary prepared of all concerns and comments.
- The full process has resulted in the development of a preferred alignment and associated facilities for the Scarborough Malvern LRT line to operate from Kennedy Station on the Bloor-Danforth Subway line to Sheppard Avenue/Morningside Avenue.

The Preferred Design for the Scarborough-Malvern LRT

The design proposed on Eglinton Avenue, Kingston Road and most of Morningside Avenue consists of two LRT tracks operating on an approximately 150 mm raised median in the middle of the road. On Morningside Avenue, north of Beath Street to Ellesmere Road the LRT will operate to the east side off the roadway. Midblock, there will be two traffic lanes, plus a bicycle lane, on either side of the LRT. Generally, at signalized intersections, the raised right-of-way is lowered and the cross-section will accommodate a left-turn lane and LRT passenger platforms. On sections which currently have three traffic lanes in each direction, two of the existing six traffic lanes will be converted to LRT right-of-way, and any widening necessary would be minor.

Traffic will be permitted to cross the tracks at signalized intersections only. Unsignalized intersections and driveways will be limited to right-in/right-out operation. U-turns will be permitted from left-turn lanes at signals to assist motorists, who can no longer make left-turns at unsignalized locations, to reach their destination. In general, there will be reduced vehicular capacity on Kingston Road and Eglinton Avenue.

LRT stops will generally be provided every 400-to-600 metres. Passenger platforms will be 60 metres long to accommodate two-vehicle trains.

The urban design element of this project recognizes the importance of designing an “entire street”. As outlined in the City's *Vibrant Streets* document, a key objective is to create a street that is accessible, more attractive, and pedestrian-friendly. Urban design, cycling, and pedestrian-realm issues have been paramount throughout the development of the environmental assessment. During the detailed design phase, urban design considerations will continue to be integrated throughout the project, focusing on accessibility, treatments in areas such as LRT platforms, crosswalks, and boulevards that would be unique to *Transit City* LRT lines, provision of adequate space for street furniture, as well as incorporating special urban design treatments where possible. The project will include a public art component.

Special Design Areas

Connection at Kennedy Station: The connection of the Scarborough-Malvern LRT in the Kennedy Station area is part of the separate SRT/Kennedy Station Project that is addressing improved integration between the existing subway, the SRT, the Transit City Eglinton Crosstown and Scarborough-Malvern lines and buses. The connection of the Scarborough-Malvern LRT to Kennedy Station will be the subject of an EA amendment.

University of Toronto – Scarborough Campus: The University of Toronto is developing a master plan for the Scarborough Campus (UTSC). Although not complete at this time, in the context of the master planning exercise, the TTC, City of Toronto and UTSC jointly

developed a recommended alignment that will connect to the University via Ellesmere Road and Military Trail.

Costs and Schedule

The capital costs of constructing the Scarborough-Malvern LRT line, between Kennedy Station and Sheppard Avenue East, including vehicles, apportioned maintenance and storage facilities and apportioned Kennedy Station Improvements is estimated to be \$1,078 million. These figures are expressed in 2009 dollars and do not carry any escalation allowance for work undertaken in future fiscal periods.

The Scarborough-Malvern LRT is not included in the TTC Transit City Priority Projects and has not received Provincial or Federal funding. The EA approval will ready this project for implementation and provide for corridor protection.

Metrolinx's Regional Transportation Plan schedules the Scarborough-Malvern LRT in the 15-25 year timeframe.

Official Plan Amendments

Map 5 of Toronto's Official Plan, "Surface Transit Priority Network" identifies Eglinton Avenue and Kingston Road as Transit Priority corridors from Kennedy Station to Morningside Avenue. City Planning staff are conducting an Official Plan Amendment to also identify the section of Morningside Avenue, between Kingston Road and Sheppard Avenue and the roadways in the general vicinity of the University of Toronto Scarborough Campus as Surface Transit Priority corridors, in support of this initiative. City Planning is also proceeding to amend the Right-of-Way widths shown on Map 3 of the Toronto Official Plan for the section of Morningside Avenue, north of Kingston Road to 36 metres (from existing 30m) and for Military Trail between Ellesmere Road and Morningside Avenue to 36 metres (from existing 27m).

Environmental Assessment

Under the Transit Projects Regulation of the *Environmental Assessment Act* (EA), transit projects, such as the Scarborough-Malvern LRT, are exempt from the requirements under Part II of the *Act*. The new regulation has created a process which allows for an assessment of potential environmental impacts to be completed and approved within six months.

The key steps in the Transit Project Assessment Study process are:

- Contact the Ministry of Environment for a list of agencies to contact;
- Distribute the Notice of Commencement;
- Take up to 120 days to consult with interested persons and regulatory agencies,

- and process the recommendation for approval;
- Publish a Notice of Completion of the Environmental Project Report (EPR);
 - Provide 30 days for the public, regulatory agencies, Aboriginal communities, and other interested persons to review the Environmental Project Report;
 - 35 days for the Ministry of Environment (MOE) to act if there is a potential for a negative impact on a matter of Provincial importance that relates to the natural environment or has cultural heritage value; is of interest to, or has an impact on a constitutionally protected Aboriginal or treaty right.

The preliminary planning has been completed for the project and the Transit Project Assessment Process Notice of Commencement was issued June 19, 2009. Public consultation has been included throughout the process. The attached report, entitled "Scarborough-Malvern LRT, Transit Project Assessment, Environmental Project Report Summary" provides additional details on:

1. The process followed to develop the project;
2. The rationale for the design elements selected for the Scarborough-Malvern LRT, and,
3. A summary of the environmental impacts of the project and net effects following proposed mitigation measures.

Complete details on the Scarborough-Malvern LRT line, including plans of the 13-kilometre corridor from Kennedy Station to Sheppard Avenue East, will be contained in the project's Environmental Project Report, which is in draft form and will be finalized following Commission approval. Following City Council approval of the recommended project, the Environmental Project Report will be completed and placed on the public record for the mandatory 30-day review period.

JUSTIFICATION

The Scarborough-Malvern Light Rail project is a component of the *Toronto Transit City Light Rail Plan*, the Province's *MoveOntario 2020* plan and Metrolinx Regional Transportation Plan. The recommendations of the Scarborough-Malvern LRT Transit Project Assessment Study should be approved by the Commission as a cost-effective way of providing excellent, reliable, high-capacity, environmentally-sustainable transit service and to, thereby, reduce auto dependency in this corridor and create a more liveable, attractive, and sustainable city.

August 13, 2009

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Attachment



Toronto Transit Commission / City of Toronto

SCARBOROUGH-MALVERN LIGHT RAIL TRANSIT
TRANSIT PROJECT ASSESSMENT
ENVIRONMENTAL PROJECT REPORT SUMMARY

FOR TTC COMMISSION REPORT

August 2009



EXECUTIVE SUMMARY

E.1. INTRODUCTION

The Toronto Transit Commission (TTC) and City of Toronto have undertaken a Transit Project Assessment Process (TPAP) study for the 13 km long Scarborough-Malvern Light Rail Transit (SMLRT) corridor that would link Kennedy Station, including the Bloor-Danforth Subway, the Scarborough RT and the proposed Eglinton Crosstown LRT, with northern Scarborough. This study recommends that bus services along the SMLRT corridor be replaced by Light Rail Transit (LRT) – electrically powered “light rail” vehicles operating in a designated right-of-way in the centre of the street. The light rail service would run east from Kennedy Station on Eglinton Avenue, northeast on Kingston Road, and then north on Morningside Avenue via Ellesmere Road and Military Trail to northern Scarborough.

Study Background and Context:

Study Area

The study area for this TPAP consists of three major corridors including Eglinton Avenue Corridor, Kingston Road Corridor and Morningside Avenue Corridor as shown on Exhibit E-1. The study limits for each corridor are provided as follows:

1. Eglinton Avenue Corridor

- ♣ Eglinton Avenue, from 200m west of Midland Avenue to Kingston Road. The study of the connection at Kennedy Subway Station will be the subject of an EA amendment following completion of the Kennedy Subway Station study;

2. Kingston Road Corridor

- ♣ Kingston Road, from Eglinton Avenue to Morningside Avenue;

3. Morningside Avenue Corridor

- ♣ Morningside Avenue and Ellesmere Road, from Kingston Road to the University of Toronto Scarborough Campus (UTSC);
- ♣ UTSC via Ellesmere Road/Military Trail and Morningside Ave. to Sheppard Avenue East (and 140 m north of the intersection) to connect with the Sheppard East LRT.

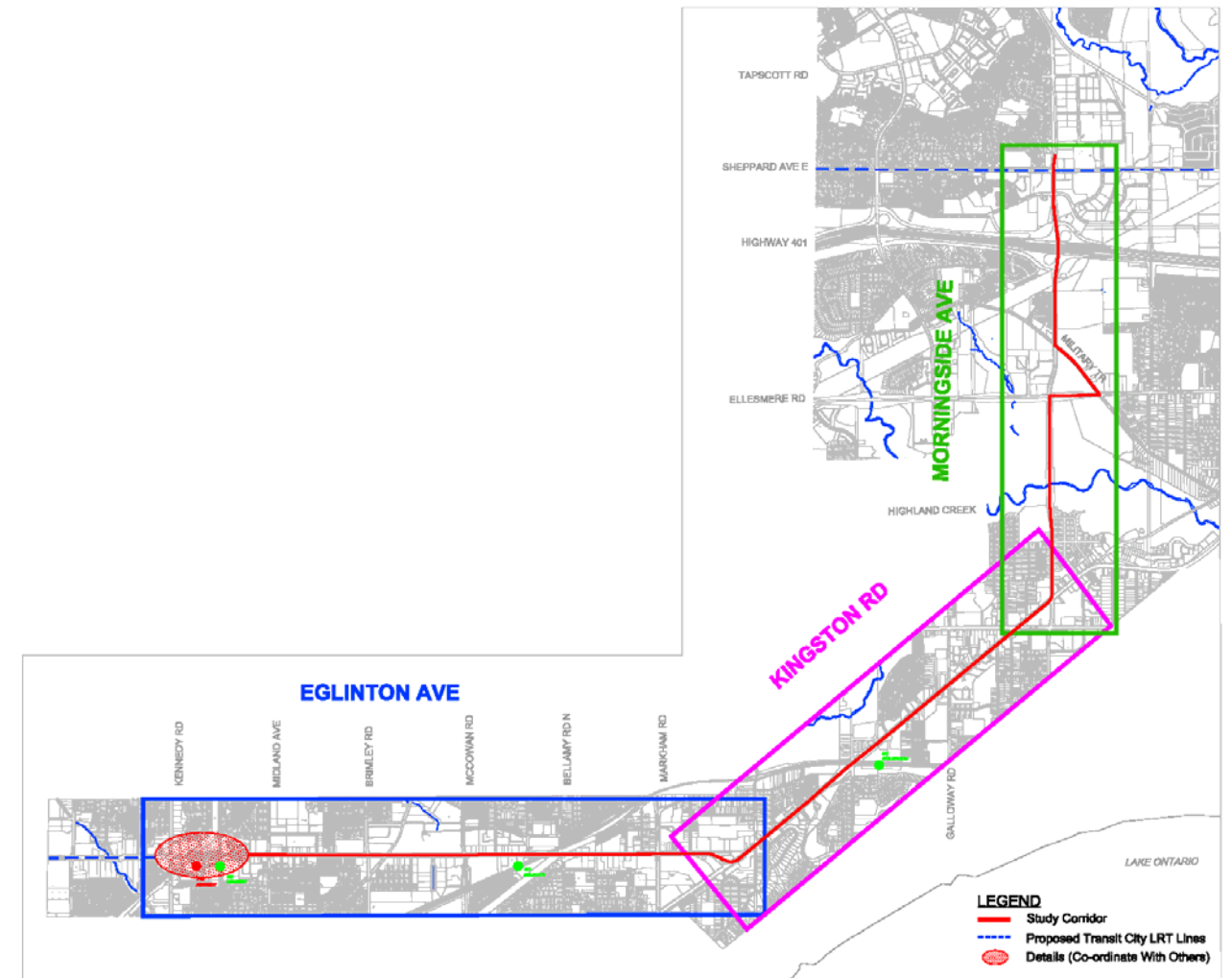
The study area was developed based on a feasibility study that was undertaken in early 2008. Alternative corridors from the Kingston Road/Morningside Avenue intersection to northern Scarborough connecting the Malvern Community were identified, developed and assessed, consistent with established City planning policies and the overall project objectives during the feasibility study phase.

Study Process –The Transit Project Assessment Process (TPAP)

This study was conducted following a Transit Project Assessment Process (TPAP) in accordance with Ontario Regulation 231/08 for Transit Projects and Greater Toronto Transportation Authority Undertakings. It is one of the TTC and City of Toronto LRT Transit Improvement Projects that have been carried out following this new

TPAP, which provides a framework for an accelerated consultation process for the assessment of potential environmental effects of a transit project.

Exhibit E-1: Study Area



Toronto Official Plan

The City’s Official Plan strives to decrease dependency on private automobiles through a wide range of sustainable transportation objectives that support the development of a network of alternative forms of travel that are seamlessly linked, safe, convenient, affordable and economically competitive. LRT is one of the key elements of the City’s transportation network and is crucial to supporting the growing travel needs of residents and workers over the next 30 years. Developing a LRT line in the Scarborough-Malvern study area supports the Official Plan.

Eglinton Avenue and Kingston Road are designated as Avenues in the Toronto Official Plan. These are important corridors along major streets where redevelopment and growth is encouraged. Growth and redevelopment must be supported by high quality transit services that promote a safe pedestrian environment and efficient commutes by placing priority on buses, streetcars, and LRT. Lands designated as mixed-use areas along the Avenues have the opportunity to perform a 'Main Street' function and become meeting places for local neighbours and the wider community. By promoting alternative forms of travel, these areas become vibrant communities centred on activities and uses instead of automobiles. By directing growth to areas such as Avenues, the Official Plan provides greater certainty for land owners, businesses, and residents about what type of growth can be anticipated, and where growth will occur.

An amendment to Map 5 of the Official Plan is required in order to identify the segment of Morningside Avenue from Kingston Road to Ellesmere and from Military Trail to North of Sheppard Avenue as well as Ellesmere Road between Morningside Avenue and Military Trail and Military Trail from Ellesmere Road to Morningside Avenue as part of the City's "Surface Transit Priority Network". This amendment will enable public works related to the proposed Transit City – Scarborough-Malvern Light Rail Transit (LRT) to proceed north of Kingston Road. In addition, City Planning is proceeding to amend the Right-of-Way widths shown on Map 3 of the Toronto Official Plan for a section of Morningside Avenue, north of Kingston Road to 36 metres (from 30m) and Military Trail between Ellesmere Road and Morningside Avenue to 36 metres (from 27m)

Toronto Transit City Light Rail Transit Plan

In 2007, the TTC developed a plan that built upon the transit concepts in several studies, including the Toronto Official Plan, the TTC Ridership Growth Strategy, Building a Transit City and the Mayor's "Transit City" Platform (2006), and recommended a network of electric light-rail lines throughout the City, each with its own right-of-way. There are seven new lines proposed, with a total length of 120 km, all connecting with the City's existing and planned rapid transit routes. By 2031, it is estimated that the new lines would carry 175 million riders per year.

Other Related Studies

Preparation of this study has also taken into consideration the policies, plans and strategies of the following municipal and provincial documents:

- Toronto Bike Plan – Shifting Gears
- Cycling and Transit Strategy: Bicycle Parking and Access to the Toronto Transit Commission
- Provincial Policy Statement
- Growth Plan for the Greater Golden Horseshoe
- Regional Transportation Master Plan (Metrolinx)
- Sheppard East LRT Class Environmental Assessment Study

E.2. PROJECT DESCRIPTION

The preferred Scarborough-Malvern LRT project includes the following key design components:

1. construction of the LRT in the centre of the roadway on a raised median to separate the LRT from vehicular traffic, crossing signalized intersections at-grade, with the exception of the areas adjacent to Highland Creek and UTSC;
2. construction of 3.0 m wide far side platforms or a minimum 5.0 m wide centre platform with an average spacing of 400-500 m, in general;
3. provision of a 1.6 m delineated cycling lane on both sides along Eglinton Avenue, Kingston Road and Morningside Avenue with the exception of the Highway 401 area;
4. provision of 2 vehicular traffic lanes in each direction adjacent to the Scarborough-Malvern LRT corridor;
5. provision of left turn lanes at signalized intersections except identified locations;
6. provision of U-turn opportunities at signalized intersections where there are no significant adverse traffic impacts;
7. construction of a new bridge over Highland Creek parallel to the existing Morningside Avenue structure;
8. reconfiguration of the following intersections to minimize adverse traffic impacts: Eglinton Avenue & Kingston Road, Kingston Road & Morningside Avenue and Lawrence Avenue & Kingston Road;
9. provision of a new access road connection between Warnsworth Street and Beath Street on the west side of Morningside Avenue;
10. minor realignment of the south-east ramp of the Highway 401/Morningside Avenue interchange for 200 m at the entrance area.

LRT Alignment

The Scarborough-Malvern LRT alignment will generally follow the existing roadway alignments along the study corridor, with the exception of Morningside Avenue (between Beath Street and Ellesmere Road) and on Ellesmere Road. Beginning at the Kennedy Station west of Midland Avenue, the LRT will travel eastward along the existing centrelines of Eglinton Avenue, Kingston Road, Morningside Avenue from Kingston Road to just north of Beath Street. It will then cross the Morningside Avenue northbound lanes just north of Beath Street and tie into a new Highland Creek structure located on the east side of Morningside Avenue. At Ellesmere Road it will turn east and run along the south side of Ellesmere Road to serve the University of Toronto Scarborough Campus. The LRT will then turn north to the centre of Military Trail from Ellesmere Road to Morningside Avenue. Thereafter, the LRT alignment will operate north in the centre of Morningside Avenue, pass over Highway 401, cross Sheppard Avenue East and terminate 140 m north of the intersection.

The existing horizontal alignments of Eglinton Avenue and Kingston Road will remain the same, except at the Eglinton Avenue and Kingston Road intersection. Morningside Avenue will be widened on both sides between Kingston Road and north of Warnsworth Street. The alignment will be realigned slightly to the west from Warnsworth Street to tie into the existing Highland Creek structure. The Morningside Avenue widening will be along the existing east side edge of pavement north from Warnsworth Street, to accommodate the existing travel lanes, the proposed LRT facilities and bicycle lanes.

Vertical alignment for the LRT alignment will generally follow the existing road profile. The maximum grade for the LRT will be 5.0%.

Typical Cross-Sections

Typical cross-sections along the Scarborough-Malvern corridor were developed for both mid-block sections and at the intersection areas. Typically, the LRT alignment is located in the middle of the corridor with a 150 mm high median to separate the LRT traffic and the general traffic between traffic signals. At intersections, the track will be constructed at the same elevation as the crossing road. Light rail vehicles (LRVs) will be operating on standard TTC gauge embedded track. The proposed system will be double-tracked throughout, providing a separate track for both directions. Generally, a cross-section of at-grade double tracks for LRT alignment requires 7.4 m. The minimum vertical clearance is approximately 4.0 m from top of rail. Crossovers will be provided at designated locations for special LRT operations to allow trains to cross to the opposite track.

Centre-located poles are recommended from an urban design perspective (removal of some visual clutter from the street), and because they cost less to construct, are less prone to damage and have lower maintenance requirements. Pole locations will be confirmed at the detailed design stage.

The following Exhibit E-2 cross-section shows a typical mid-block condition on Eglinton Avenue and Kingston Road. On Eglinton Avenue, the existing 6 traffic lanes and centre left turn lane will be replaced by the LRT right-of-way, 2 lanes of traffic in each direction, bicycle lanes and boulevard/sidewalk. Similarly, on Kingston Road, the existing 6 traffic lanes and raised median/centre left turn lane will be replaced by the LRT right-of-way, 2 lanes of traffic in each direction, plus bicycle lanes and boulevard/sidewalks. The existing Morningside Avenue right-of-way between Kingston Road and Warnsworth Street will be widened to accommodate the LRT right-of-way, 2 lanes of traffic in each direction, bicycle lanes and boulevard/sidewalk as shown in Exhibit E-3.

Exhibit E-2: Typical Mid-Block Cross Section – Eglinton Avenue and Kingston Road

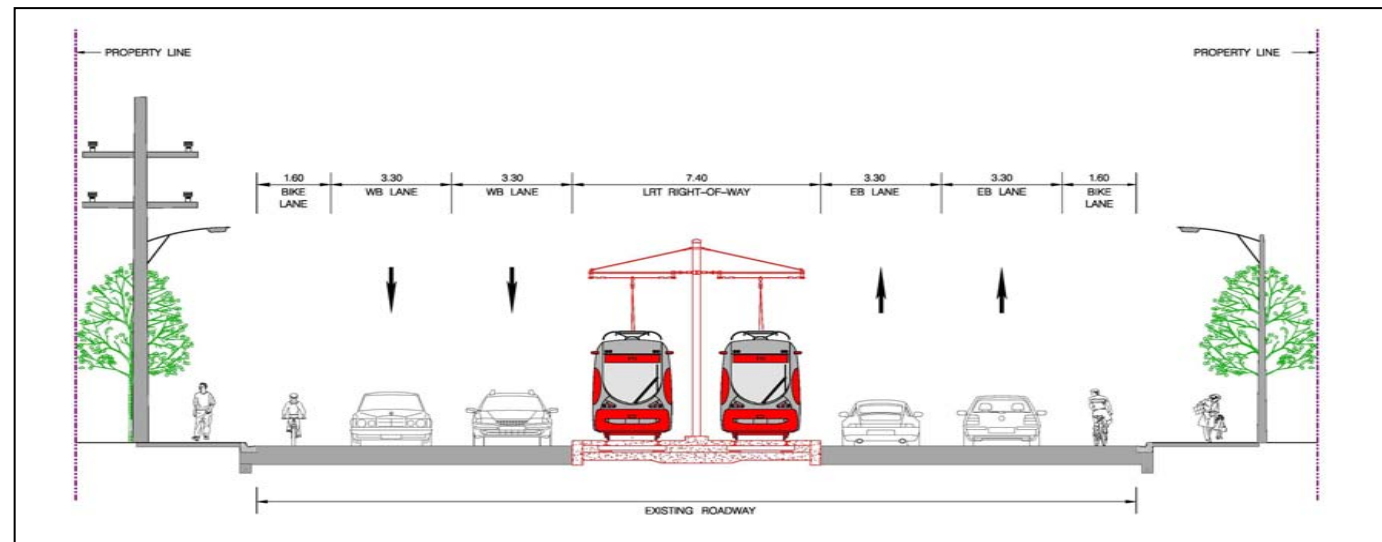
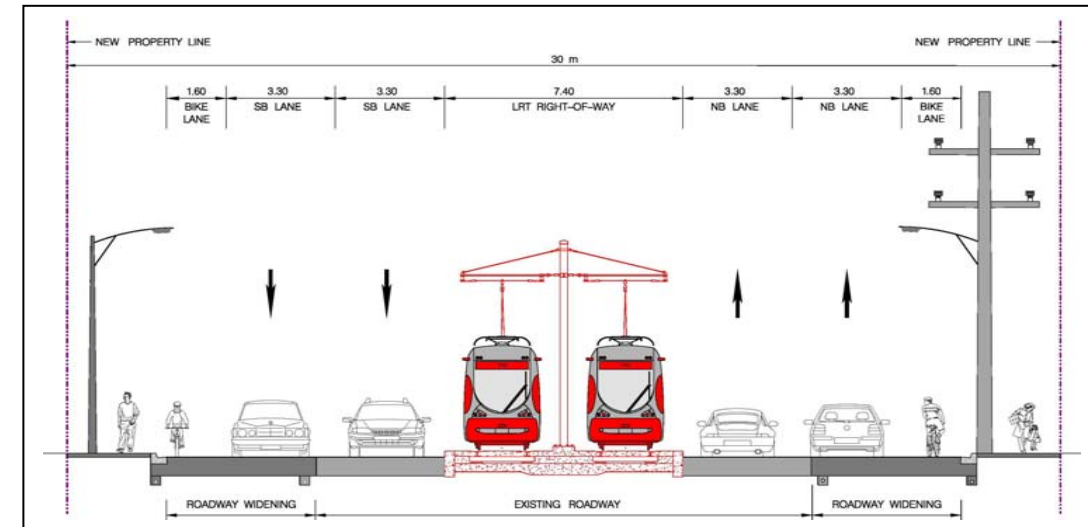


Exhibit E-3: Typical Cross Section – Morningside Avenue



The existing Highland Creek Structure will require widening by 1.7 m on the east side to accommodate the bicycle lanes as shown in Exhibit E-4. In addition, a new 9.0 m wide structure is proposed on the east side of Morningside Avenue for the LRT.

Ellesmere Road has a four-lane cross section with no median and a sidewalk on the south side. The existing roadway cross-section will be maintained with the LRT located on the south side of Ellesmere Road and bicycle lanes will not be provided as shown in Exhibit E-5. Military Trail will become a four lane road with the LRT facilities located in the median as shown in Exhibit E-6. The LRT right-of-way along Military Trail will be wider than other locations due to the special trackwork located within this area.

Left Turning Movements at Unsignalized Intersections

Left turns across the Scarborough-Malvern LRT tracks will only be permitted at signalized intersections, where possible. Loss of left turn access to driveways/streets located between traffic signals will be facilitated at nearby signalized intersections where “U” turns will be permitted to allow motorists an opportunity to achieve the equivalent movement/access.

Exhibit E-4: Typical Cross Section – Morningside Avenue over Highland Creek

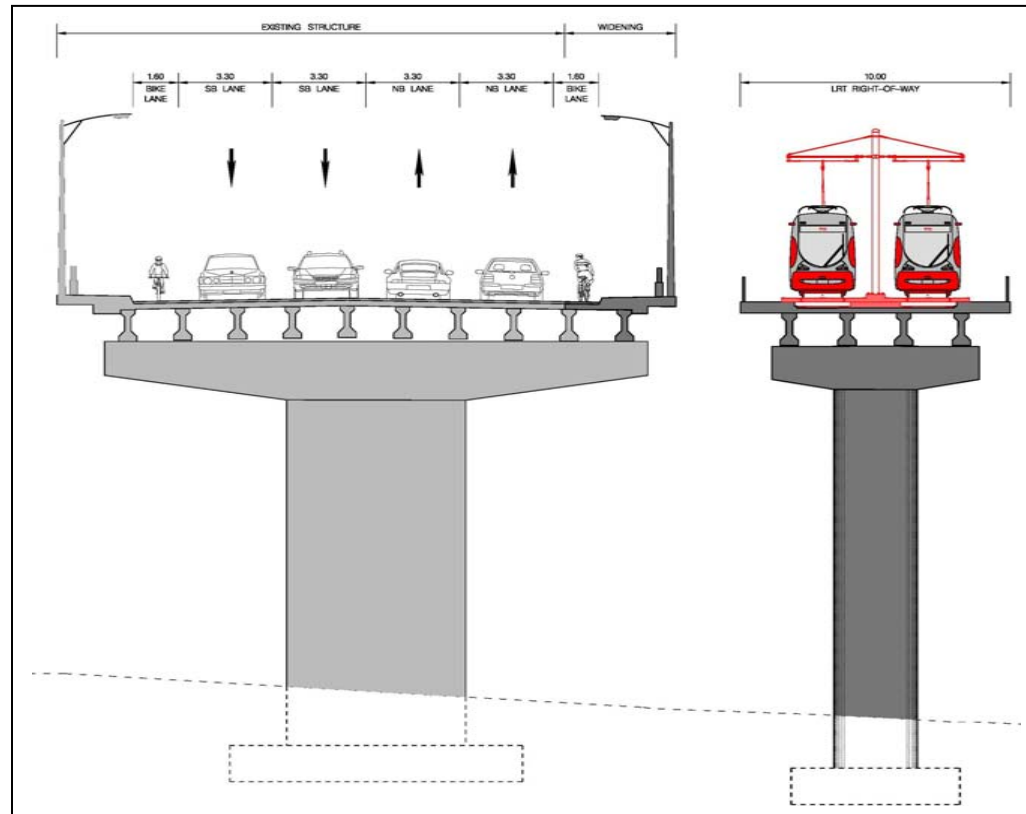


Exhibit E-5: Typical Cross Section – Ellesmere Road

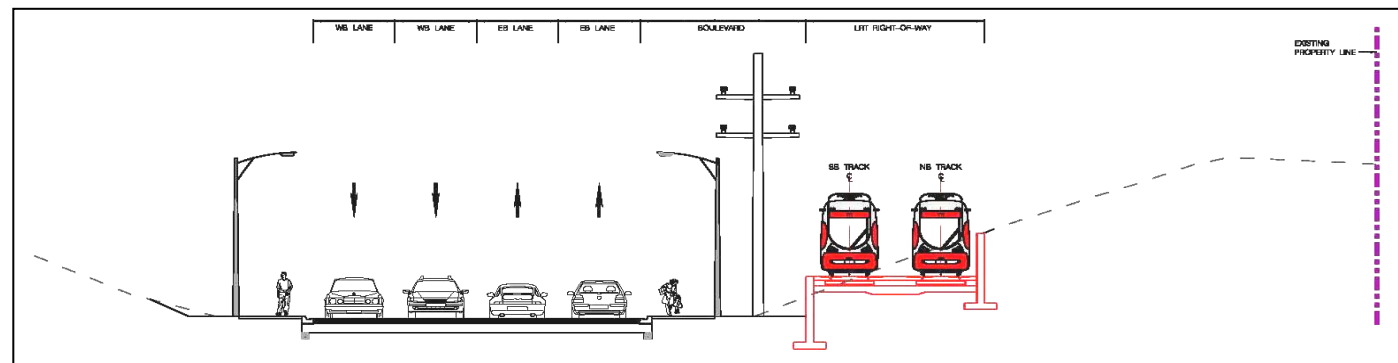
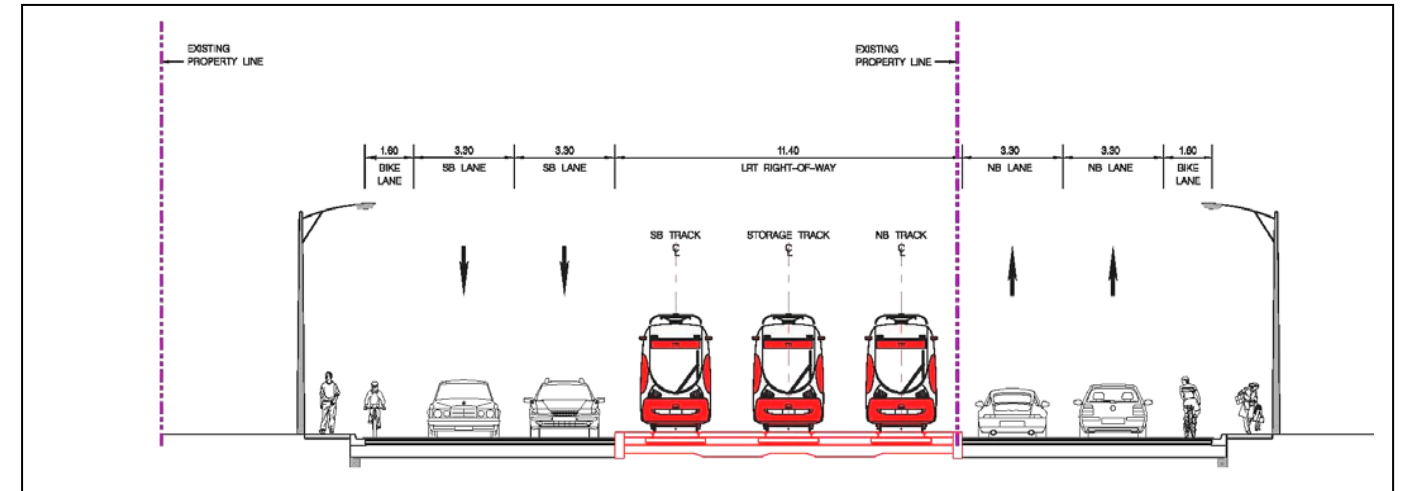


Exhibit E-6: Typical Cross Section – Military Trail



E.3. EXISTING CONDITIONS / POTENTIAL IMPACTS / MITIGATION AND NET EFFECTS

Design alternatives for the SMLRT were developed to assess the potential impacts on all existing significant features and sensitive areas within the proposed corridor. A summary of some key findings is provided as follows:

Transportation System / Traffic Operations

The Toronto Transit Commission currently operates three bus routes in the Scarborough-Malvern corridor, the 34 Eglinton East, 86 Scarborough and 116 Morningside. These three routes have a combined daily ridership of 63,600 and a peak hour peak point ridership of 2,700 persons per hour per direction. An additional 12 bus routes cross the Scarborough-Malvern corridor.

GO Transit currently operates four routes within the Scarborough-Malvern study area; the Lakeshore East and Stouffville rail corridors (with complementary bus service in the Stouffville corridor), the Highway 407 East GO Bus and UTSC/Centennial College GO Bus. The typical AM peak period / peak direction rail boardings are over 1,000 passengers per hour at both the Guildwood and Eglinton Stations.

Existing Eglinton Avenue, Kingston Road and Morningside Avenue do not currently provide any designated bicycle facilities. However, these corridors are included in the City of Toronto Bicycle Lane Network as part of the City of Toronto's Bike Plan. With regard to pedestrian facilities, Eglinton Avenue, Kingston Road, and Morningside Avenue along the Scarborough-Malvern corridor currently include sidewalks along both sides of the road. Pedestrian crossings with traffic signals are provided at major cross streets.

The major east-west roads in the study area include Eglinton Avenue, Lawrence Avenue, Ellesmere Road, Highway 401 and Sheppard Avenue. These run perpendicular to Morningside Avenue which runs north-south. Kingston Road runs at a diagonal connecting Eglinton Avenue with Military Trail and east to the Region of Durham, while Military Trail also runs at a diagonal connecting Kingston Road to Morningside Avenue.

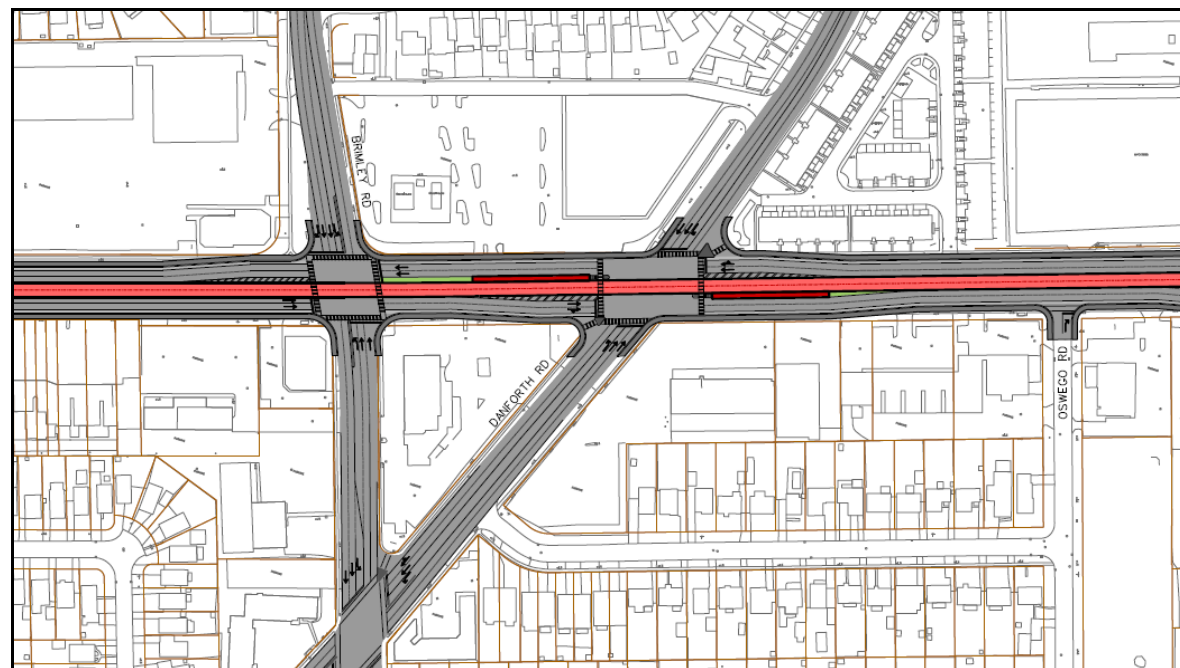
Signalized intersections define the level of traffic congestion (typically called the “level of service”) on that segment of the roadway. A detailed traffic analysis shows that 18 intersections in the Scarborough-Malvern corridor are currently operating at or over capacity during the AM or PM peak hours.

Traffic analysis combined with LRT operation identified four locations that will require specialized treatment.

1) Eglinton Avenue at Brimley Road and Danforth Road (Exhibit E-7)

The proximity of these two major road crossings resulted in a recommendation to provide farside platforms at Danforth Road only. In addition, operational measures including restricted left turns from Eglinton Avenue and cycle length adjustments will be implemented to facilitate traffic flows at these locations.

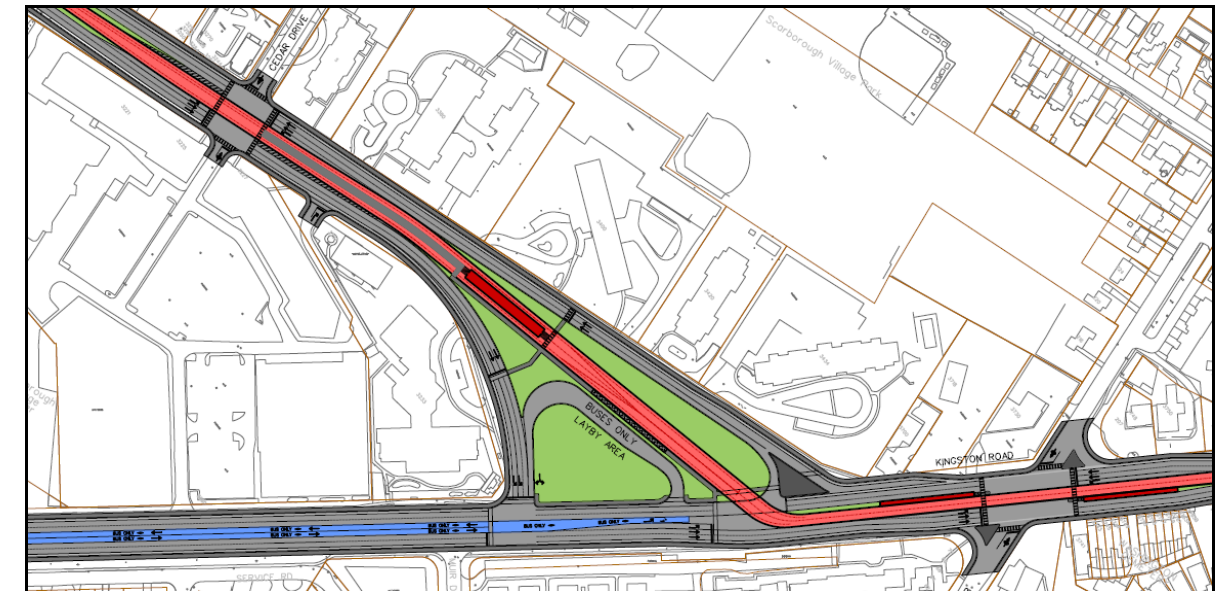
Exhibit E-7: Preferred Design - Eglinton Avenue at Brimley Road and Danforth Road



2) Eglinton Avenue at Kingston Road (Exhibit E-8)

This intersection will be redesigned to accommodate a connection between the SMLRT and the proposed Kingston Road BRT including the LRT platform, special trackwork to allow turnback of service and a bus terminal for the BRT and local bus services. The new design can be accommodated within the existing road allowance.

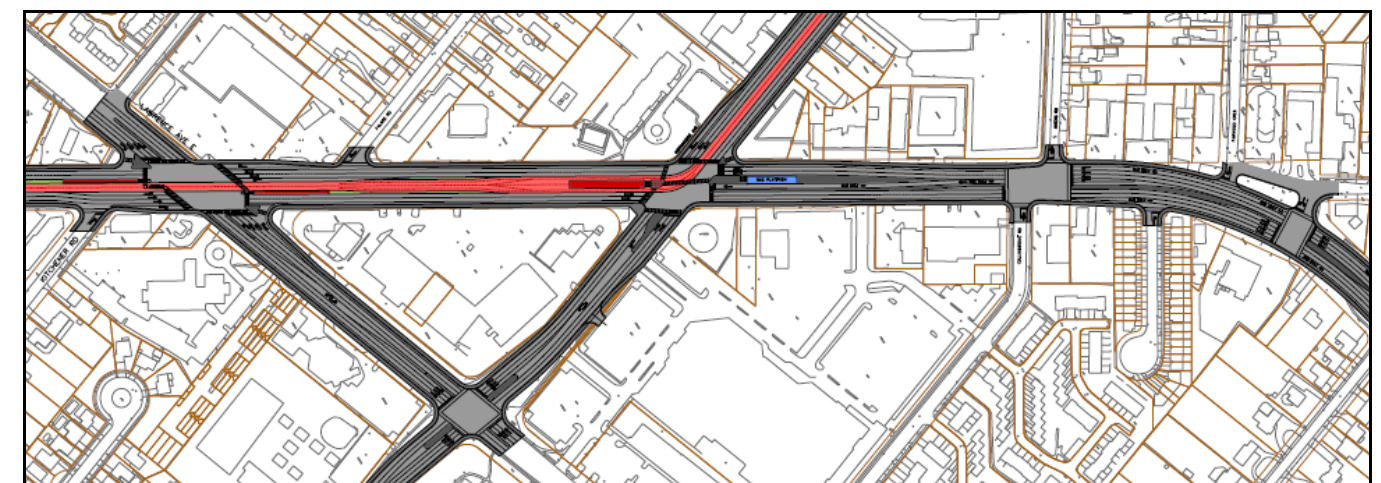
Exhibit E-8: Preferred Design - Eglinton Avenue and Kingston Road Intersection



3) Kingston Road/ Morningside Avenue (Exhibit E-9)

Due to the heavy flow of traffic from Kingston Road East, several operational measures will be implemented in the general vicinity of Kingston Rd./Morningside including the Kingston Rd./Lawrence intersection. These measures will include restricted left turns, added right turn lanes, and signal phase adjustments.

Exhibit E-9: Preferred Design - Kingston Road and Morningside Avenue intersection



4) Morningside Ave./Hwy 401

A detailed traffic analysis was conducted at the Morningside/Hwy 401 crossing resulting in recommendations that provide the most benefit to the LRT operation, and mitigation measures to effectively accommodate critical highway movements. The recommended changes have been agreed in principle by the MTO.

LRT Service

A successful transit system should be able to maintain the existing transit riders and to attract new riders by offering a fast, reliable and safe transit service with the future travel demand in the corridor of 4,600 to 5,000 persons per hour in the peak direction at the busiest point on the line, while being affordable and environmentally sustainable. The existing bus services along the Scarborough-Malvern Corridor operate in mixed traffic, and therefore do not provide enough incentive, from a travel time and reliability perspective, to be an attractive alternative to continued auto use.

LRT is recommended as the preferred transit method over Subway/SRT due to its passenger carrying capacity. The forecasted peak point demand for the Scarborough-Malvern corridor ranges between 4,600 and 5,000 people per hour, well below the threshold of 10,000 people per hour normally required to justify the very high cost to construct Subway/SRT facilities.

Transit Service Connections

The TTC is undertaking a separate study to expand the existing Kennedy Subway Station including the terminal of the Scarborough-Malvern LRT.

The City of Toronto has initiated a Transit Project Assessment Study to identify potential transit improvements along the Kingston Road and Danforth Avenue Corridor. The study is to investigate how to improve transit service along Kingston Road and Danforth Avenue between Victoria Park and Eglinton Avenue.

Local bus services in the corridor will be redesigned to provide integrated service with the new SMLRT.

The connection between the Sheppard East LRT and Scarborough-Malvern LRT is located at the intersection of Sheppard Avenue East and Morningside Avenue. A "half-grand union" track connection is proposed to provide a link between the two LRT lines for servicing purposes.

Stop Locations

The recommended stop spacing for Scarborough-Malvern is in the order of 400 to 600 metres, based upon the pattern of development and cross-streets. With an expected average speed of 22 to 23 km/h, this spacing is considered to be the best balance between the overall route speed and good local access for LRT service. The stop spacing may be longer at some locations for the Scarborough-Malvern LRT due to the presence of undeveloped zones along the corridor, including the crossings of the Highland Creek and Highway 401. The recommended stop locations are:

- Kennedy Subway Station
- Markham Road
- Lawrence Avenue
- Midland Avenue
- Kingston Road
- Morningside Avenue

- Falmouth Avenue
- Scarborough Golf Club Road
- Beath Street
- Danforth Road
- Guildwood Parkway
- Ellesmere Road
- McCowan Road
- Celeste Drive/Guildwood GO
- UTSC
- Bellamy Road N/Eglinton GO
- Galloway Road
- Military Trail
- Mason Road
- Sheppard Avenue

Natural Environment

A Natural Heritage Report documents the existing natural resources and provides findings on potential impacts and the associated mitigation measures for the proposed LRT. The study area is urbanized and therefore no major natural features exist along the study corridor, with the exception of the Highland Creek area. The Highland Creek area includes two designated Environmentally Sensitive Areas (ESAs) and one Area of Natural Scientific Interest (ANSI). The ANSI includes the entire area of the Morningside Park ESA and adjacent lands along Highland Creek. The Highland Forest ESA is located on both sides of Morningside Avenue south of Ellesmere Road. The City of Toronto Official Plan identifies Highland Creek as a "Natural Heritage Area".

Eighteen regionally rare plant species have been identified in the Highland Forest ESA and Morningside ANSI. No "At Risk" species or species considered rare, threatened or endangered for both wildlife and fisheries were identified in the Highland Creek area in the recent years.

With the implementation of the LRT, removal of mature vegetation along the east side of Morningside Avenue in the Highland area is anticipated and minor loss of fish and wildlife habitat are also anticipated but is negligible. Mitigation measures, including vegetation protection and compensation plan, fish habitat restoration and compensation plan, stormwater management plan, erosion and sedimentation control plan will be prepared in accordance with the Toronto Region and Conservation Authority requirements.

Social Environment

The existing social environment conditions were identified within the study area. The Scarborough-Malvern LRT corridor consists of commercial development, low-rise and high-rise residential areas, and educational institution. Land use inventoried along the corridor includes planned growth at the University of Toronto Scarborough Campus/Centennial College Ellesmere Campus area. The number of people accessing this location is expected to grow to 20,000 in 10 years, and to double in the longer term. There is high potential for development on these campus sites which shows a strong need for the Scarborough-Malvern LRT line. A major sports facility is proposed to be built in the Scarborough-Malvern study area and is planned to straddle the City/UTSC properties along Morningside Avenue, north of Military Trail.

A Secondary Plan has been developed for the Highland Creek Community as identified in the City of Toronto Official Plan. As noted in the secondary plan, lands east of Morningside Avenue, north of Ellesmere Road and west of Conlins Road are within the area of potential influence of a landfill site.

Lands east of Morningside Avenue, north of Ellesmere Road and west of Conlins Road are within the area of potential influence of an old landfill site.

A total of 62 sites within 200 m of the proposed LRT route also have a high potential to contribute to environmental contamination. No utility issues were identified within the study area.

Property Requirements

For the most part, the LRT facilities can be constructed within the 36 m right-of-way at the midblock sections of Eglinton Avenue and Kingston Road. Property frontages may be affected due to the provision of left turn lanes, centre platform and/or sight-distance triangle requirements at the intersection areas. Property frontages will be required along Morningside Avenue between Kingston Road and north of Warnsworth Street, and on Ellesmere Road and Military Trail to accommodate the proposed design. In the West Hill area, 10 properties located on the west side of Morningside Avenue between Warnsworth Street and the Highland Creek structure may be required, including open space, parkland, residential and commercial areas. Final property requirements will be confirmed at the preliminary and detailed design stage.

Noise and Vibration Analysis

As part of this study, a detailed noise analysis was carried out to assess the potential noise and vibration impacts and to determine the mitigation measures if required. In summary, the projected noise level changes, as a result of the implementation of the SMLRT, are predicted to be less than 5dBA at any receptor location. Therefore, the consideration of noise mitigation is not required based on the MOE/TTC Criteria.

The vibration impact analysis for the proposed SMLRT was completed using the results of vibration study reports that have been completed for the TTC Eastern Waterfront Project (RWDI, 2007). This report outlined vibration levels expected at increasing distances from a TTC streetcar travelling on a track (representing the latest TTC track design) and are regarded as being applicable to this project.

According to the measurement data, vibration levels resulting from TTC vehicles are well below the MOE/TTC Protocol Criteria at distances beyond 12 m from the track. Given the shortest distance between the centreline of a proposed SMLRT track and any receptor in this assessment is 15 m, it is expected that no mitigation will be required.

Air Quality Analysis

The Air Quality Assessment study shows that installation of the Scarborough-Malvern Light Rail Transit (SMLRT) corridor will result in a reduction of particulate based pollutant emissions and will result in small changes to all gaseous pollutant emissions; therefore, no impacts are predicted based on the operation of the SMLRT system. Particulate based pollutants from within the study area corridor will be reduced by approximately 25% and gaseous pollutants will be reduced by approximately 2%. It is estimated that carbon dioxide equivalent emissions (CO₂-e), which is the unit of measure for global warming potential, will be reduced within the study area corridor by 1.1 to 1.2 ktonnes/year.

Cultural Environment

A Stage 1 Archaeological Assessment identified no registered sites within or near the study area, but the historical land use exhibits some archaeological site potential. Research into built and cultural heritage within the study area also revealed twenty identified heritage areas and properties that may be affected by the planned LRT project.

Based on these potential impacts, it is recommended that:

The proposed light rail transit route be suitably planned in a manner that avoids all identified, above ground, cultural heritage resources. Where any identified, aboveground, cultural heritage resources are to be affected by loss or displacement, further research should be undertaken to identify the specific heritage significance of the affected cultural heritage resource. Based on the results of a detailed heritage evaluation, appropriate mitigation measures such as retention, relocation, salvage, and/or documentation, should be adopted.

E.4. PUBLIC CONSULTATION

The general public, government agencies and various interest groups were provided opportunities to review, and comment on this project during the course of the study. The City of Toronto Public Consultation Team was involved in the overall public consultation process. They offered a wide range of communicating methods to the public, including project web site, dedicated telephone number, fax and email address for contacting the project team.

Technical agencies including federal, provincial, municipal agencies, utilities, potential interested groups, were contacted in the beginning stage for their initial inputs.

Consultation was carried out to encourage the technical agencies to provide input during the course of the study. Meetings with two major stakeholder agencies, the Toronto and Region Conservation Authority (TRCA) and the Ministry of Transportation of Ontario (MTO) were held to discuss the potential impacts and mitigation measures regarding the proposed LRT facility.

Three rounds of Open Houses were scheduled for the public and advertised in the local newspaper to have direct communication with Project Team members. Flyers were distributed throughout the study area prior to each open house.

One of the key components of the EA process is public consultation throughout the study. Information panels and audio-visual presentations were provided at the Public Open Houses. The Project team including representatives from TTC, City of Toronto, IBI Group/Arup (prime consultant) and Lura Consultant (Public Consultation Unit) was in attendance to answer questions regarding the study.

Newsletters and/or emails outlining the project and frequently asked questions were sent directly to individuals on the Project Team's mailing list, and to all residents and businesses within the Scarborough-Malvern Corridor. This list included representatives from external agencies, municipalities, and members of the public within the study area or affected by the project, and the public who requested to be added to the mailing list.

From the beginning of the study, the following methods were set up for the public to submit their comments or obtain the project information at any time:

Telephone:	416-392-6900
TTY:	416-397-0831
Fax:	416-392-2974
Email:	malverntransit@toronto.ca
Mail:	Public Consultation City of Toronto Metro Hall, 19th Floor 55 John Street Toronto, ON M5V 3C6

Web: http://www.toronto.ca/involved/projects/malvern_lrt/index.htm

Public Open Houses No. 1

Two public open houses were held on July 23 and July 24, 2008 as part of the first series of Scarborough-Malvern LRT open houses. The purpose of the open house was to share information about the project with the community and gather feedback on the study area, objectives, background and supporting planning policies, existing conditions and the alternative and recommended transit solution. A total of 121 people attended these open houses, with 23 comment forms received. There was general support for the project, with some concerns noted about station locations, LRT routing and increased traffic delays result from the LRT operation and left turn restrictions.

Public Open Houses No. 2

Two public open houses were held on May 20 and May 21, 2009 to present the preferred design, the assessment of impacts, construction staging and benefits. Almost 200 people signed in to these two sessions. Participants were invited to submit their ideas and opinions on comment forms, with 24 forms received plus about 40 other comments at the sessions. Once again there was general support for the project, but with concerns about left turn restrictions, potential traffic infiltration into neighbourhoods, LRT stop locations, impacts on surrounding property and roadway traffic congestion.

Public Open House No. 3

The Notice of Study Commencement and the Third Public Open House was placed in Scarborough Mirror on June 19, 2009, with the open house held on June 29th. The notice advised the public of the commencement of this Transit Project Assessment Study. The purpose of the open house was to share information about the project with the community and to gather feedback on the preferred design concept, the associated impacts and proposed mitigation measures.

Additional Public Meetings

In addition to these Public Open Houses, the EA team met with the Coronation Community of West Hill, and two Town Hall Meetings arranged and held by the Councillor for Ward 43 on June 25, 2009 at West Hill Collegiate Institute and the Councillor for Ward 42 on June 19, 2009. Over 150 residents attended these question and answer meetings, where questions concerning left turn restrictions, potential traffic infiltration, roadway congestion (particularly on Kingston Road), preference for a subway and property impacts were raised.

First Nations

This TPAP has addressed the new Ontario Regulations 231/08 requirement to involve and consult with involved First Nations communities. No First Nations interests were recorded that would affect the TPAP or the preferred design project.

Future Approvals

The TTC and the City of Toronto have worked closely with the technical agencies to address any environmental concerns and issues associated with this project. The potential impacts, mitigation measures

and the associated net impacts have been identified, evaluated and assessed as documented in the full Environmental Project Report (EPR). However, the design process, including both preliminary design and detailed design, may lead to refinement or modification of the proposed conceptual design as noted in the EPR. It is anticipated that such changes will be minor and will not alter the original project intent and commitments to the public and involved agencies.

The detailed design will also evaluate and assess construction methods in stages that will minimize the impacts to the surrounding properties. It will include its own mitigation plans to address traffic staging, noise, air quality and etc. This will involve ongoing liaison with the technical agencies, emergency services providers, and the affected property owners/communities.

The TTC and the City of Toronto will comply with the TRCA/MOE and other regulatory government agencies' regulations, standards and directives. TRCA has provided a number of the specific issues that must be addressed during detailed design and construction phase as reported in the EPR.
