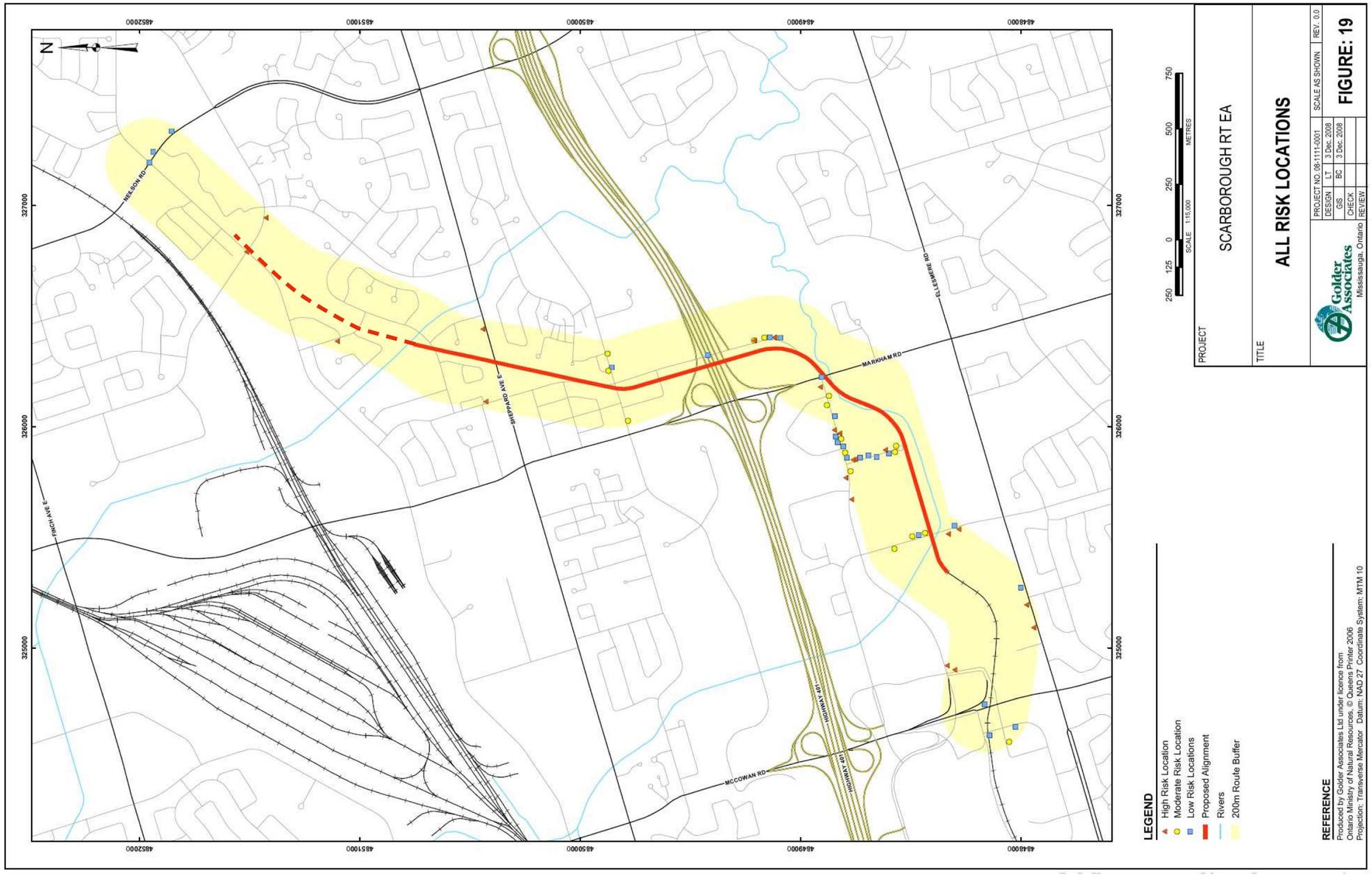
Exhibit 3-7: Sites in the vicinity of the SRT Extension with High Potential Environmental Concern



3.1.5.4 Future Conditions

There are no other major undertakings planned within the Study Area. Therefore no changes in geology, soils and groundwater in the future are anticipated.

3.1.6 Surface Water

The SRT is located within the Highland Creek watershed. The Highland Creek watershed is comprised of 102 km2, with over 75 km of watercourses. The watershed is almost completely (85%) urbanized, and represents the most developed watershed in the jurisdiction of the Toronto and Region Conservation Authority (TRCA). Most of the development had occurred before stormwater management controls became required, resulting in high peak flows associated with urban watercourses, as well as poor water quality. The watercourses have been significantly altered as a result of the development occurring in the past. This approach also resulted in severe erosion affecting a number of reaches, and requiring frequent stabilization efforts. As a result, a significant percentage of the channel network has been either buried underground or lined with concrete or gabion baskets to reduce erosion and prevent flooding.

3.1.6.1 Kennedy Station

Kennedy Station consists of paved transit-ways and parking lots and storm water on the property appears to drain via overland flow to catch basins located in the paved transit-ways and parking lots.

3.1.6.2 Conversion

3.1.6.2.1 Existing Storm water system

With regards to the existing line, surface water runoff is directed to nearby creeks, indirectly through a series of deck drains (for the elevated guideways) or ditches and catchbasins to the nearby storm sewer systems. No storm water quantity or quality measures are in place for the existing SRT system.

For the conversion (up to and including McCowan Station), the interaction of surface water and the project is largely determined by existing conditions. The relative area of impermeable surface associated with the built form of the SRT is negligible in most locations relative to the larger drainage area for the supporting sewer systems. As such, no adverse impacts are expected. Similarly, the opportunities to affect positive change on surface water quantity and quality are equally limited given the minor changes contemplated in most locations.

3.1.6.2.2 Existing Creek Crossings

The conversion section of the SRT crosses two branches of the West Highland Creek. Immediately north of Ellesmere Station, the West Highland Creek tributary crosses under the SRT / GO Stouffville corridor in a 48 metre long twin culvert. The inlets and outlets are outside the limits of the SRT right or way.

As illustrated in Exhibit 3-8, the West Highland Creek is contained within an engineered channel designed to contain the 100-year and regional storm events. The SRT runs parallel to the creek (south of top of bank) west of the Midland Station and crosses the creek in an elevated structure east of the creek.

Exhibit 3-8: Existing Watercourses associated with SRT Conversion

Engineered Channel of West Highland Creek at Midland Station

West Highland Creek immediately north of Ellesmere Station

3.1.6.3 Extension

The proposed alignment for SRT extension will introduce several crossings of East Highland Creek. There will be three above-grade crossings near Bellamy Road and Markham Road, as well as one below-grade crossings near Mammoth Hall Trail, just north of Sheppard Avenue and a major modification of the Sheppard Avenue bridge over the Highland Creek. In addition to these watercourse crossings, the extension will also pass beneath a dry stormwater detention pond located at the northeast corner of Progress Avenue and Milner Avenue. Existing condition and future changes are discussed as follows.

3.1.6.3.1 Markham Branch of Highland Creek at Progress Avenue and Bellamy Road

The Markham Branch of Highland Creek flows in a south-easterly direction across both Progress Avenue and Bellamy Road approximately 405 m and 750 m downstream of Highway 401, respectively. The watercourse has been channelized in the past although fairly recent efforts to naturalize the valley are evident. The watercourse travels under both roads through double-celled concrete box culverts. The channel upstream of Progress Road is a long flat, approximately 5-6 m wide. Approximately 40 m upstream, the channel is fairly deep (>60 cm) and gradually becomes shallower as it approaches the culvert (15 cm). Substrates were a mix of boulders, cobble, gravel and silt in the deeper area with less silt as the water became shallower. Instream cover was comprised of boulders and cobble with overhanging bank vegetation providing additional refuge. The banks were heavily vegetated by dense shrubs which shade the creek. The valley corridor is 40-50 m wide and is completely vegetated with grasses, shrubs and small trees. Mean bankfull width was approximately 10 m and bankfull depth 1.5 m.

Between Progress Avenue and Bellamy Road, the valley has been substantially enhanced with both aquatic and terrestrial habitat features. The watercourse meanders through a floodplain containing pools that are connected during high flows. The substrates in this section of the watercourse were comprised of boulders, cobbles and gravel with some sand. A few areas of exposed clay were observed. Channel morphology was a mix of riffles, runs and pools. Water depth varied from less than 10 cm in some riffles to over 100 cm in pools. Wetted width also varied from 3 m in riffles to 10 m at the pools. Bankfull width was approximately 30-35 m and bankfull depth was close to 2.0 m due to a wider floodplain in this area. Valley width was also wider (70m) than upstream of Progress Avenue.

Downstream of Bellamy Road, the concrete floor of the culvert extended for approximately 1.2 m and formed a 0.5 m drop. At this point, the creek turns and is oriented in an east – west direction for approximately 550m where it then flows north-easterly toward Markham Road.

The watercourse, valley and floodplain conditions were similar in dimensions in this 550m section of the watercourse as they were upstream of Bellamy Road.

Along the proposed alignment, the 100 year and regional storm event are contained within the originally engineered top of bank. The top of bank is considered to be relatively stable.

3.1.6.3.2 Markham Branch of Highland Creek at Markham Road

Just west of Markham Road, the Markham Branch of Highland Creek flows in a north-easterly direction and then immediately west of Markham Road, the creek turns eastward, running parallel to Progress Avenue before it crosses Markham Road. The watercourse throughout this area has been channelized and stabilized using armourstone and large boulders. It travels under Markham Road through a concrete bridge. Upstream of Markham Road the channel is contained within vertical armourstone walls that line both banks. The channel has been engineered to dissipate energy through step-pools for the reach between 70 and 85 m upstream of the Markham Road bridge. Upstream of that, the channel contains more natural riffle structures, one of which is approximately 70 m long. Channel width was 4-6 m wide and average depths ranged from 15 cm in the riffles to 75 cm in the step-pools. Substrates were entirely coarse with large boulders (as large as armourstone blocks in the channel), cobbles, gravel and sand. Instream cover was provided by boulders and cobbles.

Due to the peaking and velocity characteristics within this section of the creek, scouring and erosion damage has occurred along this section of the creek. In response, Toronto Water is undertaken creek restoration works. A revised model was not available at the time that this Environmental Project Report was prepared.

3.1.6.3.3 SWM Retention facility at Rosebank Park (Milner Avenue and Progress Avenue)

South of the Rosebank Park is a dry storm water detention pond located at the north east corner of Progress Avenue and Milner Avenue. The purpose of this facility is to store storm water in a 100 year storm event associated with overland flow activities (Elev. 161.01). At the north east corner of the detention pond, across from Burrows Hall Blvd, a catch basin (inlet elev. 159.85) connects to a 125mm diameter PVC subdrain collecting water from surrounding areas (outlet structure is visible in the background of Exhibit 3-9).

Exhibit 3-9: Existing Rosebank Park SWM facility

3.1.6.3.4 Malvern Branch of Highland Creek at Mammoth Hall Trail

The Malvern Branch of Highland Creek flows in a southeasterly direction across Sheppard Avenue approximately 780 m east of the Markham Road intersection. The watercourse has been completely channelized with gabions both upstream and downstream of the crossing. It travels under Sheppard Avenue through a concrete bridge. The upstream channel is contained within a trapezoidal channel formed by gabions. Substrates are cobble and boulder (rip-rap from gabions) with some silt and detritus overlaying. Much of the chain link holding the gabions together appears to have degraded and much of it was not visible. The channel upstream consists of one long run which is approximately 7 m wide and 15-20 cm deep. The creek continues in a northwest direction crossing Mammoth Hall Trail, McLevin Avenue and the CP rail line. Morphologically, the channel was similar along the entire section upstream of Sheppard Avenue. Substrates and channel dimensions were also similar.

3.2 Emissions

3.2.1 Air Quality

The existing ambient air quality conditions for the project area are based on the most recently available data published by the MOE, Air Quality Report (2007) from the closest monitoring stations to the project area for which data was available. The closest monitoring station which provided NO_2 and $PM_{2.5}$ is the Toronto East Station located on Lawrence Avenue East, near Kennedy Road. Data for CO concentrations are based on the measurements at the Toronto Downtown Station. A review of data for the project area indicates that CO and NO_2 concentrations are well below the Ontario AAQC. Ambient $PM_{2.5}$ concentrations, at the 90th percentile level are at 57% of the proposed federal standard that will come into effect in 2010. However, maximum $PM_{2.5}$ concentrations have exceeded the proposed limit on seven occasions. Table 3-4 presents the applicable Ontario AAQC and CWS, along with the 2007 measurements at the Toronto East or Toronto Downtown stations.

Table 3-4: Ambient Air Quality Summary (2007)

Pollutants (Unit)	Average Time	Criteria (1)	90th Percentile (4)	Maximum Concentrations	Number of Times Above Criteria
$PM_{2.5}$ (µg/m^3) (2)	24-hour	30	17	41	7
Suspended Particulate Matter (<44 µm) (µg/m^3)	24-hour	120	NA	NA	NA
	Annual	60	NA	NA	NA
NO_2 (ppb) (2)	1-hour	200	33	77	0
	24-hour	100	NA	46	0
CO (ppm) (3)	1-hour	30	0.36	1.70	0
	8-hour	13	NA	1.08	0
NO_x (ppb) (2)	1-hour	NS	55	456	NA
	24-hour	NS	NA	131	NA

Notes: (1) The criterion for $PM_{2.5}$ is the federal standard published in CWS for PM and Ozone adopted by the Canadian Council of Ministers (July, 2000). (2) The pollutant measured at the Toronto East station. (3) The pollutant measured at the Toronto Downtown station. (4) If the 90th percentile value is 60 ppb, then 90 percent of the data are equal to or below 60 ppb. NA - Not Available. NS - No Standard.

Background Concentrations

The 90th percentile level was selected to represent the background concentration. This is considered a very conservative input value for modeling, and was deemed suitable by the MOE as confirmed by discussions during previous similar project work (URS, 2006) with Dr. Robert Bloxam, Senior Leader, Modeling, Environmental Modeling and Data Analysis Branch. To avoid interannual variability when assessing the air quality impacts in the project area, the background concentrations used in modeling were average values of the 90th percentile concentrations over a five-year period (2003 – 2007). The calculated background concentrations were 35.00 ppb, 0.54 ppm and 18.40 µg/m^3 respectively for NO_2, CO and $PM_{2.5}$. It is therefore concluded that the background concentrations in the study area are well below the Ontario AAQC for CO and NO_2, and the CWS for $PM_{2.5}$.

Detailed Air Quality modeling and data is attached to this report (see Appendix E).

3.2.2 Noise and Vibration

3.2.2.1 Kennedy Station

Noise and vibration monitoring measurements were conducted at representative noise and vibration sensitive Points of Reception (PORs) in the vicinity of the proposed aboveground portions of the SRT/LRT between March 18, 2010 and March 25, 2010. The full Noise and Vibration Report is located in Appendix C.

The results of the ambient noise and vibration monitoring for Kennedy Station are presented in Table 3-5 and Table 3-6 respectively.

Table 3-5: Existing Equivalent Daytime and Night Time Sound Levels at Kennedy Station

Location	L_{EQ} (16hr, Day) dBA	L_{EQ} (8hr, Night) dBA
K1	74	69
K2	61	56

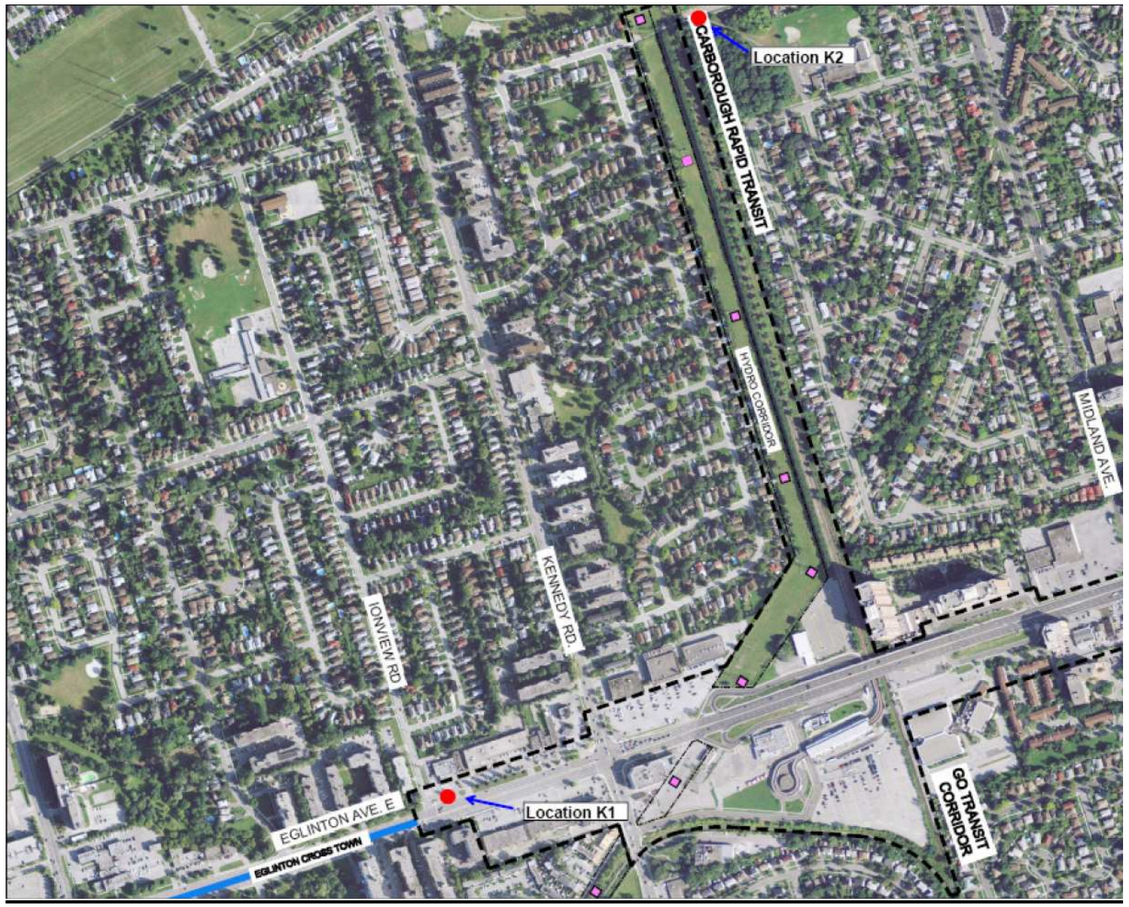
Table 3-6: Vibration Monitoring Statistics for Kennedy Station

Location	Minimum (PPV mm/s)	Maximum (PPV mm/s)	Average (PPV mm/s)	95% Conf. Int.[1] (mm/s)	Number of Samples[2]	Maximum RMSV[3]
K1	0.0794	0.4600	0.1861	0.0045	561	0.0920
K2	0.0635	0.8100	0.1410	0.0078	551	0.1620

Notes:
(1) Conf. Int. – Confidence Interval
(2) Indicates the number of samples used for statistics. Data which was collected during periods of inclement weather were not included in the statistical analysis.
(3) Root mean square velocity (RMSV) values were estimated from PPV values using a crest factor (C.F.) of 5 corresponding to vibration from trains as per reference (RMSV=PPV/C.F.)

The noise and vibration levels are typical of a location in an urban environment. A site visit to the area indicated that the major contribution to the ambient noise in the area is the road and rail traffic (Eglinton Avenue, Kennedy Road, Midland Avenue, and the rail corridor north of the Facility). Road traffic is a major contributor to the background vibration levels at the PORs located on Eglinton Avenue while road and rail traffic is the contributor to the background vibration levels at the PORs located along the rail/hydro corridor to the north of the Facility.

Exhibit 3-9: Noise and Vibration Monitoring Locations around Kennedy Station



3.2.2.2 Conversion

There are several major and moderate sources of ambient noise in the study area including:

- Existing SRT: The current SRT vehicles in service are the Mark I cars which were built in the early 1980s by UTDC in Kingston, Ontario. The existing SRT vehicle Lmax is approximately 88 dBA @ 15m at the 80 km/hr speed planned for the SRT. Additional information can be found in Appendix C.
- Roads: Major arterial roads including Lawrence Avenue, Ellesmere Road, Midland Road, Brimley Road and McCowan Road are sources of noise due to the existing automobile and truck traffic.
- Existing industrial and commercial activities: Along the existing SRT from Lawrence East Station to Brimley Road, the SRT traverses heavy industrial lands. Most are significant noise generators and are not sensitive to outside sources of noise.

3.2.2.3 Extension

There are several major and moderate sources of ambient noise in the study area. The following sources of ambient noise were considered in this study:

- Highway 401
- Markham Road
- Progress Avenue
- Milner Avenue
- McLevin Avenue
- Neilson Road
- Sheppard Avenue East

The sound level measurement procedures were primarily based on the Ministry of Environment procedures in their Publication NPC-103 “Procedures” included in the Model Municipal Noise Control by-Law, the recommendations of the instrument manufactures and the best engineering practices to suit site specific conditions. The sound level meters were checked and calibrated before, during and following completion of the measurement sessions without any appreciable change in the sound levels.

In support of this project, SS Wilson Associates Consulting Engineers (SSWA) undertook an analysis of sound and vibration impacts of the SRT Extension Project. These impacts are explained in detail in Appendix C and are summarized in the table below.

Exhibit 3-10: Predicted ambient sound levels within the SRT Extension Study Area

Location	Existing Ambient Sound Level Daytime Leq (16h)	Existing Ambient Sound Level Nighttime Leq (8h)
Industrial Building South of East Highland Creek, West of Bellamy Road	55 dBA	50 dBA
Industrial Building South of Progress Avenue, East of Bellamy Road	52 dBA	45 dBA
Place of Worship South of Progress Avenue, West of Markham Road	55 dBA	49 dBA
Office Building South of Progress Avenue, West of Markham Road	58 dBA	51 dBA
High-rise Apartment Building South of Progress Avenue, East of Markham Road (3rd Floor)	64 dBA	62 dBA
High-rise Apartment Building South of Progress Avenue, East of Markham Road (10th Floor)	74 dBA	73 dBA
Place of Worship North of Progress Avenue, East of Markham Road	68 dBA	61 dBA
Student Residence Building South of Hwy 401, West of Progress Avenue	71 dBA	71 dBA
Office Building Southeast Corner of Milner Avenue and Progress Avenue	73 dBA	75 dBA
Townhouses Northeast Corner of Milner Avenue and Progress Avenue	67 dBA	65 dBA
Townhouses Northwest Corner of Progress Avenue and Milner Avenue	70 dBA	68 dBA
High-rise Apartment Building Northeast Corner of Burrows Hall Boulevard and Progress Avenue	61 dBA	54 dBA
Townhouses North of Burrows Hall Boulevard, East of Progress Avenue	52 dBA	45 dBA
Single Houses South of Sheppard Avenue East, East of Progress Avenue	52 dBA	45 dBA
Single Houses South of Sheppard Avenue East, East of Progress Avenue	52 dBA	45 dBA
Chinese Cultural Centre Southeast Corner of Sheppard Avenue East and Progress	63 dBA	57 dBA
Chinese Cultural Centre Southeast Corner of Sheppard Avenue East and Progress	63 dBA	57 dBA
Chinese Cultural Centre Southeast Corner of Sheppard Avenue East and Progress	63 dBA	57 dBA
Single Houses North of Sheppard Avenue East, East of Hydro Corridor Along Rayward Court	53 dBA	46 dBA
Single House at 19 Sunburst Square	53 dBA	46 dBA
Single House South of Mammoth Hall Trail, West of Hydro Corridor	53 dBA	46 dBA
Single House at 124 Mammoth Hall Trail	47 dBA	44 dBA
Single House at 12 Littleleaf Drive	47 dBA	43 dBA
Single House at 178 Mammoth Hall Trail	49 dBA	45 dBA
Single House Along Shepmore Terrace	47 dBA	45 dBA
Office Building South of Tapscott Road, West of McLevin Avenue	67 dBA	60 dBA
Townhouses West of McLevin Avenue Fronting to Bon Echo Court	63 dBA	57 dBA
School East of McLevin Avenue Fronting to Bon Echo Court	48 dBA	41 dBA
Townhouses Southwest Corner of Pinery Trail and McLevin Avenue	63 dBA	56 dBA

3.2.2.4 Future Conditions

Along the existing SRT, reductions in noise and vibration levels are anticipated due to changes in fleet and track technology (associated with this transit project). Specifically:

- New vehicles:
- Comprehensive noise and vibration control plan – testing of prototypes
- Specific new features that will reduce noise and vibration

- New track:
- Rubber pads in structures that reduce the transmission of vibrations to the ground
- Continuously welded rail
- Ongoing maintenance of tracks and vehicles

- Results:
- Vibration minimal at distances greater than 15m.
- The current SRT alignment sound levels from Eglinton to the existing terminal at McCowan are expected to experience a noise reduction as a result of new vehicle technology.

3.2.3 Stray Current

The SRT is powered electrically. Substations with DC (direct-current) rectifiers will supply electricity to the train through an overhead cable. The overhead cable is connected to the positive side of the rectifier. The rails on which the train travels serve as the negative (return) conductors connected to the negative side of the rectifier. The DC current will use any conductive medium to return to the substation. This means the entire LRT system, including trackwork, power system and other equipment, including train yards, shops, etc., can potentially send stray electric currents, into the surrounding soil and onto nearby buried structures, specifically underground utilities (containing iron / steel). Stray-current corrosion occurs at the point where the current leaves the pipeline, carrying iron ions that became positively charged.

As identified in Appendix J there are several underground utilities that may be susceptible to stray current within the study area. This includes, but is not limited to, older ductile iron watermains, larger diameter steel gas mains.

3.3 Socio-Economic Environment

3.3.1 Kennedy Station: Socio-Economic Environment

3.3.1.1 Land Use/ Economics

As illustrated in Exhibit 3-11, the City of Toronto Official Plan, Land Use Designations (Map 20) designates the existing land use along Eglinton Avenue between Kennedy Road and Midland Avenue, including the existing Kennedy Station as “Mixed Use”. The present land uses in the study area are primarily represented by: utilities (CNR, SRT and a hydro transmission line corridor), commercial (strip malls), residential (single family, apartments and condominiums), and a recreational facility.

Along Eglinton Avenue, the study area encompasses a number of shopping plazas and apartment buildings, interspersed with larger commercial and industrial buildings and individual houses that have been converted into commercial enterprises. The study area also encompasses the existing Kennedy subway station and a number of parking lots associated with public transit operations.

3.3.1.2 Local Parks and Community Facilities

There are no parks in the immediate vicinity of the existing Kennedy Station. The Don Montgomery Community Recreation Centre is located just east of the GO tracks at 2457 Eglinton Avenue. Treverton Park is located off of Oakworth Street in the residential neighbourhood north of the station.

3.3.1.3 Property

The surrounding property around Kennedy Station is a mix of residential and commercial lands. In addition, lands owned by TTC and Ontario Hydro contributes to the majority of the proposed undertaking.

3.3.1.4 Utilities

Within the study area, utilities such as Bell communication lines, Rogers communication lines, Enbridge gas lines, Sanitary Sewer, Storm Sewers, Watermains and Toronto Hydro lines are present. Of particular note would be the 1050mm Storm Sewer, the 300mm Enbridge Gas line, the 525mm Storm Sewer within the study area.

3.3.1.5 Archaeology

A Stage 1 Archaeological Assessment was completed by Archaeological Services Inc. (ASI) in March 2010, for the proposed re-development of Kennedy Station at Eglinton Avenue East and Kennedy Road. A full report is located in Appendix D-3.

The Stage 1 archaeological assessment determined that no archaeological sites have been registered within the immediate vicinity of the study area. A review of the geography of the study area suggested that it has low potential for the identification of Aboriginal archaeological sites dating to any period as they are unlikely to have survived the high levels of historic and urban development.

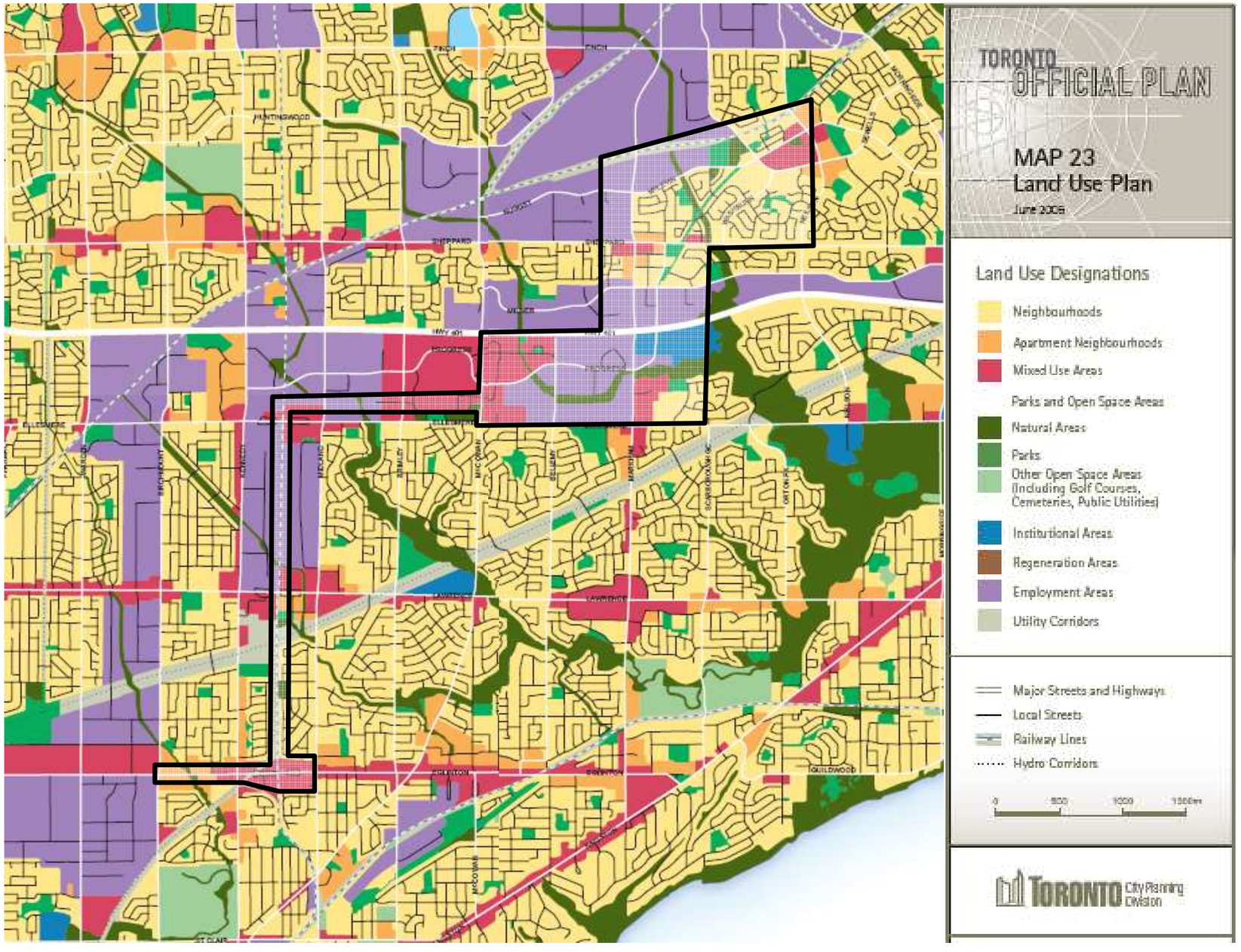
Given the proximity to early Euro-Canadian settlements and early settlement roads, there is potential for the identification of Euro-Canadian archaeological sites. The property inspection confirmed that the majority of the study area has been previously and thoroughly disturbed by various development activities such as road grading and landscaping. However, minimal disturbances may have occurred within the hydro corridor.

3.3.1.6 Built Heritage Resource and Cultural Landscape

A Built Heritage Resource and Cultural Landscape Assessment were completed by ASI in March 2010 for the proposed re-development of Kennedy Station at Eglinton Avenue East and Kennedy Road. A full report is located in Appendix D-1. The report was subsequently approved by the Ministry of Tourism and Culture, Culture Services Unit, who agree with the conclusions of the report and support its recommendations.

The assessment determined that the study area has undergone nineteenth century settlement patterns and associated landscape character are no longer extant or readily visible, with the exception of the Bethel Cemetery (also known as the Bethel Pioneer Memorial Cemetery), located immediately south of the study area, at 741 Kennedy Road. As indicated above, the Bethel Cemetery is listed on the City of Toronto's inventory of heritage resources, designated under Part V of the Ontario Heritage Act, and serves as the sole cultural heritage resource located within or adjacent to the Kennedy Station re-development study area. It is highly likely that this cemetery is historically associated with the Primitive Methodist Church, which dates to ca. 1860 and which is illustrated in the 1876 historic atlas.

Exhibit 3-11: Existing Land Uses (Map 20 from the City of Toronto Official Plan)



3.3.2 Conversion: Socio-Economic Environment

3.3.2.1 Land Use

The City of Toronto Official Plan, Land Use Designations (see designates the existing land use along the existing corridor as employment or mixed use areas.

3.3.2.2 Local Parks and Community Facilities

There are no local parks and community facilities within the study area of the conversion.

3.3.2.3 Property

Currently, the Scarborough Rapid Transit line is contained within right of way secured at the time of its original construction. There are varying amounts of setback between the facility itself and the property lines. The existing elevated sections is accommodated through a combination of full right of way ownership and aerial easements with full ownership for the supporting pier footprints.

3.3.2.4 Utilities

The preliminary utilities survey identifies existing underground gas pipelines located adjacent to the at grade stations: Lawrence East and Ellesmere. For elevated sections, utilities pass beneath the SRT within existing road right of ways.

3.3.2.5 Archaeology and Built Heritage

The modifications to the existing Scarborough Rapid Transit will be completed within the existing trackbed and properties and therefore no archaeological or cultural heritage investigations are warranted.

3.3.3 Extension: Socio-Economic Environment

3.3.3.1 Land use

The City of Toronto Official Plan, Land Use Designations (see designates the existing land use along the proposed corridor and are varied within the Study Area. In support of the planned extension of the SRT, The Planning Partnership has identified the key objectives for these policies in a report (see Appendix F). Existing land use conditions, population and employment data, active development applications and future development potential were identified.

For example, Centennial College was established in 1966, primarily serving the eastern portion of the Greater Toronto Area through four campuses and seven satellite locations. Centennial College enrolls approximately 12,000 full-time students and 28,000 in Continuing Education. There is high potential for development on and near to the campus which shows a strong need for the SRT Extension Project.

Similarly, land use policies in combination with large tracts of undeveloped or underdeveloped lands within the study area (such as the abandoned rail corridor and surface parking lots in the Milner / Progress area) create an opportunity for new medium and high density transit supportive development. Lands south and east of the Markham Road and Sheppard Avenue intersection are currently experiencing development pressures.

3.3.3.2 Local Parks and Community Facilities

The Burrows Hall Community Centre and Library plus Chinese Cultural Centre are located at the intersection of Sheppard Avenue East and Progress Avenue, and are used for a variety of programs or activities involving the arts or other endeavours. To the south of the community centre is Rosebank Park which provides playground equipment, basketball courts, pathways and general open spaces (including the SWM facility as discussed previously). Rosebank Park is situated on lands owned by the City of Toronto and the Toronto Catholic District School Board. Although not designated as a park, the abandoned rail corridor north of Sheppard represents a continuous open space that is valued by the local community.

3.3.3.3 Property

Within the Study area between Markham Road and McCowan Road, most of the properties are private businesses. Beyond Markham Road, the properties are a mix between residential and community facilities. There is an abandoned Rail Corridor owned by a varierty of agencies, including Ontario Hydro Networks Inc. and the City of Toronto.

3.3.3.4 Utilities

Within the study area, utilities such as Bell communication lines, Rogers communication lines, Enbridge gas lines, Sanitary Sewer, Storm Sewers, Watermains and Toronto Hydro lines are present. The utilities are, for the most part, confined to existing road right of ways, with the heaviest concentration along Sheppard Avenue and Markham Road (at Progress Avenue). Areas of interest also include the roads that cross the abandoned rail corridor where the alignment is below grade. An inventory of each of these areas of interest is contained in Appendix J.

3.3.3.5 Built Heritage

In support of the extension, a field assessment was conducted on May 30th, 2008 (see Appendix D).

The SRT Extension study area surrounding landscape is largely redeveloped consisting of industrial and commercial parks and residential subdivisions. All roads have been substantially widened over the years to accommodate large volumes of traffic. The study area encompasses existing waterscapes all of which have been channelized to accommodate for urban development.

Although the Highland Creek is present on the historic map, the course of these waterscapes which intersect with the proposed alignments for the two segments have been channelized or altered from their historic positions. There is a rail line located in the study area that is no longer in use (the abandoned rail

corridor used for the SRT extension in the vicinity of Sheppard Avenue). Consequently, the proposed alignments for the SRT Extension and adjacent lands have been substantially altered and maintain limited heritage character.

The only identified significant heritage property is the Malvern Primitive Methodist Cemetery, which is on the east side of Markham Road, north of Sheppard Avenue. The heritage property is depicted on the 1878 Illustrated Historical Atlas of the County of York, Township of Scarboro, Ontario.

The preferred alignment will not have an impact to any cultural heritage resources.

3.3.3.6 Archaeology

Within the south segment of the preferred alignment, there is a partial open area and woodlot that has not been developed at the intersection of Markham Road and Progress Avenue. A historic map of this branch of Highland Creek shows a homestead was located south of the creek. A newly developed building was constructed overlooking the river on the west side of Markham Road, however, some of the land may have retained some of its natural integrity, even after the creek was channelized.

The open area and wooded area should be subjected to a Stage 2 archaeological assessment in order to determine the degree of disturbance (see Exhibit 3-12 for location). As the lands in question are owned by the Toronto Regional Conservation Authority (TRCA), TRCA has advised TTC that they will undertake the Stage 2 investigations using their own forces. All other sections of the south section of the alignment have been severely impacted by developments in the area and do not maintain any natural integrity. As a result, these sections do not require further archaeological assessment and are clear of further archaeological concern.

Within the north segment of the preferred alignment (see Exhibit 3-13), there are three sites that will require a Stage 2 archaeological assessment. These sites include:

- On the south side of Mammoth Hall Trail where the abandoned rail corridor connects with the street, required to assess the disturbance caused by the railway because of the proximity to Highland Creek and the historic crossroad community of Malvern
- On the north side of Mammoth Hall Trail, where the preferred alignment intersects with lots associated with the historic community of Malvern to determine the degree of disturbance that the channelization of the creek and residential development has caused
- The segment along McLevin Avenue to Neilson Road, where the proposed Malvern Station is in close proximity to the archaeological registered site AkGt-3 (see Appendix D-4).

Aside from these three sites, there are no areas that exhibit archaeological concern in the north section of the preferred alignment and are therefore clear of further archaeological concern.

Exhibit 3-12: Areas of Archaeological Potential (south section)

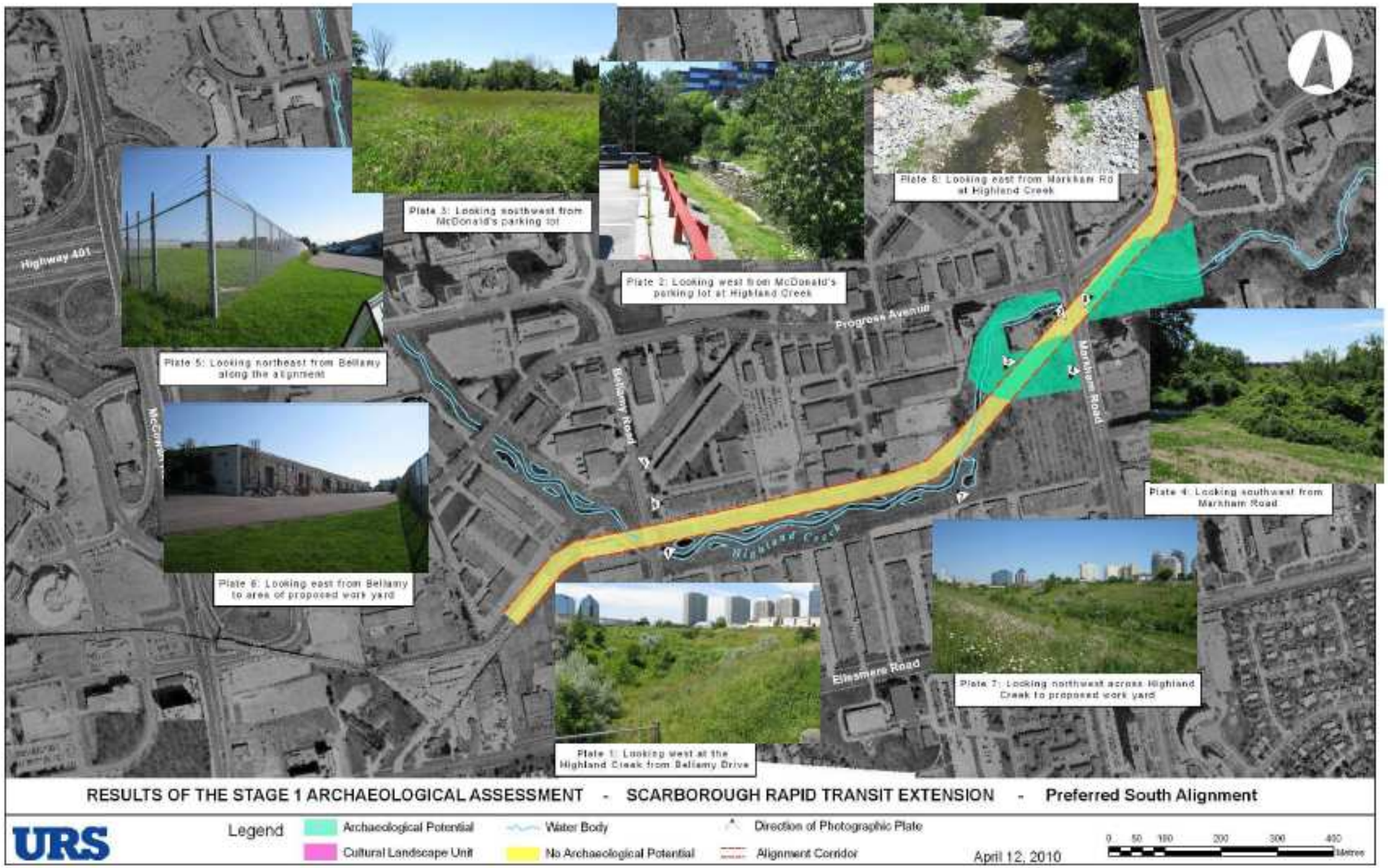


Exhibit 3-13: Areas of Archaeological Potential (North section)

3.3.4 Future Conditions: Socio-Economic Environment

The future condition investigates the socio-economic landscape if the project is not implemented.

3.3.4.1 Kennedy Station

Existing land uses are considered stable with no major developments planned for the area. However, Metrolinx is developing a mobility hub concept for the area surrounding the station. Mobility hubs are major transit station areas with significant levels of transit service planned for them in the Regional Transportation Plan. They also include high development potential, and a critical function in the regional transportation system as major trip generators. They are places of connectivity where different modes of transportation, from walking to high-speed rail, come together seamlessly and where there is an intensive concentration of employment, living, shopping and/or recreation. In addition to serving as places to arrive, depart and wait for transit, successful mobility hubs have the potential to become vibrant places of activity and destinations in themselves.[1] The Mobility Hub study for Kennedy Station has not commenced. It will build on the findings of this Transit Project Assessment.

3.3.4.2 Conversion

It is expected that the City of Toronto will continue to develop the area as designated within the Toronto Official Plan.

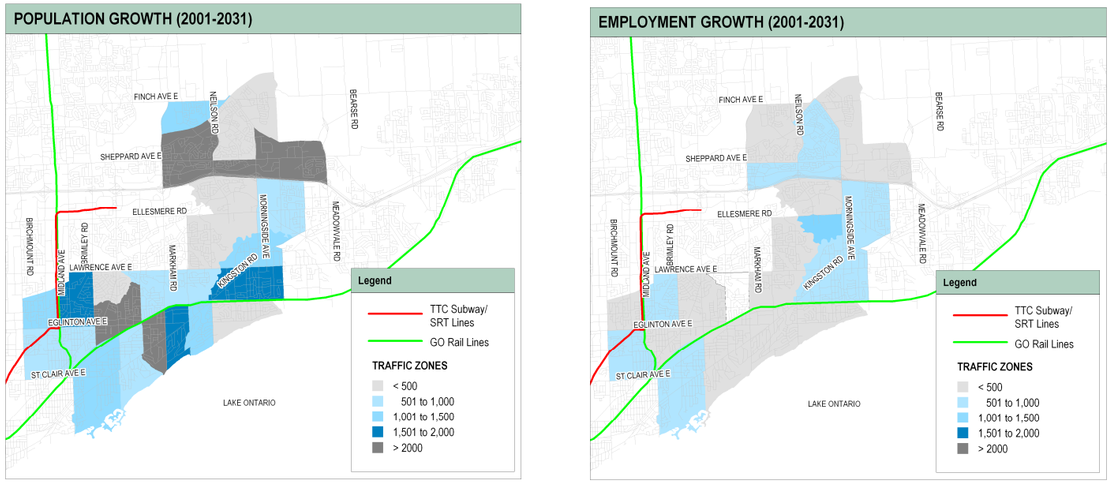
3.3.4.3 Extension

Some future intensification of land use can be expected in this area. One major change that can be expected, with or without the SRT are increases in the number of students travelling to the Centennial College.

Exhibit 3-14 illustrates the population and employment increases projected for the areas in the SRT Extension Corridor. Based on the growth in population and employment projected for this corridor, and the 2031 future forecast travel patterns in this area, the peak hour travel demand is estimated to be 9,000 to 10,000 persons per hour (peak direction) at the busiest point along the route (Kennedy Station).

[1] "The Big Move", Mobility Hubs Backgrounder, December 2008.

Exhibit 3-14: Future Population and Employment Growth (2031)



3.4 Transportation

A large number of TTC bus routes, the existing Scarborough RT, the Bloor-Danforth Subway, GO Rail and GO Bus inter-regional services, private inter-regional bus services and freight rail operations are located within the study area.

Most of the road network in the study area operates at capacity during the morning and afternoon peak hours. With the notable exception of minor operational changes to Progress Avenue and Milner Business Court, the introduction of the SRT will not affect the existing road network system.

Based on an initial determination by Transport Canada, the Highland Creek and its associated branches within the study area are not considered navigable. Final confirmation of this determination is pending with Transport Canada.

3.4.1 Kennedy Station: Transportation

Kennedy Station is located at the eastern terminus of the Bloor Danforth Subway line and the southern terminus of the SRT. As such, it provides a significant connection between Scarborough and areas further south and west, including downtown Toronto.

The Kennedy Station study area is bounded by Eglinton Avenue on the north, CN rail and Transway Crescent on the south and the GO Transit Stouffville rail line on the east.

3.4.1.1 TTC Service

The existing Toronto Transit Commission (TTC) bus routes passing through the SRT study area are shown in below

Exhibit 3-15: Existing Transit Services

and the existing associated ridership is shown in Table 3-7.

The TTC currently operates the following bus routes within the study area (Source www.ttc.ca):

The **12 Kingston Rd** operates between Victoria Park Station on the Bloor-Danforth Subway, through the St. Clair Avenue East and Brimley Road area, and Kennedy Station on the Bloor-Danforth Subway, generally in an east-west direction. Accessible service is provided on the route. Bike racks are available on this route. Kennedy Station is an accessible station.

The **20 Cliffside** operates between Main Street Station and Kennedy Station on the Bloor-Danforth Subway, generally in an east-west direction. Accessible service is provided on the route. Bike racks are available on this route. Both Main Street and Kennedy Stations are accessible subway stations.

The **21 Brimley** operates between Kennedy Station on the Bloor-Danforth Subway, through Scarborough Centre Station on the Scarborough RT, and the area of Brimley Road and Steeles Avenue East, generally in a north-south direction. Accessible service is provided on the route. Both Kennedy and Scarborough Centre Stations are accessible subway or RT stations. Bike racks are available on this route.

The **34 Eglinton East** operates on Eglinton Ave, E. between Eglinton Station on the Yonge-University-Spadina Subway and Kingston Road, in an east-west direction. It also serves the Kennedy Station on the Bloor-Danforth Subway. Accessible service is provided on the route. Both Eglinton and Kennedy Stations are accessible subway stations. Bike racks are available on this route.

The **43 Kennedy** operates on Kennedy Road between Kennedy Station on the Bloor-Danforth Subway, and Steeles Avenue East in a north-south direction. Accessible service is provided on the route. Bike racks are available on this route. Both Kennedy and Scarborough Centre Stations are accessible subway or RT stations.

The **57 Midland** operates between Kennedy Station on the Bloor-Danforth Subway and the area of Midland Avenue and Steeles Avenue East, generally in a north-south direction. It also serves the Midland Station on the Scarborough RT. Accessible service is provided on the route. Kennedy Station is an accessible subway station. Bike racks are available on this route.

The **86 Scarborough** operates between Kennedy Station on the Bloor-Danforth Subway, and the Toronto Zoo, with short turn service to the area of Lawrence Avenue East and Beechgrove Drive. Accessible service is provided on the route. Kennedy Station is an accessible subway station. Bike racks are available on this route.

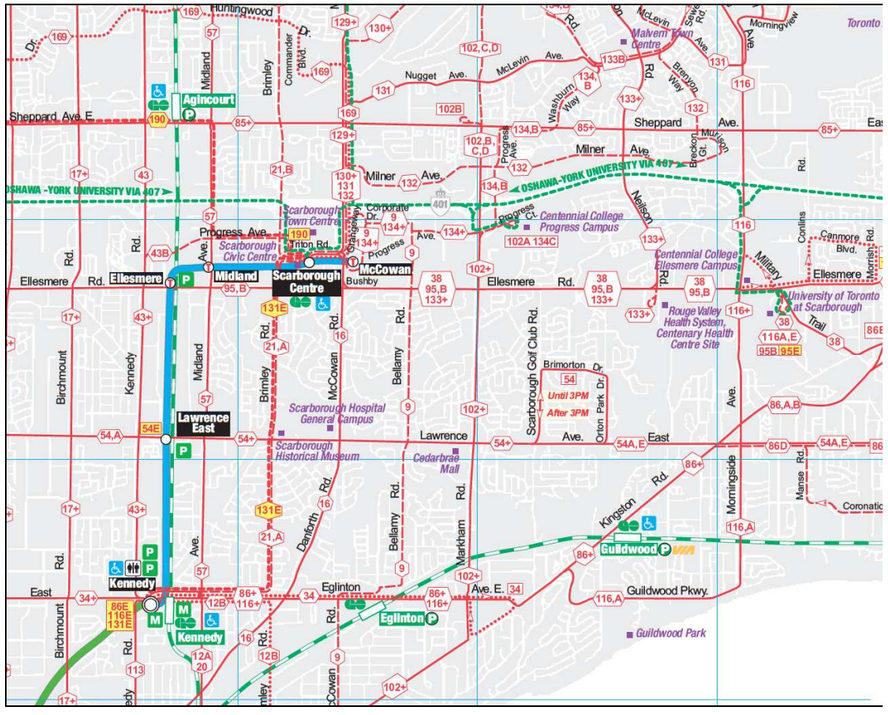
The **113 Danforth** operates between Main Street Station and Kennedy Station on the Bloor-Danforth Subway, generally in an east-west direction. Accessible service is provided on the route. Bike racks are available on this route. Both Main Street and Kennedy Stations are accessible subway stations.

The **116 Morningside** operates via Eglinton Ave. E., and Morningside Ave. between Kennedy Station on the Bloor-Danforth Subway and the area of Morningside Avenue and Old Finch Avenue. Branch service is provided to the University of Toronto at Scarborough campus, and the area of Conlins Road and Ellesmere Road. Accessible service is provided on the route. Kennedy Station is an accessible subway station. Bike racks are available on this route.

The **131 Nugget** operates between Scarborough Centre Station on the Scarborough RT and the area of Old Finch Avenue and Morningview Trail, generally in an east-west direction. It also serves the Kennedy Station on the Bloor-Danforth Subway via Brimley Road, but only during the peak periods from Monday to Friday. Both Scarborough Centre and Kennedy Stations are accessible RT or subway stations. Bike racks are available on this route.

The **305 Eglinton East Blue (**Night bus route) operates between the area of Eglinton Station on the Yonge-University-Spadina Subway and the Rouge Hill GO Station, in an east-west direction. Accessible service is provided on the route. Bike racks are available on this route.

Exhibit 3-15: Existing Transit Services



Source: TTC Ride Guide

Table 3-7: Existing (2005-2006) Ridership in the SRT Extension Study Area[2]

TTC Bus Route	Typical Weekday Ridership (Passengers/Day)	TTC Bus Route	Typical Weekday Ridership (Passengers/Day)
12 Kingston Rd	6,900	86 Scarborough	17,100
20 Cliffside	5,300	113 Danforth	4,200
21 Brimley	8,100	116 Morningside	20,200
34 Eglinton East	26,300	131 Nugget	6,600
43 Kennedy	14,600		
57 Midland	12,000		

[2] (taken from TTC Service Improvements for 2008)

3.4.1.2 GO Transit

The Kennedy Station also connects to GO Transit at the Stouffville-Kennedy GO Station. Service on the Stouffville line comprises five southbound trains during the morning period from 6:49 to 8:34[3] and five northbound trains during the afternoon period from 16:45 to 18:47[4].

3.4.1.3 Road Network, Pedestrian and Cyclists

The existing road network consists of a grid pattern of arterial roads and freeways within the City of Toronto. Kennedy Road is a major north-south arterial immediately west of the Station.

Eglinton Avenue is a major east-west arterial in the City of Toronto. Within the study area, it consists of a six-lane cross-section with a sidewalk on both sides. A bridge built in 1976 carries Eglinton Avenue over the GO Transit Corridor and the existing at-grade section of the SRT leaving Kennedy Station.

All major roads within the vicinity of Kennedy Station are equipped with sidewalks on both sides. At present, there are no designated bike lanes on any of the major roads in the vicinity of Kennedy Station.

A pedestrian/bicycle bridge and trail crosses the rail and hydro corridor just north of the study area, connecting the Lord Robert Woods to other parks north of Kennedy station.

3.4.1.4 Navigable Waterways

There are no navigable waterways within the Kennedy station study area.

3.4.1.5 Emergency Service and Access

The current built form have emergency service and access requirements built into its design. There are no emergency services stations within the study area for Kennedy station.

3.4.2 Conversion: Transportation

The SRT itself is a central component to the transportation network within Scarborough. Between Kennedy Station and McCowan Station, the SRT intersects and interacts with several roads and surface transit lines.

3.4.2.1 TTC Service

The services provided at the other five stations on the existing SRT (besides Kennedy) vary. The following discusses the role of each station.

[3] First scheduled train service does not stop at Kennedy Station.
[4] Scheduled departure times from Kennedy Station.

Lawrence East Station

The Lawrence East Station is an existing at grade station situated beneath the Lawrence Avenue East overpass. Pedestrians can access the station from the east and west sides of the existing rail corridor. Beneath the Lawrence Avenue overpass, on the east side, there is a 90 space commuter parking lot and a passenger pick-up and drop-off facility. On the west side, there is a three-bay bus terminal that serves the following route (see Table 3-8):

The existing station is not barrier free.

Table 3-8: Existing TTC Bus Route that use Lawrence East Station and Associated Ridership (2005-2006)[5]

TTC Bus Route	Typical Weekday Ridership (Passengers/Day)
54 Lawrence East	33,800

Exhibit 3-16: Existing Lawrence East Station, looking northwest

Ellesmere Station

The Ellesmere Station is an existing at grade station situated beneath the Ellesmere Road overpass. Pedestrians can access the station from the east and west sides of the existing rail corridor. Beneath the overpass, on the east side, there is a 60 space commuter parking lot and a passenger pick-up and drop-off facility.

The existing station is not barrier free.

There are no bus bays or direct connection to any bus route at the station.

Exhibit 3-17: Existing Ellesmere Station, looking north

[5] (taken from TTC Service Improvements for 2008)

Midland Station

The Midland Station is an existing elevated station located above Midland Avenue. Pedestrians can access the station from the east and west sides of the road (collectors booth on the west side and automatic entrance on the east side).

The **57 Midland** bus operates between Kennedy Station on the Bloor-Danforth Subway and the area of Midland Avenue and Steeles Avenue East, generally in a north-south direction (see Table 3-7 for existing ridership volumes). Curb side stops at the entrances to Midland Station allow passengers to transfer between buses and the SRT.

The existing station is not barrier free.

Exhibit 3-18: Existing Midland Station looking north

Scarborough Centre Station

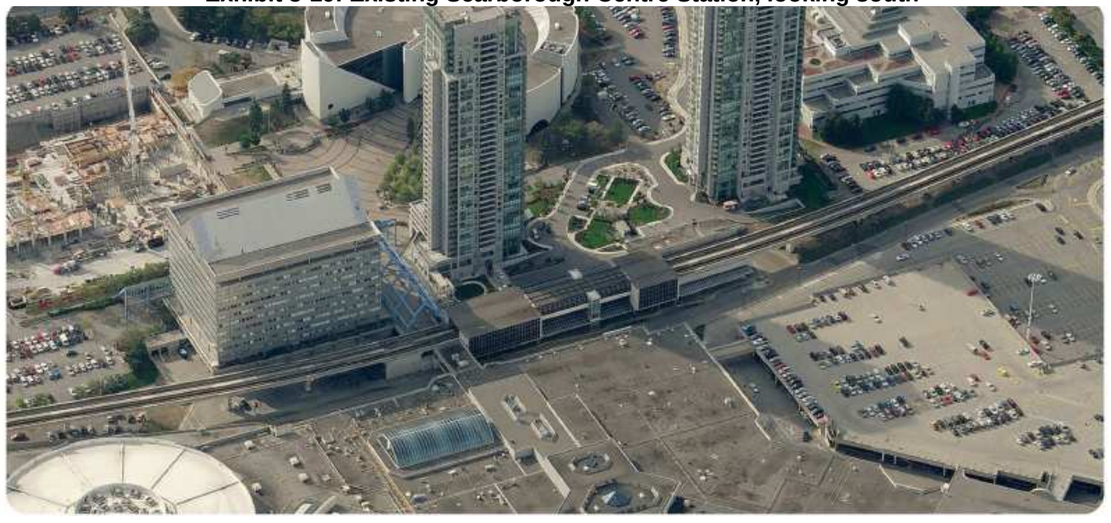
The Scarborough Centre Station is an existing elevated station. Pedestrians can access the station from the north (from the Scarborough Town Centre mall) and the south (towards the Scarborough Civic Centre. This station is barrier free.

On the lowest level of the station is a twenty bay bus terminal that serves TTC, GO Transit and other Regional and National bus operators, including:

Table 3-9: Existing TTC routes at Scarborough Centre Station[6]

TTC Bus Route	Typical Weekday Ridership (Passengers/Day)
9 Bellamy	3,700
16 McCowan	10,300
21 Brimley	8,100
38 Highland Creek	8,900
43B Kennedy	14,600
129 McCowan North	13,600
130 Middlefield	2,300
131 Nugget	6,600
133 Neilson	9,700
134 Progress	8,100
169 Huntingwood	910
190 Scarborough Centre Rocket	8,200

Exhibit 3-19: Existing Scarborough Centre Station, looking south



[6] (taken from TTC Service Improvements for 2008)

McCowan Station

McCowan Station is an existing elevated station located east of McCowan Road. Pedestrians can access the station from the east side of the road. Public parking is available south of Bushby Drive (to the south side of McCowan Station).

Immediately to the east of McCowan Station is the existing McCowan carhouse and storage facility. It is a purpose built facility with sufficient storage capacity and maintenance provisions for the existing UTDC Mark I vehicles.

Table 3-10: Existing TTC routes at McCowan Station

TTC Bus Route	Typical Weekday Ridership (Passengers/Day)
9 Bellamy	3,700
134 Progress	8,100

Exhibit 3-20: Existing McCowan Station, looking north

3.4.2.2 GO Transit

The eastern portion of the Scarborough Centre bus terminal is used by GO Transit (and other regional carriers). The GO routes that use this terminal include:

- **The Highway 407 East:** operates from Pickering, and serves UTSC, the Centennial College Ellesmere Campus, Scarborough Town Centre, Richmond Hill and York University.
- **The Durham College/UOIT:** operates from Scarborough Centre and ends at OUIT campus.
- **The Oshawa Hwy 2**: operates from Oshawa and serves Whitby, Ajax, Pickering, Scarborough, York Mills and Yorkdale.
- **The Oshawa Hwy 2 Express:** operates from Oshawa and serves Whitby, Ajax, Pickering, Scarborough and Finch.
- **The Oshawa Hwy 401:** operates from Oshawa and serves Whitby, Ajax, Scarborough Centre and Finch.

3.4.2.3 Road Network, Pedestrian and Cyclists

The existing road network consists of a grid pattern of arterial roads and freeways within the City of Toronto. The major east-west roads include Eglinton Ave, Lawrence Ave, Ellesmere Ave. These are perpendicular to the major north-south roads, including Kennedy Road, Midland Road, Brimley Road and McCowan Road.

All major roads within the vicinity of the SRT are equipped with sidewalks on both sides. At present, there are no designated bike lanes on any of the major roads in the vicinity of the SRT.

3.4.2.4 Navigable Waterways

There are no Navigable waterways issue with the existing conditions as all built form has been constructed.

3.4.2.5 Emergency Service and Access

The current built form have emergency service and access requirements built into its design. There are no emergency services facilities adjacent to the existing SRT.

3.4.3 Extension: Transportation

3.4.3.1 TTC Service

Many of the existing Toronto Transit Commission (TTC) bus routes listed in sections 3.4.1.1 originate from the SRT Extension Study Area. There are also a number of routes that currently do not connect (directly) to the SRT but carry substantive riders. Theses include:

Table 3-11: Existing TTC routes within the SRT Extension Study Area that do not cross the existing SRT TTC routes at Scarborough Centre Station[7]

TTC Bus Route	Typical Weekday Ridership (Passengers/Day)
12 Kingston Rd	6,900
20 Cliffside	5,300
34 Eglinton East	26,300
57 Midland	12,000
85 Sheppard East	25,500
86 Scarborough	17,100
102 Markham Road	17,600
113 Danforth	4,200
116 Morningside	20,200

3.4.3.2 GO Transit

GO Transit currently operates four bus routes within the SRT Extension study area. These routes are described in section 3.4.1.2.

3.4.3.3 Road Network, Pedestrian and Cyclists

The existing road network consists of a grid pattern of arterial roads and freeways within the City of Toronto. The major east-west roads include Progress Avenue, Highway 401, Milner Avenue, and Sheppard Avenue. These are perpendicular to the major north-south roads, including McCowan Road, Bellamy Road, Markham Road and Neilson Road.

All intersections were analyzed as part of the existing conditions. Appendix G-1 contains details on intersections analyzed and the prevailing conditions. The most congested intersections for the extension area were Markham Road/Progress Avenue, which was found to operate at LOS F during the PM peak hour and the intersection of Markham Road/Sheppard Avenue was found to operate at LOS E during the AM peak hour and at LOS F during the PM peak hour.

All major roads within the vicinity of the SRT are equipped with sidewalks on both sides. At present, there are no designated bike lanes on any of the major roads in the vicinity of the SRT.

3.4.3.4 Navigable Waterways

The Highland Creek Branch at Markham road (Northern Branch) is not designated as a Navigable Waterway by Transport Canada.

3.4.3.5 Emergency Service and Access

There are no emergency services facilities within the study area.

[7] (taken from TTC Service Improvements for 2008)

3.4.4 Future Conditions: Transportation

3.4.4.1 Kennedy: other transit initiatives

GO Stouffville Line

GO transit has recently announced plans in 2010 to conduct a study which allows all day service on the GO Stouffville line and possible extension to Uxbridge.

Scarborough Malvern LRT

The Scarborough-Malvern LRT will generally follow the existing roadway alignment beginning at the Kennedy Station west of Midland Avenue. The LRT will travel eastward along existing centerlines of Eglinton Avenue, Kingston Road and Morningside Avenue from Kingston Road to just north of Beath Street. It will then cross the Morningside Avenue northbound lanes and tie into a new Highland Creek bridge 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 into 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 140m north of the intersection.

- Length of project: 13km
- Number of Stops: 20 stops, including 2 terminus and 18 intermediate stops

The forecasted peak point demand for the Scarborough-Malvern corridor ranges between 4,600 and 5,000 people per hour per direction. At present, this project is not funded.

Eglinton Crosstown

The Eglinton Crosstown LRT will traverse at surface from Pearson International Airport to east of Black Creek Drive, underground from east of Black Creek Drive to east of Brentcliffe Road, then at surface from east of Brentcliffe Road to Kennedy Road including a short underground section at Don Mills Road.

- Length of project: 33km
- Number of Stops: 28 surface stops and 13 underground stations
- Start of construction:2010
- Scheduled start of service: 2020

The ridership forecast for the year 2031 at this location with the highest demand in this corridor is anticipated to be 5,400 passengers per hour in one direction.

3.4.4.2 Conversion: other transit initiaitves

As discussed in section 3.7.1.2, GO Transit has long term plans to increase service on the GO Stouffville line.

No other changes to the transportation system in the vicinity of the SRT are contemplated.

3.4.4.3 Extension: other transit initiaitves

Sheppard East LRT

The introduction of the Sheppard East LRT represents a significant change within the Study Area. This route will operate between Don Mills Subway station and Meadowvale Road in northeast Scarborough and will intersect with the Sheppard Subway line, GO Transit Stouffville line, Don Mills LRT, the SRT, the Scarborough Malvern LRT and numerous north-south bus routes.

- Length of project: 14km
- Number of stops: 30
- Start of construction: 2009
- Scheduled start of service: 2014

By 2031, the transfer activity between the Sheppard East LRT and the SRT is anticipated to be 2,000 to 2,500 passengers per hour during the morning and afternoon peak periods.

Also, with the extension of the SRT to Sheppard Avenue (as part of Phase 1), a number of routes will be redirected to the new terminal station (Sheppard East station). The seven bay bus terminal will support the routes listed below.

Table 3-12: Routes to be redirected to new SRT terminal station (Sheppard East Station)

Route	Headway mm.sss	Trips/hr	Bus Bays Required
102 Markham Rd express	10.000	6.0	1
114 Markham Rd North	10.000	6.0	1
131 McLevin	7.000	8.6	1
133 Neilson	15.000	4.0	0.5
134 Progress	15.000	4.0	0.5
136 Neilson North	7.500	8.0	1
169 Huntingwood	20.000	3.0	1
TTC Wheel-Trans (shared bay)			0
Unloading (1 for every 4 routes)			1
TOTAL BUS BAYS REQUIRED:			**7**