Figure 8-4: Proposed Grade Separation

Note that all dimensions are preliminary; they are subject to potential modifications/refinements during detailed design.
8.6 Identifying Alternative Designs for the Connection to the Sheppard Subway Line

Typically, the most unattractive part of a transit trip is a transfer from one transit vehicle to another. Research on travel behaviour reveals that transit customers perceive a transfer to be roughly equivalent to the inconvenience of 10 minutes of travel time and not having to switch vehicles.

The data modeling projected that 2000 of the 3000 LRT customers at the peak point on the Sheppard East LRT line will transfer to or from the subway, therefore a very high priority was given to developing designs for the LRT connection to the eastern terminus of the Sheppard Subway Line at Don Mills Station such that the connection is as convenient as practically possible.

In the initial “green lighting” sessions on optional ways to design the connection with the subway at Don Mills Station, it was recognised that there is no ‘absolute’ that defines when a transfer is too inconvenient. Judgements were made based on existing situations that are considered to fall far short of ‘excellent’. For example, complaints have been received repeatedly from members of public who use Kennedy Station about the distance of vertical separation (four levels) between the Scarborough Rapid Transit (SRT) service and the subway. Similarly, the separation between the bus terminal and the subway level at Don Mills Station is considered too great to be considered a convenient transfer.

LRT connection options that were ruled out as being too inconvenient for transferring customers were:

- LRT crossing Highway 404 on an elevated structure, similar to the SRT, with an elevated station above Sheppard Avenue
- Any LRT station in the Fairview Mall parking lot besides Sheppard Avenue (both due to inconvenience of transfer and to impact on the mall operation)
- Any LRT station at a level below the Fairview Mall parking lot, including integration with the existing underground bus terminal, given the lengthy walk now required from the bus terminal to the subway.

Also ruled out from further consideration was a surface LRT via a new bridge over Highway 404 and with an underground connection at the south side of the mezzanine level of the Don Mills subway station. While a very attractive alternative in principal, given the 5% maximum gradient assumed for the new LRT vehicle for design purposes, and the downhill slope of Sheppard Avenue - from Highway 404 bridge to Don Mills Road – it was not physically possible to develop a design where the LRT could get to the mezzanine level in the relatively short distance available between Highway 404 and Don Mills Station.

A short-list of LRT/subway connection designs were developed for more-detailed evaluation, with the designs reflecting:

- The broader goal of providing the most convenient transfer practical between LRT and subway
- The requirement by the Ministry of Transportation that traffic operations in the vicinity of the ramps from Highway 404 not be impacted to the extent that there would be any significant worsening of existing traffic back-ups for motorists exiting Highway 404 onto Sheppard Avenue, and
- The fact that the Official Plan still includes an easterly extension of the Sheppard subway in the longer term.

Figure 8-5: Aerial visual of study area between Don Mills and Consumers Road

The five alternatives selected for more-detailed evaluation were:

Surface LRT Connection:
1) Highway 404 bridge expanded to maintain existing traffic lanes and incorporate two lanes for LRT in the centre. Traffic lanes would be reduced from six to four through lanes on the eastbound and westbound approaches to Don Mills Road to allow an LRT stop on the
surface, in the centre of Sheppard - a wide centre platform would include stairs and elevators connecting to the mezzanine level of the subway station. (See Figure 8-5)

**Underground LRT Connection**: Tunnel under Highway 404, beginning west of Consumers Road and connecting to either:

2) The concourse level of the subway (one level below the surface)

3) ‘Butting up’ against the east end of the subway platform (two levels below the surface)

**Subway Extension**: Extend the subway to the Consumers Road area and build an LRT connection there:

4) Subway with underground LRT connection

5) Shallow subway with surface LRT connection, LRT platform in the middle of the street

* (Note: EA approval already exists for a subway in the general alignment of Sheppard Avenue East as per the “Sheppard Subway Environmental Assessment”. A review of the conditions in the area did not reveal any significant changes, since that EA, which would impact the previous approval)

These five alternatives were evaluated based on the following criteria:

- Capital Cost (not including property)
- Consistency with plans for a future subway extension to the east
- Ease of transfer – LRT to subway
- Ease of transfer to Don Mills Transit services
- Impact on total traffic, including the requirements by the Ministry of Transportation noted above
- Ease of incorporating “feeder” tracks to a future Don Mills LRT – in the event that the closest LRT carhouse was located on Sheppard Avenue
- Catalyst for transit-oriented development at Consumers Business Park
- Impact on adjacent property

A summary of the evaluation is included in Table 8-1 and discussed below.

**Evaluation of the Five Alternative Options:**

**Elimination of Options 2 and 4**

Options 2 and 3 are very similar, as are Options 4 and 5.

In Options 2 and 3, illustrated in Figure 8-6 and 8-7, an LRT tunnel would be provided from just west of Consumers Road, under Highway 404. In Option 2 the LRT would connect on the south side of the mezzanine level of Don Mills Subway Station; a new access would be provided into the mezzanine area from the LRT and customers would be one level from the subway. In Option 3, the LRT would connection directly to an easterly extension of the subway platform; customers transferring between the LRT and the subway would simply walk along the platform from one vehicle to another.

Option 2 has some property impacts in that it would interfere with the proposed design of a parking structure for an approved development on the south side of Sheppard Avenue. It was also seen as inferior to Option 3 in two key areas:

1) Assuming the LRT tunnel was constructed to also accommodate easy conversion to subway, the western portion of the facility in Option 2 would be “throw-away” in the event that the subway is extended each in the future

2) Customers would be one level above the subway, not at the same level as in Option 4

A similar comparison was made between Options 4 and 5, which both involve an extension of the subway to Consumers Road, with an LRT connection there. In Option 4 the subway platform would be extended to the east and be used for a connection to an underground LRT, at the same level, similar to Option 3, above. The underground LRT would come to the surface just west of Victoria Park Avenue. In Option 5, the LRT would remain on the surface and stop on-street at a single wide platform on the east side of the Consumers Road intersection – as shown in Figure __. The platform would form an LRT ‘station’ in the middle of the road, with vertical passageways linking to a centre platform for the subway, directly below.

When comparing Option 4 and Option 5, Option 4 would clearly provide for a better transfer between the subway and the LRT since both vehicles would be at the same level; however, this benefit was not considered sufficient to justify the very high additional cost associated with this option and it was eliminated.

**Elimination of Option 1: The Surface Option**

The three ‘finalist’ alternative connections of the LRT to the Sheppard Subway options were Options 3 and 5, described above, and Option 1, the only option where the LRT would remain on the surface at the connection to Don Mills Station.

Option 1 would require a new two-lane bridge structure over Highway 404 in order to maintain the current number of traffic lanes at this very busy interchange. However, west of Highway 404 this option included the reduction of traffic lanes on Sheppard Avenue from six through lanes, to four, to accommodate the LRT and a wide center platform ‘station’ in the middle of Sheppard Avenue. An elevator, plus stairs and escalators, would be provided on the platform to connect with the mezzanine level of the Don Mills Subway Station. From that level they would use the existing vertical passageways if transferring to the subway.

Option 1 had a significantly lower cost than the other options, at $125 Million. However, it was inferior in all of the other major criteria:
Ease of transfer: results in the most inconvenient transfer between LRT and subway (2,000 of the 3,000 peak point demand on the LRT would transfer to the subway) both from the perspective of physical separation between the two modes and because the surface platform would be narrow and restrictive for customers when the elevator and other vertical passageways are included.

- Consistency with a future subway: the Official Plan still identifies the need for an extension of the subway in the longer term. None of the expenditure required for the surface connection would be consistent with such a future subway extension.

Traffic Impacts: The LRT platform in the centre of Sheppard Avenue would require the removal of two through traffic lanes at the busy Sheppard / Don Mills intersection. This would reduce the capacity of this intersection far below the existing demand and cause a significant worsening of congestion in this busy area. This, in turn, would cause increased queuing on Highway 404 off-ramps to Sheppard Avenue – an impact that Ministry of Transportation staff had advised would be unacceptable.

Two options are being recommended for EA approval since the high cost and complexity of construction for both requires further comparison at a more detailed level of design:

1) **Option 2b** – LRT underground to subway platform level at Don Mills Station; and,

2) **Option 3b** – Shallow subway extension to Consumers Road with surface LRT (note that EA approval already exists for an easterly extension of the subway, but that earlier EA approval did not include a surface LRT connection).

### 8.6.1 Recommended Option 2b - Underground LRT Connection

Option 2b, with an underground LRT connection to the subway platform level at Don Mills Station (Figures 8-7 and 8-8), would require extending the subway platform to the east, with LRT tracks on either side. For customers east of Victoria Park and destined to the subway, the option is equally as favourable as a shallow subway extension, while the cost is lower and the tunnel construction would be designed to allow for a future subway extension. However, the separation between the subway and LRT is still under policy discussion; separation between vehicles could be between 100-125 metres.

### 8.6.2 Recommended Option 3b - Subway Extension

Option 3b, with a shallow subway extension to Consumers Road, would require an LRT “station” in the middle of Sheppard Avenue (east of Consumers Road) with direct passageways to the subway below (Figure 8-9). This option avoids the need for travellers from the Business Park to travel one stop and then transfer to the subway as per Option 2b (above). As such, Option 3b is a much more effective “catalyst” for denser, transit-oriented development in this development node. However, the cost is much higher for this alternative and more detailed design is necessary to determine if a “shallow” subway is achievable. More work is required on the depth needed to avoid inducing settlement of the Highway 404 bridge and to avoid the large, 6 metre deep sanitary sewer near Consumers Road.

### 8.7 Pedestrian Bridges

In order to compensate for the added width of LRT right-of-way, while maintaining the present lanes, bridge-widening would have been required. In addition to that, to minimize bridge widening, bike lanes would have become discontinuous as well. Therefore, as a viable solution, pedestrian bridges (Figure 8-6) will be installed at watercourse bridge location to avoid any structural widening, which will also allow for continuity of bike lanes.

The 2.5m wide, single span, pre-fabricated structures provide a safe pedestrian environment that is separated from traffic and are a much more cost effective option compared to widening existing structures.

Following are the watercourse locations where such bridges are to be installed:

- East of Gordon Avenue – West Highland Creek
- East of McCowan - East Highland Creek
- East of Gateforth Drive – East Highland Creek

![Figure 8-6: Typical Planview of a Pedestrian Bridge](image)

Note: The preliminary plans call for the bike lane to be implemented in place of the sidewalk on the existing bridge structures, however, the possibility of the bike lane sharing the new pedestrian bridges will be further explored during detailed design.
Table 8-1: Evaluation of Don Mills Subway Connection Alternatives

<table>
<thead>
<tr>
<th>Options</th>
<th>Evaluation Criteria</th>
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<td>Cost In millions (does not include property)</td>
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<tr>
<td>3 LRT under Highway 404</td>
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<tr>
<td>Connection at Don Mills Station at subway level</td>
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<tr>
<td>4 Subway to Consumers Rd / Brian Dr</td>
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</tr>
<tr>
<td>Subway with underground LRT connection.</td>
<td></td>
</tr>
<tr>
<td>5 Subway to Consumers Rd / Brian Dr</td>
<td>350 - 370</td>
</tr>
<tr>
<td>Shallow subway with surface LRT connection, LRT platform in the middle of the street</td>
<td></td>
</tr>
</tbody>
</table>

Preferred Options

1. Costs don't include “feeder” tracks in mixed traffic from portal to future Don Mills LRT to get the LRT vehicles into service on Don Mills in the event that a closest LRT carhouse is located on Sheppard Avenue
Figure 8-7: Underground LRT connection to subway

Note that all dimensions are preliminary; they are subject to potential modifications/refinements during detailed design.
Figure 8-8: LRT to Don Mills (connecting at platform with subway)

Note that all dimensions are preliminary; they are subject to potential modifications/refinements during detailed design.
Figure 8-9: LRT under 404 to Don Mills subway

Note that all dimensions are preliminary; they are subject to potential modifications/refinements during detailed design.
Figure 8-10: Subway Extension to Consumers (with surface connection to LRT)

Note that all dimensions are preliminary; they are subject to potential modifications/refinements during detailed design.
8.8 Electrical Substations

Electrical power is required to operate lights, equipment, and safety systems associated with the LRT platforms. Electrical power is also required to power the trains themselves. Toronto Hydro will distribute power to the TTC through the use of electrical substations. Substations (Figure 8-11) contain transformers, switches, and circuit panels to support the LRT system.

New electrical substations are required at nine locations (Figure 8-12) along the Sheppard LRT line. These facilities reduce the voltage from the Toronto Hydro power supply for the 750 volts required to run the LRT and help maintain consistent power levels along the line. The structures are roughly 12 metres by 4 metres by 4 metres high, not including additional width and length that may be required for options of a more attractive façade and access. Property must be acquired for their construction. These structures must be carefully sited so that they do not impede development along the route. Substations are required roughly every 1.5km. Residential properties have been avoided; the locations that are preferred for these facilities are not considered “final” to allow for some flexibility in negotiations, should it be appropriate, with other nearby landowners.

8.9 Preferred location addresses for substations are the following:

- 2500 Sheppard Ave (NW of Victoria Park)
- 3526 Sheppard Avenue (School/Church Parking lot - NE of Bay Mills Blvd.)
- In Vicinity of GO Transit land
- 4452 Sheppard Ave (NE of Brimley Rd.)
- 4930 Sheppard Ave (NE of Shorting Rd.)
- 5625 Progress Ave (SE of Progress Ave.)
- 6705 Sheppard Ave (SE of Neilson Rd.)
- 8129 Sheppard Ave, and 60 Grand Marshall Dr. (SE of Morningside Rd.)
- In the Vicinity of Hydro corridor (SE of Sheppard / Dean Park intersection). If Hydro doesn’t allow a substation on their land then we will negotiate with an adjacent landowner

8.10 Capital Cost

Preliminary capital costs have been developed for the Sheppard East LRT line, between Don Mills Road and Meadowvale Road. The costs are estimated to be in the order of $655 million, with the option of assuming the LRT connects with the subway at the subway platform level of Don Mills Subway Station. With the option of the subway being extended to Consumers Road, with a surface LRT station constructed there, the facility capital cost would increase to $775 million.

The estimated cost of purchasing 35 new light rail vehicles for this line, to accommodate the projected future ridership up to 2031, including additional vehicles for maintenance, is $210 million.

Therefore, the total order-of-magnitude of cost of the line is $865 million with the LRT connecting at Don Mills Station, and $985 million, if the subway were to be extended to Consumers Road. These cost estimates will undergo significant refinements as the project moves into the detailed design and engineering phases. These costs do not include property acquisition nor the appropriate factor for escalation over the duration of the construction.

Sheppard East LRT – Preliminary Designs

Preliminary, planview designs for Sheppard LRT are in Appendix 7. They have been created with the aim of attaining the best possible alignment that also minimizes impacts to properties adjacent to the Sheppard right-of-way, while keeping the technical specifications in line with those listed in Section 8.3 above. It is note that designs may be modified/refined during the detailed design phase.
Figure 8-12: Substation Locations
D. IMPACTS AND MITIGATION

9.0 Environmental Effects and Mitigation Measures

This section summarizes the anticipated effects resulting from the implementation of the Sheppard East LRT and, where appropriate, the manner in which any negative impacts will be mitigated against.

9.1 Environmental Benefits of Improved Public Transit

The importance of excellent transit for the health and vitality of big cities is well documented. A recent study on the sources of greenhouse gases and air pollutants in the City of Toronto indicates that close to 40% of greenhouse gas emissions originate from the transportation sector. The vast majority of these emissions are from cars and trucks. Encouraging residents to choose alternatives to the automobile for as many trips as possible must be a vital part of any action plan to reduce harmful emissions and address climate change. It is projected that the Sheppard LRT line will result in the diversion or replacement of 6 Million car trips, and result in an annual reduction of 25,000 tonnes of CO$_2$ emissions, every year.

Transit helps cities be more liveable and vibrant by:
- providing increased mobility for people so that they can take advantage of the employment, educational, recreational, and many other opportunities cities offer
- improving air quality and, in doing so, improving people’s health and their ability to enjoy outdoor spaces and activities
- freeing up road space for goods movement and reducing the wear-and-tear on city roads and the need to spend tax dollars on repairing and expanding road infrastructure
- ensuring the long-term economic stability and environmental sustainability by reducing climate-changing emissions and reliance on fossil fuels

Light-rail transit technology in its own right-of-way, as proposed for Sheppard Avenue East, is particularly effective in achieving positive impacts. These include:
- Provision of premium quality service – quiet, smooth, comfortable, fast, and reliable – which attracts people to ride transit
- Highly energy-efficient technology: light rail vehicles produce 92% less CO$_2$ than autos and 83% less CO$_2$ than diesel buses, and produce zero local-area or “tailpipe” emissions
- Ample capacity for projected ridership, with the capability to expand to meet increasing demands
- Demonstration of long-term and substantial commitment to quality transportation, to instil the confidence which landowners and investors need to invest in development and city-building, and the confidence which residents need to choose a transit-oriented lifestyle
- Creation of a strong and highly-recognizable presence which signifies the availability of high-quality transit
- Association with Toronto’s streetcar heritage and the positive connotations which streetcars bring to the City and its transit system

9.2 Impacts to Traffic

Sheppard Avenue, west of Pharmacy Avenue, has six through lanes; the LRT will require that the through general traffic lanes be reduced to four in section between Pharmacy Avenue and Consumers Road. East of Pharmacy, Sheppard has two through traffic lanes in each direction and the road will be widened to maintain these lanes. However, any existing bus-bays/right-turn lanes will be removed to allow more space for a better pedestrian/cycling environment. The designs do not include a reduction to the number of lanes on Sheppard in the vicinity of the Hwy 404 overpass.

9.2.1 Impacts to Left Turning Movements at Unsignalized Intersections

Left Turns across the right-of-way will only be permitted where there is a traffic signal. Between traffic signals, there will be no left turns permitted from Sheppard into un-signalized intersections or driveways, or from those locations, onto Sheppard. However, there will be separate left turn lanes provided at the signalized intersections and motorists will be able to make “U” turns from these lanes (Figure 9-1); a motorist on Sheppard who now makes a left turn into a midblock driveway could, with the LRT in place, simply go past the driveway, to the next signalized intersection, and make a “U” turn to return to their planned destination.

Major intersections will operate in three phases of signals, which considers future left turn requirements:
- Phase 1 – All east-west traffic / LRT/ pedestrian stopped, north-south traffic / pedestrians cross;
- Phase 2 – All “through” traffic / LRT/ pedestrians stopped, eastbound and westbound left-turn / U-turn phase; and,
- Phase 3 – Left-turn/U-turns stopped, east-west LRT / “through” traffic / pedestrians cross.
These changes to Sheppard Avenue will increase delays to certain traffic movements – as shown in Figure 9-2.
As part of improving the traffic conditions of the study area in general, consideration will be given to extending the Right-Turn lanes on cross-streets at specific intersections, in conjunction with velocity bus stops, now in the right turn lane, to far side of the intersection. This will allow the cross-street “green time” to be reduced, without a loss in existing capacity, and (in turn) this saved green-time to be added to east-west movements on Sheppard Avenue to help mitigate against the increased delays resulting from the addition of the LRT line.

9.2.2 Fire/Emergency Services

It is important to ensure that Fire/Emergency services continue to operate optimally, even with LRT in place, in Sheppard corridor. As a step towards accommodating emergency vehicles’ entry/exit, we will work with representatives to modify the design as necessary (e.g. mitigation by having no raised right-of-way at the driveway of fire ambulance station).

9.3 Noise and Vibration

In accordance with the applicable sound level criteria, no noise mitigation is warranted since the noise impact due to LRT movements along the centre lane of Sheppard Avenue East is predicted to be less than 5 dBA. A detailed report can be found in Appendix 6.

For noise and vibration control, it is recommended that the TTC implement the necessary measures within the planned tracks and track bed such as installation of continuously welded tracks on tangential sections, rubber boot vibration isolation and other concrete bedding details similar to the new TTC tracks. It is also recommended that the TTC continue to implement its tracks and wheels grinding programs with the objective of reducing noise and vibration on a continuous basis. Furthermore, the TTC should develop construction noise/vibration control program during the detailed design stages in accordance with the MOE EA procedures and the City of Toronto Noise Code.

Points of Reception

Points of reception are points on the premises of a person where sounds originating from other than the premises are received. For the purposes of this study, over 60 representative locations were selected to represent all the closest points of reception as per the MOE/TTC Protocols, which may potentially be affected by noise. The receptor heights were set at typical first and second storey levels in dwelling units. For a brief list of the selected receptors (denoted R1 to R28), please refer to Tables 1, 2, 3 and 4 of the Environmental Noise/Vibration Assessment Study. Figures 3.1 to 3.16 of that report show the locations of the selected receptors.

Ambient / Background Noise

“Ambient noise” in this report is the sound level at the selected receptor locations without the additional noise generated by the proposed LRT system. The existing ambient/background sound levels are due to vehicular traffic on Sheppard Avenue East in the area and the intersecting arterial roads. The following is a list of the existing transportation sources of noise considered in this study:

- Sheppard Avenue East traffic including truck traffic
- TTC buses

Predicted LRT Sound Levels

The predicted LRT alone sound levels range from 56 to 61 dBA during the day and from 49 to 57 dBA during the night (see Table 4 of the Noise/Vibration Assessment).

Since the LRT noise will be blended with the future traffic, see Tables 2 and 3 of the Noise/Vibration Assessment report in Appendix 6 for the future ambient sound levels with the proposed LRT noise during the day and night, respectively at the same representative receptor locations.

Impact Assessment

From the results, it is concluded that in some sections, there will be an overall reduction in the noise environment of approximately 1dBA, while the maximum calculated excess is only 1dBA. The reductions noted in Tables 2 and 3 reflect insignificant improvements to the acoustic environment and on the other hand, the 1dBA increase represents insignificant noise impact that can hardly be detected by the humans as being of any acoustic significance.

With respect to ground-borne vibration from the LRT, the closest residential receptor to the edge of pavement is approximately 11m and approximately over 15m to the future LRT alignment. The resulting vibration levels, based on the previously discussed vibration database are predicted to be below the applicable criteria. Therefore, it is this study’s finding that ground-borne vibration will not be an issue of concern as the resulting vibration levels are considerably below the applicable MOE/TTC Protocol criteria. The existing ambient vibration levels due to heavy trucks and bus movements on the outer lanes of Sheppard Avenue East are likely to be higher than the future LRT located in the centre of the right-of-way.

Therefore, it is the study’s finding that the addition of the LRT service to Sheppard Avenue East is predicted to generate no appreciable impacts on the existing and future sound and vibration environments, the reasons of which were explained in the previous sections.

Conclusion

This study has been carried out to investigate all aspects of the potential noise impact of the proposed LRT system on the nearby noise sensitive areas. The study dealt with documentation of the existing and future ambient conditions, the applicable criteria, the future sound levels and noise control measures (see Section 9.2.1), where warranted.
Vehicular traffic on Sheppard Avenue East is considered as the major source of environmental ambient noise within the study area. The predicted sound levels at most of the residences prior to undertaking of the proposed LRT system do exceed the MOE/TTC objectives due to their close proximity and wide exposure to the existing bus and traffic lanes.

The established excess sound levels due to the LRT system over the existing and future “do-nothing” ambient sound levels will be up to 1dBA at all locations; i.e. within the maximum allowable excess of 5 dBA.

9.4 Natural Environment

Trees:

Impacts on Existing Trees – The arbicultural study area along the Sheppard corridor consists of two zones. These zones are in keeping with Toronto Urban Forestry Services Arborist Report guidelines, which stipulate that all trees within the project boundary (36m corridor) and all trees 30cm or larger within 6m of the project corridor need to be inventoried. Therefore, the full arborist report will account for the majority of the trees within a 48m (36m+6m+6m) corridor along Sheppard.

Upon initial examination of the Sheppard corridor it has been estimated that approximately 334 trees will be immediately affected in the 36m high impact corridor and 551 trees impacted in the 48m corridor consisting of the 6m buffer on each side of the primary corridor (Total of 884 trees). In the worst-case scenario in the 36m corridor, it can be assumed that all 334 trees will be removed. However, some of these trees may be specimen trees and therefore candidates for further efforts to incorporate them into the streetscape design. For the 551 trees in the 6m buffer zones, it can be assumed that the majority of these trees will survive the impacts of the construction unless their root zones are seriously jeopardized. For the sake of precaution, it may be worth stating that 20% (110) of the 551 trees in the 48m corridor will be seriously impacted. The following outlines some of the expected outcomes of the trees in the two zones:

- **Zone 1 (36m): High Impact**
  - **Group A** – Trees removed
    - Required Actions – Tree Removal
  - **Group B** – Specimen Trees preserved
    - Required Actions – Design Integration, pruning (branches & roots as necessary), fertilize, irrigate, tree protection from construction.

- **Zone 2 (48m): Impact Mitigation to trees along the project boundary**
  - **Group A** – Damaged Trees (roots, branches, stem, grading issues, change in drainage patterns)
    - Required Actions – Tree protection fencing, pruning (branches & roots as necessary), fertilize, irrigate.
  - **Group B** – No Impact
    - Required Action – None

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<th>48m Zone</th>
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<td>551</td>
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</table>

Mitigation Measures – The next steps are as follows:

- Survey Acquisition (Tree locates and diameters along 48m corridor)
- Field Inventory (qualitative and quantitative)
- Analysis
- Arborist Report including Tree Preservation Plan

Tree planting along the Sheppard corridor will primarily focus on the placement of trees in areas where the soil volumes are enough to support a tree with the City of Toronto minimum soil volume target of 30m³/tree. The uncompacted soil volume of at least 30m³/tree is one of the most important factors (along with adequate irrigation) contributing to urban tree health. It is with this in mind that the proposed tree planting is being designed. The tree planting rationale within the Sheppard corridor is linked to Toronto Urban Forestry Service’s higher-level goals. The City of Toronto currently has 18% forest canopy cover. This is below the target of 30-40% canopy cover target set by Urban Forestry Services. Research by such agencies as American Forests indicates that the minimum urban forest cover necessary to achieve a socially, ecologically, and economically sustainable urban condition is 40%. Tree planting within the Sheppard corridor is not only attempting to contribute to this objective, but is also utilizing species that will create a resilient urban canopy.

In order to achieve a healthy urban forest condition that is resilient to biotic (i.e. pests and pathogens) and abiotic (i.e. salt and temperature extremes) influences there needs to be a diversity of species. Traditionally in Toronto there has been an over-reliance on Maples (Acer spp.) as the primary street-tree which has contributed to an imbalance in the species diversity of the urban tree canopy. Tree planting efforts will enhance the character along Sheppard through the pragmatic placement of trees.

The spatial arrangement of trees will consist of an appropriate mix of species and sizes that aim to optimize the social, ecological, and economic capacity of the corridor.

Assuming that with approximately 15km of corridor (15000m) and with tree planting at 10m on centre we will have about 3000 trees (1500 on each side-north and south). However, due to non-plantable areas (i.e. intersections, sight triangles, driveways, utilities, etc.) it has been estimated...
that the number will be 70% of 3000, so we can expect approximately 2100 trees to be planted along the corridor on the tail end of development activities. Ultimately, tree planting and landscape architectural design decisions will create more contiguous and healthier tree canopy than currently exists as it is being envisioned as one complete unit as opposed to numerous disparate entities.

**Vegetation:**

**Impacts on Vegetation** – Although implementation of an LRT has the potential to impact the vegetation and vegetative communities in general; however, those existing near Sheppard Avenue are representative of previously disturbed environments, and therefore the significance of the resulting impacts is somewhat diminished. All-in-all, the impacts of developing an LRT on Sheppard poses minimal impacts to vegetation/vegetative communities.

**Mitigation Measures** – While the impacts to vegetation are minimal, the collective ecological value of it all should not be overlooked. Therefore, efforts should be made on a site-specific basis to protect the vegetation communities that do not need to be removed in order to build Sheppard LRT.

**Fisheries:**

**Impacts on Fisheries** – Fisheries data provided by TRCA indicates that a number of species have been captured from the watercourses in the study area; however, none of those (listed in detail in LGL’s report), nor any other were found during site visits.

**Mitigation Measures** – Although proof wasn’t found of fish activity in any of the four creeks in the study area, efforts should be made to reduce the potentials for alteration of fish habitat. Some of the mitigation measures include: installing culvert extensions to avoid potential barriers to fish migration; placing silt fence along stream margins in areas of soil disturbance; no in-water work should be permitted from April 1 to June 30; etc. (more details can be found in LGL’s report).

**Wildlife:**

**Impacts on Wildlife and the Mitigation Measures** – Given the extent of urbanization in the study area, the tolerance of the wildlife assemblage to human activities and the limited zone of influence of the LRT, disturbance to wildlife from noise, light and visual intrusion will have no significant adverse effect.

**Natural Areas:**

**Impacts on Natural Areas and the Mitigation Measures** – It is determined that Sheppard LRT transit project will have no adverse effects on designated natural areas within the zone of influence of the project.

The Natural Heritage report by LGL (included in Appendix 3) identifies that the Sheppard LRT is being built within the area that has already been urbanized to a great extent, and therefore the impacts to existing environment, with respect to vegetation, fisheries, wildlife, and natural areas are diminishingly minimal.

Staff will continue to work with the TRCA during detailed design and construction to identify and mitigate any potential impacts on the natural environment during implementation of this project.

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**Water Treatment in Rural Section converted to Urban:**

In that section of Sheppard Avenue where the existing cross-section is rural (ditches) that are being modified to urban (curb and gutter with storm sewers), staff will include in the detailed design an appropriate method to mitigate against a lowering of the quality of stormwater resulting from this change. The method will be consistent with Policy and Guidelines of City of Toronto Wet Weather Flow Master Plan.

One mitigation method to be considered is to incorporate some form of swale along the boulevard area immediately adjacent to the roadway, which would act as a filler to provide treatment to the water prior to it entering the storm sewer system. Other mitigation methods along the roadway (conveyance control measures) will also be considered. An alternate end-of-pipe approach that will be considered is a form of treatment of the water at the outflow end of the stormwater system in that area. End-of-pipe approach will only be considered when conveyance control measure is unable to improve the quality of stormwater to the desire level.

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**9.5 Socio-Economic and Cultural Environment**

**9.5.1 Archaeology**

The Stage 1 archaeological assessment was conducted for the Class Environmental Assessment Study for the Sheppard Avenue East Light Rail Transit construction from Don Mills Road through to Meadowvale Road, City of Toronto. It was determined that 15 archaeological sites have been registered within two kilometres of the study area. Additionally, a review of the general physiography and local nineteenth century land uses of the study area suggests that the study area exhibits archaeological site potential.

A field review of the study area was conducted July 9th, 2008 and it was determined that most of the Sheppard Avenue East study area had been previously disturbed by commercial, industrial and residential development and road construction and all associated servicing and landscaping. The proposed construction along Sheppard Avenue East is to only have impact on a 15 metres wide zone from the centre of the existing Sheppard Avenue East ROW. The field review also determined that several areas exhibit potential for archaeological sites due to the presence of several watercourses within and in close proximity to the study corridor.

In light of these results, the following recommendations are made:

1) Should the proposed improvements to Sheppard Avenue East result in the encroachment onto previously undisturbed lands determined to have archaeological site potential, a Stage 2 archaeological assessment of the study corridor should be conducted in accordance with the Ministry of Culture’s Standards and Guidelines for Consultant Archaeologists (2006 final draft), prior to any land disturbing activities. The purpose of this work would be to identify any archaeological remains that may be present;
1. Any proposed work through the study corridor should be suitably planned in a manner that avoids any identified, aboveground, cultural heritage resource; and

2. No additional archaeological assessment is required within the remainder of the study area, and those areas which do not exhibit archaeological site potential may be considered clear of further archaeological concern; and

The above recommendations are subject to Ministry of Culture approval, and it is an offence to alter any archaeological site without Ministry of Culture concurrence. No grading or other activities that may result in the destruction or disturbance of an archaeological site are permitted until notice of Ministry of Culture approval has been received.

3. Should deeply buried archaeological remains be found during construction activities, the Heritage Operations Unit of the Ontario Ministry of Culture should be notified immediately. In the event that human remains are encountered during construction, the proponent should immediately contact both the Ontario Ministry of Culture and the Registrar or Deputy Registrar of the Cemeteries Regulation Unit of the Ontario Ministry of Government Services, (416) 326-8392.

9.6 Property Acquisition

Installing LRT tracks along the Sheppard Ave East centerline requires widening of midblocks and intersections approximately by 7.38 meters and 10.00 meters, (right-of-way width plus left turn lane as left turn lanes can no longer 'line up' opposite one another on either side of the intersection) respectively. There are specific areas where the existing road right-of-way is not sufficient to accommodate this widening and additional property must be acquired. Locations where the newly designed roadway exceeds the present Right-of-Way are clearly identified in Appendix 7 with dashed orange lines and the key areas are described below:

Property Requirement where Sheppard Avenue is less than 36 metres:

The typical cross-section for the Sheppard LRT is based on a street right of way of 36 metres, consistent with the designated width in the Official Plan. However there are specific sections where the actual right-of-way is less than 36 metres and property acquisition is required. The key locations where property is required are:

- East side of Pharmacy Rd and Sheppard Ave intersection
- From the west side of Kennedy Rd to Brimley Road a number of properties are impacted on the north and the south side due to the widening of Sheppard.

Property requirement for Agincourt GO:

The grade separation at Agincourt GO station impacts properties adjacent to Sheppard Ave due to the revised grades on Sheppard. Some of these properties will need to be acquired for the construction of the grade separation and the retaining walls. These property owners are being contacted during the EA to discuss the changes to their properties.

Property Required at Consumers Road intersection:
The initial designs of the Consumers Road intersection, including a single LRT ‘station’ in the middle of the road possibly including elevator, stairs and escalators (in the option of a subway extension to this point) which requires a much wider LRT platform in the middle of the street than elsewhere and this requires some additional widening.

- West and east side of Consumers Rd (both north and south side for the subway extension to Consumers Rd)
- West and east side of Consumers Rd (both north and south side for the subway extension to Consumers Rd)

**Property requirement for permanent easements of tunnels between Don Mills and Consumers Road:**

Permanent easements are required for the tunnel sections between Don Mills Station and Consumers Rd, where the tunnels are outside the Sheppard Ave Right-of-Way. The properties have been identified and initial discussions have taken place with representatives of the owner; further discussions will occur once the tunnel alignment is finalised.

**Property requirements for Substations:**

New electrical substations are required at nine locations along the Sheppard LRT line. These facilities reduce the voltage from the Toronto Hydro power supply to the 750 volts required for the LRT and help maintain consistent power levels along the line. The structures are roughly 12 metres by 4 metres by 4 metres high and property must be acquired for their construction.

The study has identified the preferred locations. One of the major objectives of the study was to select locations such that the effects on residential properties are minimized – the locations were selected to meet the technical requirements for spacing while avoiding a substation being recommended on any residential property.

The recommended substation locations are shown in Figure 8-12. However, for purposes of allowing some flexibility during negotiations, these locations are not ‘fixed’. For example, if a new development is proposed on a property adjacent to one of the recommended locations, it may be advantageous to work with that property owner with respect to acquiring the land for an electrical substation.

Details of the development/installation of the substation(s), as well as work on a façade to make the structures less noticeable, will be considered in the detailed design phase.

**9.6.1 Special Considerations at Midland Avenue**

Sheppard Avenue Right-of-Way at the intersection with Midland Avenue has a width less than 36 metres. In addition to that, the Knox United Church Cemetery is located at the northeast corner of Sheppard and Midland. In order to facilitate the road/LRT traffic in best utilizing the reduced Right-of-Way width, while respecting the cemetery, this EA is proposing two options.

The first option is for all the required widening to be on the south side of Sheppard such that no property is required from the Church/Cemetery. However, this option would result in a greater property requirement on the south side of Midland/Sheppard intersection.

In order to balance the property requirements between north and south of Midland/Sheppard, a second option (Figure 9-3) is to acquire a strip from the Church, which will reduce the amount of detour required for Sheppard and thereby minimize the amount of properties required on the south side. It is important to note that the strip to-be acquired from cemetery is not the portion of cemetery with graves. In this option, the sidewalk would have to be elevated, relative to the road to reduce impacts on a grove of trees.

A final choice between these options will be made during the detailed design.
Figure 9-3: Option with “Balanced” Property Impacts at Midland Avenue

Note that all dimensions are preliminary; they are subject to potential modifications/refinements during detailed design.
10.0 Consultation

Public and stakeholder consultation is a key requirement of the Municipal Class EA. The plan for public consultation was to offer the public a wide range of methods of communicating with the EA Study Team so they could choose their level of involvement in this EA. Accordingly, a dedicated telephone number (including TTY), fax, email address and web site were introduced. Opportunities for public participation in decision-making at the three key milestones of the study included: Information Centres (with commenting forms), and interactive on-line commenting.

In addition, at the beginning of the study, contacts were established with a broad range of Federal, Provincial and Municipal agencies with a potential interest in the Project. The Study Team met with representatives from GO Transit to discuss connections with the TTC and future plans for the Agincourt Station.

Major comments received from the public and stakeholder agencies about key study findings and recommendations are noted in Appendices E.2 and E.4. Issues that will need to be addressed during the design phase are included in Commitments to Future Work (Appendix 9).

10.1 External Agencies

Other stakeholder agencies included CP rail and representatives from GO Transit, as this study is proposing a grade separation between the tracks, currently at grade, and the roadway at the Agincourt Station.

10.2 Public Consultation

Members of the public were consulted through newspaper advertisements, letters (a postal walk of all addresses in the general proximity of the project), email, fax, telephone, and at two Public Information Centres held in April 2008 and June 2008. The Municipal Class EA has defined mandatory points of contact during Phases 2, 3 and 4 of the Municipal Class EA process as outlined in Appendix 1. A summary of those key points of contact is provided below.

10.2.1 Study Commencement

A “Notice of Study Commencement and First Public information Centre” was placed in the Scarborough Mirror (North and East editions) on April 4th and April 11th, 2008, the North York Mirror (South and East editions) on April 4th and April 11th, 2008, and the Ming Pao on April 3rd and April 10th. A copy of these advertisements can be found in Appendix 8. This notice advised of the commencement of the Class Environmental Assessment study and notified the public of the date, time and location of the first Public Information Centre. This notice was also posted on the City of Toronto’s website (www.toronto.ca/involved).

Letters and/or emails were sent directly to individuals on the Project Team’s mailing list, and to all residents and businesses within the Sheppard Avenue corridor. This list included representatives from external agencies, municipalities, and members of the public within the study area or affected by the project, as well as additional members of the public who requested to be added to the mailing list. These letters included details of both the Notice of Study Commencement and of the first Public Information Centre.

From the beginning of the consultation program, the following methods were promoted to the public for submitting their comments at any time:
1) Telephone: 416-338-1166
2) TTY: 416-397-0831
3) Fax: 416-392-2974
4) Email: sheppardtransit@toronto.ca
5) Mailing Address:
   Public Consultation
   City of Toronto
   Metro Hall, 19th Floor
   55 John Street
   Toronto, ON M5V 3C6

Public Information Centres provided information panels and a looped audio-visual presentation. The Study Team was in attendance to answer questions regarding the Sheppard Avenue East LRT, which included representatives of City of Toronto, TTC, URS Canada (lead consultant), and The Planning Partnership (sub-consultant).

Commenting areas were set up to encourage members of the public to sit comfortably and make their comments following their review of the information panels and discussions with the Project Team. Comment forms were provided. Comment boxes, prepaid feedback envelopes, project cards, project email address, and a fax number were provided to help the public provide their comments.

10.2.2 Public Information Centre 1

The first Public Information Centre (PIC) was held on April 15 and 17, 2008. This PIC provided the general public, agencies, and other stakeholders with an opportunity to meet with the Project Team, and to provide input with respect to the material presented.
240 residents signed in on April 15 at the Saints Peter and Paul Banquet Hall and over 250 attended. At the April 17 Information Centre at Sir John A Macdonald Collegiate, 301 signed-in and over 310 attended. Comments are summarized in this section and Appendix 8 (Public Consultation) illustrates specific answers given to questions.

Public Information Centres formed an important part of the overall consultation program for this project and were designed to involve stakeholders early and throughout the study to identify public concerns and assist in the selection of a preferred alternative. The first PIC also addressed the mandatory consultation principles required during Phase 2 of the Municipal Class EA process.

The purpose of the first PIC was to present the following:

- Study Area;
- Study Purpose and Objectives;
- The Environmental Assessment (EA) Study Process;
- Transportation, Planning, Urban Design Policies and Objectives;
- Existing and Future Conditions;
- Evaluation of the Alternative Transit Solutions;
- Results of Phases 1 and 2 - Recommended Transit Solution;
- Status of the Phase 3 Work; and,
- Next Steps.

Some of the common questions/concerns that were raised at the Public Information Centres are listed below:

- Reason for choosing LRT over a subway
- Subway’s increase on demand
- The difference between LRT and streetcars
- Location of the LRT yard
- Bus route eliminations / reductions
- Scarborough Centre Connection
- Stop locations (particularly Yorkland Road)
- Stop Request program
- LRT connection to subway
- Traffic volumes on Huntingwood Drive
- Bicycle lanes
- Landscaping and Trees

- Noise and Vibration

The most common points raised by attendees are listed below:

**Stops** – Tentative LRT stop locations were shown at the Information Centre for people to respond to

- 56 made specific request to maintain a stop at a particular location
- 11 said they thought stops should be closer together than shown
- 4 said we should have wider stop spacings than shown
- 3 thought the stops we showed were good spacing

**Technology**

- 68 comments were received saying they would prefer a subway
  - 34 made the statement generally
  - 11 said to specific locations (e.g. Markham, Meadowvale, Scarborough Centre area, Downsview)
  - 12 gave the reason that a subway would have less impact on traffic
  - 11 stated their reasons as concern about LRT technology such as capacity, maintenance, etc.
- 76 comments of support for LRT
  - 42 were explicit support of the project
  - 34 were implied support of LRT
    - 14 said build LRT, but to a specific destination such as zoo, Port Union
    - 18 said build subway to Consumers or Victoria Park and then LRT from there
    - 2 said build LRT and extend it to Yonge as a replacement for the subway.
  - 9 supported a different technology than above - bus, elevated rail, keep the status quo, etc.

A key conclusion from Public Information Centre 1 was that additional explanation was needed as to the reason that subway was not considered an appropriate solution, based on the forecasted demand.

These explanations were posted on the website and on the presentation boards at the second round of consultation.
10.2.3 Public Information Centre 2

The second round of public consultation was held on June 3 and June 4, 2008, and addressed the mandatory consultation required during Phase 3 of the Municipal Class EA process. Public notification of the second Public Consultation Centre was completed through the placement of ads in local newspapers, and through individual letters mailed directly to individuals on the Project Team’s mailing list. A “Notice of Final Public Information Centre” was placed in the Scarborough Mirror (North and East editions) on May 21st and May 28th, and the North York Mirror (South and East editions) on May 21st and May 28th. Letters were sent directly to individuals on the Project Team’s mailing list, including external agencies, and members of the public.

The second PIC presented the following:

- Study Background;
- PIC 1 Background;
- Recommended Transit Solution;
- Recommended Alignment (including extension to Meadowvale Road);
- Issues Raised during PIC 1;
- Preferred Design for the Sheppard LRT;
  - Cross-sections
  - Plan Views
  - Urban Design / Landscaping Treatments
- LRT Stop Locations and Stop Spacing;
  - Recommended Stop Spacing and Stops
- LRT Connection Alternatives;
  - Preferred Options
  - Evaluation of Options
- Preferred LRT Design from Victoria Park to Meadowvale Road;
- GO Agincourt - Proposed Grade Separation;
- Alignment Options at Midland Avenue;
- Future Left Turn Operations;
- Substation and Street Furniture;
- Existing and Proposed Landscaping Features;
- Pedestrian Bridges;
- Noise and Vibration Study;
- Traffic Impacts;
- Property Impacts;
- Extension of the Study to Meadowvale Road;
- Future Studies;
- Official Plan Amendment Process; and,
- Next Steps.

Members of the Study Team were available to address questions, comments and concerns. 189 residents signed in at the June 3, 2008 Information Centre at Agincourt Collegiate High School and over 200 attended. At the June 4, 2008 Information Centre at the Malvern Community Centre, 123 residents signed-in and over 130 attended. Over 64 comment sheets were received during or after the event. The key issues that were raised are:

- Preference for a subway extension over an LRT
- Preference for the LRT to be built quickly
- Concerns regarding left-turn configuration and inability of driver to turn left at non-signalized intersections
- Stop spacing (too large, too small, fair compromise)
- Preference for underground connection from Don Mills Station eastward to Consumers Road
- Passenger accessibility concerns (e.g. seniors)

The most common points made by attendees are listed below:

**Stops** – Updated LRT stop locations were shown at the Information Centre for people to respond to

- 19 said proposed spacing good
- 7 said stops were too close
- 6 said the proposed spacing was too far apart

**Technology**

- 69 in Support of LRT
  - 27 showed explicit support for proposed LRT (e.g. “build it!”)
  - 42 implied support
    - 16 said subway to Consumers and LRT from there
    - 15 said LRT to specific destinations (e.g. zoo, Port Union, City Centre)
- 41 indicated preference for subway
  - 8 of these gave no reason
9 requested subway to specific destination (e.g. Downsview, zoo, airport)
18 gave reason as specific concern with LRT technology – capacity/maintenance etc.
6 indicated their reason as subway would impact traffic less than LRT.
3 said they support a different technology than above – e.g. bus, elevated rail.

Answers to all these concerns were provided in writing. A copy of the PIC boards for the first and second round of consultation were provided for this project at www.toronto.ca/involved.

10.3 Political Approval

The recommendations of this EA study were approved by the Commission at its meeting on June 18, 2008, by the City’s Planning and Growth Management Committee on July 2, and then by Council at its meeting on July 25.

Both the Commission and the Planning and Growth Management Committee allow deputations by the public. At the Commission meeting on June 18, 2008, a deputation was made by representatives of the owners of the property at 2205 Sheppard Avenue East, asking that an LRT stop be added at Settlers Road, given that the distance between the recommended stops on either side of this intersection – at Consumers Road and at Victoria Park Avenue – would be greater than at any other location on the Sheppard East LRT line.

While, at the time of writing this report, a stop at Settlers Road is not being recommended, the deputant has been advised that the EA approval for this project must include the flexibility to allow for future discussion, and if appropriate, installation of additional stops, at locations such as this.

Hence at this time, the EA is intended to allow for the flexibility of installing additional stops in the future, if a decision is made to do so. The key areas identified for continued discussion regarding the possibility of future stops are the above location, at Settlers Road, and one or two locations in the developing area east of Morningside Road.

10.4 Supplemental Consultation

10.4.1 Consultation with Directly Affected Property Owners

Early in the process, the Study Team identified that one of the key adverse environmental impacts of the undertaking would result from the temporary or permanent disruption to existing housing, businesses and cultural features (e.g. cemetery). Property acquisition is discussed in more detail in Section 6.12. Consultation with potentially affected property owners took various forms in addition to highlighting potentially affected property owners via the plans displayed at the public information sessions:

- Telephone conversations with property owners (or their representatives);
- Letters;
- Site visits to study existing conditions in order to minimize the amount of properties required;
- One-on-one meetings with property owners and the Study Team;
- Toronto Transit Commission and City of Toronto Committee meetings.

10.5 Filing of ESR and Notice of Study Completion

A "Notice of Environmental Study Report Submission" was placed in the Scarborough Mirror and the North York Mirror on January 9th and 14th, 2009 advertising that this ESR had been placed on the public record for a public review period, ending February 9th, 2009.

In addition, notification letters were mailed to all individuals on the Project Team’s mailing list. The letters and the newspaper ad provided information about the locations where the ESR could be viewed, as well as contact information for individuals wishing to comment on the ESR.
This EA study is a planning process. It has been done at a sufficient level to identify impacts, but there are still many details that must be worked out – and many activities that must occur – during detailed design and construction. A summary of some of the main activities are as follows:

### 11.0 Detailed Design

This document satisfies Phase 4 of the EA study process – documenting the planning process that was followed. The next phase in that process – Phase 5 – is detailed design and construction.

Detailed design will build upon, and by definition, involve a much greater level of detail, than the planning done in the EA process. This stage will ‘fine-tune’ the design to the point where a more precise estimate can be made of the dimensions of any property requirements. It will also involve an assessment of temporary property impacts during the construction stage (e.g., where a temporary easement is required during construction activities but where such land would be restored to its original state following that work.

Further structural assessments will be made of the bridge structures where the LRT tracks will be incorporated to identify any structural modifications that may be required. Some of the features contained in this Environmental Study Report will be designed in greater detail – such issues as the design of the terminus at the east limit, at Meadowvale Road, the exact location and grade of the access to the GO station parking lot as part of the grade separation, the manner in which the LRT design must be altered to allow breaks for Fire and Emergency Services – for e.g., in front of the two stations on Sheppard Avenue – whether some of the requests made by the public can be accommodated in the design – for determining if the signalised intersection at Shorting Road can be designed so as to include Havenview Road in the same intersection as it is a very short distance to the east.

The detailed design phase will include working with City staff on the various urban design elements to be integrated with the project. The may affect the typical cross-sections in that, in some special cases, short sections of treed medians on either side of the LRT right-of-way may be considered. This stage will include a detailed urban design plan for the street, with special attention given to specific urban design areas. The work will integrate, to the extent possible, with the longer term vision for urban design in the corridor (see Figure 11-1). It will also involve liaising with Fire and Emergency Services to determine where the LRT should be kept at the same level as the road, protected by raised curbs, rather than the typical raised median, with breaks to allow access across the right-of-way, for example, to a Fire Station with an unsignalized access. They may also be involved in the consideration of the location of poles that support the electrical overhead wires for the LRT power.

Figure 11-1: Existing, Intermediate, and Future concept images of Sheppard Ave.
It is important to note the detailed design process may lead to refinement, or modification, to the design (and thus also the respective property requirements) presented in the EA, but such changes would be minor, and not be a significant departure from what was committed to the public, nor to the impacts already identified.

The detailed design stage will evaluate ways to do the construction in stages that will minimize – to the extent practical – the impacts on the surrounding properties and will include its own plan for mitigation – e.g. noise, dust and traffic infiltration – caused by the construction activities. This will involve ongoing liaison with members of the affected public.

A copy of the letter from the TRCA which includes a number of the specific issues that must be addressed during detailed design and construction is included in Appendix 9.

There is flexibility for refinement and modifications to the “typical” plans in this document. For example, though the typical cross-section shows trees at the side of the road, this EA allows the flexibility for landscaped medians within the street, adjacent to the LRT right-of-way. Also, in some areas where LRT stops are close together, it may be preferred to keep the tracks at the same level as the road, protected by curbs on either side rather than create a raised median for a relatively short distance.

12.0 Permits and Approvals

TTC will secure necessary permits and approvals for the implementation of the Sheppard LRT Project, including, but not limited to:

1) Planning approvals (including Site Plan Approval) for above-grade structures and facilities;
2) Permit to Take Water from the Ministry of the Environment if dewatering exceeds 50,000 litres per day;
3) Stormwater management, in accordance with City of Toronto, TRCA and MOE requirements;
4) Sewer discharge approvals, in accordance with City of Toronto requirements;
5) Railway Crossing Agreement (GO Transit); and
6) Any adjustments near CPR will require new Crossing Agreement with CPR.

12.1 Property Acquisition & Requirements

The City of Toronto and TTC will:

1) Proceed with a Property Protection Study during the early stages of the detailed design of the Sheppard LRT;

2) Continue contact/meetings with property owners where property negotiations are required for the Project;
3) The City of Toronto will acquire all other properties required including temporary easements to facilitate construction and for implementation of substations

The exact property requirements can only be identified through completion of detailed design process.

12.2 Construction Issues

TTC will conduct further research and analysis for the construction of the Sheppard LRT, including, but not limited to the following activities:

1) Include noise and vibration and mitigation measures and construction site maintenance/upkeep requirements in construction contract documents;
2) Develop traffic, transit and pedestrian management strategies to be included in construction contract documents;
3) A copy of the letter from the TRCA which includes a number of the specific issues that must be addressed during detailed design and construction is included in Appendix 9;
4) Prepare and implement tree and streetscape protection and restoration plans;
5) Undertake Designated Substances Surveys for any buildings or structures which require demolition and to reflect the findings in construction contract documents;
6) Develop procedures for disposal of excavated materials, including contaminated soils, in accordance with Ministry of the Environment requirements;
7) Prepare and implement a groundwater management strategy,
8) Prepare an erosion and sediment control plan, which complies with prevailing TRCA and City of Toronto water guidelines and requirements;
9) Prepare an Environmental Management Plan including monitoring, triggers and contingencies in the event that further groundwater investigations indicate a potential adverse effect on Sheppard Ave;
10) Undertake buildings, structures, and railway protection and monitoring, and condition surveys; and
11) Undertake stray current protection and monitoring for pipelines and other utilities.

12.3 Consultation

The TTC/City will consult with the public, property owners and stakeholder agencies (including Police, Fire and other emergency service providers) during the design of the Sheppard LRT alignment, stations and related commuter and ancillary facilities.
12.4 Future Environmental Work

TTC will conduct a noise and vibration study, in accordance with the protocols established with the Ministry of the Environment. Specifically, this will include additional base line noise and vibration surveys (as required), similar to those already undertaken as part of this EA. Post construction measurement will be undertaken to confirm “no adverse impact” as predicted in the noise and vibration impact analysis undertaken as part of this EA.

A separate EA is taking place to establish the preferred locations for LRT storage and maintenance yard.