7. TOMKEN GRADE SEPARATION

7.1 Need & Justification / Rationale

7.1.1 Current BRT Plan

The approved EA Addendum plan has the busway passing under Tomken Road, with a station at the crossing. Tomken Road remains at its existing grade.

7.1.2 Outstanding Issues

The sump created by the busway passing under Tomken Road is at a lower elevation than nearby Little Etobicoke Creek, triggering the need to provide a permanent pumping station (cost in the order of $2.5 M plus ongoing operational costs) and to floodproof the station so that the regional storm level at Little Etobicoke Creek does not cross the busway and enter the station.

The need to minimize the amount of excavation throughout the BRT East project (due to cost, rock exposure, retaining wall requirements, and disposal of excavated material) suggests that passing under Tomken Road would only exacerbate that problem.

The busway at Tomken is immediately adjacent to a set of large gas and oil pipelines, with Eastgate Parkway to the south. Being in a deep excavation amidst those constraints will require significant retaining walls and have limited opportunity for open slope grading and landscaping.

Crossing under Tomken Road while maintaining traffic will require 2- or 3-stage construction, yielding additional cost and disruption to traffic.

7.2 Alternatives

It is proposed to lift the busway over Tomken Road. The busway alignment would not change. The station platforms would be shifted to the west side of Tomken Road, to allow for the grade down from the structure to the nearby Little Etobicoke Creek crossing.

Recognizing the need to continue to protect the residential community south of Eastgate Parkway from noise and visual intrusion, the existing berm south of Eastgate Parkway would be extended and supplemented by visual screening / landscaping along the north part of Tomken Road. This would screen the view of the tops of double decker buses along the busway from the second-floor windows of south side residences (as shown on Figure 7-2).

7.3 Evaluation / Analysis

Taking the Busway over Tomken Road would alter the station configuration, avoid the need for a pedestrian bridge at the station, eliminate the drainage sump and the need for a pumping station, floodproof the station, eliminate a substantial amount of excavation, provide a site to use excess material from elsewhere in the project, avoid pipeline impact, reduce wall requirements, simplify construction staging, and overall result in a net cost reduction of in the order of $7 million.

The visual impact of the change on south side residents can be eliminated through berm expansion.

The elevated station would be considerably better positioned than the below-grade facility to create a visual landmark for the BRT project in the corridor, as the site would be clearly visible along Eastgate Parkway from Cawthra Road to Dixie Road, and from the north and south approaches on Tomken Road.

Table 7-1: Analysis of Alternatives for Tomken Road Crossing

Analysis Factor	Busway Under Tomken Road (Base Case)	Busway Over Tomken Road
Cost	Guideway: $1.4 M Structure: $0.7 M Retaining Walls: $4.6 M Utilities: $5.8 M Station: $3.7 M Miscellaneous: $1.5 M Total $17.7 M	Guideway: $1.3 M Structure: $0.7 M Retaining Walls: $3.5 M Utilities: $0.5 M Station: $3.2 M Miscellaneous: $1.6 M Total $10.9 M
Impact to Utilities	Retaining wall needed to protect parallel pipelines	Reduced retaining wall requirements to avoid parallel pipelines
Drainage	Pumping station required at Tomken Road crossing sump. Below-grade station would require floodproofing.	Gravity drainage to existing ditches and Little Etobicoke Creek.
Construction Issues	Detours and lengthy / costly two-stage structure construction required for Tomken Road crossing. Below-grade operation requires significant rock excavation and relocation for disposal.	Tomken Road structure can be built with temporary road closures during bridge-deck implementation. Above-grade construction offers opportunity to dispose of excess excavated material from busway construction elsewhere in corridor.
Community **Visual Impact**	Station structure visible from a few houses. See Fig. 7.1	Busway station and top of moving buses will be visible from some south side residences. Visual barrier treatment (including increased berm and landscaping) required as mitigation. See Fig. 7.2
Noise Impact	Daytime noise level (Leq) in dBA for two nearby sites (Re14, Re15) Existing 53.6/52.9 Future without BRT 54.5/54.0 Future with BRT 55.5/56.6 Impact +1.0/+2.6 Eastgate Parkway noise remains dominant noise source in corridor; revised busway grade has insignificant impact.	Daytime noise level (Leq) in dBA for two nearby sites (Re14, Re15) Existing 53.6/52.9 Future without BRT 54.5/54.0 Future with BRT 56.2/54.1 Impact +1.7/+0.1 Eastgate Parkway noise remains dominant noise source in corridor; revised busway grade has insignificant impact.
Urban Design	Station has low-key presence in corridor	Station more visible to users and motorists; greater opportunity to highlight BRT. Greater visibility improves passenger security.

7.4 Conclusions / Recommendations

The proposed alternative is to lift the busway over Tomken Road. The station location and busway alignment would not change. The recommended alternative is shown on Figure 7-2.

7.5 Environmental Effects and Commitments to Mitigation

The following section discusses environmental effects and commitments to mitigation only as they differ from those previously identified in the 1991 Environmental Assessment and the 2005 Environmental Assessment Addendum for the Mississauga Transitway.

7.5.1 Physical Environment

7.5.1.1 Roads

The construction of the Busway structure over Tomken Road will have a temporary localized disruptive effect on roadway traffic. These effects will be mitigated through conventional traffic management programs that maintain a level of traffic capacity and safety acceptable to the City of Mississauga. Lane closures, temporary / overnight closures, signal timing revisions, lane markings, and signage will be used as appropriate. The motoring public will be advised of planned activities that may result in traffic disruption in advance (both temporally and physically). Bicycle and pedestrian access along Tomken Road will be maintained at all times. These mitigation measures will reduce impacts to a level acceptable to authorities and the public.

A program of traffic management that maintains capacity and safety will be developed in the Detail Design process.

In addition to the disruption associated with the above noted structure construction, corridor roads will be used by construction equipment, temporary construction access points will be implemented, and a substantial amount of truck traffic will be associated with the disposal of excess fill.

Most construction will, however, take place within the BRT right-of-way and will not impinge on or affect traffic operations on the adjacent or nearby roads.

Operation and Maintenance Effects

Once the BRT facility is in operation, there should be no special ongoing operational or maintenance effects on the road system or general traffic operations. The new structure will be added to the inventory of road structures in Mississauga and will follow conventional inspection, maintenance and rehabilitation schedules.

Significance

The construction of the busway structure will have a localized disruptive effect on roadway traffic. With the implementation of the above noted mitigation measures, the potential for adverse effects can be minimized and no significant residual effects should occur.

7.5.1.2 Utilities Within / Crossing Corridor

Pipelines

Between Cawthra Road and Tomken Road, the busway will cross two Trans-Northern Pipelines at-grade. No utility relocation is required.

Avoiding the need to shift or otherwise affect pipelines is a key station design parameter, as is maintaining the ability for the pipeline owner to access, inspect, and maintain the pipeline without disrupting busway operations to an unacceptable degree. Ongoing liaison with the pipeline owners through the Detail Design stage will be required to satisfy their needs.

Tomken Road

There are no effects on Hydro One facilities at this location. Bell telephone lines should remain as is, although individual poles may need to be shifted in some station areas. No significant effects are expected to the electrical services and control boxes provided at the signalized intersection.

For discussion related to *Construction Effects, Operation and Maintenance Effects* and *Significance* of utility impacts, please refer to Section 5.5.1.2.

7.5.2 Natural Environment

7.5.2.1 Watercourse Crossings

The impacts to the Little Etobicoke Creek crossing under the recommended alternative at Tomken Road are not significantly different than those associated with the previously-approved plan. However, further capacity evaluation will be undertaken for appropriate measures, if necessary, during detail design stage in light of altered site geomorphology.

7.5.2.2 Vegetation, Wetlands, and Wildlife

The BRT facilities in this area will result in the permanent removal of cultural meadow and associated habitat. However, the effect is limited given the common, tolerant nature of this vegetation community, habitat type and associated wildlife compliment.

The two wetland pockets located on the east and west sides of Tomken Road, south of Eastgate Parkway will be removed with the expansion of the earthen berm. The expansion of the berm is being undertaken to mitigate social / cultural effects of the BRT alignment and provide additional screening to adjacent residences. These features are very small (both are less than 0.2 ha) and are comprised of common wetland vegetation species with non-native/invasive species present. The effect of removal of these wetland pockets is considered negligible. In accordance with the practice for the whole BRT project, the City will implement its typical vegetation replacement and enhancement protocols for both woody vegetation and the wetland pockets removed by the project, based on CVC and/or TRCA's guidelines, with consideration of land ownership and usage, including utilities.

The proposed changes to the busway alignment crossing Tomken Road will not affect the amount of vegetation impacted compared to the approved plan. The increase in grade will, however, eliminate groundwater drawdown and site drainage concerns.

7.5.2.3 Species of Conservation Concern and Species at Risk

The proposed changes to the approved plan / profile will not have any effect on species of concern / risk.

7.5.2.4 Stormwater Management

Section 5.5.2.4 discusses the *Potential Construction Effects, Hydraulic Criteria,* and *Stormwater Management Criteria* for the entire Mississauga Bus Rapid Transit Project. The existing outlets for the Tomken Road / Eastgate Parkway study area are:

- Outlet 8 – Little Etobicoke Creek West; and
- Outlet 9 – Little Etobicoke Creek East.

The outlets listed above will be utilized under proposed drainage conditions and the existing drainage regime will not be greatly altered under proposed conditions. Existing peak flow rates to each outlet will not be exceeded under proposed conditions.

Existing peak flow rates to the wet pockets on either side of Little Etobicoke Creek will not increase under proposed conditions. Runoff volumes to the wet pockets on either side of Little Etobicoke Creek will increase under proposed conditions; however measures can be taken to prevent this increase if required.

Construction of the approved busway plan would require floodproofing (berms) to protect the below-grade Tomken Station from overflow of Little Etobicoke Creek. Construction of the proposed "over" option will require installation of 4 new culverts and relocation of several ditches to maintain existing drainage characteristics.

The proposed extension of the Little Etobicoke Creek crossing structure will have a negligible impact on flood levels during the 100 year and Regional storm events; this impact does not vary whether the BRT crosses over or under Tomken Road.

7.5.2.5 Groundwater

The proposed change in busway profile will have the effect of reducing or eliminating the groundwater issues associated with the previously approved alignment.

7.5.3 Socio-Cultural Environment

7.5.3.1 Archaeology

For potential impacts and proposed approaches to mitigate impacts, please refer to Section 5.5.3.1.

7.5.3.2 Heritage

Compared to the approved plan, no additional adverse environmental effects to heritage resources are anticipated during this phase of the project.

7.5.3.3 Noise

Methodology

Points of reception are considered any point on the premises of a person where sounds originating from other than the premises are received. For the purposes of this study, two representative locations were selected to represent all the closest points of reception to the BRT system which may potentially be affected by noise. The receptor heights were considered as typical first and second storey levels in dwelling units when calculating the BRT system lane and stations sound levels, respectively. The following gives a brief description of the selected receptors:

- Re14 House #4402 Lee Drive, south of Eastgate Road between Cawthra Road and Dixie Road.
- Re15 House #4404 Shelby Circle, south of Eastgate Parkway between Cawthra Road and Tomken Road.

For the Tomken Station area, the potential noise impact was assessed at the 2nd storey windows on the most exposed building façades of the residential dwellings and is based on comparing the future (worst case scenario) BRT station noise levels with the higher of the existing highway/roadway ambient noise level or the minimum exclusionary sound level limits set by the MOE for urban Class 1 areas similar to the one under consideration.

Results

The data included in Table 7-2 shows that the maximum calculated excess future sound level over the ambient is 1.7 dBA, i.e. acoustically insignificant and is within the maximum 5 dBA excess criterion.

Table 7-2: Noise Analysis – Tomken Road

Receptor	Street	Existing Sound Levels (dBA)	Future Sound Levels – No BRT (dBA)	Future Sound Levels with BRT – approved grade per EA (dBA)	Future Sound Levels with BRT – proposed grade per EA Addendum (dBA)
R14	Lee Dr	53.6	54.5	55.0 (+0.5)	56.2 (+1.7)
R15	Shelby Cr.	52.9	54.0	54.8 (+0.2)	54.1 (-0.7)

Impact Assessment Rating : < 3 dB change : Insignificant
>3 to < 5 dB change : Noticeable
> 5 to < 10 dB change: Significant
> 10 dB change : Very Significant

Criteria for mitigation: >5 dB change

In accordance with the applicable sound level criteria, no noise mitigation is warranted since the noise impact due to bus movements along the modification to the busway profile at the Tomken Station site is predicted to be less than 5 dBA. The modification of the busway profile, in combination with the expanded berms on the south side of Eastgate Parkway, does not result in a significant noise impact to adjacent residential properties, nor does it significantly differ from the noise levels associated with the previously approved plan and profile. The project does, however, result in an increase in noise level at site Re14 to above the MOE/Region/City day-time Leq 55 dBA objective.

7.6 Consultation with Property Owners and Developers

During the public consultation process for this area, little interest was exhibited by the public, with the exception of a single adjacent resident. The following table summarizes the resident's concerns and responses provided.

Table 7-3: Summary of Comments and Responses – Tomekn Road Site

Summary of Concerns Regarding BRT Project Modifications (Public Consultation: June 24 & 26, 2008)		
Concern Raised By:	**Comment**	**Response**
Resident	The resident was concerned about traffic impacts on Tomken Road, and the potential noise and visual impacts associated with the proposed modifications.	Representatives from the project team advised that on-street parking would be prohibited, and that a separate parking lot would be provided via expanding the existing parking lot at the hockey arena immediately north of the station site. In addition, the existing berm between Eastgate Parkway and the residential development to the south will increased to mitigate noise and visual impacts of the proposed modification to the busway profile.

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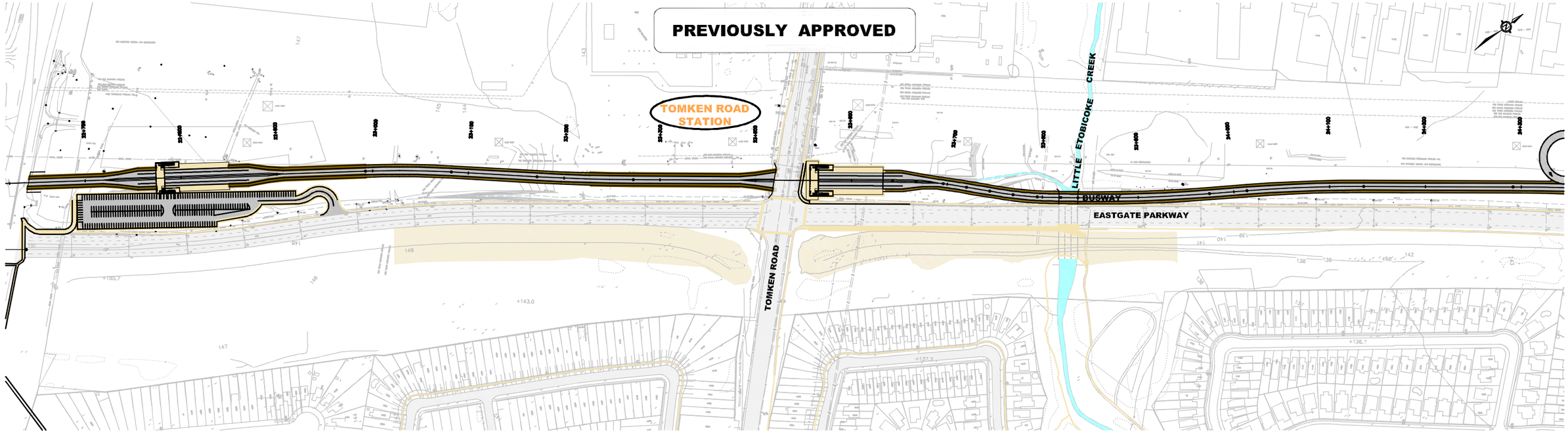


	McCormick Rankin Corporation	MISSISSAUGA Transportation and Works	DATE: September 2008	MISSISSAUGA BRT PROJECT ENVIRONMENTAL ASSESSMENT ADDENDUM	FIGURE 7-1
		Transit	SCALE: N.T.S.	BASE CASE BUSWAY ALIGNMENT - UNDER TOMKEN	

PROPOSED

TOMKEN ROAD STATION

TOMKEN ROAD

LITTLE ETOBICOKE CREEK

BUSWAY

EASTGATE PARKWAY

SECTION A-A

SECTION B-B

TOMKEN ROAD STATION

CAWTHRA ROAD STATION

	McCormick Rankin Corporation	MISSISSAUGA Transportation and Works	DATE: September 2008	MISSISSAUGA BRT PROJECT ENVIRONMENTAL ASSESSMENT ADDENDUM
		Transit	SCALE: N.T.S.	RECOMMENDED ALTERNATIVE BUSWAY ALIGNMENT - OVER TOMKEN

FIGURE 7-2

STUDY AREA

7-1 51.9 ha
7-2 2.78 ha
7-3 0.76 ha
7-4 2.25 ha
7-5 2.54 ha
8-1 1.59 ha
8-2 0.45 ha
8-3 1.45 ha
8-4 2.91 ha
8-5 0.18 ha
8-6 1.77 ha
8-7 1421 ha
8-8 0.87 ha
8-9 0.66 ha
8-10 0.44 ha
9-1 0.08 ha
9-2 0.44 ha
9-42 5.04 ha

LIMIT OF REGULATED AREA

REDIRECT EXISTING DITCH

PARKING LOT STORAGE

CAWTHRA ROAD STATION (PARKING LOT)

QUALITY CONTROL OF RUNOFF WILL BE PROVIDED BY OIL AND GRIT SEPARATOR. QUANTITY CONTROL WILL BE PROVIDED ON-SITE (PARKING LOT).

INSTALL NEW 900mm BOX CULVERT TO MAINTAIN DRAINAGE

INSTALL ADEQUATE NUMBER OF CBS AT SAG OF BRT TO CAPTURE 100-YEAR EVENT

STORM SEWER SIZED TO CONVEY 100-YEAR EVENT FROM SAG TO SWM FACILITY

UPGRADE EXISTING DITCH TO FBGS AND PROVIDE ADDITIONAL STORAGE IF REQUIRED

NEW SEWER REPLACES EXISTING DITCH AND DIRECTS EASTGATE PKWY FLOWS TO FBGS

CONNECT EXISTING TOMKEN STM TO PROPOSED STM

SWM-QUALITY AND QUANTITY FACILITY (OUTLET TO EXISTING WETLAND)

L. ETOB. WEST SWM

L. ETOB. EAST SWM

OUTLET 7

OUTLET 8

OUTLET 9

OUTLET SEWER TO EXISTING DITCH AND LITTLE ETOBICOKE CREEK

RELOCATE EXISTING EASTGATE DITCH TO NORTH OF BRT

SUPERPIPE IN BRT

INSTALL NEW LATERAL SEWERS FROM EXISTING CBs ON EASTGATE TO DITCH NORTH OF BRT

MAINTAIN EXISTING DITCH

SPREADER SWALE

900mm CIRCULAR CULVERT

LITTLE ETOBICOKE CREEK

TOMKEN ROAD

FEWSTER DRIVE

EASTGATE PARKWAY

FC13 FC14 FC15 DI OGS

EQNBK 22+478.94
EQNAHD 22+700

EQNBK 23+300
EQNAHD 23+400

EQNBK 24+300
EQNAHD 24+400

22+400 22+800 23+000 23+200 23+600 23+800 24+000 24+200

0+800

LEGEND

- CATCHMENT BOUNDARY
- FUTURE CULVERT*
- FC1 FUTURE CULVERT I.D.
- FUTURE DITCH
- FUTURE FLAT BOTTOM GRASSED SWALE
- FUTURE STM SEWER
- FUTURE TWIN STM SEWER
- OGS FUTURE OIL AND GRIT SEPARATOR
- DI / CB FUTURE DITCH INLET OR CATCHBASIN
- EXISTING CULVERT
- EXISTING STORM SEWER
- EXISTING DITCH/SWALE
- EXISTING FLOW DIRECTION
- 4-1 / 3.64 ha CATCHMENT ID / CATCHMENT AREA

* ALL PROPOSED CULVERTS 800mm DIAMETER UNLESS OTHERWISE SPECIFIED. PROPOSED CULVERT SIZE SUBJECT TO CHANGE DURING DETAILED DESIGN STUDY

McCORMICK RANKIN CORPORATION

MISSISSAUGA Transportation and Works

Transit

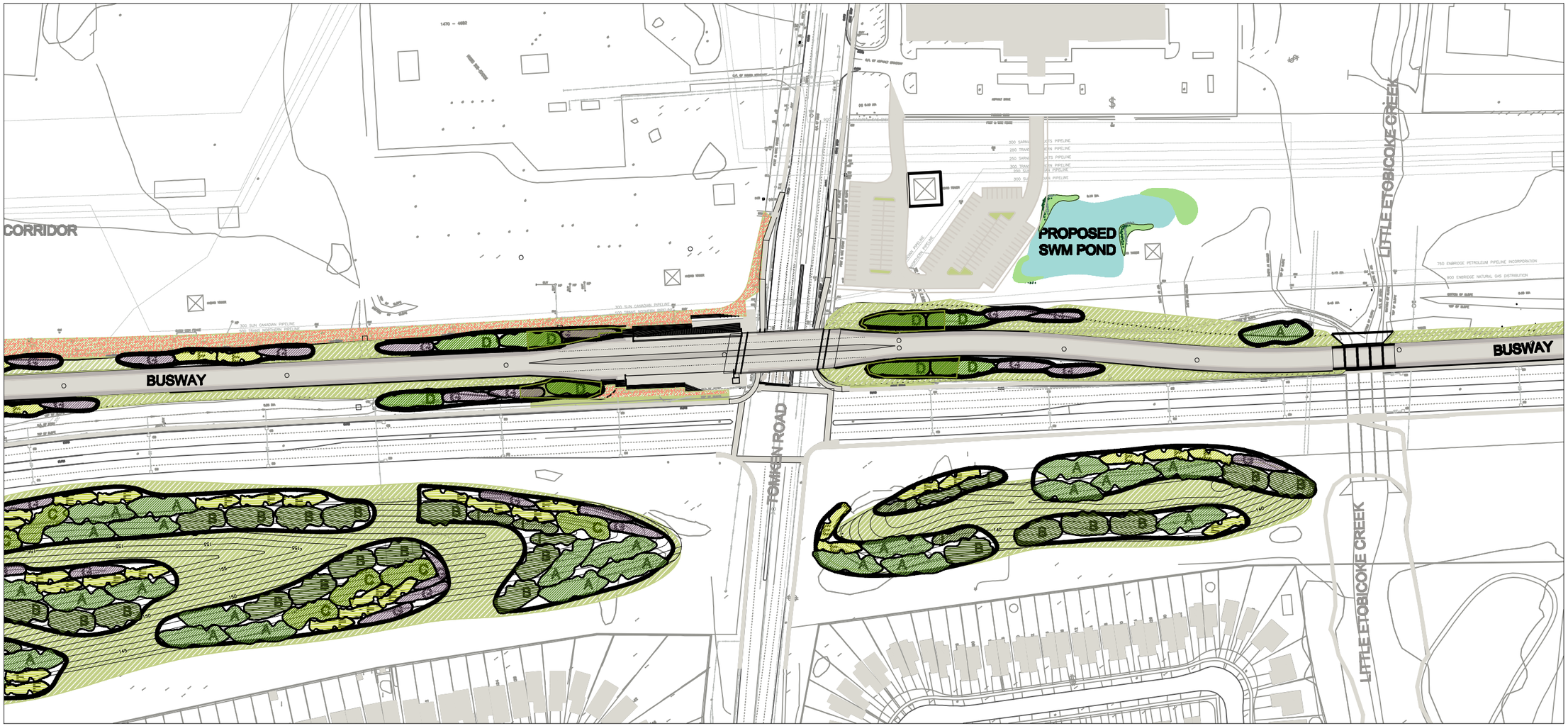
DATE: December 2008

SCALE: 1:4,000

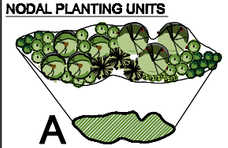
MISSISSAUGA BRT PROJECT
ENVIRONMENTAL ASSESSMENT ADDENDUM

TOMKEN ROAD / EASTGATE PARKWAY
FUTURE DRAINAGE AND STORMWATER MANAGEMENT

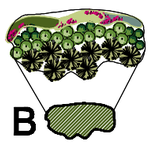
FIGURE 7-3



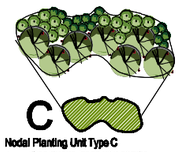
NODAL PLANTING UNITS



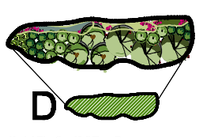
Nodal Planting Unit Type A
- Mixed deciduous and coniferous trees with shrubs
- Provides perforated visual screen to soften views to and from busway corridor
- Plant selection to be drought tolerant, salt resistant and to provide multi-seasonal aesthetic interest



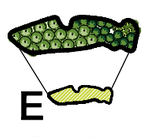
Nodal Planting Unit Type B
- Coniferous trees with shrubs and perennials
- Provides continuous visual buffer / screening
- Plant selection to be drought tolerant, salt resistant and to provide multi-seasonal aesthetic interest



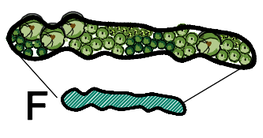
Nodal Planting Unit Type C
- Deciduous trees with shrubs
- Perforated visual buffer softens views to and from BRT
- Plant selection to be drought tolerant, salt resistant and to provide multi-seasonal aesthetic interest



Nodal Planting Unit Type D
- Deciduous trees with shrubs and perennials
- Plants to be drought tolerant, salt resistant and provide multi-seasonal aesthetic interest
- Locate at approach / departure of stations to create visual signal to passengers and pedestrians the proximity to a station

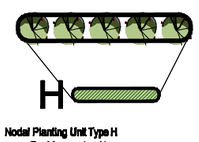


Nodal Planting Unit Type E
- Mixed shrub bed
- Provides continuous low level visual buffer / screening
- Plant selection to be drought tolerant, salt resistant and to provide multi-seasonal aesthetic interest



Nodal Planting Unit Type F
- Interception planting strip between top of slope (start of run-off) and other Planting Units
- Composed of tightly knitted suckering shrubs to stabilize slope and to take brunt of air-borne salt spray
- Species to include hardy dogwoods, willow, and sumac

Nodal Planting Unit Type G
- Mixed perennials, wildflowers, ornamental, and or native grasses
- To provide seasonal colour and interest
- Ensure species are drought tolerant and salt resistant



Nodal Planting Unit Type H
- Deciduous street trees
- Select species with multi-seasonal interest
- Where adjacent to overhead utilities, select small to medium sized species
- Plant selection to be drought tolerant and salt resistant

Nodal Planting Unit Type I
- Coniferous trees with shrubs
- Provides visual buffer / screening
- For areas where space is limited but a dense visual screen is required
- Plant selection to be drought tolerant, salt resistant and to provide multi-seasonal interest

LEGEND

Deciduous Trees · Coniferous Tree · Deciduous Shrubs · Perennials

GROUND COVER ZONES
- SOD
- LOW MOW MIX
- NO MOW MIX
- SLOPE MIX
- SWALE SEED MIX

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Date: MARCH 2009

Scale: 1:2000

MISSISSAUGA BRT PROJECT
ENVIRONMENTAL ASSESSMENT ADDENDUM

BRT EAST CORRIDOR LANDSCAPE PLAN

FIGURE
7-4

8. DIXIE STATION

8.1 Need & Justification / Rationale

8.1.1 Current BRT Plan

In the approved EA Addendum plan, the busway passes under Dixie Road, where a station is located. The Dixie station has bus access ramps on both the west and east sides of Dixie, connecting both directions of Dixie Road with the Busway via right-in / right-out moves. Buses can also stop on Dixie Road itself. A small parking area is shown (in concept) connected with the east side ramp.

The right-in / right-out configuration was used in the original plan due to the inability to insert a third signalized intersection for general traffic between the immediately adjacent Eastgate Parkway and South Gateway Road signalized intersections on Dixie Road.

8.1.2 Outstanding Issues

The approved configuration has limited operational flexibility for both buses and parkers. For buses, a City Centre – Dixie North route would pass through the busway station on its eastbound trip, but would not be able to use the station on the return move. The opposite would be the case for buses coming from the east on the busway and destined to Dixie northbound; they would miss the station on the westbound trip but not on the eastbound trip.

Buses coming from the north and terminating at the Dixie station could loop via the ramps and eastbound platform, although there is no place for a layover such as is normally needed for a route terminus. The same applies to buses looping from the south.

The bus ramps themselves would need to be lengthened and spread out from Dixie Road in order to have enough room to bring the busway up to grade and allow the ramp connections to pass over the existing pipelines.

The access to the parking lot would be right-in from the south and right-out to the north only. The inability to provide users with a return move would deter users and may result in motorists making unsafe U-turns on Dixie Road.

8.2 Alternatives

There are three improvements proposed at the Dixie station:

- Remove the west side bus ramp and create a full-move bus-only signalized intersection on Dixie Road for all connecting buses to use the east-side ramp;
- Locate a larger (200-space) parking lot on the west side of Dixie Road, with access from Encino Street off Fewster Drive (the lot could be extended westerly to the extent required by demand); and
- Provide a bus link to the parking lot access area, as well as a turnaround loop and layover area at the Encino Street connector.

The busway platforms would be shifted to the west side of Dixie Road, in order to be accessible from both Dixie Road buses and the parking area.

8.3 Evaluation / Analysis

The three modifications outlined in Section 8.2 would be low-cost, functional improvements that would substantially improve bus operations and Park and Ride access. The only concerns raised by agencies and the public relate to the traffic operational impact of the new bus intersection on Dixie Road and the potential impact of Park & Ride lot traffic on the Crestlawn / Dixie intersection operations.

Table 8-1: Analysis of Alternatives for the Dixie Station Park and Ride Lot Access

Analysis Factor	EA Addendum Plan – Parking Access from Dixie Road (Figure 8-1)	Current Proposal – Parking Access from Encino Street (Figure 8-2)
Traffic Operations	Right in – right out intersections on Dixie Road; no signal required. Minimal impact on Dixie Road operations. Out-of-way travel required by parking lot users (i.e. U-turns) in order to return to the direction from which they arrived.	Bus-only actuated signal north of Eastgate will be tied to adjacent signals to minimize disruption to Dixie Road operations. Park and Ride access / egress directed to Dixie Road / Crestlawn Drive intersection (supplemented by Eglinton Avenue / Burgoyne Street); an acceptable level of service can be maintained at that signal. Peak Hour trip generation is estimated to be 95 peak direction and 5 off-peak direction trips; the incremental traffic volume generated by the Dixie Station Park and Ride facility can be adequately accommodated by the existing road network capacity.
Transit Operations	Transitway loops required east and west of station to allow full operational flexibility. Access ramp intersections on Dixie Road conflict with requirement for bus stops.	All transit operations are accommodated on segregated facilities.
Parking Lot Access	Right-in / Right-out arrangement on Dixie does not provide adequate access to Park and Ride lot (users cannot return to the direction from which they arrived).	Parking lot access is indirect (via Fewster Drive and Encino Street) but can be signed. All access routes are two-way through signal-controlled intersections.

8.4 Conclusions / Recommendations

It is recommended that the three improvements outlined above (Section 8.2) be implemented at the Dixie station site. The recommended alternative is shown on Figure 8-2.

8.5 Environmental Effects and Commitments to Mitigation

The following section discusses environmental effects and commitments to mitigation only as they differ from those previously identified in the 1991 Environmental

Assessment and the 2005 Environmental Assessment Addendum for the Mississauga Transitway.

8.5.1 Physical Environment

8.5.1.1 Roads

Operations

The following is a summary of the analysis and anticipated operational impacts associated with the proposed park and ride lot and access configuration proposed:

- Planned capacity of Park and Ride lot is 200 parking spaces with access from Dixie Road via Crestlawn Road and Fewster Drive.
- Peak Hour trip generation is estimated to be 95 peak direction and 5 off-peak direction trips, based on observations at a similar transit Park and Ride lot at the Mississauga City Centre.
- The assumed distribution of Park and Ride trips reflects a) the proximity of residential land use to the south, b) the proximity of the planned Park and Ride lot at Cawthra Road and c) any traffic approaching from the east is likely to be coming only from Fieldgate Drive. The following distribution is expected:
    - Dixie Road to/from the north 10%
    - Dixie Road to/from the south 55%
    - Eastgate Parkway to/from the west to Tomken Road 15%
    - Eastgate Parkway to/from the east to Fieldgate Drive 20%
- Park and Ride traffic generation results in a relative increase in peak hour peak direction travel demand of less than 5% on Dixie Boulevard. The corresponding relative increase in the combined direction travel demand is approximately 3%.
- It is expected that the incremental traffic volume generated by the Dixie Station Park and Ride facility can be adequately accommodated by the existing road network capacity.

Signal timing modifications may be required at the Dixie / Eastgate intersection, to create an “all red” period (including a “no right on red for westbound Eastgate traffic) that would clear northbound Dixie Road in sync with a southbound bus left turn into the busway access ramp, or to allow a bus to turn left out of the access ramp.

The construction of the relocated Dixie Station Park and Ride Lot and associated parking/BRT access roadways will have a localized disruptive effect on roadway traffic. These effects will be mitigated through conventional traffic management programs that maintain a level of traffic capacity and safety acceptable to the Regional Municipality of Peel and the City of Mississauga. The motoring public will be advised of planned activities that may result in traffic disruption in advance (both temporally and physically). These mitigation measures will reduce impacts to a level acceptable to authorities and the public.

Corridor roads will be used by construction equipment, temporary construction access points will be implemented, and a substantial amount of truck traffic will be associated with the disposal of excess fill. Most construction will, however, take place within the BRT right-of-way and will not impinge on or affect traffic operations on the adjacent or nearby roads.

The detailed traffic analysis for the Dixie Road corridor is included as Appendix E.

Significance

The construction of the busway structures will have a localized disruptive effect on roadway traffic. With the implementation of the above noted mitigation measures potential for adverse effects can be minimized and no significant residual effects should occur.

8.5.1.2 Utilities Within / Crossing Corridor

Pipelines

The busway does not cross any buried pipelines in the Dixie Road / Eastgate Parkway area.

Dixie Road

The N-S Region of Peel water main along Dixie Road (250 mm) will need to be realigned (vertically and/or horizontally) to avoid the busway.

There are no effects on Hydro One facilities at this location. Bell telephone lines should remain as is, although individual poles may need to be shifted in some station areas. No significant effects are expected to the electrical services and control boxes provided at the signalized intersection.

For discussion related to *Construction Effects, Operation and Maintenance Effects* and *Significance* of utility impacts, please refer to Section 5.5.1.2.

8.5.2 Natural Environment

8.5.2.1 Watercourse Crossings

The busway does not cross any watercourses at the Dixie Road / Eastgate Parkway vicinity.

8.5.2.2 Vegetation, Wetlands, and Wildlife

The BRT facilities in this area will result in the permanent removal of cultural meadow and associated habitat. However, the effect is limited given the common, tolerant nature of this vegetation community, habitat type and associated wildlife compliment.

Shallow Marsh (MAS2-1b) is located east of Dixie Road, north of Eastgate Parkway. Also, several very small wetland pockets (each <0.1 ha) dominated by Narrow-leaved Cattail are situated under the hydroelectric corridor and between two pipelines on the east side of Dixie Road. The two wetland pockets east of Dixie Road are removed by the BRT alignment. Edge effects may result along two of the other small pockets of wetland vegetation depending on final grading limits, developed at Detail Design.

These effects are not significantly different from those incurred under the previously approved alignment.

8.5.2.3 Species of Conservation Concern and Species at Risk

The proposed changes to the approved plan / profile will not have any effect on species of concern / risk.

8.5.2.4 Stormwater Management

Section 5.5.2.4 discusses the *Potential Construction Effects, Hydraulic Criteria,* and *Stormwater Management Criteria* for the entire Mississauga Bus Rapid Transit Project. There is no significant difference between the approved and proposed alternatives at Dixie Road in terms of stormwater management requirements or impacts.

8.5.2.5 Groundwater

The proposed changes in the Dixie Road area will have no effect on the groundwater issues associated with the approved alignment.

8.5.3 Socio-Cultural Environment

8.5.3.1 Archaeology

For potential impacts and proposed approaches to mitigate impacts, please refer to Section 5.5.3.1.

8.5.3.2 Heritage

Compared to the approved plan, no additional adverse environmental effects to heritage resources are anticipated during this phase of the project.

8.5.3.3 Noise

There are no noise sensitive areas significantly affected by the proposed modification at the Dixie Station site.

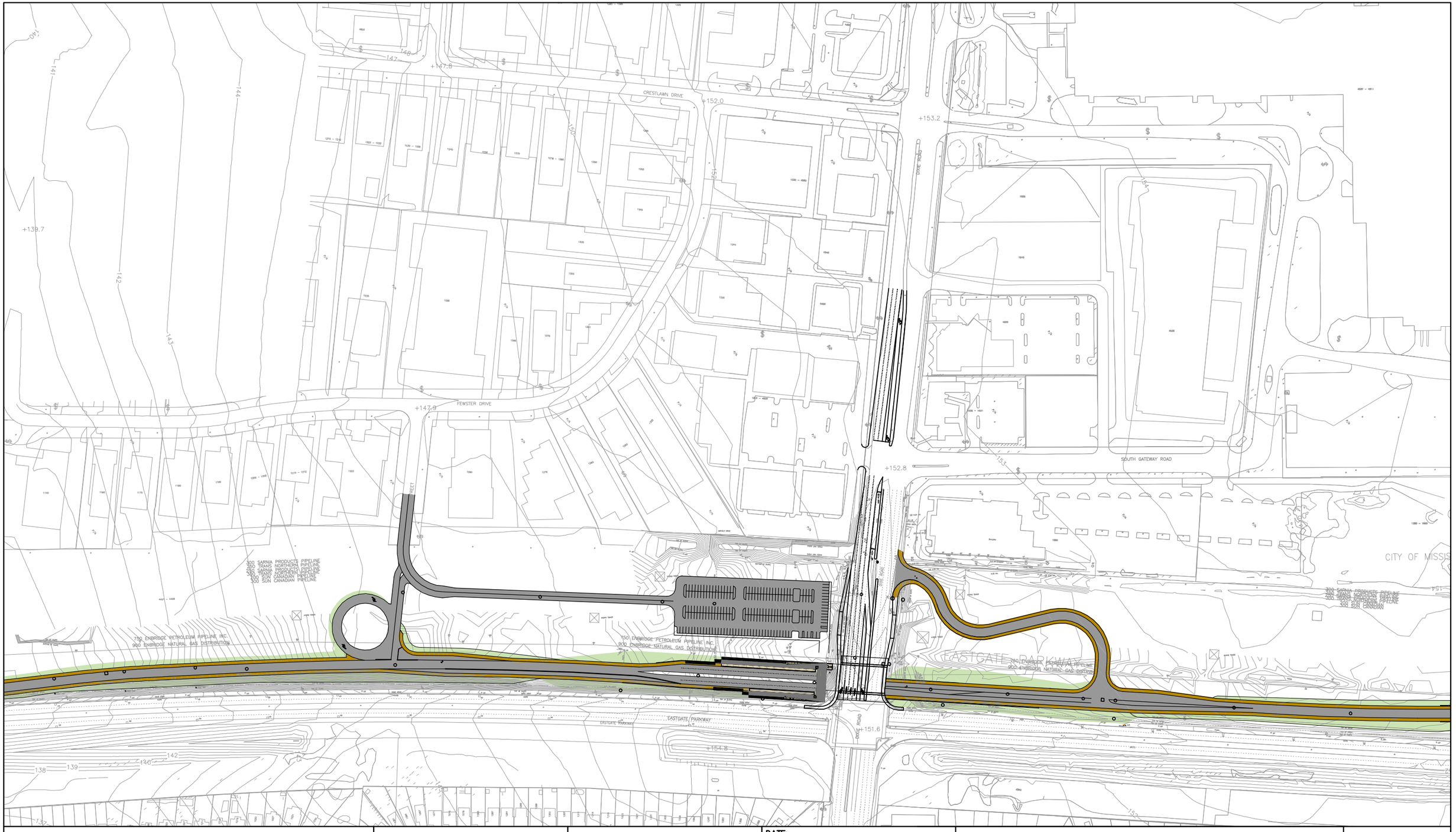
8.6 Consultation with Property Owners and Developers

While little interest was exhibited at the public information centres regarding the modifications to the Dixie Park and Ride lot, an owner of property in the area raised some concerns, as summarized below.

Table 8-2: Summary of Comments and Responses – Dixie Site

Comment	Response
Traffic "Fewster Drive is a narrow and winding road...[it] is already difficult enough to manoeuvre without the increased traffic a park-and-ride lot would bring. Furthermore, the intersection of Dixie Road and Crestlawn Drive, as well as Crestlawn Drive and Fewster Drive, would be subject to bottlenecks, with the increased traffic as is proposed."	Fewster Drive is 8 m wide, which provides adequate room for two travelled lanes (normally 3.75 m wide). On-street parking is prohibited. Park and Ride lot activity would generate up to 100 veh/h, or an average of one vehicle per 36 seconds. Traffic analysis shows that the added demand can be accommodated at the Dixie / Crestlawn intersection, with the provision of a protected signal phase for the northbound left turn (currently not protected).
"What is the impact on current road traffic, particularly peak times – Eglinton/Dixie and Dundas?"	90% of the traffic destined to the Park and Ride lot is expected to access the area from the south (i.e. the Eastgate/Dixie intersection), therefore impacts to the Dixie and Dundas intersection are expected to be minimal. The traffic analysis indicates that the projected impacts on the Dixie/Eastgate intersection related to the incremental demand generated by the Dixie BRT Station and the proposed access can be accommodated with only marginal changes in the level of service with further opportunities for operational improvements through the introduction of protected left-turn phases.
Concerns re: ongoing traffic impacts associated with the lot, and potential conflicts with transport trucks.	Further intersection improvements will be assessed at the detailed design phase of the study.
Parking Concerns re: potential parking spillover from the Park and Ride lot onto Fewster Drive and into adjacent developments.	The Park and Ride lot is initially to be constructed with a 200-vehicle capacity. Should demand warrant it, the lot can be expanded into the hydro corridor lands to the west.
Pedestrians Concerns re: pedestrian safety due to lack of sidewalks on Fewster and Encino.	The City is committed, as part of its capital sidewalk construction program, to include construction of sidewalks along Fewster Drive and Encino Drive once warranted.
Suggestion – construct the Park and Ride lot on the east side of Dixie Road.	The presence of buried pipelines, hydro towers, and the need for exclusive bus access collectively preclude the viability of constructing a reasonably sized Park and Ride lot on the east side of Dixie Road. There is no public access to the east side of the corridor as there is via Encino Street to the west side.
Provide access to the Park and Ride Lot from Eastgate Parkway	Such an access was considered but is not recommended as it requires cars to cross the busway, triggering the need for a grade separation and subsequently lowering the busway, bringing about a substantial increase in cost due to grading, retaining walls, pipeline protection, and additional structure.

	MRC McCORMICK RANKIN CORPORATION	MISSISSAUGA Transportation and Works Transit	DATE: February 2009 SCALE: 1:3,000	MISSISSAUGA BRT PROJECT ENVIRONMENTAL ASSESSMENT ADDENDUM DIXIE ROAD / EASTGATE PARKWAY BASE CASE (EA ADDENDUM) PLAN - DIXIE STATION	FIGURE 8-1



	MRC McCORMICK RANKIN CORPORATION	MISSISSAUGA Transportation and Works Transit	DATE: February 2009 SCALE: 1:3,000	MISSISSAUGA BRT PROJECT ENVIRONMENTAL ASSESSMENT ADDENDUM DIXIE ROAD / EASTGATE PARKWAY RECOMMENDED ALTERNATIVE - DIXIE STATION	FIGURE 8-2

LEGEND

- CATCHMENT BOUNDARY
- FUTURE CULVERT*
- FC1 — FUTURE CULVERT I.D.
- FUTURE DITCH
- FUTURE FLAT BOTTOM GRASSED SWALE
- FUTURE STM SEWER
- FUTURE TWIN STM SEWER
- OGS — FUTURE OIL AND GRIT SEPARATOR
- DI / CB — FUTURE DITCH INLET OR CATCHBASIN
- EXISTING CULVERT
- EXISTING STORM SEWER
- EXISTING DITCH/SWALE
- EXISTING FLOW DIRECTION
- 4-1 / 3.64 ha — CATCHMENT ID / CATCHMENT AREA

STUDY AREA

CRESTLAWN DRIVE

FEWSTER DRIVE

SOUTH GATEWAY ROAD

EASTGATE PARKWAY

DIXIE ROAD

LITTLE ETOBICOKE CREEK

LIMIT OF REGULATED AREA

10-1 / 65.89 ha

9-7 / 1.15 ha

9-42 / 5.04 ha

9-41 / 6.16 ha

900mm CIRCULAR CULVERT

DIVERSION DITCH

SPREADER SWALE

FC16

FC15

L ETOB. EAST SWM

EQNBK 24+300
EQNHD 24+400

24+000

24+200

24+600

24+800

9-5 / 3.10 ha

9-6 / 0.87 ha

23+800

OGS

OUTLET 9

OUTLET 8

OUTLET SEWER TO EXISTING DITCH AND LITTLE ETOBICOKE CREEK

RELOCATE EXISTING EASTGATE DITCH TO NORTH OF BRT

SUPERPIPE IN BRT

INSTALL NEW LATERAL SEWERS FROM EXISTING CBs ON EASTGATE TO DITCH NORTH OF BRT

MAINTAIN EXISTING DITCH

STORM SEWER SIZED TO CONVEY 100-YEAR EVENT FROM SAG TO SWM FACILITY

INSTALL ADEQUATE NUMBER OF CBs AT BRT SAG TO CAPTURE 100-YEAR EVENT

9-1 / 0.08 ha

9-2 / 0.44 ha

9-3 / 5.50 ha

RELOCATE EXISTING DIXIE/EASTGATE STORM SEWER THROUGH BRT ACCESS AREA

CONNECT NEW DI TO NEW SEWER

NEW DIXIE/EASTGATE STORM SEWER

DI

10-4 / 0.68 ha

25+000

25+200

EXISTING 1800mmØ STM

CONNECT BRT STORM SEWER TO EXISTING 1800mmØ STM ON EASTGATE

EQNBK 25+300
EQNHD 25+400

10-3 / 3.32 ha

CITY OF MISSISSAUGA

GRADE BOU… EASTGATE … SUCH THAT … FROM EAST … DIRECTED …

EX… 210… STM…

* ALL PROPOSED CULVERTS 800mm DIAMETER UNLESS OTHERWISE SPECIFIED. PROPOSED CULVERT SIZE SUBJECT TO CHANGE DURING DETAILED DESIGN STUDY

McCORMICK RANKIN CORPORATION

MISSISSAUGA Transportation and Works

Transit

DATE: December 2008

SCALE: 1:4,000

MISSISSAUGA BRT PROJECT
ENVIRONMENTAL ASSESSMENT ADDENDUM

DIXIE ROAD / EASTGATE PARKWAY
FUTURE DRAINAGE AND STORMWATER MANAGEMENT

FIGURE 8-3

9. EASTGATE PARKWAY / FIELDGATE DRIVE

9.1 Need & Justification / Rationale

9.1.1 Current BRT Plan

The EA approved plan has the busway passing under Eastgate Parkway and then turning through a 130 m radius horizontal curve to pass under Fieldgate Drive, as illustrated in Figure 9-1. This would require relocation / lowering of eight pipelines:

- two 250mm Imperial (oil)
- one 250mm and one 500mm TransNorthern (oil)
- one 200mm and one 300mm Sun Canadian (oil)
- one 750mm Interprovincial (oil)
- one 900mm Enbridge (gas)

The EA plan also involves the relocation of a Hydro One transmission line tower. The large (3 m) storm sewer crossing just south of the alignment may be unavoidable, and the busway would intercept a 2100 mm storm sewer at the crossing point; that sewer would require relocation. The busway would also intercept a 1200 mm storm sewer and a 400 mm sanitary sewer to the east of Eastgate Parkway, requiring their realignment.

9.1.2 Outstanding Issues

The primary issue in this segment is one of cost. The proposed alignment intercepts and requires relocation of numerous buried and aerial utilities. The cost of pipeline relocation has soared since this alternative was developed in the early 1990s.

- The estimated cost for lowering all the eight affected pipelines as cited in the 1992 EA report was $1,815,050. This involved lowering in place (noting that Eastgate Parkway was not yet constructed at that point) and re-use of existing pipe, not relocation and use of new pipe.
- Based on discussions with pipeline owners in the BRT West segment, each of the eight pipelines could now be expected to cost in the order of $0.5 M - $3 M to shift:
  - two 250mm Imperial (oil): $3M
  - one 250mm and one 500mm TransNorthern (oil): $4M - $5M
  - one 200mm and one 300mm Sun Canadian (oil): $2M - $3M
  - one 750mm Interprovincial (oil): $2M - $4M
  - one 900mm Enbridge (gas): $3M
- Pipeline relocation alone in this brief segment of busway could cost in the order of $15 M, or $13 M above the earlier estimate upon which the recommended alignment was based.

Practical issues of construction sequencing and coordination would be significant, since only one pipe could be relocated at a time. Lowering in situ would also have a potentially significant impact on Eastgate Parkway (traffic disruption).

The north-south storm and sanitary sewers would need to be relocated or lowered prior to any lowering of an east-west pipeline

The original EA did not assign any cost to the relocation of the affected hydro tower; current estimate (per BRT West) is in the order of $500,000.

The original EA did not include a drainage plan or associated costs; the current version of the plan shows that the sump created at the crossing would be too low to drain to the storm sewer system and would need either a pumping station ($2.5 - $3M) or an equivalently costly new low-level outlet sewer to Etobicoke Creek

The 130 m horizontal curve is the lowest-radius curve in the entire busway, restricting bus speeds in what would otherwise be a high-speed segment between the Dixie and Tahoe stations.

The busway, in crossing under Eastgate Parkway, will intercept a major 3 m diameter storm sewer that carries stormwater in the Eastgate corridor to Etobicoke Creek. The storm sewer would have to be relocated and reconstructed. The busway also intercepts a 1200 mm storm sewer and 900 mm sanitary sewer on the east side of Eastgate Parkway and a 2100 mm storm sewer to the west. These are costs that were not identified in the original estimate.

The excavation for the busway will involve rock and substantial retaining walls, both of which have risen substantially in unit cost since the busway estimates were last updated. The unit costs used for structures in 1992 were $1,350/m^2 for bridges and 650/m^2 for walls. Those figures are now $4,500 and $2,000. The excavation will generate a substantial amount of excavated material, for which no suitable depository has been identified.

Due to the skew of the crossing, the detour of Eastgate Parkway during the busway construction period would be difficult, leading to the use of potentially more costly three phase construction balanced against the incremental cost of a larger detour.

9.2 Alternatives

There are three alternatives at this site:

- Lower the busway so as to cross under the pipelines (requiring their suspension in a bridge structure across the busway cut)
- Shift the undercrossing of Eastgate Parkway westerly to allow the busway to rise over the pipelines then down under Fieldgate; or
- Elevate the busway over Eastgate Parkway, returning to grade at the pipelines and dropping under Fieldgate (see Figure 9-2).

The latter two options would increase the busway's horizontal radius to 150 m at Fieldgate. The first two options avoid the pipelines but still impact the 3 m storm sewer and the north-south utilities; the elevated option avoids all utility impact, and can use a girder structure to minimize the need to detour Eastgate Parkway during construction of the crossing.

9.3 Evaluation / Analysis

The following table summarizes the comparative features of the alternatives.

Table 9-1: Analysis of Alternatives for Eastgate Parkway / Fieldgate Drive

Analysis Factor	Base Case (EA Alignment)	Deep Cut Option	Under Eastgate / Over Pipelines	Over Eastgate / Over Pipelines
Cost	Pipelines $15M Utilities $4.8 Pump Stn $2.5M Structure $2M Walls $3.5M Detour $1.5M Fill / Ex $1.2M *Total $30.5M*	Pipelines $1M Utilities $4.8 Pump Stn $2.5M Structure $2M Walls $4.5M Detour $1.5M Fill / Ex $2.0M *Total $18.3M*	Pipelines $0 Utilities $2.5 Pump Stn $2.5M Structure $2M Walls $2.5M Detour $1.5M Fill / Ex $1.2M *Total $12.2M*	Pipelines $0 Utilities $0.5 Pump Stn $0 Structure $1.5M Walls $0.8M Detour $0.2M Fill / Ex $0.8M *Total $3.8M*
Utilities	Intercepts every utility in the area	Avoids pipelines, but intercepts all other utilities.	Avoids pipelines and hydro tower, but intercepts all other utilities.	Avoids all major utilities
Drainage	Pumping station required	Pumping station required	Pumping station required	Gravity drainage to ditches
Construction Disruption	Major multi-stage detour of Eastgate	Major multi-stage detour of Eastgate	Major multi-stage detour of Eastgate	No detour; short-term closure of Eastgate to place bridge girders.
Environmental Assessment	Approved	Falls under original approval	Minimal impact; no Addendum needed	Profile and alignment change requires Addendum
Busway Geometry	130 m radius	130 m radius	150 m radius; opportunity for emergency access from Fieldgate	150 m radius; opportunity for emergency access from Fieldgate
Community Impact - Visual	None	None	Buses visible when crossing pipelines; can mitigate via extended berm	Buses visible from first row of houses; can mitigate by combination of berm expansion and landscaping
Community Impact - Noise	Daytime noise level (Leq) in dBA for three nearby sites (Re8, 9, 10): *Existing* 55.7/53.9/54.4 *Future without BRT* 56.8/55.1/55.4 *Future with BRT* *57.7/51.5/55.9* *Impact* *+2.6/-3.9/+1.1* Eastgate Parkway noise remains dominant noise source in corridor; busway has insignificant impact.	Deeper busway profile would have slightly lower noise impact than base case.	Profile would yield a slightly lower noise impact than base case for Re9 and Re10; similar to "over" option for Re8	Daytime noise level (Leq) in dBA for three nearby sites (Re8, 9, 10): *Existing* 55.7/53.9/54.4 *Future without BRT* 56.8/55.1/55.4 *Future with BRT* 52.2/56.7/56.5 *Impact* -4.6/+1.6/+1.1 Eastgate Parkway noise remains dominant noise source in corridor; revised busway grade has insignificant impact.

Building the busway on its approved alignment would be a costly and difficult proposal, even if it were to be lowered enough to pass under the eight east-west pipelines present. The deep walls, rock excavation, hydro tower relocation, complete disruption of the storm and sanitary sewer system, the need for a pumping station, disposal of excavated material, and the impacts on Eastgate Parkway during construction are all issues that remain and in most cases are worse than with the original profile.

Shifting the busway crossing to the west would allow many of these issues to be resolved, although issues regarding the major storm sewer, pumping station, retaining walls, rock excavation, and construction impact would remain, all requiring costly solutions.

Taking the busway over Eastgate Parkway avoids almost all the issues present with an underpass, and would be the simplest, least costly, least disruptive, and most beneficial of the alternatives, as long as the residential community to the south can be satisfied that noise and visual intrusion will not be felt. There is adequate room south of Eastgate Parkway to expand, extend, and heighten the existing berm (and/or top it with a wall) to respond to these concerns.

9.4 Conclusions / Recommendations

The proposed alternative is to take the busway over Eastgate Parkway, over the pipelines, and under Fieldgate Drive. Particular attention is required to mitigating the effects of the new facility on the existing residential area to the south, by improving the existing berm and installing visual screening. The recommended alternative is shown on Figure 9-2.

9.5 Environmental Effects and Commitments to Mitigation

The following section discusses environmental effects and commitments to mitigation only as they differ from those previously identified in the 1991 Environmental Assessment and the 2005 Environmental Assessment Addendum for the Mississauga Transitway.

9.5.1 Physical Environment

9.5.1.1 Roads

The construction of the structure's median pier and abutments near the road will have a localized disruptive effect on roadway traffic. Construction in the median, in particular, may require temporary closure of one lane on Eastgate Parkway. Localized widening will be used to maintain two lanes of traffic in each direction at all times. This will be supplemented through conventional traffic management programs that incorporate advisory detours, advance signs, and special lane markings as appropriate. The motoring public will be advised of planned activities that may result in traffic disruption in advance (both temporally and physically). Bicycle and pedestrian access along Eastgate Parkway (where pre-existing) will be maintained at all times.

The adjacent or affected traffic signals will be re-timed as appropriate to accommodate the modified traffic patterns during the construction period. The duration of each disruption or lane closure will vary, but at most will occur over a single construction season (April – November). Capacity reduction will not be scheduled simultaneously on parallel adjacent roads.

A program of traffic management that maintains capacity and safety will be developed in the Detail Design process.

In addition to the disruption associated with the above noted structure construction, corridor roads will be used by construction equipment, temporary construction access points will be implemented, and a substantial amount of truck traffic will be associated with the movement of excavated earth.

Most construction will, however, take place within the BRT right-of-way and will not impinge on or affect traffic operations on the adjacent or nearby roads.

Operation and Maintenance Effects

Once the BRT facility is in operation, there should be no special ongoing operational or maintenance effects on the road system or general traffic operations. The new structure will be added to the inventory of road structures in Mississauga and will follow conventional inspection, maintenance and rehabilitation schedules.

Significance

The construction of the busway structure will have a localized disruptive effect on roadway traffic. With the implementation of the above noted mitigation measures potential for adverse effects can be minimized and no significant residual effects should occur.

9.5.1.2 Utilities Within / Crossing Corridor

Pipelines

West of Fieldgate Drive, the busway crosses the following buried pipelines (8 in total):

- Enbridge Gas
- Enbridge Oil
- Sarnia Products
- Sun Canadian; and
- Trans-Northern

In all cases, the busway is at or above grade, and there is no pipeline relocation required. The design of the crossing requires pipeline owner agreement, but no NEB permits.

Avoiding the need to shift or otherwise affect pipelines is a key station design parameter, as is maintaining the ability for the pipeline owner to access, inspect, and maintain the pipeline without disrupting busway operations to an unacceptable degree. Ongoing liaison with the pipeline owners through the Detail Design stage will be required to satisfy their needs.

Eastgate Parkway / Fieldgate Drive

There are no effects on Hydro One facilities at this location.

For discussion related to *Construction Effects, Operation and Maintenance Effects* and *Significance* of utility impacts, please refer to Section 5.5.1.2.

9.5.2 Natural Environment

9.5.2.1 Watercourse Crossings

The busway does not cross any significant watercourses in the vicinity of the Eastgate Parkway crossing.

9.5.2.2 Vegetation, Wetlands, and Wildlife

The BRT facilities in this area will result in the permanent removal of cultural meadow and associated habitat. However, the effect is limited given the common, tolerant nature of this vegetation community, habitat type and associated wildlife compliment.

Two very small (each <0.1 ha) wetland pockets are located south of Eastgate Parkway at the proposed busway crossing. Both of the features are wet or seasonally wet depressions on the south side of an existing earthen berm. Both wetland pockets will be removed with the expansion of the earthen berm. The expansion of the earthen berm is being undertaken to mitigate social / cultural effects of the BRT alignment and provide additional screening to adjacent residences. The effect of removal of these wetland pockets is considered negligible.

These effects are not significantly different from those incurred under the previously approved alignment.

9.5.2.3 Species of Conservation Concern and Species at Risk

The proposed changes to the approved plan / profile will not have any effect on species of concern / risk.

9.5.2.4 Stormwater Management

Section 5.5.2.4 discusses the *Potential Construction Effects, Hydraulic Criteria,* and *Stormwater Management Criteria* for the entire Mississauga Bus Rapid Transit Project.

The only outlet identified under existing conditions for the Eastgate Parkway / Fieldgate Drive study area is Outlet 10 – Eastgate Trunk Sewer.

The outlet will be utilized under proposed drainage conditions and the existing drainage regime will not be greatly altered under proposed conditions. Existing peak flow rates to the outlet will not be exceeded under proposed conditions. However, further capacity evaluation will be undertaken for appropriate measures, if necessary, during the detail design stage in light of altered site geomorphology.

9.5.2.5 Groundwater

The proposed change in busway profile will have the effect of reducing or eliminating the groundwater issues associated with the previously approved alignment.

9.5.3 Socio-Cultural Environment

9.5.3.1 Archaeology

For potential impacts and proposed approaches to mitigate impacts, please refer to Section 5.5.3.1.

9.5.3.2 Heritage

Compared to the approved plan, no additional adverse environmental effects to heritage resources are anticipated during this phase of the project.

9.5.3.3 Noise

Methodology

Points of reception are considered any point on the premises of a person where sounds originating from other than the premises are received. For the purposes of this study, three representative locations were selected to represent all the closest points of reception to the BRT system which may potentially be affected by noise. The receptor heights were considered as typical first and second storey levels in dwelling units when calculating the BRT system lane and stations sound levels, respectively. The following gives a brief description of the selected receptors:

- Re8: house at #1713 Chalkdene Grove
- Re9: house at #1685 Copseholm Trail
- Re10: house at #4394 Poltava Circle

For the Eastgate Parkway crossing area, the potential noise impact was assessed at the 2nd storey windows on the most exposed building façades of the residential dwellings and is based on comparing the future (worst case scenario) BRT station noise levels with the higher of the existing highway/roadway ambient noise level or the minimum exclusionary sound level limits set by the MOE for urban Class 1 areas similar to the one under consideration.

Results

The data included in Table 9-2 shows that the maximum calculated excess future sound level over the ambient is 1.6 dBA, i.e. acoustically insignificant and is within the maximum 5 dBA excess criterion.

Table 9-2: Noise Analysis – Eastgate Parkway

Recep-tor	Street	Existing Sound Levels (dBA)	Future Sound Levels - No BRT (dBA)	Future Sound Levels with BRT – approved grade per EA (dBA)	Future Sound Levels with BRT – proposed grade per EA Addendum (dBA)
Re8	1713 Chalkdene Grove	55.7	56.8	53.4 (-3.4)	52.2 (-4.6)
Re9	1685 Copse-holm Trail	53.9	55.1	55.7 (+0.6)	56.7 (+1.6)
Re10	1507 Bough Beeches Blvd	54.4	55.4	56.2 (+0.8)	56.5 (+1.1)

Impact Assessment Rating : < 3 dB change : Insignificant
>3 to < 5 dB change : Noticeable
> 5 to < 10 dB change: Significant
> 10 dB change : Very Significant

Criteria for mitigation: >5 dB change

In accordance with the applicable sound level criteria, no noise mitigation is warranted since the noise impact due to bus movements along the modification to the busway profile at the Eastgate Parkway crossing site is predicted to be less than 5 dBA. The modification of the busway profile, in combination with the expanded berms on the south side of Eastgate Parkway, does not result in a significant noise impact to adjacent residential properties, nor does it significantly differ from the noise levels associated with the previously approved plan and profile. The berm modification will actually improve conditions for properties on Bough Beeches Boulevard. The project does not, however, result in an future noise levels being reduced to below the MOE/Region/City day-time Leq 55 dBA objective.

9.6 Consultation with Property Owners and Developers

The proposed modification to the EA-approved plan at the Eastgate Parkway crossing drew the most concern from the public. In particular, the residents of Copseholm Trail (immediately south of Eastgate Parkway, west of Fieldgate Drive) expressed considerable concern over the perceived visual and noise impacts of the proposed modification.

Members of the BRT Project Office attended an informal community meeting on June 25th, 2008 to present the rationale for the proposed changes to the EA-approved plan, and to discuss the residents' concerns and suggested improvements to the proposed alignment to mitigate the impacts.

The following table summarizes the main comments received. A copy of all comments and responses is provided in Appendix B.

Table 9-3: Comments and Responses from Consultation Process

Comment	Response
Visual Concerns Many residents expressed concerns that the proposed modification brings the busway closer to their homes/backyards than the alignment indicated in the original EA or the 2004 EA Addendum.	The potential to realign the busway (horizontally and vertically) was investigated following the public meetings to maintain the greatest possible separation between the homes and the busway while adhering to minimum design parameters and avoiding impacts to buried and aerial utilities. The review resulted in a slight realignment of the overpass away from the residential development, and a lowering of the structure by approximately 2m at the expense of a longer structure.
Suggestion Realign the busway to the north "into the light industrial area and away from the residences". "Move the proposed raised bridge overpass more to the north and reduce the radius of the loop for the busway to align closer to and in parallel to Eastgate."	
Noise-related Concerns Many residents expressed concerns that the proposed modification to the busway alignment would bring about additional noise in the vicinity of the residential development.	A preliminary noise investigation indicated that, while the busway may bring about a minor increase in noise, traffic on Eastgate Parkway will remain the dominant noise source in the area, and the incremental increase attributed to the busway does not warrant additional noise protection. The proposed realignment of the busway (discussed above) and increase in berming will likely have a positive effect on the noise impacts attributed to both the busway and Eastgate Parkway.
Suggestion Increase the height and width of the berm and add pleasant landscaping.	The current plan is to increase both the height and the width of the berm between the busway and the residential development. The Project Team is developing a landscaping plan for the proposed berm that would mitigate some of the visual impacts of the increased berm. The BRT Project Office will review the landscaping plan for the proposed berm increase with the Copseholm Trail community for input prior to finalizing the plan.
Suggestion Designate a lane on Eastgate Parkway for BRT rather than construct a separate guideway.	Operating buses on Eastgate Parkway would not achieve the travel time savings desired to provide an attractive and efficient rapid transit service.
Suggestion "The best solution is that the BRT go under Eastgate Parkwaay at a convenience point and continue to go underground to Fieldgate and Tahoe."	The impacts to the buried pipelines (i.e. relocation of 8 major oil and gas pipelines and 3m diameter storm sewer) at Eastgate Parkway / Fieldgate Drive under the EA-approved alignmetn would result in significant and unjustified cost and construction schedule implications.

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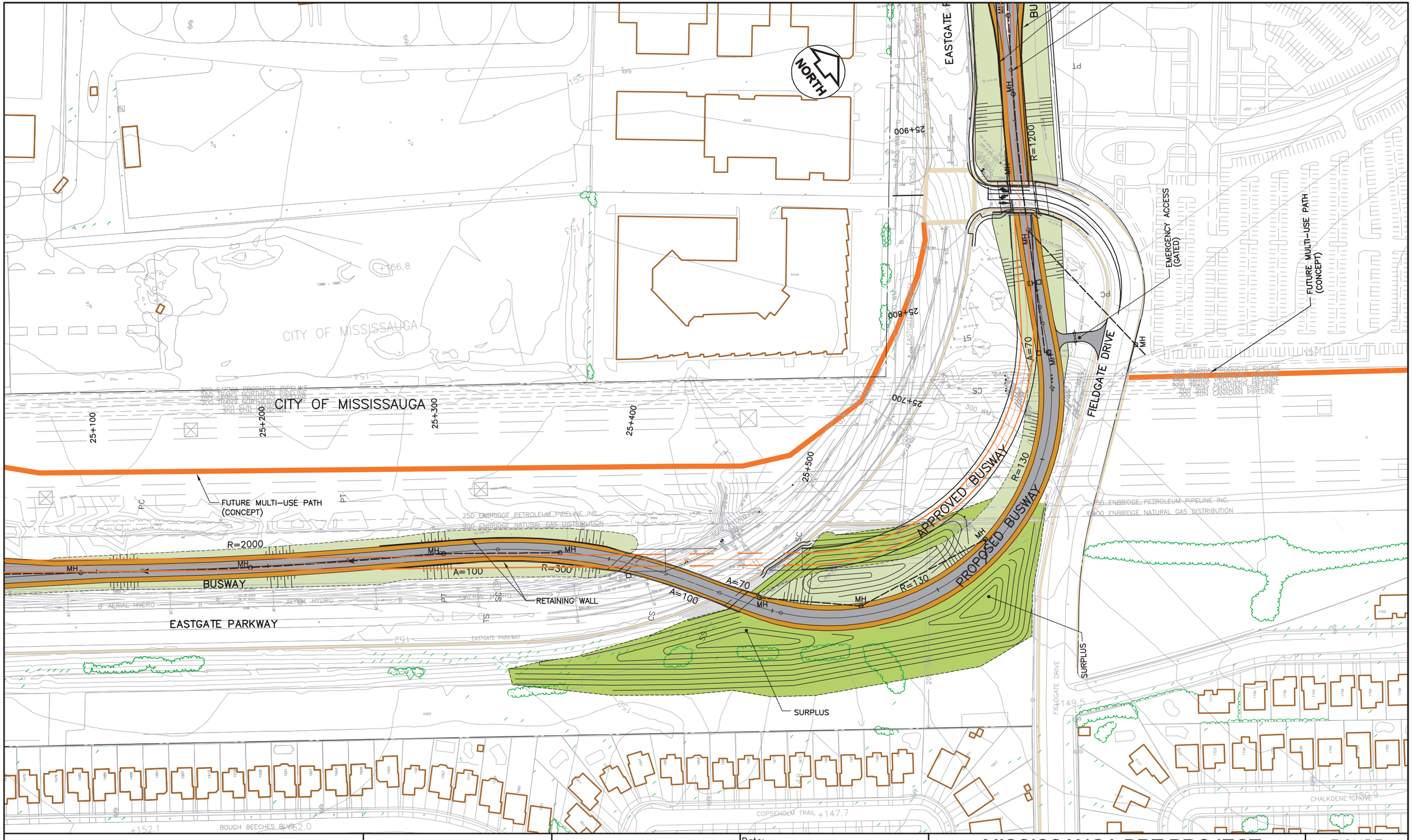

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Transit

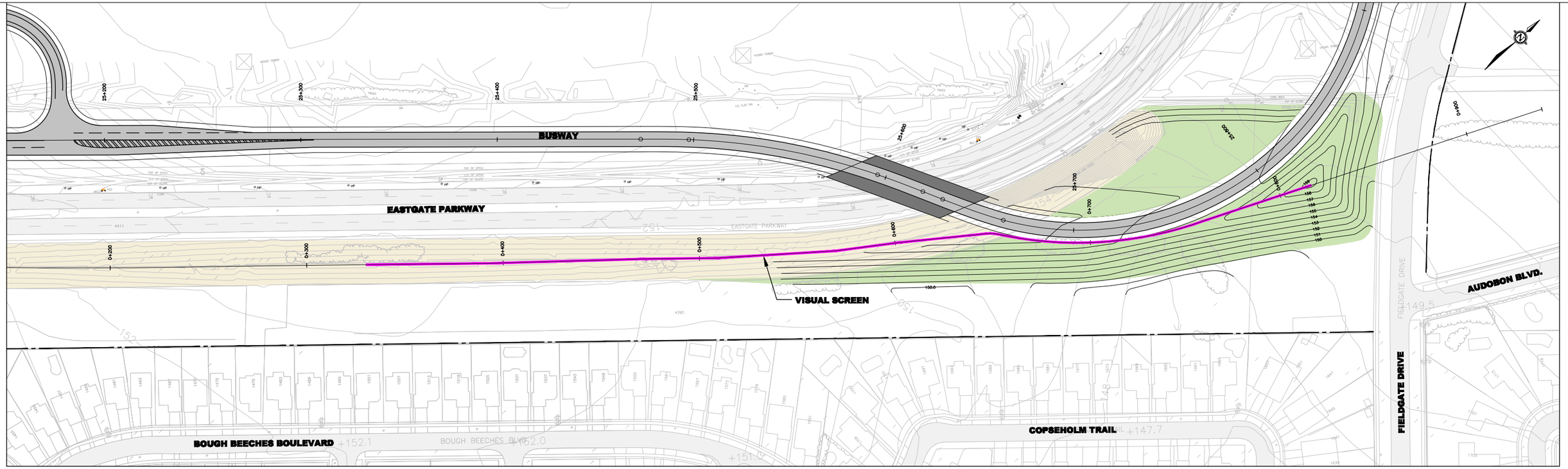
Date: JAN-2009

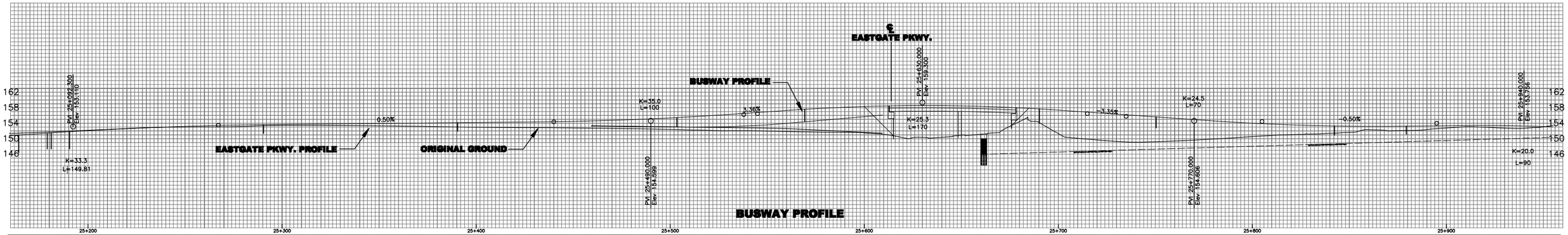
Scale: HORIZONTAL 0m 20 40; VERTICAL 0m 2.0 4.0

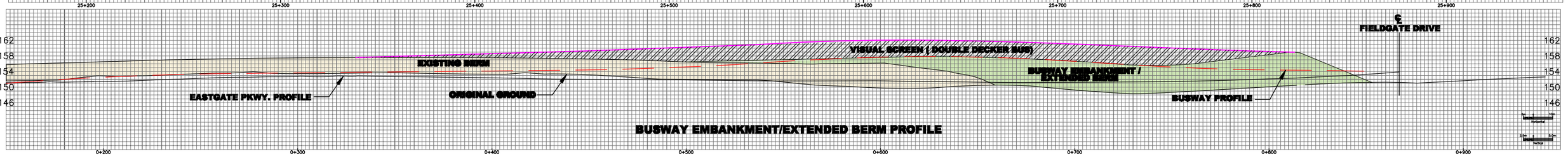
MISSISSAUGA BRT PROJECT
ENV. ASSESSMENT ADDENDUM

PREVIOUSLY APPROVED AND RECOMMENDED ALTERNATIVES
EASTGATE PARKWAY / FIELDGATE DRIVE

FIGURE 9.1







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MISSISSAUGA Transportation and Works

Transit

DATE: December 2008

SCALE: 1:2,000

MISSISSAUGA BRT PROJECT ENVIRONMENTAL ASSESSMENT ADDENDUM

RECOMMENDED ALTERNATIVE
EASTGATE PARKWAY / FIELDGATE DRIVE

FIGURE 9–2

STUDY AREA

10-1
65.89 ha

10-2
22.51 ha

10-8
1.39 ha

FC17

10-7
7.56 ha

9-7
1.15 ha

SOUTH GATEWAY ROAD

RELOCATE EXISTING DIXIE/EASTGATE STORM SEWER THROUGH BRT ACCESS AREA

CONNECT NEW DI TO NEW SEWER

NEW DIXIE/EASTGATE STORM SEWER

GRADE BOULEVARD BETWEEN EASTGATE PARKWAY AND BRT SUCH THAT NO OVERLAND FLOW FROM EASTGATE PARKWAY IS DIRECTED TO BRT

EASTGATE PARKWAY

INSTALL ADEQUATE NUMBER OF CBs AT SAG TO CAPTURE 100-YEAR EVENT

STORM SEWER SIZED TO CONVEY 100-YEAR EVENT FROM SAG AT 26+643 TO OGS AT 25+950

9-6
0.87 ha

DI

10-4
0.68 ha

10-9
0.56 ha

OGS

DI

EXISTING 3000mmØ STM

OUTLET 10

24+800

25+000

25+200

EXISTING 1800mmØ STM

EXISTING 2100mmØ STM

25+600

DI

OGS

OGS

25+800

10-10
0. 6 ha

10-11
0.15 ha

CONNECT TO EXISTING 3000mmØ STM

INSTALL ADEQUATE NUMBER OF CBs AT BRT SAG TO CAPTURE 100-YEAR EVENT

CONNECT BRT STORM SEWER TO EXISTING 1800mmØ STM ON EASTGATE

EQNBK 25+300
EQNAHD 25+400

10-3
3.32 ha

10-6
0.25 ha

CITY OF MISSISSAUGA

LEGEND

- CATCHMENT BOUNDARY
- FUTURE CULVERT*
- FC1 — FUTURE CULVERT I.D.
- FUTURE DITCH
- FUTURE FLAT BOTTOM GRASSED SWALE
- FUTURE STM SEWER
- FUTURE TWIN STM SEWER
- OGS — FUTURE OIL AND GRIT SEPARATOR
- DI / CB — FUTURE DITCH INLET OR CATCHBASIN
- EXISTING CULVERT
- EXISTING STORM SEWER
- EXISTING DITCH/SWALE
- EXISTING FLOW DIRECTION
- 4-1 / 3.64 ha — CATCHMENT ID / CATCHMENT AREA

* ALL PROPOSED CULVERTS 800mm DIAMETER UNLESS OTHERWISE SPECIFIED. PROPOSED CULVERT SIZE SUBJECT TO CHANGE DURING DETAILED DESIGN STUDY

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MISSISSAUGA Transportation and Works

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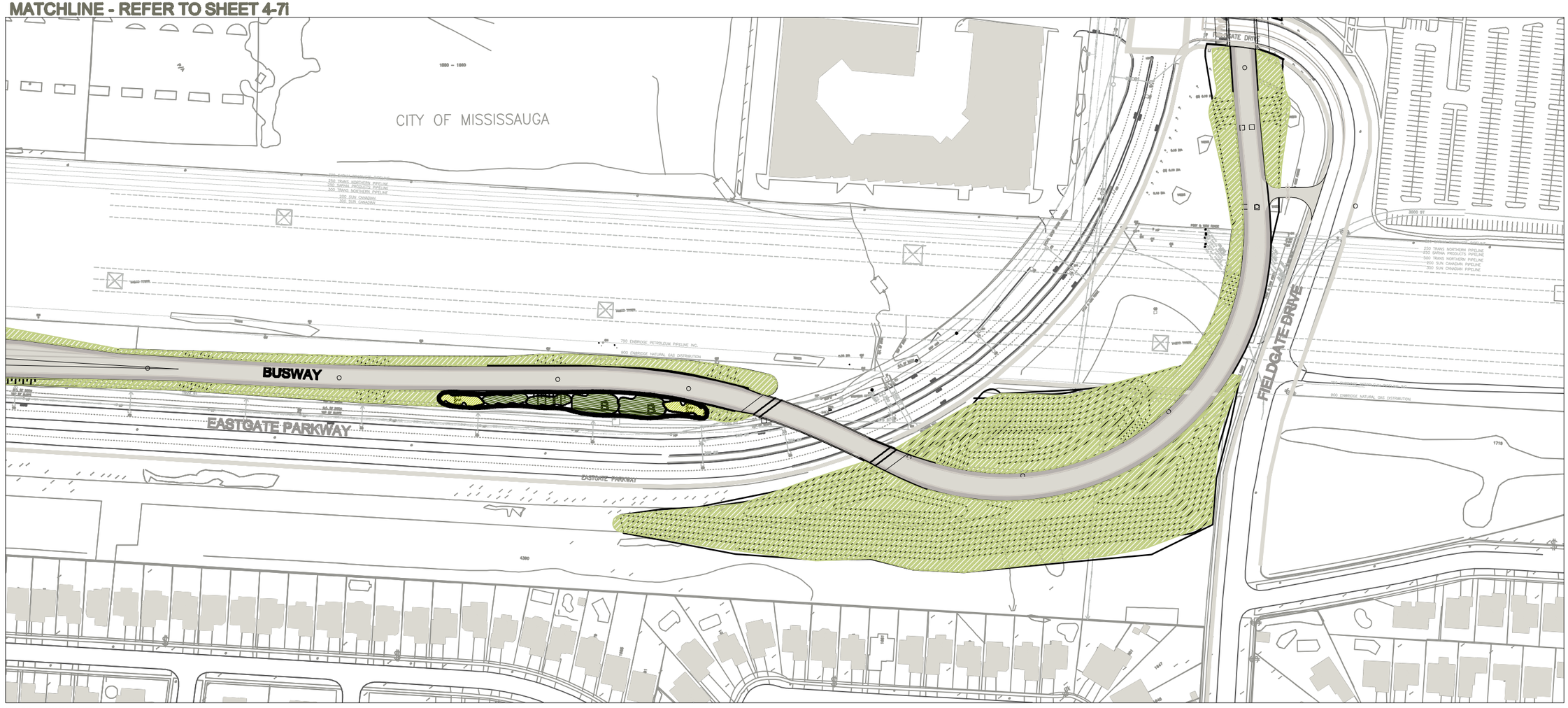
MISSISSAUGA BRT PROJECT
ENVIRONMENTAL ASSESSMENT ADDENDUM

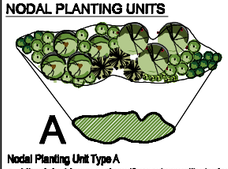
EASTGATE PARKWAY CROSSING
FUTURE DRAINAGE AND STORMWATER MANAGEMENT

FIGURE
9-3

MATCHLINE - REFER TO SHEET 4-71

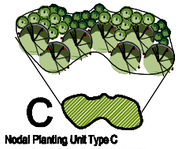


NODAL PLANTING UNITS

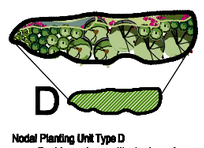


Nodal Planting Unit Type A
- Mixed deciduous and coniferous trees with shrubs
- Provides perforated visual screen to soften views to and from busway corridor
- Plant selection to be drought tolerant, salt resistant and to provide multi-seasonal aesthetic interest

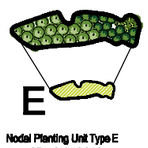
Nodal Planting Unit Type B
- Coniferous trees with shrubs and perennials
- Provides continuous visual buffer / screening
- Plant selection to be drought tolerant, salt resistant and to provide multi-seasonal aesthetic interest



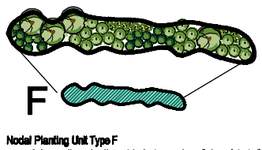
Nodal Planting Unit Type C
- Deciduous trees with shrubs
- Perforated visual buffer softens views to and from BRT
- Plant selection to be drought tolerant, salt resistant and to provide multi-seasonal aesthetic interest



Nodal Planting Unit Type D
- Deciduous trees with shrubs and perennials
- Plants to be drought tolerant, salt resistant and provide multi-seasonal aesthetic interest
- Locate at approach / departure of stations to create visual signal to passengers and pedestrians the proximity to a station

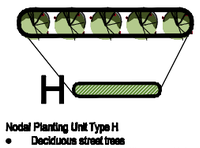


Nodal Planting Unit Type E
- Mixed shrub bed
- Provides continuous low level visual buffer / screening
- Plant selection to be drought tolerant, salt resistant and to provide multi-seasonal aesthetic interest

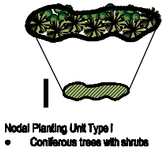


Nodal Planting Unit Type F
- Interception planting strip between top of slope (start of run-off) and other Planting Units
- Composed of tightly knitted suckering shrubs to stabilize slope and to take brunt of air-borne salt spray
- Species to include hardy dogwoods, willow, and sumac

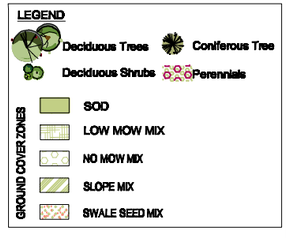
Nodal Planting Unit Type G
- Mixed perennials, wildflowers, ornamental, and or native grasses
- To provide seasonal colour and interest
- Ensure species are drought tolerant and salt resistant



Nodal Planting Unit Type H
- Deciduous street trees
- Select species with multi-seasonal interest
- Where adjacent to overhead utilities, select small to medium sized species
- Plant selection to be drought tolerant and salt resistant



Nodal Planting Unit Type I
- Coniferous trees with shrubs
- Provides visual buffer / screening
- For areas where space is limited but a dense visual screen is required
- Plant selection to be drought tolerant, salt resistant and to provide multi-seasonal interest



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MISSISSAUGA Leading today for tomorrow

Transit

Date: MARCH 2009

Scale: 1:2000

MISSISSAUGA BRT PROJECT
ENVIRONMENTAL ASSESSMENT ADDENDUM

BRT EAST CORRIDOR LANDSCAPE PLAN

FIGURE
9-4