4. ALTERNATIVE DESIGN

As noted in **Chapters 1 and 2**, Metrolinx Regional Transportation Plan (2008), *The Big Move*, a higher-order transit facility along Dundas Street between Brant Street and Kipling Station was identified. The need for a higher order transit facility on Dundas Street was also included in the Halton Region Transportation Master Plan (to 2031) – The Road to Change.

Completing the widening of Dundas Street through Oakville and Burlington will take a number of years, and after meeting with residents, local municipalities, transit authorities and others, further consideration was given to the implementation approach. With the widening of Dundas Street to 6-lanes, there is opportunity to consider the introduction of High Occupancy Vehicle (HOV) curb lanes allowing a mix of transit and private vehicles with two or more occupants. In parallel, active transportation, bus stops and transit priority measures can be provided at key intersections as required. The timing for introduction of HOV lanes / transit improvements is to be determined in consultation with the local municipalities (i.e. Town of Oakville and City of Burlington, which are the transit operators in their respective areas). As transit ridership builds, there is the opportunity to convert the HOV lanes into dedicated bus lanes in the future (i.e. 2031).

The purpose of this Chapter is to provide an overview of elements of BRT (**Section 4.1**), and the decision making process in determining the preferred BRT alternative (i.e. curb lane BRT vs. median lane BRT) (**Sections 4.2 and 4.3**) in the context of Dundas Street within Halton Region; as noted above, Metrolinx Regional Transportation Plan identified a higher-order transit facility along Dundas Street between Brant Street and Kipling TTC Station. **Section 4.4** discusses the implementation strategy for improvements on the Dundas Street corridor.

4.1 Bus Rapid Transit

Bus Rapid Transit (BRT) is defined as the operation of buses in an exclusive or semi-exclusive right-of-way with on-line stations.

BRT provides unlimited flexibility to tailor the public transport operation to suit the corridor and regional needs because the rapid transit vehicle, the bus, can operate on and off the rapid transit right-of-way. BRT bus station design allows buses to pass other buses that are stopping for passenger pick-up or drop-off. This means that "skip stop" and express services can be combined with local stopping services in the same right-of-way without any conflicts between different types of services.

The planning and design of BRT involves a total systems approach to the supply and operation of a bus based rapid transit service. The flexibility of the bus to operate on different types of right-of-way and under different operating conditions means that BRT encompasses significant variations in guideways, stations, vehicles, information technologies and operating strategies.

4.1.1 BRT Guideway

There are two types of guideway typically applied in BRT systems: a fully exclusive, grade-separated roadway referred to as a Busway; or lanes reserved for buses within a roadway shared with general traffic.

In the case of the Dundas Street corridor, reserved lanes for BRT operation would be considered to be more suitable given the constraints on either side of the corridor due to existing and planned development. That type of BRT guideway is discussed below.

As with the Dundas Street context, BRT can operate in a priority lane (bus lane or HOV lane) or a mixed flow lane on an arterial road. The priority lane may be a conventional curb lane or median lane, see example in **Exhibit 4-1**. Intersection priority may be provided through various forms of signal priority with or without queue jump lanes or by grade separation in very difficult locations. There are numerous examples of different bus lanes and intersection treatments.

Exhibit 4-1: Example of HOV Lane (VIVA Bus on Yonge Street, York Region)

4.1.2 BRT Stops

When operating in reserved bus lanes, bus stops – similar to those of a conventional transit service – are generally used. These stops can be either curbside, or in a median island, depending on the location of the designated lanes in which buses are operating. Where feasible, these stops are provided with bus bays to accommodate stopping buses without impeding the operation of express or "limited stop" bus services. These stops are generally equipped with modern passenger information systems, incorporate enhanced passenger amenities, and are fully accessible. An example of a BRT bus stop eleswhere in the GTA is shown in **Exhibit 4-2**.

BRT stops can be designed with raised platforms and pre-paid areas to speed loading and facilitate access by disabled persons where some form of precision docking is employed. Properly designed stops are of paramount importance for the functioning of the BRT system as a rapid transit facility and in presenting BRT as a high quality transit

technology. The stops should be designed to a common highly recognizable architectural theme. They are normally not staffed and their design should stress passenger safety, convenience, comfort, low maintenance and accessibility. Stop layouts follow design standards subject to the local site conditions.

Passengers arrive and depart from most stops as pedestrians, local bus passengers, bicycle riders, park and ride or kiss and ride users depending on amenities provided. The pedestrian links to the local active transportation system are therefore very important and should accommodate pedestrian flows via the shortest practical route to and from all parts of the community. The majority of walk-in passengers walk less than 400 m to and from the station but some passengers can be expected to walk up to 1000 m.

Experience in cities with BRT has shown that well designed bus stations have the same ability as rail stations to act as catalysts for land use intensification. Bus station investments can influence compact, mixed use, and transit-supportive development. This in turn can stimulate increased transit ridership, but transit investment alone is not sufficient to influence land use decisions. Other supportive policies are required as well. These may include transit-oriented regional and local planning policies, urban design standards and parking policies.

Exhibit 4-2: Example of BRT Stops and Stations (Bramalea Stop, Brampton Züm BRT)

4.1.3 Future BRT Operations on Dundas Street

In order to fully understand the potential benefits that could be achieved by BRT on Dundas Street in the future, a representative operating plan was developed. The operating plan was based not only on the Dundas Street corridor, but how to integrate BRT services with other services within and beyond the Region (for example, the

Trafalgar Road corridor), offering speed and flexibility to meet the needs of the community. Service types include:

- All Stops Service
- Peak Direction Express / Limited Stop Service
- Counter Peak Direction Express / Limited Stop Service
- Local Arterial / Feeder Services

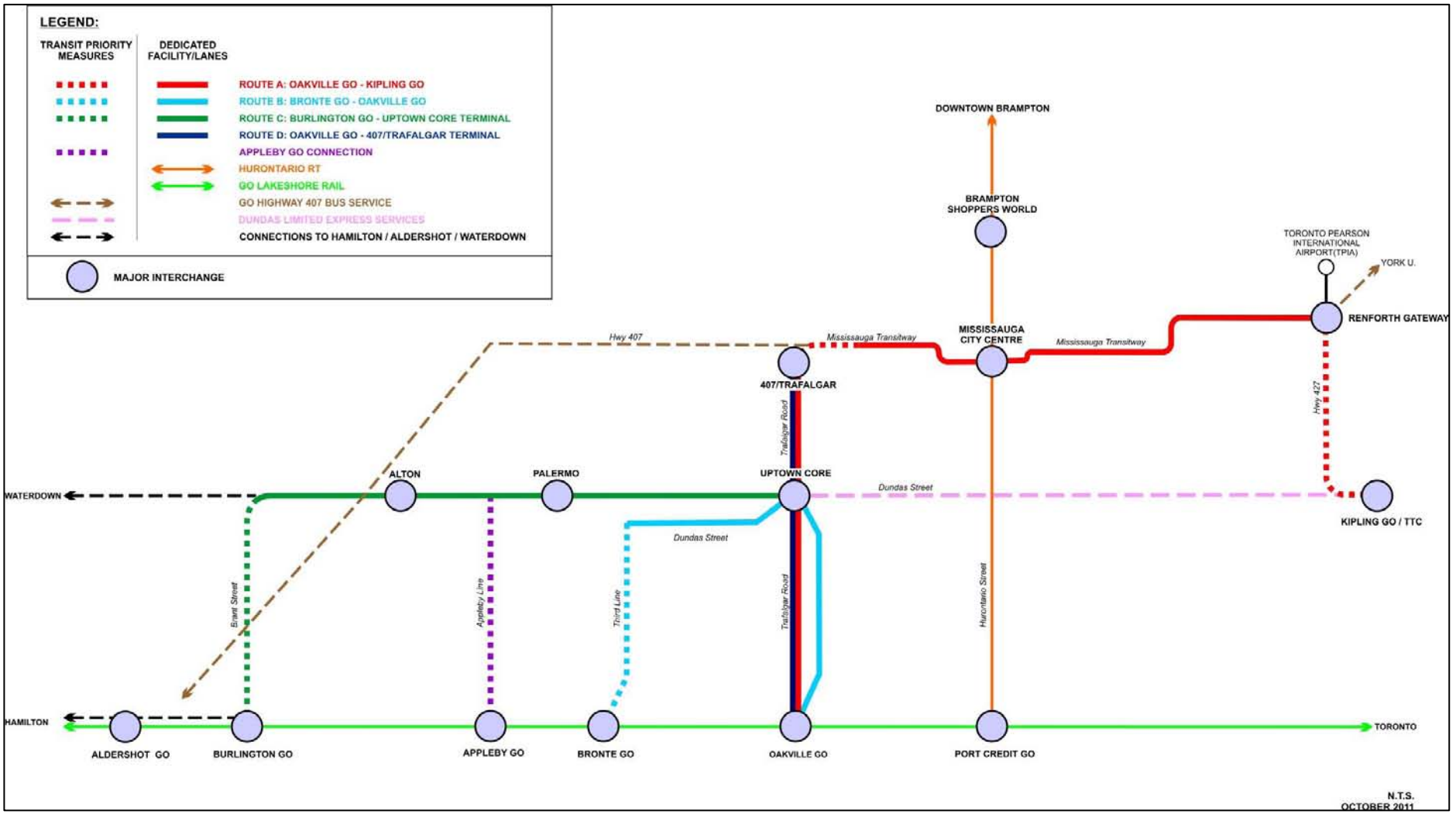
A single representative option was used to test the merits of introducing "higher order" transit operations in the Dundas Street corridor. The BRT concept best reflects the level of commitment, quality of operation (speed, reliability, comfort), that would be required for this type of network. This concept has been developed for study purposes only. In this representative conceptual BRT plan, four anchor routes are proposed to form the basic Dundas Street BRT service framework:

- **Route 'A'** – all-stops route between Oakville GO Station and Mississauga City Centre via Trafalgar Road, Highway 407, and Mississauga Transitway.
- **Route 'B'** – all-stops route between Bronte GO Station and Oakville GO Station via Wyecroft Road, Third Line, Dundas Street, and Trafalgar Road.
- **Route 'C'** – between Burlington GO Station and Uptown Core Terminal in the Town of Oakville. This route will serve all stops between Burlington GO Station and Uptown Core Terminal via Brant Street and Dundas Street.
- **Route 'D'** – as part of the Trafalgar Road BRT, there will be services between the Oakville GO Station and the 407ETR/Trafalgar Terminal. (This is under a separate EA study by Halton Region).

These routes would be supplemented by various feeder, local, and counter-peak express services, as well as support corridors such as Brant Street, Appleby Line and Third Line. Buses using BRT infrastructure would be available for use by GO Transit / Metrolinx, Burlington Transit, Oakville Transit, Mississauga Transit and other permitted bus services. Potential transit connectivity beyond Halton is also an important consideration.

The representative conceptual BRT service plan is illustrated in **Exhibit 4-3**.

Exhibit 4-3: Transit Service Plan Concept



4.2 Approach to Developing Alternatives

As noted in **Chapter 2**, improvements on the Dundas Street corridor are needed to address existing and future travel demands, as well as planned developments. The proposed widening of Dundas Street to six lanes (with provision for 4 general traffic lanes and 2 lanes for transit / High Occupancy Vehicles with the ability to convert to 4 general traffic lanes and 2 dedicated BRT lanes as transit ridership increases) was identified as the preferred planning solution.

Recognizing future opportunity for higher order transit facility on Dundas Street, alternatives for curb lane BRT vs. median lane BRT for the Dundas Street corridor between Brant Street and Trafalgar Road were developed in the planning process.

Given the key considerations and constraints on both sides of Dundas Street and the existing development adjacent to the right-of-way as stated in **Chapter 3**, it was not considered reasonable to develop alternate route alignments. Accordingly, the focus for the development of alternatives is on the existing Dundas Street corridor.

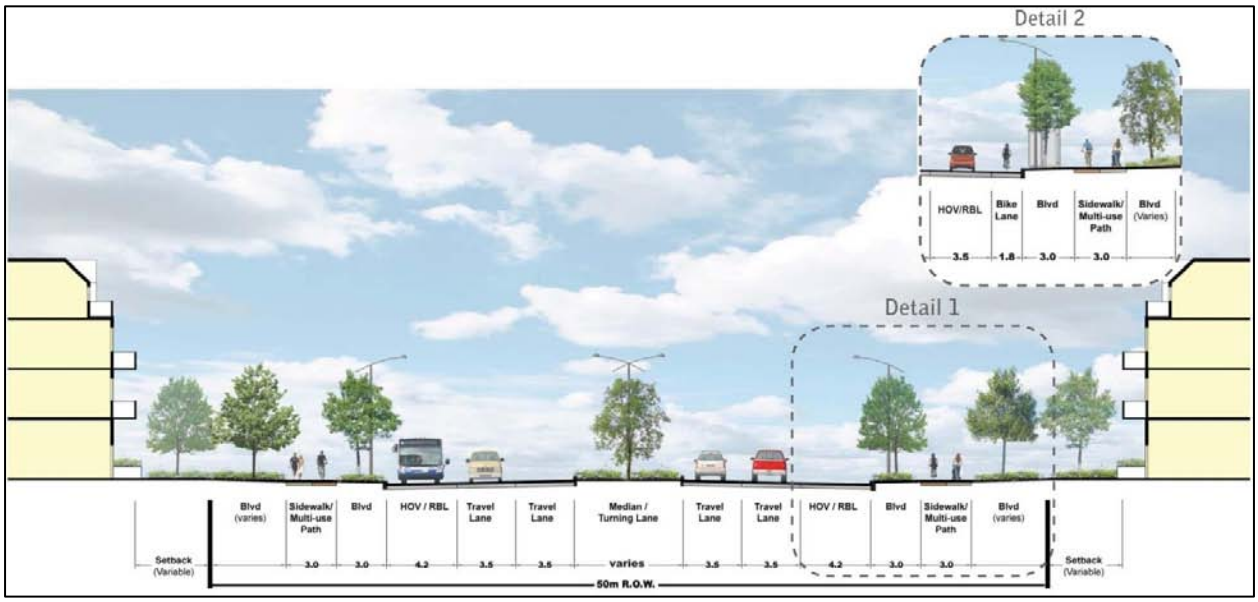
4.2.1 Roadway Design Considerations

4.2.1.1 Cross-Section

Halton Transportation Master Plan – The Road to Change 2031

Halton Region Transportation Master Plan (to 2031) – The Road to Change (2011) identified a 50 m right-of-way on Dundas Street with an urban cross section including provision for pedestrians and cyclists on sidewalks and/or multi-use paths on both sides of the road (see **Exhibit 4-4**). The corridor is to be maintained as 4 general traffic lanes with provision for 2 lanes for Transit / High Occupancy Vehicles.

Exhibit 4-4: Halton Transportation Master Plan Proposed Dundas Street Cross Section



*Source: Halton Region Transportation Master Plan – The Road to Change (**Appendix E**)*

Halton Region Active Transportation Plan

Halton Region is carrying out an Active Transportation Master Plan Study to create a 20-year vision for active transportation in Halton Region. As part of the Dundas Street improvements, features of active transportation were considered, such as implementation of sidewalks and/or multi-use paths for pedestrians and cyclists.

4.2.1.2 Horizontal Alignment and Existing Constraints

The preliminary plan for the proposed widening of Dundas Street was developed based on a 50 m right-of-way. Lands south of Dundas Street are mostly developed with existing residential communities and associated commercial developments. North of Dundas Street, most lands are designated for future development, including the North Oakville Secondary Plan, and other future developments in the City of Burlington. The proposed widening would be along the existing Dundas Street corridor with minor shifts to the north and south to avoid and minimize impact to existing community and natural areas where possible. Consideration was given to areas that are highly constrained (e.g. heritage properties, natural environmental features, and existing communities).

Development of the horizontal alignment integrated with sections of Dundas Street that are already constructed and widened to six lanes, including Appleby Line intersection, Bronte Road intersection, Sixteen Mile Creek crossing west of Neyagawa Boulevard, as well as between Oak Park Boulevard and Highway 403, which has recently been widened to 6 lanes.

4.2.1.3 Access

As part of the 1999 Regional Roads 5 and 25 Corridors Study, objectives for future access along Dundas Street were addressed and an Access Management Plan (AMP) was prepared by Halton Region for Dundas Street. Given the function of Dundas Street, the AMP notes that "the provision of access to abutting land is subordinate to the mobility function in order to minimize the delay to through traffic". The AMP also recognizes that Dundas Street is in transition: historically, it was a rural corridor with high operating speeds; with ongoing development, it now functions as a commuter route; and, as adjacent development continues, it will likely become an urban road. Therefore, "*the long term plans include RR5 (Dundas Street) transitioning from a rural highway to an urban arterial road*"… "*it is expected that an appropriate speed limit for this road will be 60 km/h*".

The thrust of the AMP is to control access, for example, by providing a centre raised median and signalized intersections at main crossing roads, restricting access to new development and providing right-in/right-out only to existing land uses. The AMP indicates that private access will be permitted should there be no other reasonable access to the public roadway network.

As a result, the Region is proposing a centre raised median with right-in/right-out only where there is existing full access. While the Region's opportunity to control access can readily be accommodated with new development, it is more complex with existing community. Therefore, access to the existing community is to be reviewed on a case by case basis. Where access cannot be provided through a signalized intersection, for those

properties currently with direct access onto Dundas Street, it is proposed to restrict their access to right-in/right-out only. As an alternative and to mitigate impact to current full move accesses on Dundas Street, U-Turns are permitted at signalized intersections. While it is recognized that this will result in users having to modify some of their travel patterns, it is considered necessary for the acceptable and safe operation of Dundas Street.

4.2.1.4 Focus Area within Current EA Study Limits

In order to highlight areas where constraints must be considered, Focus Areas were identified. Focus Areas refer to localized areas with their own site-specific issues. For the purpose of this ESR, only the Focus Areas within the limits of the current Class EA Study are noted (i.e. between Brant Street and Bronte Road). Focus Areas beyond Brant Street and Bronte Road have been documented in the respective Dundas Street Class EA studies (i.e. between Bronte Road and Proudfoot Trail [completed in December 2012], as well as Neyagawa Boulevard to Oak Park Boulevard [completed in November 2013]).

Within the limits of the current Class EA Study, the areas at Tansley Bridge (i.e. Bronte Creek), 407 ETR interchange and the Fourteen Mile Creek crossings east of Bronte Road are considered to be Focus Areas. Discussions regarding the respective areas are documented in **Chapter 6**.

4.3 Consideration of Curb Bus Lanes vs. Median Bus Lanes

Functional plans for curb bus lanes and median bus lanes were developed for consideration as described in the subsequent sections. It should be noted that since the development of the functional plans, Halton Region has been carrying out an Active Transportation Master Plan Study to create a 20-year vision for active transportation in Halton Region (see **Section 2.1.9**). As part of the Dundas Street improvements, features of active transportation were considered, such as implementation of on-road bike lanes, multi-use paths, sidewalks and road crossings for pedestrians and cyclists. Additional features beyond those shown in typical cross section in **Exhibit 4-6** and **Exhibit 4-7** have been considered. See **Chapter 6** for a description of the different active transportation features proposed throughout the Dundas Street corridor.

4.3.1 Curb Lane BRT

Right side bus lanes are the conventional and widespread form of providing transit priority on arterial roads. With stops at the curbside, this configuration mimics regular transit service. The exception is the near complete elimination of other vehicles in the right curb lane, thereby allowing buses to avoid intersection queues. Signage and pavement markings are used to identify the eligible use of the lane, and police enforcement and a strong (frequent service) transit presence contribute to keeping the lanes free of unauthorized users.

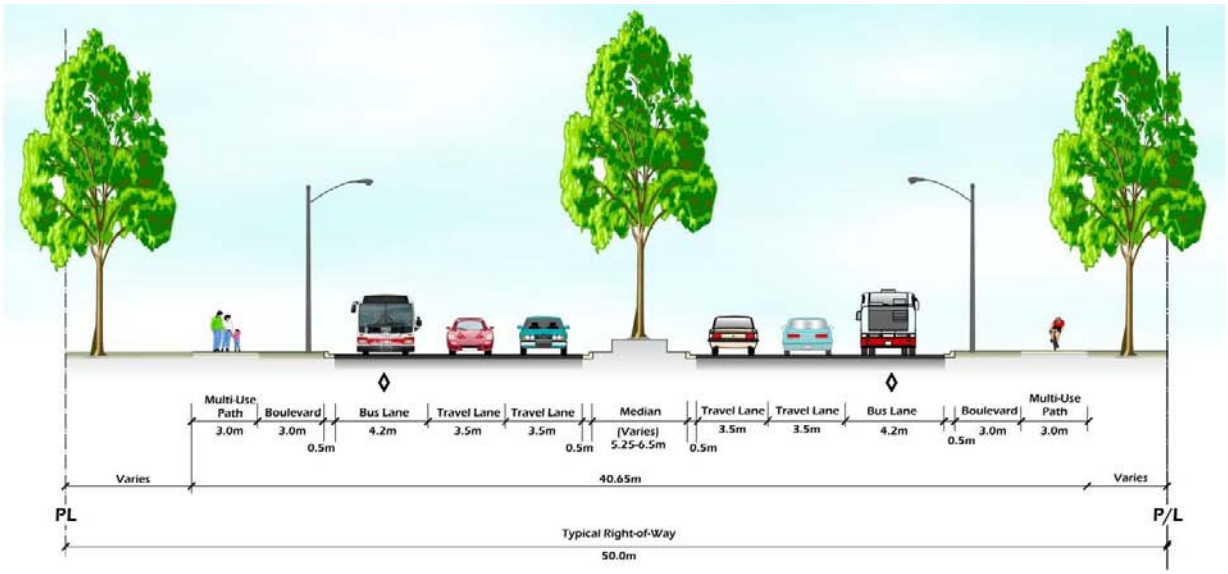
Bus stops may be in a bus bay to allow express buses to bypass a stopped bus, or they may be at the curb in the event that there is no need for bypassing or if it occurs so infrequently that buses simply slip into the adjacent general traffic lane to pass. Bus stops can be connected with adjacent developments and would be located in closer proximity to provide access to nearby communities.

The right curb bus lanes can be shared by High Occupancy Vehicles to support transit use and carpool practices. Emergency vehicles may also utilize the dedicated bus lane and reduce response time. Potential conflict between right turning motorists at intersections will be overcome by providing far-side bus stops (i.e. bus stops located on the far side of the intersection).

A typical cross section of curb bus lanes on Dundas Street is shown in **Exhibit 4-5** (as presented at the November 2011 Public Information Centre), which includes:

- Two 3.5 m general traffic lanes in each direction;
- One 4.2 m curb bus lane in each direction;
- One 3.0 m multi-use path on each side of the road; and
- A raised centre median with landscaping opportunities.

Exhibit 4-5: Dundas Street Typical Cross Section – Curb Bus Lanes (as presented at November 2011 Public Information Centre)



4.3.2 Median Bus Lanes

Median bus lanes provide a two-lane two-way bus-only roadway in the middle of the arterial, with general traffic lanes operating to the outside. Raised medians are normally used to separate the bus lanes from the adjacent general traffic lanes. No uncontrolled turns are allowed across the dedicated bus lanes. Where there is enough right-of-way available, the raised median may be wide enough for landscaping and street trees or other features. Due to the width of the roadway, street lighting would usually need to be located in one or both of the medians rather than at the outside of the road.

Median BRT bus stops are usually located at signalized intersections, and include sheltered waiting areas on the raised median, similar to a typical streetcar stop. If there is enough lateral space and the operating plan requires it, a passing lane can be provided to allow through buses to bypass a bus at a stop. Otherwise, all buses would be required to stop in sequence at all stops.

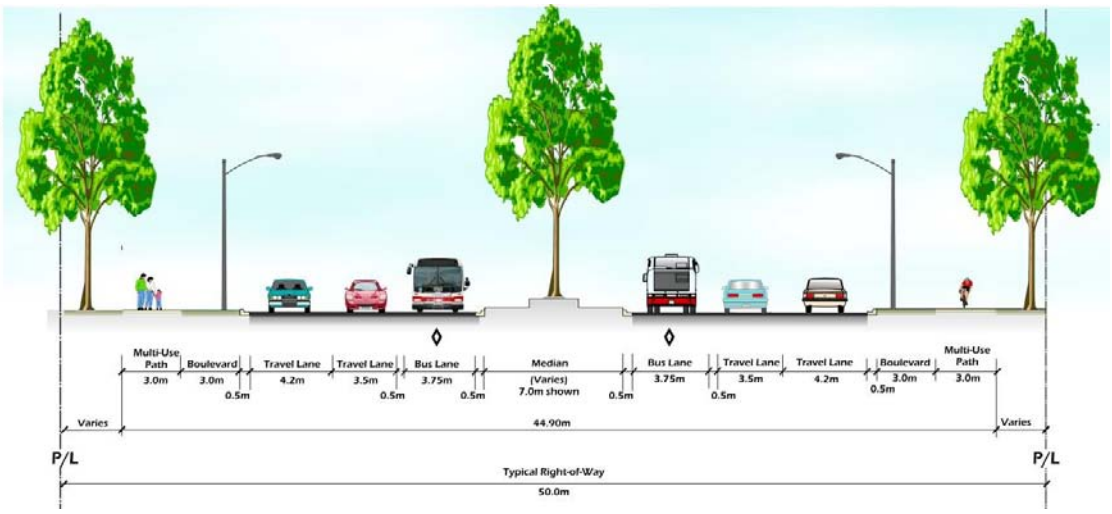
Buses move through intersections together with the adjacent general traffic lanes. Left turns by general traffic across the dedicated bus lanes are accommodated on exclusive protected signal phases only. Signal phases may also be provided for buses to turn into or out of the dedicated bus lanes at intersections. Alternatively, buses can travel in or out of the dedicated bus lanes by way of mid-block slip lanes, and make their turns from the general traffic lanes. Operationally, median bus lanes are more complex to both manage traffic flows and for the motorists to manoeuvre through.

Median bus lanes have the advantage of representing a commitment to permanent BRT operation in the corridor. The signal treatment and station layout make it unsuitable for use by High Occupancy Vehicles (HOVs) or for part-time use by general traffic. It can reflect a visually attractive corridor, provides the optimum bus operational performance (due to complete segregation from general traffic), improves safety (again due to the segregation of vehicle types) and is pedestrian- and cyclist-friendly. It tends to be somewhat more costly than curbside bus lanes, due to the additional infrastructure and roadway width.

A typical cross section of median bus lanes is shown in **Exhibit 4-6 (**as presented at the November 2011 Public Information Centre), which includes:

- One 3.5 m (inside lane) and one 4.2 m (curb lane) general traffic lanes in each direction;
- One 3.75 m median bus lane with a buffer between the bus lane and the general traffic lanes;
- One 3.0 m multi-use path on each side of the road; and
- A raised centre median with landscaping opportunities.

Exhibit 4-6: Dundas Street Typical Cross Section – Median Bus Lanes (as presented at November 2011 Public Information Centre)



4.3.3 Analysis and Evaluation of Curb Bus Lanes vs. Median Bus Lanes

4.3.3.1 Factors and Criteria

The potential impacts associated with curb bus lanes and median bus lanes on Dundas Street were compared and evaluated using factors in Socio-Economic Environment, Cultural Environment, Natural Environment, Transportation, as well as Cost and Staging. Under each factor group, the following criteria were used:

Factors Group	Criteria
Socio-Economic Environment	• Proximity of Stations to Station-Area / Transit-Oriented Development • Support of Urban Form and Liveable Community Goals • Required Right-of-Way Acquisition • Potential Impact to Businesses • Streetscape Enhancement Opportunities
Cultural Environment	• Built Heritage • Archaeology Resources
Natural Environment	• Vegetation, Designated Features • Fish and Aquatic Habitat and Wildlife • Stormwater Management
Transportation	• Travel Time 2031 PM Peak Period – Average Bus Travel Time – Average Automobile Travel Time • Pedestrians / Riders – Total Pedestrian Crossing Distance to/from Platform – Availability of Crossing Refuge in Median – Perceived Passenger Waiting Comfort – Accessibility – Multi-Use Path • Traffic Operations – Impacts to Left-Turning Vehicles – U-Turns to Access Driveways and Entrances – Neighbourhood Traffic Cut-Through Issues – Enforcement Issues (Vehicles in BRT Lanes) – Emergency Vehicle Benefits (Use of BRT Lanes) – Snow Removal • Transit Integration – Benefits to Local Bus Routes – Benefits to BRT Bus Routes – Ease of Transfer between BRT and Local Bus Services – Consistency with Preferred Trafalgar Road BRT (Curb)
Cost and Staging	• Staging Opportunities • Construction Cost (Order of Magnitude)

4.3.3.2 Analysis and Evaluation

Analysis and evaluation of curb bus lanes vs. median bus lanes can be found in **Table 4-1**.

Under socio-economic environment, both curb bus lanes and median bus lanes are considered to be similar. While, median bus lanes would provide better opportunities for landscaping, curb bus lanes would have less roadway platform requirement and would provide greater opportunity to integrate transit-oriented development (i.e. stops would be located closer to adjacent communities).

In terms of cultural environment, both curb bus lanes and median bus lanes are considered to be similar, as there would be limited impact to built heritage and archaeology resources based on the proposed widened footprint on Dundas Street.

Both curb bus lanes and median bus lanes are considered to be similar also under natural environment. The general footprint as a result of the proposed widening of Dundas Street would be similar under both alternatives and therefore, potential impacts to natural environment would generally be along areas immediately adjacent to Dundas Street. Existing culverts will either be extended or replaced subject to findings under stormwater management, and provision for wildlife passage will be considered where appropriate.

The only factor group where the two alternatives are not similar is under transportation. Curb bus lanes are preferred under transportation as they would provide slightly better BRT travel time and better integration with local transit services. In addition, it would provide better staging opportunities for BRT to build ridership prior to implementation of a dedicated BRT system, and the capital cost for Curb BRT is significantly less than Median BRT.

Based on the foregoing, Curb Bus Lanes has been identified as preferred since it has better left turn opportunities, better station environment for passengers and will integrate better with the community (i.e. stops will be in closer proximity to the community).

Findings of the analysis and evaluation were presented at the November 2011 Public Information Centre (see **Section 5.1.5**).

Table 4-1: Analysis and Evaluation Table – Curb Bus Lanes vs. Median Bus Lanes

Factors/Criteria	Curb Bus Lanes	Median Bus Lanes
Socio-Economic Environment		
Proximity of Stations to Station-Area/Transit-Oriented Development	Stations would be closer to communities, therefore greater opportunity for integration between land use and transit infrastructure	Stations would be further away from the communities compared to the curb bus lanes alternative. Therefore slightly less favorable to integration of land use with transit infrastructure
Support of Urban Form and Livable Community Goals	Supports future planning of Halton Region and local municipalities by promoting transit use and active transportation	

Factors/Criteria	Curb Bus Lanes	Median Bus Lanes
Required Right-of-Way Acquisition	Slightly less right-of-way required based on overall footprint at intersections	Slightly more right-of-way required based on overall footprint at intersections
Potential Impact to Businesses	Similar impact to adjacent businesses due to change in access (right-in/right-out). U-turn at signalized intersections would be permitted	
Streetscape Enhancement	Less opportunities for planting in the median	More opportunities for planting in the median
Cultural Environment		
Built Heritage	Limited impact – may have some impact in constrained areas. However, cross section may be modified to minimize impact where possible	
Archaeology Resources	Proposed widening would mostly be along existing Dundas Street corridor which is already disturbed; therefore, potential impact should be limited	
Natural Environment		
Vegetation, Designated Features / Areas	Impact would be similar due to widening of Dundas Street, mostly along areas immediately adjacent to the roadway	
Fish and Aquatic Habitat and Wildlife	Edge impact to habitat would be similar for both options as a result of the widening of Dundas Street. Existing culverts would either be extended or replaced subject to findings in the stormwater management review and potential creek realignment will consider impact to fish habitat and provision for wildlife passage where appropriate	
Stormwater Management	Both alternatives would include an urban cross section for Dundas Street. Stormwater management facilities would be similar for both options.	
Transportation		
Travel Time		
Average Bus Travel Time (2031 P.M. Peak Period)	21 minutes*	22 minutes*
Average Automobile Travel Time (2031 P.M. Peak Period)	19 minutes*	21 minutes*
Pedestrian/Riders		
Total Pedestrian Crossing Distance to/from Platform	35 – 40 m to curb platforms	20 – 25 m to median platforms
Availability of Crossing Refuge in Median	No	Yes
Perceived Passenger Waiting Comfort	More desirable – relatively less traffic in the Platform area. Riders can stand away from the road	Less desirable – relatively more traffic in the platform area and riders would have to wait in the centre of roadway. Barrier and/or impact

Factors/Criteria	Curb Bus Lanes	Median Bus Lanes
		attenuators typically required
Accessibility	Both alternatives would be fully accessible including ramps, visual messaging, and audible signals	
Multi-Use Path	Multi-use path would be located behind stops shelters – easy access from multi-use path to stops	Multi-Use path would be provided on both sides of the road and would not be integrated with the stops
Traffic Operation		
Impacts to Left-Turning Vehicles	Can turn in advanced or regular green cycle	Can turn during green arrow only
U-Turns to Access Driveways and Entrances	Required	Required
Neighbourhood Traffic Cut-Through Issues	There may be potential infiltration into local roads under both alternatives	
Enforcement Issues (Vehicles in BRT Lanes)	Typically more difficult to enforce	Design typically is "self-enforcing"
Emergency Vehicle Benefits (Use of BRT Lanes)	Emergency vehicles can utilize lane but may experience more interference from other vehicles	Emergency vehicles can utilize lanes and would typically experience less interference from other vehicles; however, can only exit BRT lanes at signalized intersection
Snow Removal	Procedures will need to address potential for throwing snow into platforms	Procedures will need to address clearance of dedicated lanes and potential for throwing snow into platforms
Transit Integration		
Benefits to Local Bus Routes	Local buses likely to use curb BRT lanes	Local buses likely not to use median BRT Lanes
Benefits to BRT Bus Routes	High potential	
Ease of Transfer between BRT and Local Bus Services	More desirable since BRT platform and local bus station would both be adjacent to the curb	Less desirable since BRT platform would be in the median and local bus station would be adjacent to curb
Consistency with Preferred Trafalgar Road BRT (Curb)	Consistent	Not Consistent
Cost and Staging		
Staging Opportunities	Better opportunities to build ridership prior to implementation of BRT system	Less opportunities to build ridership prior to implementation of BRT system
Cost	Less costly	Significantly more costly

*Note: * results of traffic analysis were based on best available information at the time.*

4.4 Interim Improvements vs. Ultimate Improvements on Dundas Street

Based on discussion in **Sections 4.2** and **4.3**, the feasibility of dedicated curb bus lanes for BRT and the provision for higher order transit facilities on Dundas Street between Brant Street and Trafalgar Road was confirmed. The curb lane option was identified as preferred and was presented to the public at the Public Information Centre in November 2011 (see **Section 5.1.5**).

Completing the widening of Dundas Street through Oakville and Burlington will take a number of years, and after meeting with residents, local municipalities, transit authorities and others, further consideration was given to the implementation approach. With the widening of Dundas Street to 6-lanes, there is opportunity to consider the introduction of High Occupancy Vehicle (HOV) curb lanes allowing a mix of transit and private vehicles with two or more occupants. In parallel, active transportation, bus stops and transit priority measures can be provided at key intersections as required. The timing for introduction of HOV lanes / transit improvements is to be determined in consultation with the local municipalities (i.e. Town of Oakville and City of Burlington, which are the transit operators in their respective areas). As transit ridership builds, there is the opportunity to convert the HOV lanes into dedicated bus lanes in the future (i.e. 2031).

As noted in **Section 1.1.2**, Halton Region has divided the original study limits from Trafalgar Road to Brant Street into three sections and is carrying out three co-ordinated, but separate Class Environmental Assessment Studies and the implementation of improvements on Dundas Street is expected to follow the same order:

***Section 1*:** Bronte Road (Regional Road 25) to Proudfoot Trail – Town of Oakville. Class EA Study completed in December 2012. Construction began in fall 2014.

***Section 2*:** Neyagawa Boulevard (Regional Road 4) to Oak Park Boulevard – Town of Oakville. Class EA Study completed in November 2013. Construction anticipated to begin in summer 2016.

***Section 3*:** Brant Street (Regional Road 18) to Bronte Road (Regional Road 25) – City of Burlington / Town of Oakville – current EA Study. Construction will be phased, starting at Bronte Road moving westerly through City of Burlington, starting in 2017/2018.

When construction (widening to 6 lanes) between Bronte Road and Highway 403 is completed, HOV / transit lanes may operate between Bronte Road and Highway 403, in the Town of Oakville. Extension of HOV / transit operations westerly from Bronte Road will be confirmed in consultation with the City of Burlington and the Town of Oakville and local transit operators.

5. PROJECT CONSULTATION PROCESS

Public input is critical to the success of a project and Halton Region has provided opportunities for such input at key points in the study process throughout the corridor and throughout the study process.

The overall intent for all the consultation and including the Public Information Centres was to take input on transportation needs along the Dundas Street corridor and on the improvements required to support future growth and development in Halton Region.

The purpose of this chapter is to document the key consultation events (technical agencies, stakeholders, and the public) associated with the Dundas Street Class EA Study between Brant Street and Bronte Road.

As noted in **Section 1.1**, there has been a long planning history throughout the Dundas Street corridor in the Town of Oakville and the City of Burlington. For the purposes of documenting this current study, it is highlighted that a number of Public Information Centres were held since 2009 which covered various sections of Dundas Street through the planning process.

Materials presented at all the Public Information Centres are available on the study website at www.halton.ca/EAprojects and also in **Appendix C** of this Environmental Study Report (ESR).

5.1 Public Consultation

5.1.1 Notice of Study Commencement (Brant Street to Proudfoot Trail) – November 2009

As noted in **Section 1.1.1**, Halton Region initiated the Dundas Street Improvements Class Environmental Assessment Study for the section from Brant Street to Proudfoot Trail in 2009 in the City of Burlington and the Town of Oakville. The Notice of Study Commencement of this Class EA Study was combined with the notification of a Public Information Centre in November 2009. The Notice was placed on the Region's website and in the following local newspapers (see **Appendix A**):

- Burlington Post: Friday, November 13, 2009 and Friday, November 20, 2009
- Oakville Beaver: Friday, November 13, 2009 and Friday, November 20, 2009
- The Halton Compass: Thursday, November 12, 2009 and Thursday, November 19, 2009

The Notice was mailed to Local and Regional Councillors whose wards were within the limits of the Dundas Street corridor between Brant Street and Proudfoot Trail in the Town of Oakville and City of Burlington, First Nations with potential interest in the study area, Technical Agencies (including federal, provincial and municipal agencies) and utility companies, as well as property owners within the limits of Dundas Street between Brant Street and Proudfoot Trail.

Invitations to participate in a Stakeholders Group were also sent to property owners between Brant Street and Proudfoot Trail (commercial and residential) with direct access to Dundas Street, property owners of large land parcels adjacent to Dundas Street,

representatives of the churches located along Dundas Street, representatives of the adjacent residential communities and representatives of adjacent condominium corporations.

Additional details regarding the notification process are provided in **Appendix A**, and copies of pertinent correspondence are also included in **Appendix A**.

5.1.2 Stakeholders Group Meeting (Brant Street to Proudfoot Trail) – November 12, 2009

A Stakeholders Group was established to provide a smaller forum for discussion and dialogue than is usually accommodated at a public meeting or information centre for the general public. The 19 members of this group that attended provide a reasonable representative mix of people with a variety of interests and from across the study area. Members of the Stakeholders Group were invited to attend an independently facilitated meeting on November 12, 2009 to review the study approach and findings prior to the first public information centre.

The main issue areas raised at the meeting included:

- Potential impact of widening on individual landowners property
- Provision of pedestrian/cycling facilities – type and location
- Pedestrian /cyclist safety
- Provision of transit – type of transit facilities and limits
- Concern with existing and potential future noise levels
- Lower posted speed limit
- Aesthetics of the roadway
- Future hydrology of both north Oakville and north Burlington and impact on stormwater management
- Integration with the other approved planning and designs along Dundas Street
- Timing of construction

Minutes of the November 12, 2009 meeting are included in **Appendix B**. Comments received at the Stakeholder Group meeting were taken into consideration as the study proceeded.

5.1.3 Public Information Centre #1 (Brant Street to Proudfoot Trail) – November 24 and 25, 2009

The purpose of this Public Information Centre (PIC) was to obtain public input after reviewing the study scope and project materials including alternative solutions, environmental considerations and evaluation criteria.

As mentioned in **Section 5.1**, notification of this PIC was combined with the Notice of Study Commencement. Additional details regarding the notification process are provided in **Appendix C.**

PICs were held in both the City of Burlington and Town of Oakville since the overall study limits included both municipalities. The PIC on Tuesday, November 24, 2009 (City of Burlington) initially included an open house between 6:30 p.m. and 7:00 p.m., with a formal presentation at 7:00 p.m. followed by a question and answer period. During the open house, those who attended could review the available display panels and discuss the study with Regional Staff and the Consultants. Due to the low attendance of the PIC held on Wednesday, November 25, 2009 (Town of Oakville), at the preference of the attendees, there was no formal presentation. Attendees had the opportunity to review the display panels and discuss the study with Regional staff and Consultant staff.

Approximately 27 people attended the PICs, with 20 attendees signing in at the November 24th session and 7 attendees signing in at the November 25th session (not including technical agencies).

The main comments / concerns, similar to the above, were as follows:

- Potential impact of widening on individual landowners property
- Provision of pedestrian/cycling facilities – type and location
- Pedestrian /cyclist safety
- Potential impact to existing full access along Dundas Street
- Additional traffic on Dundas Street if roadway is widened
- Provision of turn lanes at specific locations
- Provision of transit – type of transit facilities, limits
- Concern with existing and potential future noise levels
- Lower posted speed limit
- Timing of construction

A summary report of the PIC including a copy of the presentation slides and the comments received is provided in **Appendix C**.

5.1.4 Public Information Centre #2 (Dundas Street Bus Rapid Transit from Brant Street to Trafalgar Road) – June 23, 2011

Since the November 2009 PIC, the Region confirmed the need for a higher order transit facility along the Dundas Street corridor through their Transportation Master Plan. Therefore, the study limits were expanded from "Brant Street to Proudfoot Trail" to "Brant Street to Trafalgar Road".

The purpose of this PIC was to provide an opportunity for members of the public to meet the Project Team, review the study scope and progress and discuss related issues.

The Notice of PIC #2 was placed in the following local newspapers:

- Burlington Post: Friday, June 10, 2011 and Friday, June 17, 2011
- Oakville Beaver: Friday, June 10, 2011 and Friday, June 17, 2011
- The Halton Compass: Thursday, June 9, 2011 and Thursday, June 16, 2011

A copy of the PIC notice is provided in **Appendix C**.

Halton Region notified local and Regional Councillors and senior staff, as well as First Nations. The Notice was also mailed to the following on June 9, 2011: Technical Agencies (including federal, provincial and municipal agencies), utility companies, property owners within the limits of Dundas Street between Brant Street and Trafalgar Road, as well as members of the public who had signed-in at the previous PIC, provided written comments or had requested to be on the study mailing list.

The PIC was held on Thursday, June 23, 2011 at the Halton Regional Centre. The PIC was an open house from 6:30 p.m. to 8:30 p.m.. Those who attended could review the available display panels and discuss the study with Regional staff and its consultants. Approximately 38 people signed in at the PIC (not including staff from technical agencies and Councillors).

Similar to previously, the main comments / concerns were as follows:

- Potential property requirements
- Preference for either curb BRT or median BRT
- Provision of pedestrian / cycling facilities
- Traffic noise levels
- Expected construction timing
- Frequency of bus services
- Reduced posted speed limits
- Early introduction of bus services to Dundas Street
- Integration with transit beyond Oakville and Burlington.

A summary report of the PIC including a copy of the presentation slides and the comments received is provided in **Appendix C**.

5.1.5 Public Information Centre #3 (Dundas Street Bus Rapid Transit from Brant Street to Trafalgar Road) – November 24, 2011

The purpose of this PIC was to provide an opportunity for residents, businesses, agencies and other interested individuals to review the preliminary preferred Bus Rapid Transit (BRT) alternative (curb lane BRT), potential elements of BRT facilities and next steps. This was held as a joint PIC with the Trafalgar Road Class EA Study. For more information regarding the Trafalgar Road Class EA Study, please visit the study website at www.halton.ca/EAprojects.

The Notice of PIC #3 was placed in the following local newspapers:

- Burlington Post: Friday, November 11, 2011 and Friday, November 18, 2011
- Oakville Beaver: Friday, November 11, 2011 and Friday, November 18, 2011
- The Halton Compass: Thursday, November 10, 2011 and Thursday, November 17, 2011

A copy of the PIC notice is provided in **Appendix C**.

Halton Region notified local and Regional Councillors and senior staff, as well as First Nations. The Notice was also mailed to the following on November 10, 2011: Technical Agencies (including federal, provincial and municipal agencies) and utility companies, property owners within the limits of Dundas Street between Brant Street and Trafalgar Road, as well as members of the public who had signed-in at previous PICs, provided written comments or had requested to be on the study mailing list.

The PIC was held on Thursday, November 24, 2011 at the Halton Regional Centre. The PIC was an open house from 6:30 p.m. to 7:00 p.m. Those who attended could review the available display panels and discuss the study with Regional staff and its consultants. A presentation was made from 7:00 p.m. to 7:20 p.m. followed by an independently facilitated question and answer period. Approximately 38 people signed in at the PIC (not including staff from technical agencies and Councillors), of which 33 have identified an interest in the Dundas Street Study.

The main comments / concerns are as follows:

- General support for proposed BRT
- Provision of pedestrian / cycling facilities, cycling tracks
- Traffic noise levels
- Expected construction timing
- Potential increase in noise level as a result of widening / BRT

A summary report of the PIC including a copy of the presentation slides and the comments received are provided in **Appendix C**.

5.1.6 Dundas Street Improvements Newsletter – August 2012

Given the process update in the Dundas Street Improvements Study, a newsletter was prepared outlining the phased implementation approach on Dundas Street to providing incremental transportation improvements (i.e. widening from 4 to 6 lanes with provision for HOV / transit lanes in the interim and the opportunity for dedicated BRT lanes in the future (i.e. 2031)), the current Class EA Study and next steps.

The newsletter was sent to the following on August 27, 2012: Technical Agencies (including federal, provincial and municipal agencies) and utility companies, property owners within the limits of Dundas Street between Brant Street and Trafalgar Road, as well as members of the public who had signed-in at previous PICs, provided written comments or had requested to be on the study mailing list.

A copy of the newsletter is included in **Appendix C.**

5.1.7 Public Information Centre #4 (Dundas Street Class EA Brant Street to Bronte Road) – May 29, 2014

Following the November 2011 PIC #3, the Region confirmed the feasibility of dedicated BRT lanes on Dundas Street between Trafalgar Road and Brant Street and the curb lane BRT option was identified as the preferred option in the future (i.e. 2031).

As noted in **Section 1.1.1**, completing the widening of Dundas Street through Oakville and Burlington will take a number of years, and after meeting with residents, local municipalities, transit authorities and others, further consideration was given to the implementation approach. With the widening of Dundas Street to 6-lanes, there is opportunity to consider the introduction of High Occupancy Vehicle (HOV) curb lanes allowing a mix of transit and private vehicles with two or more occupants. In parallel, active transportation, bus stops and transit priority measures can be provided at key intersections as required. The timing for introduction of HOV lanes / transit improvements is to be determined in consultation with the local municipalities (i.e. Town of Oakville and City of Burlington, which are the transit operators in their respective areas). As transit ridership builds, there is the opportunity to convert the HOV lanes into dedicated bus lanes in the future (i.e. 2031).

Given the above, Halton Region has divided the original study limits from Trafalgar Road to Brant Street into three sections and is carrying out three co-ordinated, but separate Class EA Studies. The first section is from Bronte Road to Proudfoot Trail and the second section is from Neyagawa Boulevard to Oak Park Boulevard, the EA Studies for these sections were completed in December 2012 and November 2013, respectively. The third, and current, section is from Brant Street to Bronte Road.

A PIC was held on May 29, 2014 for the Brant Street to Bronte Road section of Dundas Street to present the preliminary preferred design and collect public input regarding the proposed improvements.

The Notice of PIC #4 was placed in the local newspapers, Oakville Beaver and Burlington Post, on Thursday, May 15, 2014 and Thursday, May 22, 2014.

A copy of the PIC notice is provided in **Appendix C**.

Halton Region notified local and Regional Councillors and senior staff, as well as First Nations. The Notice was also mailed to the following on May 12, 2014: Technical Agencies (including federal, provincial and municipal agencies) and utility companies, property owners within the limits of Dundas Street between Brant Street and Bronte Road, as well as members of the public who have signed-in at previous PICs, provided written comments or had requested to be on the study mailing list.

The PIC was held on Thursday, May 29, 2014 at Tansley Woods Community Centre – Community Rooms 2 and 3. The PIC was an open house from 6:30 p.m. to 8:30 p.m., those who attended could review the available display panels and discuss the study with Regional staff and its consultants. Approximately 39 people signed at the PIC (not including staff from technical agencies).

The main comments / concerns were as follows:

- Inquires about the details related to active transportation facilities (e.g. type of cycling facilities, dimension, crossing at intersection, etc.)
- Safety of students near the high school at Tim Dobbie Drive
- General support for the proposed improvements on Dundas Street
- Potential impacts related to individual properties and businesses

- Increases in traffic noise levels

A summary report of the PIC including a copy of the presentation slides and the comments received is provided in **Appendix C**.

5.1.8 Meetings with Property Owners along Dundas Street

As a result of the widening of Dundas Street, some of the properties that are located directly adjacent to Dundas Street will be impacted (e.g. property requirement, impact to access, etc.). Meetings were arranged with property owners of the following:

- Terra Greenhouse – April 2, 2014
- Tansley YMCA Child Care – April 3, 2014
- St. John's Anglican Church – April 8, 2014
- Eaglesfield Community Church – May 7, 2014
- Millcroft Golf Course – September 12, 2014
- First Student (school bus service)– September 12, 2014
- Nelson Variety – September 12, 2014

Meetings were also held with other residential property owners.

5.1.8.1 Meetings with Terra Greenhouse (2273 Dundas Street)

Terra Greenhouse is located at 2273 Dundas Street, at the intersection of Dundas Street / Eaglesfield Drive, on the north side of Dundas Street. Currently Terra Greenhouse has three accesses from Dundas Street, including one at Dundas Street / Eaglesfield Drive (currently an unsignalized T-intersection). Discussions at the meeting included proposed improvements on Dundas Street (cross sectional elements and features), access to the property, property impacts as a result of Dundas Street widening, parking, signage, drainage, and construction timing.

As a result of the proposed widening of Dundas Street, a raised median will be provided between the westbound and eastbound lanes. The two existing full move accesses to Terra Greenhouse on Dundas Street east of Eaglesfield Drive will become right-in/right-out only and the Dundas Street/Eaglesfield Drive intersection (also an existing full move access) will become a signalized intersection and will continue to provide access to Terra Greenhouse. U-turn movements will be facilitated at the Dundas Street / Eaglesfield Drive intersection. The parking area will have to be reconfigured as a result of the Dundas Street widening as well as changes in the accesses. Configuration of the parking area will be subject to discussion with the property owner during detailed design.

In the proximity of Terra Greenhouse, bus stops are proposed at Eaglesfield Drive (eastbound – far side station, westbound – near side station). The westbound near side station is to avoid impact to the existing (and only) access to the property at 2217 Dundas Street, which is immediately to the west of Terra Greenhouse.

A copy of the meeting minutes can be found in **Appendix B**.

5.1.8.2 Meetings with Tansley YMCA Child Care (4426 Dundas Street)

Tansley YMCA Child Care is located on the south side of Dundas Street west of Appleby Line. Discussions at the meeting included proposed improvements on Dundas Street (cross sectional elements and features), access to the property, general usage of the facility and construction timing.

The existing full move access from Dundas Street will become right-in/right-out only. U-turns will be permitted at signalized intersections; Dundas Street / Appleby Line and Dundas Street / Millcroft Park Drive intersections are the closest signalized intersections to Tansley YMCA Child Care. There will be no direct physical property impact to Tansley YMCA Chile Care. Representatives of Tansley YMCA Child Care are in general support of the proposed improvements on Dundas Street.

A copy of the meeting minutes can be found in **Appendix B**.

5.1.8.3 Meeting with St. John's Anglican Church (2464 Dundas Street)

St. John's Anglican Church is located on the south side of Dundas Street west of Guelph Line. Discussions at the meeting include proposed improvements on Dundas Street (cross sectional elements and features), access to the property, reconstruction of access to the church and impacted parking area, provision of retaining walls to minimize property impact, drainage concerns and construction timing.

The existing full move access from Dundas Street will become right-in/right-out only. U-turns will be permitted at signalized intersections; Dundas Street / Guelph Line intersection is the closest signalized intersections to St. John's Anglican Church. Representatives of St. John's Anglican Church are in general support of the proposed improvements on Dundas Street.

The Region will work with the Church during detailed design to configure and better delineate the existing parking area that is gravel (will not include the overflow grassed parking area).

One of the major concerns identified by St. John's Anglican Church was drainage and flooding issue in the parking area. Representatives of St. John's Anglican Church indicated this has been an issue since the widening of Dundas Street from 2 to 4 lanes.

A copy of the meeting minutes can be found in **Appendix B**.

5.1.8.4 Meeting with Eaglesfield Community Church (2501 Dundas Street)

Eaglesfield Community Church is located in the southeast quadrant of Dundas Street / Eaglesfield Drive intersection; currently an unsignalized T-intersection at Dundas Street. Discussions at the meeting included proposed improvements on Dundas Street (cross sectional elements and features), access to the property, provision of retaining walls to minimize property impact, and construction timing.

A signal will be provided at this intersection as part of Dundas Street improvements. Current access to Eaglesfield Community Church is on Eaglesfield Drive and will remain the same with the widening of Dundas Street. However, access to the property immediately east of the church parking (i.e. where the existing soccer field is located) from Dundas Street will become right-in/right-out only due to the raised median. U-turn

will be permitted at signalized intersections; Eaglesfield Drive and Blackwood Drive will be the closest signalized intersections).

In the proximity of Eaglesfield Community Church, bus stops are proposed at Eaglesfield Drive (eastbound – far side station, westbound – near side station).

There will be some property requirement along the Dundas Street frontage of the property, both adjacent to the soccer field and the parking area, including day-lighting for the Dundas Street / Eaglesfield Drive intersection. It is recognized that the existing parking area for the church is being fully utilized on Sundays, and to avoid impacts to the parking area due to grading and the proposed bus stop, a retaining wall is proposed along the parking lot area adjacent to Dundas Street.

A copy of the meeting minutes can be found in **Appendix B**.

5.1.8.5 Meeting with Millcroft Golf Course (2155 Country Club Drive)

Millcroft Golf Club is located south of Dundas Street. Access to the maintenance facility to the golf course is located on Dundas Street, approximately 200 m west of Millcroft Park Drive. Hole 12 and Hole 13 of the golf course are located on the west and east side of Millcroft Park Drive, respectively. Access between the two holes require crossing of Millcroft Park Drive at Dundas Street.

Discussions at the meeting included proposed improvements on Dundas Street (cross sectional elements and features), access to the property, relocation of existing privacy wall, and construction timing.

In the proximity of Millcroft Golf Course, an eastbound bus stop is proposed on the far side of Millcroft Park Drive where Millcroft Golf Course fronts Dundas Street. A 3 m multi-use path would pass behind the bus shelter at the bus stop. Millcroft Golf Course's existing wooden privacy wall follows the existing property line. A portion of this privacy wall will be relocated or replaced to accommodate the bus shelter and multi-use path. Existing signage for Millcroft Golf Course at the proposed bus stop will likely be relocated also.

There will likely be limited operational impact to the south cross-walk at Millcroft Park Drive. Golfers (and carts) will be able to continue using this intersection for transitioning between Holes 12 and 13.

Due to the future raised median on Dundas Street, Millcroft Golf Course's maintenance entrance west of Millcroft Park Drive will become right-in/right-out only. Other movements can be accomplished via U-turn at Millcroft Park Drive or Tim Dobbie Drive.

A copy of the meeting minutes can be found in **Appendix B**.

5.1.8.6 Meeting with First Student (5401 Dundas Street)

The property of First Student is located on the north side of Dundas Street west of Tremaine Road. The property is currently being used for the operation of school buses, serving the Halton Regional School Board, French schools and other private contracts.

Discussions at the meeting included proposed improvements on Dundas Street (cross sectional elements and features), access to the property, property impacts, existing and future operation of the property, and construction timing.

Due to the widening of Dundas Street and to accommodate the 50 m right-of-way, approximately 3.8 m along the frontage of the property would be required.

A copy of the meeting minutes can be found in **Appendix B**.

5.1.8.7 Meeting with Nelson Variety (2495 Dundas Street)

Nelson Variety is located on the north side of Dundas Street west of Guelph Line and it is a local variety store with direct access to Dundas Street. There is limited parking on the property and parking routinely spills onto the Dundas Street shoulder.

Discussions at the meeting included proposed improvements on Dundas Street (cross sectional elements and features), access to the property, existing and future operation of the property, and construction timing.

While there will be no notable property requirements from Nelson Variety, a curb will be introduced as part of the Dundas Street improvements and would affect existing parking which is partially within the Region's right-of-way. The consideration of a parking easement between the property owner and Halton Region may be considered during detailed design.

Access to the property will become right-in/right-only due to the raised median. U-turns will be permitted at signalized intersections; Dundas Street / Guelph Line and Dundas Street / Blackwood Drive will be the closest signalized intersections. A sidewalk connecting the property to the nearby westbound bus station at Guelph Line will be provided.

Representatives of Nelson Variety are in general agreement with the proposed improvements on Dundas Street.

A copy of the meeting minutes can be found in **Appendix B**.

5.2 Technical Agencies

A number of meetings were held with technical agencies and are documented in this section. The three technical agency workshops were joint meetings for the Dundas Street and Trafalgar Road Improvements Studies.

5.2.1 Technical Agencies Meeting

5.2.1.1 Technical Agencies Meeting (November 24, 2009)

An independently facilitated technical agencies meeting was held on November 24, 2009 to review and receive input regarding Dundas Street Class EA (limits between Brant Street and Proudfoot Trail) study approach, problems and opportunities being addressed, background information and development of alternatives.

Representatives from the following technical agencies attended the meeting: Niagara Escarpment Commission, Conservation Halton, Town of Oakville (Parks and Open Space, Engineering and Construction, Planning Services – Heritage, and Sustainable

Transportation), Oakville Transit, as well as City of Burlington (Engineering, Planning & Building). Key comments from the respective agencies are noted in the table below.

Agency	Comments
Niagara Escarpment Commission	• Noted that a transitway is proposed along Highway 407 and whether that would impact the potential ridership of the Dundas Street BRT.
Conservation Halton	• Inquired if opportunities to provide flood-free access up to the Regional Storm will be considered if Dundas Street is an Emergency Route. • Inclusion of natural hazards as part of the evaluation criteria. • Ensure that floodplain issues can be addressed as part of the development of alternatives.
Town of Oakville	• Types of BRT facility being considered. • Types of active transportation facility to be provided. • List of heritage properties will be identified.
City of Burlington	• Inquired about study process and timeline. • City of Burlington Cycling Master Plan has been finalized.

Minutes from the Technical Agencies Meeting are included in **Appendix B**.

5.2.1.2 Workshop #1 (March 3, 2011)

The first Technical Agencies Workshop was held on March 3, 2011 and was conducted as a joint meeting for the Dundas Street and Trafalgar Road Improvements Studies to discuss Bus Rapid Transit (BRT) principles and implementation, approach to ridership forecasting, constraints and opportunities analysis for BRT on Dundas Street and Trafalgar Road, development of alternatives and preliminary impact assessment. This was an independently facilitated session.

Presentations used at the Workshop and the meeting notes are included in **Appendix B**.

Technical agencies that attended the Workshop included: Ministry of Transportation, Town of Oakville, Oakville Transit, City of Mississauga, City of Burlington, Burlington Transit, Conservation Halton, and Metrolinx.

Key discussions amongst the technical agencies included:

- Assumptions used in the transit ridership forecast (e.g. limits of the catchment area, whether High Occupancy Vehicle (HOV) lanes on the QEW have been accounted for, etc.)
- Cross sectional elements (e.g. provision for pedestrians and cyclists, median vs. curb BRT, etc.)
- Opportunities to identify early improvements to transit ridership.

5.2.1.3 Workshop #2 (May 12, 2011)

The second independently facilitated Technical Agencies Workshop was held on May 12, 2011 and was conducted as a joint meeting for the Dundas Street and Trafalgar Road Improvements Studies to discuss ridership forecast, BRT curb vs. median comparison factors and urban design.

Presentations used at the Workshop and the meeting notes are included in **Appendix B**.

Technical agencies that attended the Workshop included: Ministry of Transportation, Town of Oakville, Oakville Transit, City of Mississauga, Mississauga Transit, City of Burlington, Burlington Transit, 407 ETR, Conservation Halton, and Metrolinx.

Key discussions amongst the technical agencies included:

- Findings of the transit ridership forecast (e.g. whether a system-wide calculation was completed on the costs associated with achieving the modal split, comparative travel times between a BRT system and the GO system, any notable "gaps" in the analysis, etc.)
- Proposed BRT route configuration, station locations and / or service levels, and potential means of increasing BRT ridership
- Key messages to convey to the public regarding BRT
- Landscape opportunities between curb and median BRT

5.2.1.4 Workshop #3 (November 16, 2011)

The third independently facilitated Technical Agencies Workshop was held on November 16, 2011 and was conducted as a joint meeting for the Dundas Street and Trafalgar Road Improvements Studies to discuss transit service concept, outcomes of ridership forecast, BRT evaluation, cost and staging, corridor development including station amenities and streetscape opportunities.

Presentations used at the Workshop and the meeting notes are included in **Appendix B**.

Technical agencies that attended the Workshop included: Town of Oakville, Oakville Transit, City of Mississauga, Mississauga Transit, City of Burlington, Burlington Transit, 407 ETR, Conservation Halton, and Metrolinx.

Key discussions amongst the technical agencies included:

- Coordination between transit operators, and GO Transit initiatives and programs
- Provision of transit priority measures
- Details related to station location, investment strategies, and service assumptions and ridership forecast
- Curb vs. Median BRT evaluation – advantages and disadvantages
- Cost assumptions and staging
- Details related to station amenities (major and minor stations)
- Streetscape opportunities and urban design

5.2.1.5 Technical Agencies Meeting (May 14, 2014)

A Technical Agencies Meeting was held on May 14, 2014 to discuss the current section of Dundas Street EA from Brant Street to Bronte Road, and to review the preliminary plan, key issues associated with this section and input from the respective technical agencies.

Representatives from the following technical agencies attended the meeting: Halton Region Planning Services, Halton Agricultural Advisory Committee, City of Burlington, Burlington Transit, 407 ETR, Bronte Creek Provincial Park, Burlington Fire Department, Halton District School Board, Oakville Hydro, and GO Transit. Key comments from the respective agencies are noted in the table below.

Agency	Comments
City of Burlington	• Active transportation facility on Dundas Street between Brant Street and Northampton Boulevard • Safety of cyclists
Oakville Hydro	• Impact to existing hydro poles
Halton Agricultural Advisory Committee	• Ability to accommodate farming equipment on Dundas Street
Halton Region Planning Services	• Future land uses • Tree-Canopy Replacement policy
Bronte Creek Provincial Park	• Expansion of Bronte Creek Provincial Park north of Dundas Street • Species At Risk is an important issue
Halton District School Board	• Safety of student crossing Dundas Street
Burlington Fire Department	• Raised medians and ability for emergency vehicles to cross the road from one direction to another.

Minutes from the Technical Agencies Meeting are included in **Appendix B**.

5.2.2 City of Burlington / Burlington Transit and Town of Oakville / Oakville Transit

Given that the study area is located within the City of Burlington and the Town of Oakville, the City of Burlington and Burlington Transit, as well as The Town of Oakville and Oakville Transit have been four key agencies participating throughout the EA Study to ensure consistency with planning in the City and the Town.

A total of three meetings were held with Town of Oakville / Oakville Transit to completion of the EA documentation and will continue into subsequent design and construction. Meetings for the subject section were held on: January 21, 2011, April 13, 2011, May 31, 2012 and March 11, 2014.

A total of five meetings were held with the City of Burlington and Burlington Transit to completion of the EA documentation and will continue into subsequent design and construction. Meetings were held on: January 21, 2011, April 13, 2011, October 19, 2011, March 11, 2014 and May 8, 2014.

There will be ongoing consultation with the City of Burlington and Burlington Transit, as well as with the Town of Oakville and Oakville Transit during detailed design.

5.2.3 Conservation Halton, Ministry of Natural Resources and Forestry and Niagara Escarpment Commission

Recognizing the importance of retaining natural features throughout the study area and ensuring planning was carried out to minimize impacts, Conservation Halton was considered to be a key agency and was provided several opportunities to provide input during the study on the subject section.

Meetings were held on April 16, 2010, July 19, 2011, August 30, 2011 (site meeting), September 22, 2011 (site meeting), March 13, 2014, June 2, 2014, September 29, 2014 and December 8, 2014, as referenced in **Section 1.5.4**. All meeting minutes are included in **Appendix B**.

Early meetings (April 16, 2010 and July 19, 2011) with Conservation Halton included discussion of key natural environment features along the Dundas Street corridor and drainage features. Two site meetings were held – one focused on the Bronte Creek Valley west of Tremaine Road and the other was a site walk along selected sections of the Dundas Street corridor.

The second site meeting was held on September 22, 2011 to discuss key natural environment features and drainage features along the Dundas Street corridor from Trafalgar Road to Brant Street (not including Bronte Creek valley as is has been covered in the previous site visit). Notable water crossings between Brant Street and Bronte Road include: Fourteen Mile Creek Tributary (west of Colonel William Parkway), Sheldon Creek, Shoreacres Creek Tributaries, Appleby Creek, Tuck Creek, and Black Walnut/Regulated Area.

At the March 13, 2014, June 2, 2014 and September 29, 2014 meetings, of which representatives of the Ministry of Natural Resources and Forestry (Ontario Parks at the March 13 and June 2, 2014 meetings only) were in attendance, the focus was to discuss key natural environment features and issues between Brant Street and Bronte Road. Details related to the stormwater management strategy were discussed and an update of the natural environment existing conditions was provided for this section of Dundas Street. Niagara Escarpment Commission also attended the March 13 and June 2, 2014 meetings.

At the December 8, 2014 meeting, of which representatives of the Ministry of Natural Resources and Forestry were in attendance, the focus of the meeting was to discuss with and review the proposed work at Culvert 22 and Culvert 23 (Fourteen Mile Creek), and overall stormwater management and fluvial geomorphic recommendations associated with the Dundas Street Class EA Study.

Conservation Halton was provided with an opportunity to review the draft Environmental Study Report and their comments have been incorporated.

5.2.4 Constructability Workshop (September 23, 2014)

Recognizing the sensitivity of the Bronte Creek crossing and the technical challenges associated with the widening of Tansley Bridge, a Constructability Workshop was held on September 23, 2014. The purpose of the Workshop was to discuss issues associated with constructability for the widening of Tansley Bridge. The Constructability Review was undertaken in a Workshop environment that included a team of experts (e.g.

construction specialists, as well as geotechnical and steel erection specialists) who were predominately independent of the Project Team. Representatives from Conservation Halton and Halton Region attended.

The following represent a summary of the most significant findings and issues discussed at the Workshop. A copy of the Constructability Report can be found in **Appendix L**.

- ***Dundas Street Lane Closures:*** The ability to enact short-term lane closures on Dundas Street during the widening of Tansley Bridge will significantly reduce the impacts on the environmentally sensitive creek valley, as well as reduce construction costs and duration. Potential timeframe for lane closure and the potential for single lane operations were discussed taking into consideration Halton Region policy.
- ***Construction Staging and Property Access:*** The construction for the widening of Tansley Bridge can generally be accommodated in four stages (see **Section 6.1.8.3**). The Constructability Review Team confirmed that the staging proposed is feasible, provided there would be sufficient access to the work areas and facilitated the erection of the new steel girders and demolition of the existing truss structure when the lane closure allowances are considered.
- ***Structural Steel – Girder Erection:*** Various alternatives for erecting the new steel girders were discussed. Erecting the new steel girders from the existing north structure was deemed to be the most cost effective alternative. It would also minimize the environmental impacts to the creek valley.
- ***South Structure Deck and Truss Demolition:*** The existing south structure is to be removed in its entirety except for its foundations. It is recommended that the specifications associated with the removal of the concrete deck include constraints that would prohibit contractors from dropping any of the bridge deck materials or the effluent from cutting the concrete deck into the creek valley. Upon completion of the deck removal, the existing steel trusses would be fully exposed and ready for removal.
- ***South Structure Pier Demolition***: The potential use of the concrete from the demolished south structure pier was discussed (e.g. rock protection and or rip-rap steep valley slopes, etc.) Reuse of the concrete within the valley would result in a more cost effective design.
- ***South Structure – East Abutment Removal***: The impacts of the removal of the existing east abutment and its footing, as well as the potential long term stability of the steep east valley slope were discussed. Difficulties in accessing the slope may make if impractical to install further slope stability measures. It is therefore recommended that much of the existing east abutment be maintained
- ***South Structure Pier Footing Demolition:*** The need to remove the massive existing footings of the south structure piers revolves around the ability to construct the new piers and their foundations. That is directly related to the configuration of the new pier foundations. Based on the available information at the time of the workshop (which did not include any new project specific foundations investigations), it was agreed that large diameter caissons drilled into the shale bedrock were the most feasible and cost effective means of founding the new piers.

- ***Valley Access:*** Access to the valley with heavy equipment and trucks will be necessary for a host of reasons. Recognizing the environment and topographic constraints associated with the Bronte Creek Valley, it was agreed that access to the valley from the northwest quadrant of Tansley Bridge would be most suitable.
- ***East Pier Construction:*** Access to the east bank of the creek will be necessary to construct the new east piers (and their foundations) and to remove the existing south pier. Access to the north and the south of the existing piers will be required for light and heavy vehicles including light cranes, a caisson boring rig, excavators, tandems and possibly concrete ready-mix trucks. However, to reduce costs and environmental impacts, only a single temporary creek crossing is envisioned.
- ***Bronte Creek Crossing:*** Based on discussion at the Workshop, and from a construction access perspective, it was preferable that the temporary creek crossing be constructed well south of the existing bridge, potentially outside of the existing right of way. By constructing the temporary bridge well away from existing piers and the new pier construction, access to the east side is not constrained by any pier construction or demolition activities that might otherwise occur right at the end of the temporary bridge if it was constructed directly below the existing bridge.
- ***Stormwater Management***: Conservation Halton stated that there is precedent for runoff in other low-impact developments for at least an 80 percent removal of total suspended solids from storm water. See **Section 6.1.6** regarding drainage and stormwater management for the overall Dundas Street corridor, including areas in the proximity of Tansley Bridge.

Through the Constructability Workshop, it is confirmed that the proposed widening and construction of Tansley Bridge (two lanes to the north) is feasible. Additional details regarding construction methodology, geotechnical investigation, environmental mitigations, permits, etc., will be determined during detailed design.

5.2.5 Halton Regional Police Service

A meeting was held with the Halton Regional Police Service on January 12, 2012 to discuss the planning at that time which focused on initial implementation of dedicated bus lanes (not HOV). A copy of the meeting notes is included in **Appendix B**. This was a joint meeting for both the Dundas Street and Trafalgar Road Improvement Studies.

Halton Regional Police Service noted preference to have multi-use paths on both sides of the road. They also noted concern about U-turn moves at signalized intersections and stressed that geometry, signing and special signals should be examined. Potential vandalism at bus stops and other security issues should be investigated to determine the types of features to be incorporated at the stops.

5.2.6 First Nations

As noted in **Sections 5.1.1**, **5.1.3**, **5.1.4**, **5.1.5**, and **5.1.6**, First Nations were notified of the commencement of this study and also notified and invited to attend all Public Information Centres. Letters provided to First Nations and correspondences from First Nations are included in **Appendix A**.