

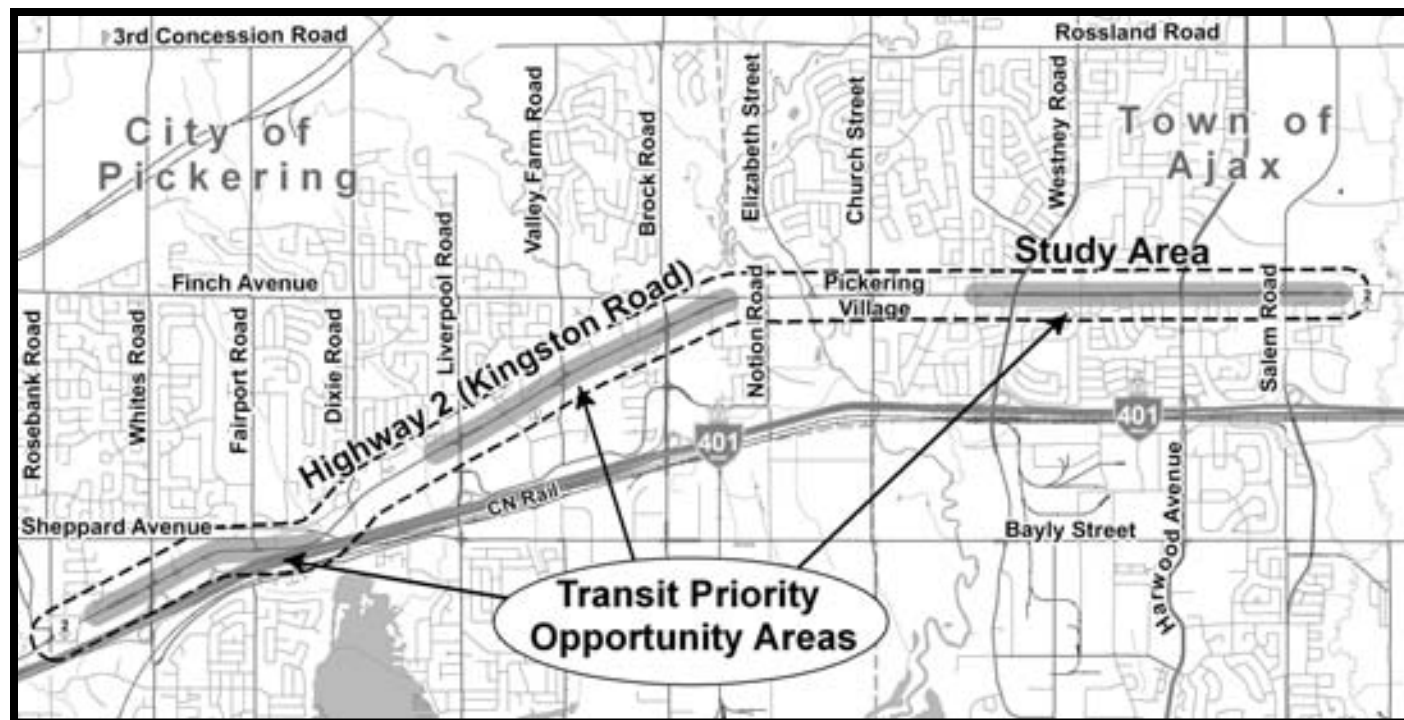
## Executive Summary

### ENVIRONMENTAL ASSESSMENT STUDY AND REPORT

The Regional Municipality of Durham (Durham Region) initiated this Class Environmental Assessment (EA) Study in 2011 to plan for Bus Rapid Transit and implement initial modifications to Highway 2 through the City of Pickering and the Town of Ajax necessary for Highway 2 (Kingston Road in Ajax and Pickering) to accommodate future traffic and transit services, as envisaged in Durham Region's Long Term Transit Strategy (LTTTS) implementation plan. The LTTTS report provided input into this Class EA study including the need and justification for the operation of a rapid transit service along the Highway 2 corridor and the feasibility of a rapid transit line in the Highway 2 corridor by widening the pavement for an ultimate median transitway.

This Class EA study assessed initial measures (roadway modifications) to implement Bus Rapid Transit in the study area and determined the form of modifications within three transit priority opportunity areas along Highway 2 (see **Exhibit ES1** below), with the purpose of optimizing transit service. This Environmental Study Report includes the development of the preliminary design for the proposed modifications. The detail design component of this project follows the filing of the Class EA.

#### Exhibit ES1: Study Area with Transit Priority Areas



This study considered and built upon previous studies and policy documents relating to Highway 2 including:

- Durham Regional Official Plan

- Growing Durham Study (ROPA 128)
- Durham Region Transportation Master Plan
- Durham Region Long Term Transit Strategy
- Regional Cycling Plan
- City of Pickering Official Plan
- City of Pickering Kingston Road Corridor Transformation Study
- City of Pickering Bikeway & Trail Master Plan
- Town of Ajax Official Plan
- Town of Ajax Transportation Master Plan
- Town of Ajax Pedestrian and Bicycle Master Plan (Walkable + Bikeable Ajax)

Some of the key challenges identified for the Highway 2 corridor include:

- Provision for all modes of travel in the corridor including automobiles, trucks, transit, pedestrians and cyclists;
- Provision of access to adjacent existing and planned commercial, institutional and residential developments;
- Consideration of aesthetics, streetscape, safety, noise, air quality, property impacts and other community issues;
- Recognition of transit opportunities along Highway 2; and
- Planned levels of population and employment growth for determination of future travel demand.

The following tasks were undertaken as part of this Class EA Study:

- Examined potential roadway modifications designed to enhance transit service along Highway 2 in three transit priority opportunity areas in the City of Pickering and the Town of Ajax in advance of corridor-wide Bus Rapid Transit roadway modifications;
- Advanced Stage 1 of Durham Region's transit vision as recommended in the LTTTS, including Bus Rapid Transit in the near term by implementing road improvements at key intersections in the City of Pickering and the Town of Ajax. The six key intersection locations along Highway 2 are at Whites Road, Liverpool Road, Brock Road, Westney Road, Harwood Avenue and Salem Road.
- Understanding and not compromising the long term vision for the corridor as recommended in Stages 2 and 3 of the LTTTS:
  - Stage 2 – Bus Rapid Transit<sup>1</sup> (medium-term): Can serve up to 3,000 passengers per hour (each direction) on dedicated lanes in Pickering, Ajax, Whitby, Oshawa and Clarington.
  - Stage 3 – Light Rail Transit<sup>2</sup> (LRT) (long-term): LRT identified as the mode of choice, based on ridership demand and growth potential.
- Identified technical, environmental and stakeholder issues, concerns and constraints associated with the provision of additional corridor capacity within the project limits;
- Identified a broad range of planning alternatives that recognize the contribution of various modes of travel (e.g. transit, walking, cycling, auto);
- Completed an assessment of alternative planning solutions and design concepts with regard to the comments, concerns and values of the public and affected agencies/Ministries, and advancing the Region's long term transit vision as documented in the LTTTS;

<sup>1</sup> Bus Rapid Transit (BRT) is a higher capacity transit system using buses that reduces travel times compared to typical local bus service.

<sup>2</sup> Light Rail Transit (LRT) is lightweight passenger rail cars operating on fixed rails in the right-of-way. LRT has most of the same technologies and amenities as BRT but is electric, can operate at higher speeds, and can accommodate more passengers than BRT.

- Identified measures needed to mitigate impacts and public concerns associated with the recommended modifications;
- Prepared a preliminary design for the preferred alternative design; and
- Prepared an Environmental Study Report that documents all stakeholder input and comments and complies with the requirements of the Municipal Class Environmental Assessment, June 2000, as amended in 2007 and 2011, for Schedule C undertakings.

This EA seeks to provide EA approval for widening of Highway 2 (Kingston Road) from four to six lanes within the Transit Priority Opportunity areas shown on Exhibit ES1.

This ESR documents the planning and decision making process, including consultation, which was followed to arrive at the preferred design. The ESR also sets out mitigating measures proposed to avoid or minimize environmental impacts both during and after construction.

Specifically, this ESR documents:

- the background to the study;
- the consultation process;
- the need and justification for the study;
- description of existing conditions;
- development, analysis and evaluation of the alternative solutions and design concepts;
- description of the preferred design; and
- monitoring and mitigation during and after construction.

## **CONSULTATION APPROACH**

The involvement of the community – residents, stakeholders, agencies and those who may be potentially affected by a project – is an integral part of the Class EA process. Prior to commencing this study, a Communications and Consultation Plan was developed that identified several strategies and techniques to engage area residents and stakeholders during the Class EA study. The Plan identified several techniques to make the public aware of the project (communications) and engage them in decision-making through committees, meetings and other events (consultation). The Plan is provided in **Appendix A-1**. Highlights of the communications and consultation strategies and techniques used during the Class EA study included:

- Two Public Information Centres in Ajax and Pickering
- Establishment of a Project Steering Committee including Durham Region, Ajax and Pickering
- Establishment of a Project Review Team including Durham Region, Ajax, Pickering, utilities, Toronto Region Conservation Authority, provincial agencies and stakeholder groups
- Classroom Project with Grade 6 students from William Dunbar Public School in Pickering and Grade 5 students from Roland Michener Public School in Ajax
- Meetings with Accessibility Advisory Committees of Durham Region, Pickering and Ajax
- Consultation with the cycling community
- Meetings and dialogue with property owners directly impacted by the recommended design
- Creation of a dedicated project website
- Public Notices
- Consultation with Aboriginal communities

The main areas of concern raised by the public related to property impacts, entrance modifications, traffic operations and safety, and environmental impacts such as noise. These issues have been addressed throughout the EA Study process and documented in this ESR.

## **PROBLEM AND OPPORTUNITY STATEMENT**

Funding totalling \$25.4 Million has been committed by the Province of Ontario, through Metrolinx under the MoveOntario 2020 Quick Win funding plan, towards implementation of roadworks for improved transit along the Highway 2 corridor, connecting Oshawa to the existing transit (TTC) in the City of Toronto. This money is targeted towards implementing the Stage 1 intersection modifications that are identified in the LTTS. This EA assesses road widening alternatives within three segments along Highway 2 in Ajax and Pickering (see Exhibit ES1 above) with the purpose of optimizing transit service through the most critical intersections that do not currently have sufficient capacity to accommodate frequent reliable transit services associated with a BRT service. This Quick Win funding is an opportunity sufficient to construct road widenings at up to six major intersection locations within the three segments.

Phase 1 of the Municipal Class EA process involves the identification of the problem and opportunity. By 2021, population and employment growth in Durham Region is forecast to increase travel demands in the southern communities and in particular within the Ajax / Pickering area. As noted previously, at current transit mode shares for local transit trips, the AM peak hour congestion crossing the Brock Road screenline is forecast to increase, with the total screenline v/c ratio slipping from 0.74 in 2010 to 0.90 by 2021. This can be restated as: For the given road capacity on east - west roads (Bayly, Hwy 401, Hwy 2, Rossland Road/Concession 3, Taunton Road), the forecast number of vehicle trips passing Brock Road each weekday morning will increase by 2021 to 90% of the roadway capacity. At this level of congestion, stop and go traffic will be very common in the towards Toronto direction for most weekday mornings, and any incident affecting capacity, such as a collision or lane blockage, will cause significant gridlock. Continued growth in travel demand on the Highway 2 corridor is a problem.

Forecasts from the Durham Region transportation model suggest that improved transit service frequency on the Highway 2 corridor, associated with the Quick Win implementation, can improve transit ridership by 130% on Highway 2. At these ridership levels, combined with planned road network improvements in the study area, the Brock Road screenline would be expected to perform at a v/c ratio of 0.84 by 2031, only moderately worse than today. This potential benefit of improving transit service along Highway 2 is an opportunity.

The current operation of the signalized intersections along Highway 2 is very close to capacity and thus it is difficult to reallocate “green time” to provide improved bus service in the corridor. If road widenings, as proposed by this study, are implemented, then it will be more feasible to provide transit priority through these key congested intersections in the study area. Transit priority becomes more critical as bus service is improved to encourage more transit usage in the corridor. Utilizing intersection widenings to enhance transit service is an opportunity.

The LTTS has recommended a long term vision for transit on Highway 2 and across the Region of Durham. The LTTS provides a detailed review of the problem, the opportunity and the longer term vision for transit service improvements across Durham Region, but also generally applicable to Highway 2.

The problems identified in the LTTS include:

- Transit service's quality, speed and reliability are being negatively impacted by existing traffic congestion.
- Travel demands will increase with population and employment growth resulting in increased traffic congestion.
- The existing infrastructure cannot accommodate future traffic demands and traffic delay conditions are expected to continue to worsen.
- Even with planned road improvements identified in the Region's capital plans and growth initiatives, existing transportation deficiencies are expected to worsen by 2021, and over the next 20 years.
- The current municipally-based bus routes and network structure does not support or encourage inter-municipal travel within the Region by transit although the demand for inter-municipal trips within the Region is very high.
- The Region lacks active transportation infrastructure such as on-road cycling facilities and pedestrian pathways.

In addition to the broader transit network improvements recommended in the LTTS report, the Highway 2 corridor has been identified for implementation of future rapid transit by widening the pavement for an exclusive median Light Rail Transit system.

The purpose of this Highway 2 Transit Priority Measures Schedule C Municipal Class Environmental Assessment (Class EA) study is to plan for and implement initial improvements to Highway 2 through Pickering and Ajax necessary for Highway 2 to be able to provide an enhanced level of transit service to accommodate future traffic and transit demands, and build ridership to support the future ultimate transit vision as expressed in the LTTS long-term implementation plan. Given the current capacity constraints in the Highway 2 corridor and at key intersections along Highway 2, one logical way to provide an enhanced level of transit service is to incorporate a widening of the Highway 2 corridor in accordance with the previous recommendations outlined in the LTTS and the Durham Region Transportation Master Plan. This widening will provide for improved capacity for both transit and auto traffic, such that improved transit service levels can be provided.

The primary purpose of this Class EA study is to examine the most appropriate short term widening configuration suitable for implementation at discrete intersection locations, which best balances the need for improved transit service and reliability with the need to continue to move large volumes of local and inter regional traffic along the Highway 2 corridor.

## **ALTERNATIVE SOLUTIONS**

Three alternative solutions were developed to address the problems and opportunities identified along Highway 2 including:

### **Alternative 1 – Do nothing**

- Comprises no physical and/or operational changes to the Highway 2 corridor within the study area. It assumes those planned improvements identified in the Region's TMP excluding the widening of Highway 2. The Do Nothing alternative was included to provide a benchmark for comparison of other alternatives although it was determined that this alternative would provide no appreciable improvements to traffic capacity and operations along Highway 2.

### **Alternative 2 – Widen Highway 2**

- Widen Highway 2 to six lanes with the lane arrangement and use of the new lanes to be determined in the assessment of design alternatives (e.g. bus only, HOV or mixed traffic).

### **Alternative 3 – Widen another corridor in Durham Region**

- Includes road or transit improvements to one or more parallel routes such as Bayly Street or Rossland Road.

Discussion of the outcome of evaluation of these alternative solutions follows, in addition to discussion on another means of reducing peak hour demand for road infrastructure, namely Transportation Demand Management.

#### Role of TDM & Active Transportation

Although not studied as a stand alone alternative solution, the implementation of enhanced Transportation Demand Management (TDM) measures and policies / infrastructure to support Active Transportation (walking & cycling) were key components of the recommended strategies contained with the Durham Region Transportation Master Plan and the Durham Long Term Transit Strategy. Both studies recognized the role that these types of initiatives can contribute to a better balance between auto and non-auto use in the community and can also help to support improved transit ridership.

The Transportation Master Plan recommended an aggressive TDM program aimed at achieving a 15% reduction in auto demand by 2031. Measures, such as the Region's participation in the Smart Commute Program, which promotes and facilitates ride sharing / car pooling, have already been initiated to begin this process of change and to encourage more awareness of alternative modes of travel in the Region. Both studies recognized, however, that these measures on their own would not be sufficient to address future travel demands. Currently, only about 10% of morning peak hour car trips have more than one person in the vehicle.

#### Widening Highway 2

The Highway 2 corridor provides the best integrated solution for implementation of the Quick Win transit priority improvements intended to build ridership and reduce auto use. The widening of Highway 2 through key intersections incorporates capacity improvements where they are most needed, as the majority of the key Highway 2 intersections are operating at or over capacity during peak periods. The widening of Highway 2 will allow for the introduction of a continuous DRT transit service to replace the current GO bus route serving portions of Highway 2, and will allow for improved transit frequency and improved service to generate new riders in preparation for a transition to the longer term LTTS vision of median LRT along Highway 2. The widening of Highway 2 to incorporate enhanced transit is consistent with the recommendations of the LTTS and the Durham Region TMP. The introduction of Rapid Transit on the Highway 2 corridor will result in enhanced transit service on the corridor with the highest ridership potential of the various corridors tested in the LTTS study.

#### Widening Alternate Roads

The LTTS study evaluated the transit demand that would utilize service on various arterial road corridors such as Bayly Street and Rossland Road. Neither of these corridors provided as much transit demand as the Highway 2 corridor, and a continuous service would be difficult to implement along Rossland Road given the discontinuous nature of this roadway through Pickering. As a result, other roads would not have the same ability to serve the Region's future transit needs as a widening of Highway 2 for transit priority. The widening of alternative roadway corridors, in advance of widening Highway 2, is not compatible with the Long Term Transit Strategy and the Transportation Master Plan.

The local municipalities have established policies to encourage intensification and a mix of land uses in the Highway 2 corridor, all of which support and are supported by rapid transit. Other parallel corridors have built up over time as mature residential neighbourhoods or other lower density land uses and would not be as suitable for intensification.

The alternative solutions were evaluated by the Project Steering Committee and reviewed with the Project Review Team and the public (at Public Information Centre #1). The assessment of the solutions, including review of input received, resulted in selection of the widening of Highway 2 to six lanes with the lane arrangement and use of the new lanes to be determined in the assessment of alternative designs (e.g. mixed traffic, HOV or bus only curbside widening or bus only median widening) as the selected alternative solution.

It is recognized that this EA is the first step in advancing the rapid transit service vision on Highway 2 as proposed in Region's LTTS. The LTTS identified Highway 2 as the highest priority rapid transit corridor in the Region and recommended a staged approach, as described above.

Following the decision to adopt widening Highway 2 to six lanes as the preferred alternative solution, this EA examines alternative design concepts for the widening of Highway 2 at discrete locations within 3 segments in Ajax and Pickering (in advance of corridor-wide roadworks).

## **ALTERNATIVE DESIGN CONCEPTS**

Four alternative designs were evaluated for the preferred solution of widening Highway 2 at discrete locations within the study area:

- Alternative 1 - Widen Highway 2 to Six Lanes for All Traffic
- Alternative 2 - Widen Highway 2 for Curbside HOV Lanes (Including Buses)
- Alternative 3 - Widen Highway 2 for Dedicated Transit in Curb Lanes
- Alternative 4 - Widen Highway 2 for Dedicated Transit in the Median

Each alternative has a 45m right-of-way including 1.5m on-road cycling lanes with a 0.6m width buffer, 1.8m sidewalks and 4.3m boulevards in either direction. The detailed evaluation of bicycle facility alternatives and the selection of an on-road buffered bike lane as the preferred alternative bicycle facility are detailed in Section 7.1.8 of this ESR. In the Town of Ajax, an existing multi-use path is proposed to remain on the north side of the roadway in place of the 1.8m sidewalk shown on the typical section, **Exhibit ES2** below.

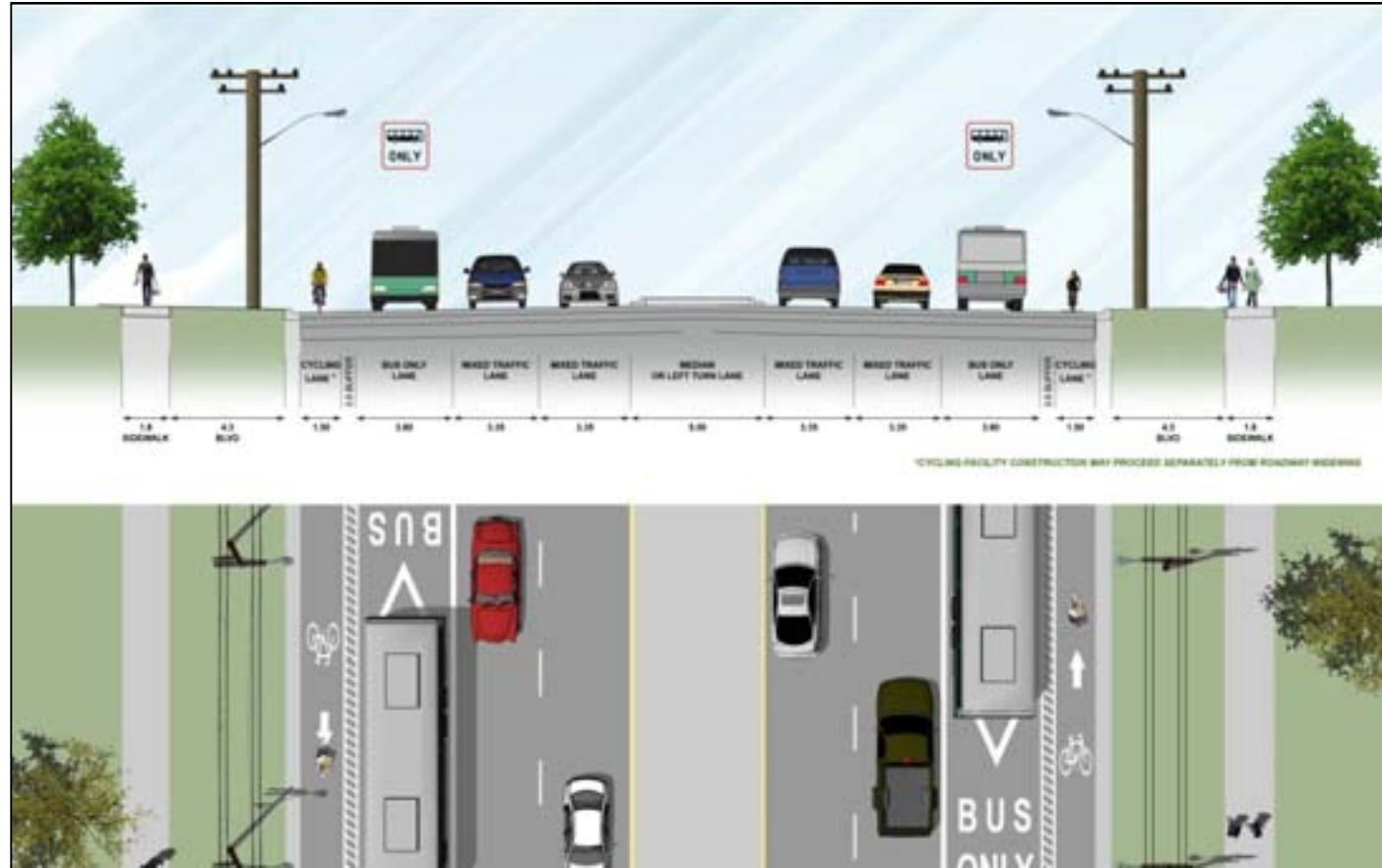
All four alternatives use the same horizontal and vertical alignment, which closely matches the existing Highway 2 alignment through most of the study area. Generally, widening is symmetrical both north and south of Highway 2. A minor horizontal alignment shift to the south occurs in the Whites Road segment between Steeple Hill Boulevard and the Whites Road Highway 401 ramps to avoid development on the north side of the roadway which is close to the existing property line. Similarly at the east end of the Westney Road – Harwood Avenue - Salem Road segment from east of Salem Road to Carruthers Creek, a horizontal alignment shift to the north occurs to avoid development on the south side of the roadway which is close the existing property line.

The results from the detailed analysis and evaluation of the alternative designs indicates that **Alternative 3, widen Highway 2 for dedicated transit in curb lanes with buffered on-road bicycle lanes (illustrated below in Exhibit ES2), is the preferred alternative design for the corridor for the following reasons:**

- Traffic congestion does not significantly impact transit vehicle movement as buses are permitted to bypass mixed traffic lane congestion by means of the dedicated curb lane, hence improving the reliability of transit service. This alternative also provides a high maximum capacity for transit passengers (i.e., 3,000 per hour). New ridership is anticipated to be encouraged by an improved transit travel time in comparison to buses travelling in mixed traffic lanes.
- No increase in infiltration to both local-collector and arterial roadways was measured for this alternative. Widening provides additional east-west capacity to accommodate Highway 401 Emergency Detour Route (EDR) operations on Hwy 2, provided traffic controls are in place to manage the use of the dedicated bus lane during emergencies.
- The presence of the curb side bus lane may facilitate emergency service vehicles accessing their destinations during peak periods. However, no increase (or decrease) to emergency vehicle response times to businesses or neighbourhoods were identified.
- Pedestrian safety and accessibility is supported by a curb side BRT and associated transit stops. Conflicts are not anticipated between buses within bus only lanes and vehicular traffic at curb side bus stops; hence the potential for collisions is reduced for transit vehicles.
- Alternative 3 is compatible with each of the goals and objectives considered as part of this evaluation. Specifically, this alternative provides a transit service focus in the short term, as well as the flexibility for an eventual transition to the longer term vision of median LRT as envisaged by the LTTS. In addition, Alternative 3 compliments and supports the future urban structure and land use plan (i.e., intensification) for the area.

Although Alternative 4, widen Highway 2 for dedicated transit in the median, is not currently selected as the recommended alternative it will be revisited as an alternative in future Highway 2 transit studies. In future studies many of the noted shortcomings could be addressed with changes to land use and the provision of longer continuous segments of dedicated transit lanes. Further, as transit ridership in Durham increases and funding becomes available for more continuous dedicated transit lanes, the associated disbenefits to autos will become less significant, and the priority will shift from an auto focused Highway 2 corridor to a transit focused Highway 2 corridor to provide the maximum potential person throughput. To allow the maximum potential person throughput on the Highway 2 corridor the alternative with the highest capacity, fastest and most reliable transit service would be selected, which is Alternative 4.

**Exhibit ES2: Preferred Design - Alternative 3, widen Highway 2 for dedicated transit in curb lanes**



**MONITORING DURING & AFTER CONSTRUCTION**

Many of the environmental concerns related to this project have been mitigated through the process by which the recommended design was selected, as described in this ESR. The potential impacts and proposed mitigation measures have been described in **Section 10**. This section provides a detailed list of specific commitments to be carried forward to Phase 5 of the Municipal Class EA process, Implementation. These commitments have been developed with the Ministry of the Environment, the Toronto and Region Conservation Authority and other stakeholders.

Specific mitigation measures have been selected and committed to by Durham Region to address potential impacts as discussed in **Section 10**. It is recommended that these commitments presented in the ESR and **Exhibit 34** be incorporated into the construction contract package so that contractors are aware of the requirements when preparing their tender submission.

**PROJECT DESCRIPTION**

After considering Public and Stakeholder input following the send round of Public Information Centres, the Project Steering Committee determined that the Preferred Design for the Highway 2 Transit Priority Measures EA will be the same as the Recommended Design (Alternative 3 – Widen Highway 2 for dedicated transit in curb lanes with buffered on-road bicycle lanes) except that the north-south road widenings shown at Whites Road, Liverpool Road and Westney Road will not be included. These north-south widenings will be studied at a future time.

Although the concept and typical cross section for the recommended alternative remained the same, input received from the public and stakeholders was incorporated into the recommended alternative to create the preferred design. The typical roadway cross section for the preferred design is shown above in **Exhibit ES2**. Plan and profile drawings for the preferred design are shown on **Sheets 1 to 25** in **Section II** of this ESR document.