

# Brooklin Transportation Master Plan

November 2017



prepared by

**AECOM**



for the Town of Whitby



November 24, 2017

Ms. Tara Painchaud, P.Eng.  
Manager of Transportation and Parking Services  
Public Works Department  
Town of Whitby  
575 Rossland Road East,  
Whitby, ON L1N 2M8

Dear Ms. Painchaud:

**Project No: 60278570**

**Regarding: Brooklin Transportation Master Plan  
Town of Whitby**

We are pleased to provide you with this final version of the Transportation Master Plan report for your records.

On behalf of AECOM, thank you for the opportunity to work with the Town to complete this assignment. We look forward to working with you again soon.

Sincerely,  
**AECOM Canada Ltd.**



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# Executive Summary

## Study Background

The Brooklin Transportation Master Plan (TMP) is a planning document that provides a comprehensive assessment of the long-term transportation system infrastructure and mobility requirements across all modes of transportation in the Brooklin area of the Town of Whitby. The Brooklin TMP was conducted as part of an integrated approach of the Municipal Class Environmental Assessment (EA), in coordination with the Draft Proposed Brooklin Secondary Plan. The work previously completed for the Northwest Brooklin Class EA, the purpose of which was to “give consideration to establishing an alternative route for provincial Highway 7/12 as it passes through Brooklin so that the Town of Whitby can gain care and control over Baldwin Street as it passes through Downtown Brooklin”, has been incorporated into the TMP. **Section 1** of this report provides additional information on the study background.

## Planning Context & Purpose

The TMP will satisfy Phases 1 and 2 of the Municipal Class EA process. Subsequent phases of the Class EA process (i.e., Phases 3 and 4) will be required for projects / studies with the potential for impacts to the environment. More detailed investigation and further consultation will be required to implement specific projects recommended in the TMP.

The purpose of the TMP is to identify, at a strategic level, an integrated and multi-modal transportation framework to support long term growth (2031 and beyond) that provides for the efficient movement of people and goods to areas within and to/from the Brooklin area. The scope of the TMP is focused on major roadway needs and policies and guidelines to support a pedestrian and cycling active transportation network within the Brooklin Secondary Plan area. **Section 1** of this report provides additional information on the Municipal Class EA process and the study purpose. **Section 3** provides details on the planning context as it relates to the TMP.

## Consultation and Public Engagement

The Brooklin Study involved extensive public consultation, in accordance with both the Planning Act and Environmental Assessment Act, and as directed by Council to provide



information to stakeholders on all components of the study and facilitate a full spectrum of community and agency input.

The consultation program included:

- Establishment of an Interested Parties List;
- Establishment of a study website;
- Notification of consultation events via mail, email, newspaper publication and posting of milestones on the study website ([www.whitby.ca/brooklinstudy](http://www.whitby.ca/brooklinstudy));
- Technical Advisory Committee and Community Advisory Committee meetings; and
- Four formal Public Information Centres (PICs).

**Section 2** of this report provides additional information on consultation for this study, and an in-depth and detailed public engagement and consultation summary is provided in **Appendix A**.

## Existing Environmental Conditions

As part of the identification and evaluation of alternative solutions, discussed in **Section 9**, the existing baseline conditions related to the existing physical environment, natural heritage, cultural heritage and archaeological resources were assessed and used to determine the potential impact(s) that may result from revising the existing transportation network to accommodate future development and community growth. This existing environment assessment was completed using the Northwest Brooklin Class EA Study area, for which the south limit is Winchester Road / Highway 7; the TMP Study Area south limit is Taunton Road. As part of the Combined Study, additional assessments were completed for the Secondary Plan study area, and these reports were referenced in the TMP assessment (see list of reports in **Section 4.6**). The alternative road networks assessed within the TMP are within these two study area boundaries. The existing environment assessments were referenced when evaluating the road network alternatives, as discussed in **Section 9.2**. Additional details on the existing baseline conditions assessment is provided in **Section 4** and **Appendix C**.

## Future Transportation Needs Assessment

As part of the identification and evaluation of alternative solutions, the existing and planned transportation network was assessed and used to determine the future



transportation needs to horizon year 2031 and the potential impact(s) that may result from revising the existing transportation network to accommodate future development and community growth. **Appendix F** provides the detailed report for the transportation demand management and traffic assessment completed in support of the TMP; a summary of this information is provided in **Section 5** of this report. Within **Appendix F** is a detailed discussion of the existing transportation network with respect to active transportation, transit, arterial road network and collector road network components considered in this study.

The future transportation needs assessment in the form of a transportation demand model was conducted to assess future travel demands and capacity deficiencies in the 2031 horizon year. The proposed land use options and the resulting population and employment growth that were developed through the Secondary Plan study for the Brooklin area have been input to the transportation demand model. Details of the future transportation needs assessment are included in **Appendix F**.

The Future (2031 AM peak period) Do Nothing assessment indicates that there is a future roadway network capacity deficiency within the study area, particularly on the existing and planned north-south roadways that are located to the north of Highway 7 / Winchester Road and to the north of Columbus Road. In the downtown core, Baldwin Street to the north of Winchester Road to Columbus Road is forecasted to operate with “Stop-and-Go” conditions, and is expected to continue to carry a significant amount of through traffic. The future planned east-west roadways appear sufficient to accommodate the future traffic projections given the recent widening of Highway 7, planned improvements to Columbus Road (widening to four lanes) and Winchester Road (addition of centre turning lane and road widening to the east), the Mid-Block Arterial, as well as the Highway 407 extension. It is noted that Garden Street is also part of the future planned road network and is expected to connect Taunton Road to the Mid-Block Arterial.

## **Problem/Opportunity Statement**

In order to address the significant population growth anticipated for Brooklin, the existing and expected transportation deficiencies in the downtown area and transportation improvements being planned in the area, this TMP will assess future transportation system needs, provide recommendations for new and/or improved infrastructure and recommend transportation policies that the Town of Whitby can use to manage transportation infrastructure in Brooklin.



Having regard for community and Council input, the Problem / Opportunity Statement for this study is as follows: “With impending significant population growth, and to support a community-focused, pedestrian-oriented, business friendly, and sustainable downtown, the longer-distance through traffic, heavy-truck traffic, and some commuter traffic is no longer suited to travel through Downtown Brooklin. Diversion of Provincial Highway 7/12 to a suitable alternative has the potential to alleviate congestion and improve the social environment of the downtown core. Transportation policies and infrastructure improvements are required to encourage alternative sustainable modes of travel throughout Brooklin (transit, walking, and cycling) and to accommodate the transportation infrastructure needs associated with growth identified in the Brooklin Secondary Plan Area.”

## **Proposed Alternative Solutions**

Four broad strategies were considered in the process of developing the proposed alternative solutions that would alleviate future roadway network capacity deficiencies and address the Problem and Opportunity Statement. These strategies include:

- **Do Nothing:** The Do Nothing alternative is an assessment of the future transportation network where the future population and employment development areas are considered but no changes are made to the active transportation network, transit services or the road network.
- **Transportation Demand Management (TDM) Strategy:** On its own, TDM Strategies will provide some measure of capacity relief to the transportation network through development of commuter parking lots; continued promotion of transit, active transportation, and ride sharing programs such as Smart-Commute Durham; promotion of teleworking and flexible work hours, and improved active transportation network and trip end facilities.
- **Enhanced Transit:** The reduction in vehicle trips through increase in transit usage is beneficial for reducing congestion but is not sufficient to accommodate the future transportation needs of the community as a stand-alone solution. Therefore it is recommended that Enhanced Transit Strategies be incorporated into all of the network solutions.



- Network Alternatives: Four overall network improvement strategies were examined in order to generate a “long list” of solutions that could potentially serve north-south capacity needs in the vicinity of Downtown Brooklin. The strategies include:
  - Revise the existing network;
  - Add new arterial roadways;
  - Retain Highway 7/12 designation on Baldwin Street; and
  - Change Highway 7/12 designation through Downtown Brooklin from a Provincial facility to a Town of Whitby road.

Through the screening process, a short-list of potential network alternatives was identified to be carried forward for further assessment and evaluation. In all short-listed alternatives, the intersection of Thickson Road and Baldwin Street is revised so that Thickson Road is the through road.

Based on the network improvement strategy to revise the existing network, the resulting short-list of proposed alternative solutions roadway improvements is as follows:

- Alternative 1: Do Nothing (includes already planned improvements)
- Alternative 2: Widening Thickson Road to four lanes from Winchester Road to Brawley Road and widening Lake Ridge Road to four lanes from Highway 7 to Brawley Road
- Alternative 3: Widening Cochrane Street to four lanes from Highway 7 to Carnwith Drive
- Alternative 4: Widening Ashburn Road to four lanes from Highway 7 to Carnwith Drive

## Alternative Solutions Evaluation

The evaluation criteria categories and indicators, shown in **Table ES1** below, were developed in consultation with the Town. These criteria were developed by considering the requirements of the Municipal Class EA process, public feedback, and the experience of the project team. The evaluation criteria are designed to assist with the differentiation of the benefits and impacts of each of the alternatives.



**Table ES1: Evaluation Criteria – Categories and Indicators**

Categories	Indicators
<b>Transportation/ Technical</b>	<ul style="list-style-type: none"> <li>• Road network capacity</li> <li>• Road network performance (2031 AM peak hour)</li> <li>• Road safety</li> <li>• Road network continuity and connectivity</li> <li>• Community accessibility and mobility</li> <li>• Transit serviceability</li> <li>• Potential to support sustainable modes of transportation such as cycling and walking</li> <li>• Potential traffic infiltration to residential areas</li> </ul>
<b>Natural Environment</b>	<ul style="list-style-type: none"> <li>• Fish/Fish Habitat</li> <li>• Wetlands</li> <li>• Significant Woodlots</li> <li>• ANSIs</li> <li>• Species at Risk/Habitat Areas</li> </ul>
<b>Socio- Economic Environment</b>	<ul style="list-style-type: none"> <li>• Area aesthetics</li> <li>• Impacts to businesses</li> <li>• Residential and community structure</li> <li>• Property requirements</li> <li>• Recreational land uses and trails</li> <li>• Consistency with Official Plan policies</li> <li>• Existing and proposed land uses</li> <li>• Accommodation of pedestrian/cyclist movements</li> <li>• Noise Impacts</li> </ul>
<b>Cultural Environment</b>	<ul style="list-style-type: none"> <li>• Potential to impact cultural heritage landscapes</li> <li>• Potential to impact built heritage resources</li> <li>• Potential to impact archaeological resources</li> </ul>
<b>Cost Factors</b>	<ul style="list-style-type: none"> <li>• Capital, operating, property, and maintenance costs compared to anticipated user benefits.</li> </ul>



Based on the evaluation of alternatives it is recommended that Lake Ridge Road and Thickson Road, north of Winchester Road / Highway 7, be widened by 2031. It is further recommended that Cochrane Street be widened to accommodate north-south movements and service the prestige industrial area. The widening of Ashburn Road is not identified as the preferred alternative, however, it is recommended that Ashburn Road be protected for potential future widening beyond 2031. The staging of widening within the designated right-of-way will be determined as development proceeds and as part of future environmental assessment studies, and is further discussed in the Implementation Plan outlined in **Section 10**.

## **Preferred and Recommended Land Use Plan**

In December 2015, the Town's consultant SGL developed three land use options in conjunction with the transportation network alternatives based on the background technical work undertaken in Stage One of the Brooklin Study. Following the consideration of public and stakeholder input through PICs, on-line MetroQuest surveys, submission of comments and evaluation of the three land use options, the Preferred Land Use Plan and the Draft Proposed Secondary Plan were prepared. The growth in population and employment anticipated with this Preferred Land Use Plan was used to update the previous demand macro-model assessment to confirm the Preferred Road Network.

Following the June 2017 Council meeting and 30-day review period, additional comments were incorporated to finalize the Recommended Land Use Plan and Recommended Road Network. The Recommended Land Use Plan is shown in **Exhibit 21** and **Exhibit 22**, Schedule K and K1. Additional information on the Recommended Land Use Plan is provided in **Section 9.1** and **Appendix F**.

## **Preferred and Recommended Road Network**

**Section 9** of this report provides additional information on the Preferred and Recommended Road Network, supported by additional details of specific assessments outlined in **Appendix F**. The following summarizes the recommendations related to the recommended road network. Guiding principles are discussed in **Section 9** of this report.



## Alternate Route for Highway 7/12 Corridor

The Town of Whitby is seeking agreement from the MTO to transfer ownership of Baldwin Street (Highway 7/12) through Downtown Brooklin to the Town of Whitby. As a result, Provincial Highway 7/12 must be relocated either to an alternate existing road, or to a new route constructed within the Town (or potentially outside of the Town boundaries, if appropriate). This TMP does not include the identification of an alternative route for Provincial Highway 7/12 through Downtown Brooklin, however, potential alternate routes have been identified through a Feasibility Study.

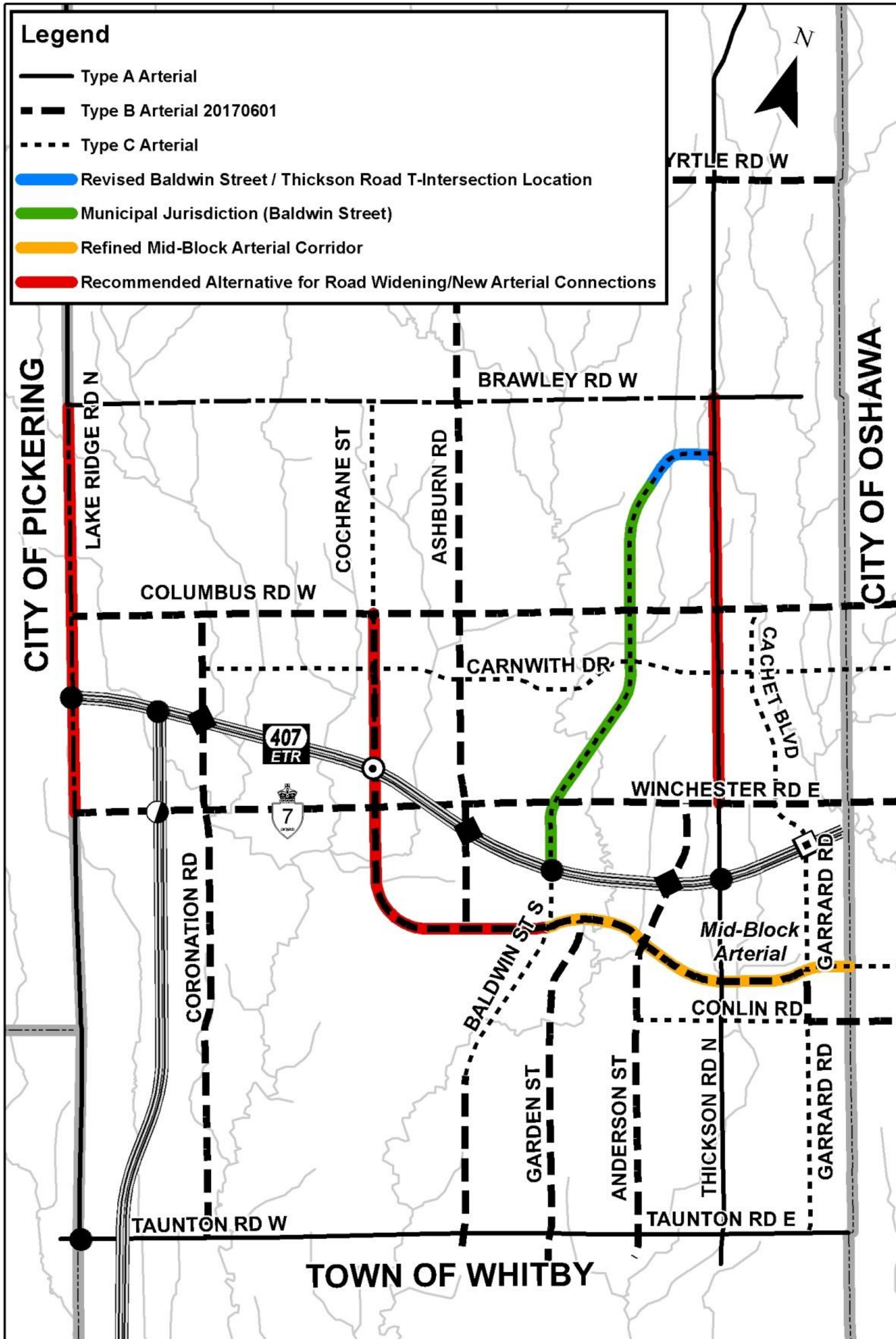
Subject to the finalization of the Feasibility Study, the next step in the process is to initiate a Provincial Class EA to consider the alternatives. The future Provincial Class EA study will likely be classified as a Group 'A' Route Planning Class EA as this would be a new highway facility. Group 'A' is applicable as an alternate route would not substantially follow the existing Highway 7/12 right of way. The Provincial Class EA would be initiated for a controlled access, four-lane highway with at-grade intersections and/or roundabouts to provide an alternate route to the existing Highway 7/12 through Brooklin. The study would follow the Class Environmental Assessment for Provincial Transportation Facilities (2000).

## Arterial Road Network

**Exhibit ES1** shows the Recommended Arterial Road Network map and includes the following recommendations related to major arterial road network projects to be implemented to meet future capacity needs:

- Widen Lake Ridge Road and Thicksen Road between Winchester Road and Brawley Road West and Cochrane Street from the Highway 407 corridor to Columbus Road West. These roads are to be widened from the existing two-lane facilities to four-lane facilities by horizon year 2031. It is expected that Cochrane Street will be widened south of the Highway 407 corridor to Winchester Road and extended from Winchester Road to connect to Baldwin Street and ultimately to the Mid-Block Arterial. These improvements are identified in red in **Exhibit ES1**.
- The Mid-Block Arterial road, north of Conlin Road, extending westerly from the Oshawa boundary, connecting to Baldwin Street, as shown in orange **Exhibit ES1**, is a minor refinement of the route identified in the Town's 2010 Transportation Master Plan in consideration of environmental constraints, the hydro corridor and the constructed Highway 407. The Mid-Block Arterial road alignment will be finalized through a future Environmental Assessment process.





Source base mapping: Land Information Ontario (MNR)  
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Exhibit ES1: Recommended Arterial Road Network





**Exhibit ES1** shows the Recommended Arterial Road Network map and includes the following recommendations related to major arterial road network projects to be implemented to improve overall connectivity and meet Town objectives related to Baldwin Street:

- Locate the Baldwin Street / Thickson Road T-intersection approximately 500 to 550 metres south of Brawley Street to improve intersection spacing (exact location to be determined through a future EA study). This improvement is identified in blue in **Exhibit ES1**.
- Continue working with MTO to ultimately gain care and control of Baldwin Street. This improvement is identified in green **Exhibit ES1**.

The following corridors and interchange locations should be protected to implement the following recommendation related to arterial road network projects to be implemented to improve overall connectivity:

- Carnwith Drive Extension (west to Country Lane); longer-term projects include the extension of Carnwith Drive east to the Oshawa border
- Highway 407 East Full Access Interchange at Cochrane Street
- Highway 407 Grade Separation at Garrard Road
- Highway 7/12 Alternate Route

### **Mid-Block Arterial Corridor Assessment**

The Mid-Block Arterial corridor identified in both the Town of Whitby 2010 TMP, and the Brooklin Study November 2015 Options Report is a solution being recommended to meet the transportation needs of the study area. It should be noted that this alignment is preliminary in nature and is not intended to be a recommended road alignment. The corridor represents the recommended arterial network based on the work completed as part of this TMP, including the corridor's ability to support the Recommended Land Use.

It was determined as part of the 2010 TMP that additional east-west capacity was required beyond the addition of Highway 407 and the existing Conlin Road and Winchester Road in this area. The improvement recommendations of the 2010 TMP have been incorporated into this study and completed modelling work for the 2031 horizon year confirmed the need for additional east-west capacity. For the 2031 horizon year the Mid-Block Arterial is modelled as a two-lane facility, Highway 407 (from



Highway 412 to the Whitby east border) is modelled as a four lane freeway facility, Winchester Road (from Anderson Street to Garrard Road) is modelled as a four-lane facility and Winchester Road (from Baldwin Street to Anderson Street) is modelled as a two-lane facility with increased capacity to represent a third lane (i.e., a centre two-way left-turn lane). While the screenline analysis supports the need for four travel lanes south of Winchester Road/Highway 407, the need for six travel lanes in the near term is not substantiated. In the future there is flexibility to widen the Mid-Block Arterial corridor to four lanes beyond the 2031 horizon year.

### **Collector Road Network**

**Exhibit ES2** shows the recommended collector road network map with the new collector roads identified in red. There are several recommended collector road connections, including a new north-south collector road east of Thickson Road that connects Columbus Road to Brawley Road. West of the Greenbelt, mid-block north-south collector roads are provided east of Ashburn Road, between Ashburn Road and Cochrane Street and between Cochrane Street and Country Lane. Vipond Road is extended west to Country Lane and a new east-west collector road is included north of Columbus Road to connect the neighbourhoods. The identified collector road network supports future residential and/or commercial development, including access to schools and parks.

### **Active Transportation**

At the time of documenting the Transportation Master Plan a separate Active Transportation Plan study is being undertaken, which will recommend an active transportation network. Feedback received on the active transportation network through the Transportation Master Plan process, such as through public meetings / workshops, will be made available for reference in this separate study. One additional consideration will be the final alignment of the alternative Highway 7/12 corridor, which may result in the need for special consideration for accommodating active transportation facilities identified in the Regional Cycling Plan (2012) and the Town of Whitby Cycling and Leisure Trails Plan (2010). The Regional Trail network will be integrated with the Active Transportation Plan. One of the guiding principles related to Active Transportation is that the Town create a “streets for people” environment where all users feel safe and secure, particularly in the Downtown. This will involve removing barriers to travelling to/from and between destinations, enhancing crossing locations, and encouraging active transportation and transit use.







A summary of active transportation recommendations follows:

- Examine inclusion of MUPs or bike lanes on arterial streets when they undergo reconstruction;
- Create connections along and across creeks/streams/natural corridors wherever possible, and at comfortable intervals;
- Utilize the existing hydro corridor for a significant east-west trail connection;
- Utilize the oil pipeline corridor as a crossing through the northern environmentally sensitive area;
- Consider and include active transportation infrastructure on all road construction projects;
- Further investigate appropriate infrastructure for cyclists and pedestrians within the Brooklin central business district; and
- Ensure that the needs of cyclists and pedestrians are considered in all transportation related studies and developments.

## **Transit**

It is recognized that the planning and operation of transit services is not under the Town's jurisdiction, however, the Town will work with Durham Region and Durham Region Transit (DRT), the Province and Metrolinx, and the Federal Government to ensure that continuous and necessary transportation investments are made within the Town and that development will be transit supportive. The town will advocate for the provision of improved conventional bus service, as well as micro-transit or demand responsive transit, to existing urban areas where service gaps currently exist. The Town will also encourage transit services to new growth areas during the initial stages of development when it is critical that alternatives to the automobile are available at the time of occupancy before auto-oriented habits are established.

## **Transportation Demand Management (TDM)**

Transportation demand management (TDM) is the use of policies, programs, services and products to influence, why, when, where and how people travel. The TDM Strategies identified in the 2010 TMP are still applicable, and are confirmed as part of the Brooklin TMP. These recommendations included the following:

- Adopt a TDM Policy and appoint/hire a TDM Coordinator
- Develop a Trip Reduction Program for the Town Municipal Offices/Faculties



- Engage major employers, institutions and school boards to participate in trip reduction initiatives
- Encourage the development of Mobility Hubs
- Include TDM in the development process.

## Intersection Improvements

The recommended TMP network identifies a realignment of the Thickson Road / Baldwin Street intersection. The assessment shows that to accommodate the projected horizon year 2031 traffic volumes traffic signals may be required, or alternately a roundabout may be implemented. The realignment also introduces a revised intersection at Thickson Road and Brawley Road. Currently the eastbound and westbound movements consist of shared left / through / right lanes. An additional left-turn lane at both approaches will help alleviate the high delays expected. Similar to the Thickson Road / Baldwin Street intersection, the implementation of a traffic signal or roundabout can be investigated to improve traffic operations. The following intersection improvements were recommended.

- Baldwin Street at Thickson Road shall be realigned south of Brawley Road as shown on Preferred Brooklin Land Use Plan proposed Schedule “K” (**Exhibit 21**). The design exercise for the realignment would be completed in a manner to mitigate impacts to the adjacent residential properties as best as possible, while still achieving the objective of having Thickson Road operate as the through road. A roundabout may be implemented at this location.
- Implement a signal at the Conlin Road / Anderson Street intersection to accommodate a heavy a westbound left-turn movement.
- The Town will consider roundabout design through Town of Whitby standards and accepted engineering design criteria, particularly for neighbourhood roundabouts to be implemented as part of new subdivisions.
- Assess roundabouts for implementation at the following locations<sup>1</sup>:
  - St. Thomas Street / Queen Street / Winchester Road
  - Montgomery Avenue / Way Street / Columbus Road

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1. Intersection improvements will be considered as part of road improvement projects or intersection improvement projects and will involve the approving authorities. Note that Durham Region presently does not support multi-lane roundabouts on Regional roads.





- Garden Street / Mid-Block Arterial
  - Garrard Road / Mid-Block Arterial
  - Baldwin Street / Roybrook Avenue
  - Garrard Road / Conlin Road
  - Baldwin Street / Carnwith Drive
  - Baldwin Street / Thickson Road
  - (Future) Thickson Road / Brawley Road
- Roundabouts are also being considered as part of future developments and may be identified along corridors, including Ashburn Road and Columbus Road, and at intersections within future subdivisions.

## Parking

With the aim of meeting the future parking demand and balancing the needs of various road users (i.e., motorists, cyclists, and pedestrians) as well as the needs of residents and local business owners in the Whitby and Brooklin downtown areas, the Town of Whitby is undertaking a Parking Master Plan (PMP) for Whitby's Downtowns. The PMP is intended to consider proposed and potential future development in determining the extent and location of future parking demands for immediate (present to 5 years), medium-term (5 to 10 years), and long-term (10 to 20 years) time-frames. The PMP would also include developing a financial strategy (e.g., setting parking hourly charges, cash-in-lieu of parking for new developments, etc.) to support future parking needs.

Currently on-street parking in Downtown Brooklin is free; however, future implementation of on-street paid parking for Downtown Brooklin will be a consideration in the PMP.

## Access Management Downtown Core / A.O.D.A

As part of the TMP study, an inventory was completed of the commercial access driveways and the cross streets along Baldwin Street, between George Street (Colston Avenue) and Roybrook Avenue. Some access driveways in Downtown Brooklin do not meet the recommended minimum corner clearance at the adjacent signalized intersections, or the recommended minimum spacing to the adjacent upstream or downstream access driveway and/or the recommended driveway width. The noted properties where access driveways do not meet guidelines are identified in **Appendix F**.



With the objective of enhancing safety and mobility along the studied section of Baldwin Street through Downtown Brooklin, the Town should develop a strategy which considers enhanced pedestrian crossings, possible turn restrictions, consolidation of driveways, and provision of auxiliary lanes where needed for safety. Future retrofitting or reconstruction projects would be used as an opportunity to mitigate the identified access management deficiencies. Baldwin Street is currently designated as a Major Arterial, which is primarily designed to provide mobility and through movement, however, the number of crossing roads and driveways on the studied section of Baldwin Street through the Brooklin downtown area suggests that it should be re-designation to a lower functional level with higher level of land access without compromising safety and mobility.

## Implementation Plan

The TMP document includes recommended infrastructure of the Recommended Road Network to support the Recommended Land Use Plan (Schedule K) and the associated future growth and development of Brooklin. Most of the new and upgraded infrastructure is expected to be implemented in conjunction with development as it occurs in the expanded Secondary Plan area. For this reason, implementation timelines and priorities will largely be tied to the pace and location of development. It is also recognized that the need to undertake future Class EA studies and detailed design activities will also play a role in the timing of each of project.

The major arterial road network projects listed in **Table ES2** are recommended for implementation prior to Horizon Year 2031, in conjunction with full-build out of the Secondary Plan Recommended Land Use Plan to meet future road network capacity requirements. The projects include widening of existing arterial roadways and construction of new arterial roadways.

The Mid-Block Arterial Corridor was listed in the 2010 TMP, and it is re-listed in **Table ES2** with an updated construction cost estimate. **Appendix H** includes a Staff Report providing additional input on the Mid-Block Arterial Corridor and need for a future Environmental Assessment to select the final corridor alignment; also refer to **Section 9.2.2** for additional detail on the Mid-Block Arterial Corridor assessment.



**Table ES2: Roadway Implementation Plan – Screenline Capacity Improvements**

**Rationale:** Recommended major arterial system to alleviate the 2031 identified screenline capacity deficiencies within the Town. These modifications to the roadways are above and beyond those already approved/planned by 2031 and include new alignments, widenings, and extensions.

Road Name	From	To	Description of Works	Estimated Costs for Whitby (\$Millions)	Estimated Costs for Region (\$Millions)	Anticipated Timing	MCEA Schedule	Remarks/ Status
1. Widen Thickson Road	Winchester Road	Brawley Road	Widening from two to four lanes	-	\$16.4	Short-Term (by 2024)	Schedule C	Type A Arterial Roadway classification. Future Class EA would be led by Durham Region. Includes upgrading Baldwin / Thickson Road intersection signal; realignment of this intersection is a separate item. Note that timing anticipated by the Brooklin TMP study is that this would be implemented in the short-term by 2024; however, as per the Durham Region 2017 TMP, the timing is identified as “2022 – 2026”. The Durham Region 2017 TMP identifies the limits to be from Winchester Road to Baldwin Street (Highway 7/12), and the widening to be from 2 to 4/5 lanes.
2. Widen Lake Ridge Road	Winchester Road	Brawley Road	Widening from two to four lanes	-	\$22.6	Short-Term (by 2024)	Schedule C	Type A Arterial Roadway classification. Future Class EA would be led by Durham Region. Note that timing anticipated by the Brooklin TMP study is that this would be implemented in the short-term by 2024; however, as per the Durham Region 2017 TMP, the timing is identified as “Beyond 2031”. The Durham Region 2017 TMP identifies the limits to be from Winchester Road (Highway 7) to Brawley Road.
3. Widen Cochrane Street	Winchester Road	Columbus Road	Widening from two to four lanes	\$10.2	-	Short-Term (by 2024)	Schedule C	Type B Arterial Roadway classification; includes widening of the bridge structure across Highway 407.
4. Extend Cochrane Street	Winchester Road	Baldwin Street	New Facility (two lanes)	\$5.5	-	Medium-Term (by 2031)	Schedule C	Type B Arterial Roadway classification. Also may be considered as part of Mid-Block Arterial.
5. Mid-Block Arterial 2-Lane Facility (north of Conlin Road)	Baldwin Street	Britannia Road (existing terminus) at Oshawa border	New Facility / Extension of Britannia Street corridor	\$30.8	-	Medium-Term (by 2031), or Dependent on Development	Schedule C	Project previously identified in the 2010 TMP. The majority of the proposed new roadway is a Type B arterial roadway, between Baldwin Street and Garrard Road. Between Garrard Road and the connection to Britannia Street in Oshawa, the facility is a Type C Arterial Road classification.
6. Columbus Road	Lake Ridge Road	Whitby/Oshawa Boundary	Widening from two to four lanes	\$29.3	-	Medium-Term (by 2031)	Schedule C	Project previously identified in the 2010 TMP as a Corridor Protection project to be implemented in the 2011 to 2016 horizon. This project was included as a base assumption in the 2031 network for this TMP update.

Notes: NC – Not Costed; TBD – To Be Determined

Costing estimates based on benchmark costs and considered order of magnitude for planning purposes. Estimates include 20% grading, 5% to 10% for utility relocations (depending on project), 10% design and engineering, and 25% contingency. Property costs are excluded.

All arterial road corridors noted above to include provisions and considerations for active transportation and transit.

Costing to be refined in future studies.

Anticipated timing for projects 1, 2, 3, and 4 is based on a qualitative assessment, as population and employment data was available for conducting the horizon year 2031 assessment only.





## Corridor Protection Projects

The road network and intersection improvement projects listed in **Table ES3** are recommended for implementation prior to Horizon Year 2031, in conjunction with full-build out of the Secondary Plan Preferred Land Use plan. The following roadways and intersections are necessary to improve overall connectivity; these connections should be addressed as the opportunity arises from development or redevelopment within the timeline of this TMP and as the TMP is updated.

Several projects that are included in the 2010 TMP are re-listed in **Table ES3**, for example:

- Garden Street Extension, Mid-Block Arterial to Robert Attersley Drive
- Highway 407 East Full Access Interchange at Cochrane Street
- Highway 407 Grade Separation at Garrard Road

One generic project category is relisted in **Table ES3**; more specific projects that would fall into this category are identified as separate projects:

- Brooklin Arterial and Collector Road network

The project previously listed as the Brooklin North/South Route in the 2010 TMP has been revised to consider other alignments and is now referenced as the Highway 7/12 Alternate Route within **Table ES3**.

## Long-Term Road Network Improvements

The long term (beyond horizon year 2031) transportation improvements for the road network are listed in **Table ES4**. For these projects, either the 2031 future traffic forecasts did not reveal the need for these improvements within the horizon year of this TMP, or the project is located outside of the Secondary Plan area and is unlikely to proceed with future development within the 2031 horizon year. It is recommended that the Town protect for these corridors beyond 2031.





**Table ES3: Roadway Implementation Plan – Network Connectivity Projects**

**Rationale:** The following roadways are necessary to improve overall connectivity; these connections will be implemented as the opportunity arises from development or redevelopment within the timeline of this TMP and as the TMP is updated

Road Name	From	To	Description of Works	Estimated Costs for Whitby (\$Millions)	Estimated Costs for Region (\$Millions)	Anticipated Timing	MCEA Schedule	Remarks/ Status
1. Baldwin Street and Thickson Road Intersection	Baldwin Street	Thickson Road	Realignment	Cost-sharing with Durham Region	\$2.3	Medium Term (by 2031)	Schedule C	Revise T-intersection so that Baldwin Street T's into Thickson Road; Thickson Road becomes the through road. Implement once Highway 7/12 alternate alignment approved, or as Thickson Road is widened, if possible. Significant potential impacts to adjacent residents and properties. Additional right-of-way is anticipated. Impacts will be mitigated as much as possible through design.
2. Carnwith Drive Extension (to Country Lane)	Ashburn Road (existing terminus)	Country Lane	Extension of Corridor	\$19.7	-	Dependent on Development	Schedule C	Extension through the Secondary Plan Area. Type C Arterial Road classification
3. Vipond Road Extension	Ashburn Road (existing terminus)	Country Lane	Extension of Corridor	\$19.3	-	Dependent on Development	Schedule C	Extension through the Secondary Plan Area. Collector Road classification
4. Collector Road North of Columbus Road	Secondary Plan boundary west of Cochrane Street	East of Thickson Road (to west of the Secondary Plan Boundary)	New Facility	\$55.6	-	Dependent on Development	Schedule C	Further study required to connect the east and west sections of this collector road between Cedarbrook Trail and Baldwin Street through the Greenbelt
5. Highway 7 / 12 Alternate Route	Highway 7	Highway 7/12	Corridor Protection	NC	-	Dependent on MTO Approval	Provincial Class EA	Provincial Class EA to be conducted to determine alternate route.
6. Way Street	Price Street	Columbus Drive	Corridor Protection	NC	-	Short-Term (by 2024)	Schedule A/A+	Review Way Street connectivity south of Carnwith Drive and at Columbus Road. Changes are not required based on capacity needs.
7. Garden Street Extension	Mid-Block Arterial	Robert Attersley Drive	Corridor Protection	\$21.3		Medium Term (by 2031)	Not classified; potentially Schedule C due to proximity to Lynde Creek and natural areas	Provides connectivity to the Mid-Block Arterial Corridor.
8. Highway 407 Grade Separation at Garrard Road			Corridor Protection	\$12.8		Medium Term (by 2031)	Schedule C	Provides connectivity across Highway 407, but no connection to Highway 407.
9. Highway 407 East Full Access Interchange at Cochrane Street			Corridor Protection	\$27.2		Medium Term (by 2031)	Schedule C	Provides connectivity to Highway 407, servicing for development and relief for the Baldwin Street / Highway 407 Interchange.
10. Intersection Improvements – Signals (per intersection)			Protection	\$0.3	-	Short-Term (by 2024)	Schedule A/A+, and C	Potential signals at the realigned Baldwin Street / Thickson Road intersection; refer to Item 8 – may incorporate a roundabout at this location. Potential Signals at the Future Thickson Road / Brawley Road intersection – may incorporate a roundabout at this location. Signals at Conlin Road / Anderson Street to accommodate future heavy westbound left-turn movement. Includes signals only, does not include road reconstruction.



Road Name	From	To	Description of Works	Estimated Costs for Whitby (\$Millions)	Estimated Costs for Region (\$Millions)	Anticipated Timing	MCEA Schedule	Remarks/ Status
11. Intersection Improvements – Roundabouts			Protection	NC	-	Medium Term (by 2031)	Schedule A/A+, B and C	Implement roundabouts at the following locations: <ul style="list-style-type: none"> <li>- St. Thomas Street / Queen Street / Winchester Road</li> <li>- Montgomery Avenue / Way Street / Columbus Road</li> <li>- Garden Street / Mid-Block Arterial</li> <li>- Garrard Road / Mid-Block Arterial</li> <li>- Garrard Road / Conlin Road</li> <li>- Baldwin Street / Roybrook Avenue</li> <li>- Baldwin Street / Carnwith Drive</li> <li>- Baldwin Street / Thickson Road</li> <li>- (Future) Thickson Road / Brawley Road</li> </ul> See Town budget for additional roundabouts that are being considered/planned for. Additional intersection may be required as part of development. Intersection improvements will be considered as part of road improvement projects or intersection improvement projects and will involve the approving authorities. Note that Durham Region does not currently support multi-lane roundabouts on Regional Roads.
12. Brooklin Arterial and Collector Road network			Protect extension of road network to accommodate new development	NC	-	Dependent on Development	Schedule A/A+, B, and C	Timing of improvement would occur in conjunction with development of Brooklin Secondary Plan or increased congestion in Downtown Brooklin. Several individual projects are listed in this table, including: Carnwith Drive Extension (to Country Lane), Vipond Road Extension, and Collector Road North of Columbus Road. Longer-term projects are listed in <b>Table 10</b> , including Carnwith Drive Extension (to Oshawa border). This item includes the following Collector Roads specifically identified in the TMP: 1) north-south collector road east of Thickson Road from Columbus Road to Brawley Road; 2) mid-block north-south collector roads located east of Ashburn Road, between Ashburn Road and Cochrane Street, and between Cochrane Street and Country Lane; 3) collector roads within the industrial area, located south of Winchester Road and north of Conlin Road.

Notes: NC – Not Costed; TBD – To Be Determined

Costing estimates based on benchmark costs and considered order of magnitude for planning purposes. Estimates include 20% grading, 0% to 10% for utility relocations (depending on project), 10% design and engineering, and 25% contingency. Property costs are excluded.

All arterial road corridors to include provisions and considerations for active transportation and transit.

Costing to be refined in future studies.

Anticipated timing for projects is based on a qualitative assessment, as population and employment data was available for conducting the horizon year 2031 assessment only.





**Table ES4: Roadway Implementation Plan – Long-Term Arterial Corridor Protection (beyond Horizon Year 2031)**

**Rationale:** The following roadways are necessary to improve overall connectivity; these connections should be addressed as the opportunity arises from development or redevelopment within the timeline of this TMP and as the TMP is updated.

Road Name	From	To	Description of Works	Estimated Costs for Whitby (\$Millions)	Estimated Costs for Region (\$Millions)	Anticipated Timing	MCEA Schedule	Remarks/ Status
1. Ashburn Road	Winchester Road	Brawley Road	Widening from two to four lanes	\$9.7	-	Long-Term (beyond 2031)	Schedule C	Protect corridor for widening beyond horizon year 2031
2. Carnwith Drive Extension (west beyond Country Lane)			Extension of Corridor	\$27.3	-	Long-Term (beyond 2031)	Not classified	Extension outside of the Secondary Plan Area. Type C Arterial Road classification
3. Carnwith Drive Extension (to Oshawa border)	Rockland Crescent (existing terminus)	Oshawa border	Extension of Corridor	\$14.2	-	Long-Term (beyond 2031)	Schedule C	Extension outside of the Secondary Plan Area. Type C Arterial Road classification. This is a long-term improvement for continuity of the road network between Whitby and Oshawa.
4. Cochrane Street / Mid-Block Arterial	Winchester Road	Garrard Road	Widening from two to four lanes	\$30.0	-	Long-Term (beyond 2031)	Schedule C	The Town will maintain flexibility to widen the Cochrane Street / Mid-Block Arterial corridor to four lanes beyond the 2031 horizon.

Notes: NC – Not Costed; TBD – To Be Determined

Costing estimates based on benchmark costs and considered order of magnitude for planning purposes. Estimates include 20% grading, 5% to 10% for utility relocations (depending on project), 10% design and engineering, and 25% contingency. Property costs are excluded.

All arterial road corridors to include provisions and considerations for active transportation and transit.

Costing to be refined in future studies.

Timing for projects based on needs assessment; corridors were identified to be protected for future road network revisions beyond the 2031 Horizon Year.





## Active Transportation / A.O.D.A. and Access Management

The Town of Whitby is currently undertaking a separate Active Transportation Plan study. The implementation plan for improvements to the pedestrian, cycling, and other active transportation infrastructure (i.e., signage, bicycle racks, etc.), and for management of the active transportation network, if required, will be outlined in the Active Transportation Plan along with a schedule of costs for implementing each of the recommended improvements. Recommendations identified in **Section 9.3** of the TMP should be considered for implementation within the Active Transportation Master Plan.

The recommendations within **Section 9.9** related to updates required to meet A.O.D.A. requirements that are related to Active Transportation are outlined in **Table ES5**, in addition to requirements for future study to confirm mitigation measures required to correct access management issues.

## Multi-Modal Development Implementation Plan

Some of the recommendations within **Section 9** are related to program development, not specific infrastructure development. These activities are identified in **Table ES6**, and are required to support the development of a multi-modal transportation network within Brooklin. Environmental Assessment approvals are not required to carry forward these activities. The Transportation Master Plan must be flexible as technology is advancing at a rapid pace. There will be opportunities to leverage emerging technologies to improve mobility; however, how technology will be used in the future is still relatively unknown.

Real time transportation information through smartphone technology, on-demand transit services, ride-share and bike-share programs, connected and autonomous vehicles are just some of the technologies that are expected to advance to improve opportunities to move people and goods more effectively.

Although not specifically address within this TMP, the guidelines, policies and strategies related to goods movement that were identified within the 2010 TMP are still applicable. The proposed 2010 TMP recommendation to undertake a comprehensive goods movement study in cooperation with Durham Region, as identified in the 2010 TMP, should be carried forward.





**Table ES5: Active Transportation / A.O.D.A & Access Management – Implementation Plan**

**Rationale:** The following revisions are necessary to improve the walking environment in Downtown Brooklin, and to meet A.O.D.A regulations.

Road Name	From	To	Description of Works	Estimated Costs for Whitby (\$Millions)	Estimated Costs for Region (\$Millions)	Anticipated Timing	MCEA Schedule	Remarks/ Status
1. Baldwin Street	Winchester Road	George Street	Exterior paths of travel – clear width	NC	NC	Short-Term (by 2024)	Schedule A/A+	As part of the technical requirements for exterior paths of travel, the exterior path must have a minimum clear width of 1,500 mm. Several locations along Baldwin Street do not appear to meet the noted requirement.
2. Baldwin Street	Winchester Road	George Street	Tactile walking surface indicators	NC	NC	Short-Term (by 2024)	Schedule A/A+	While it appears that the curb ramps are aligned with the direction of travel, tactile walking surface indicators are not currently provided and / or not in compliance with the Regulation at several locations along Baldwin Street.
3. Baldwin Street	Winchester Road	George Street	Access Management	NC	NC	Short-Term (by 2024)	Schedule A/A+, B and C	Future study to confirm turn restrictions, consolidation of driveways / provision of auxiliary turning lanes
4. Sidewalk implementation	Not applicable	Not applicable	Sidewalks	NC	NC	Dependent on future road projects	Not classified	Implement sidewalks on both sides of collector and arterial roadways as part of future road projects.

Notes: NC – Not Costed

Costing to be refined in future studies. Timing for projects is primarily based on the A.O.D.A. requirements for all new or upgraded infrastructure components to be implemented by the target date of January 2025, and safety-related work should be incorporated as soon as possible



**Table ES6: Multi-Modal Development – Implementation Plan**

**Rationale:** The following activities are recommended to support the overall development of a multi-modal transportation network within Brooklin. Several activities were identified in the Whitby 2010 TMP, as noted within the remarks, and remain valid.

Development Activity	Description of Works	Anticipated Timing	Remarks/ Status
1. Traffic Calming and Parking Studies	Study	Short-Term with development / re-development	Studies can be used in identified areas to determine the appropriate mix of vehicular, cyclist, and pedestrian traffic as well as enhance key destination features that create a sense of place. In particular, the roads that should be studied are Baldwin Street between Winchester Road and Way Street and Vipond Road between Baldwin Street and Montgomery Avenue. Parking may be addresses as part of the ongoing Parking Master Plan.
2. Develop a Transit Oriented Development policy	Policy Development	Short-Term (by 2024)	Includes policies in Official Plan and Secondary Plan as appropriate. Policies have been developed as part of the 2017 Brooklin Study (combined Secondary Plan and TMP study). Activity identified in the 2010 TMP.
3. Designate and support implementation of Higher Order Transit corridors	Policy Development	Short-Term (by 2024)	Identify Transit Corridors and policies in Official Plan and Secondary Plan as appropriate. Policies have been developed as part of the 2017 Brooklin Study (combined Secondary Plan and TMP study). Note that the implementation of specific higher order transit projects does require EA approval. Activity identified in the 2010 TMP.
4. Complete Special Study to investigate and plan for alternative people movers/ micro-transit opportunities systems to/from key destinations	Study	Medium-Term (by 2031)	Initial area of focus being within Whitby but outside of Brooklin, to be followed by a study for the Brooklin area. Emerging technologies will inform the development of the expanded urban boundary area for Brooklin, including connected and autonomous vehicles.
5. Coordinate with the Region and DRT to implement a Transit Priority Plan	Study	Short-Term (by 2024)	Assess area of potential transit delay in cooperation with DRT staff, as well as impact on surrounding road network. Activity identified in the 2010 TMP.
6. Identify and protect for missing links that could benefit transit	Study	Short-Term (by 2024)	Identify Transit Corridors in Official Plan and Secondary Plans. Transit Corridors have been identified by Durham Region in the 2017 TMP, and by the Town of Whitby in this TMP. Continue to study future possible transit links. Including those that may be used for autonomous shuttles.
7. Appoint/hire a TDM Coordinator	Staff Hire	Short-Term (by 2024)	This position would provide for specific focus on moving TDM programs forward within the community. Activity identified in the 2010 TMP.
8. Develop a Trip Reduction Program for the Town Municipal Offices/Facilities	Strategy Development	Short-Term (by 2024)	Activity identified in the 2010 TMP. Internal Strategy development by TDM Coordinator.
9. Engage major employers, institutions and school boards to participate in trip reduction initiatives	Strategy Development	Short-Term (by 2024)	Activity identified in the 2010 TMP. Internal Strategy development by TDM Coordinator. The following categories for TDM strategies should be included: <ul style="list-style-type: none"> <li>- Improved Transportation Options</li> <li>- Incentives to Use Alternative Modes and Reduce Driving</li> <li>- Parking and Land Use Management</li> </ul>
10. Encourage the Development of Mobility Hubs	Policy Development	Short-Term (by 2024)	Activity identified in the 2010 TMP. Includes policies in Official Plan and Secondary Plan as appropriate. Policies have been developed as part of the 2017 Brooklin Study (combined Secondary Plan and TMP study).
11. Include TDM in the development process	Policy Development	Short-Term (by 2024)	Activity identified in the 2010 TMP. Includes policies in Secondary Plan as appropriate. Policies have been developed as part of the 2017 Brooklin Study (combined Secondary Plan and TMP study).
12. Prepare a short- and long-term Parking Strategy for Downtown Brooklin	Study	Short-Term (by 2024)	Consider the use of surface parking and parking structures to accommodate parking needs. The strategy should engage property owners to encourage more efficient use of existing private parking areas for commercial development, and optimize the opportunity for new infill development and cohesive commercial main street development. The Town is undertaking a Parking Master Plan (PMP) in 2017 to achieve this objective.
13. Undertake a Goods Movement Study in cooperation with Durham Region	Study	Short-Term (by 2024)	Establish policies, performance measures and routings and incorporate preferred corridors in Official Plan updates. Activity identified in the 2010 TMP.

Notes: Costs have not been estimated and will be refined as part of the future study/project



# Table of Contents

Letter of Transmittal

Statement of Qualifications and Limitations

Executive Summary

	page
<b>1. Introduction and Study Background _____</b>	<b>2</b>
1.1 Background and Purpose of the Transportation Master Plan	2
1.2 Municipal Class Environmental Assessment Process	4
1.3 Project Direction	6
1.3.1 Technical Advisory Committee	6
1.4 Vision	7
<b>2. Consultation and Public Engagement _____</b>	<b>9</b>
2.1 Technical Advisory Committee (TAC)	9
2.2 Community Advisory Committee (CAC)	10
2.3 Public Information Centres	11
2.3.1 Study Notification and Public Information Centre #1	11
2.3.2 Public Information Centre #2	11
2.3.3 Public Information Centre #3	11
2.3.4 Public Information Centre #4	12
2.4 Notice of Study Completion	12
<b>3. Planning Context _____</b>	<b>14</b>
3.1 Provincial Planning Objectives	14
3.1.1 Provincial Policy Statement (PPS)	14
3.1.2 Growth Plan for the Greater Golden Horseshoe (2017)	15
3.1.3 Greenbelt Plan (2017)	16
3.1.4 Oak Ridges Moraine Plan (2017)	17
3.2 Regional Transportation Planning Context	19
3.2.1 Regional Municipality of Durham Official Plan (2015 Consolidation)	19
3.2.2 Durham Region Transportation Master Plan (2005)	20
3.2.3 Town of Whitby Official Plan (2016 Consolidation)	21



3.2.4	Town of Whitby Transportation Master Plan (2010)	21
<b>3.3</b>	<b>Other Factors Shaping the Brooklin Transportation Master Plan</b>	<b>24</b>
3.3.1	Winchester Road Municipal Class EA	24
3.3.2	Highway 407 East Extension	24
3.3.3	Downtown Brooklin Transportation Study	25
3.3.4	Feasibility Study: Alternate Route for Highway 7/12	25
3.3.5	Highway 407 Interchange Review Cochrane Street Area (Memorandum)	26
3.3.6	Ministry of Transportation Ontario Origin-Destination (O-D) Survey 2010	27
<b>4.</b>	<b>Existing Environment</b>	<b>29</b>
<b>4.1</b>	<b>Physical Environment</b>	<b>29</b>
4.1.1	Geology and Soils	29
4.1.2	Groundwater Resources	30
4.1.3	Source Water Protection	30
<b>4.2</b>	<b>Natural Heritage Environment</b>	<b>34</b>
4.2.1	Watercourses	35
4.2.2	Fish and Fish Habitat	35
4.2.3	Vegetation	36
4.2.4	Wildlife	36
4.2.5	Species at Risk	36
4.2.6	Designated Natural Areas	37
4.2.7	Significant Wetlands	37
4.2.8	Oak Ridges Moraine	39
<b>4.3</b>	<b>Socio-Economic Environment</b>	<b>39</b>
4.3.1	Land Use	40
4.3.2	Existing Community Features and Facilities	42
<b>4.4</b>	<b>Cultural Heritage</b>	<b>43</b>
4.4.1	Aboriginal Peoples	44
<b>4.5</b>	<b>Archaeological Assessment</b>	<b>45</b>
<b>4.6</b>	<b>Other Background Studies</b>	<b>45</b>
<b>5.</b>	<b>Transportation Network – Existing Conditions and Future Needs</b>	<b>48</b>
<b>5.1</b>	<b>Existing Transportation Network</b>	<b>48</b>
<b>5.2</b>	<b>Land Use Options and Transportation Network Alternatives</b>	<b>52</b>
<b>5.3</b>	<b>Historic Traffic Growth and Mode Share</b>	<b>54</b>





<b>5.4</b>	<b>Heavy Vehicle (Truck) Traffic, Commuter Traffic and Summer Travel Patterns</b>	<b>55</b>
<b>5.5</b>	<b>Existing Traffic Congestion and Capacity Deficiencies</b>	<b>58</b>
5.5.1	Existing Traffic Operations – Baldwin Street	60
<b>5.6</b>	<b>Future Transportation Needs</b>	<b>63</b>
5.6.1	Planned Road Network Infrastructure Improvements	63
5.6.2	Population and Employment Growth Forecasts	64
5.6.3	Forecasting Future Transportation Demands	65
5.6.4	Future Do Nothing Assessment	66
5.6.5	Future Traffic Operations on Baldwin Street (Do Nothing)	71
5.6.6	Summary of Future Transportation Needs	72
<b>6.</b>	<b>Problem and Opportunity Statement _____</b>	<b>75</b>
<b>7.</b>	<b>Proposed Alternative Solutions _____</b>	<b>77</b>
<b>7.1</b>	<b>Development of the Proposed Alternative Solutions</b>	<b>77</b>
7.1.1	Do Nothing	77
7.1.2	Transportation Demand Management (TDM)	78
7.1.3	Enhanced Transit	79
7.1.4	Network Alternatives	79
7.1.5	Short-list of Network Alternatives	81
<b>8.</b>	<b>Alternative Solutions Evaluation _____</b>	<b>88</b>
<b>8.1</b>	<b>Evaluation Criteria</b>	<b>88</b>
<b>8.2</b>	<b>Evaluation Matrix and Preferred Alternative</b>	<b>89</b>
<b>9.</b>	<b>The Recommended Alternative _____</b>	<b>91</b>
<b>9.1</b>	<b>Preferred and Recommended Land Use Plan</b>	<b>91</b>
<b>9.2</b>	<b>Preferred and Recommended Road Network</b>	<b>95</b>
9.2.1	Alternate Route for Highway 7/12 Corridor	95
9.2.2	Arterial Road Network	98
9.2.3	Collector Road Network	103
9.2.4	Update to the Demand Macro-Model	105
<b>9.3</b>	<b>Active Transportation</b>	<b>108</b>
9.3.1	Guiding Principles	108
<b>9.4</b>	<b>Transit</b>	<b>111</b>
9.4.1	Guiding Principles	112



9.4.2	Recommendations	112
<b>9.5</b>	<b>TDM</b>	<b>115</b>
9.5.1	Guiding Principles	115
9.5.2	Recommendations	116
<b>9.6</b>	<b>Intersection Improvements</b>	<b>117</b>
9.6.1	Guiding Principles	117
9.6.2	Recommendations	118
<b>9.7</b>	<b>Parking</b>	<b>119</b>
9.7.1	Guiding Principles	119
9.7.2	Recommendations	120
<b>9.8</b>	<b>Access Management Downtown Core</b>	<b>120</b>
9.8.1	Guiding Principles	121
9.8.2	Recommendations	121
<b>9.9</b>	<b>Accessibility for Ontarians with Disabilities Act (A.O.D.A.)</b>	<b>122</b>
9.9.1	Guiding Principles	124
9.9.2	Recommendations	124
<b>10.</b>	<b>Implementation Plan</b>	<b>126</b>
<b>10.1</b>	<b>Infrastructure Projects and Cost Estimates</b>	<b>126</b>
10.1.1	Screenline Capacity Improvement Projects	126
10.1.2	Network Connectivity Projects	128
10.1.3	Long-Term Road Network Improvements	128
10.1.4	Active Transportation / A.O.D.A. and Access Management	128
10.1.5	Multi-Modal Development Implementation Plan	132
<b>10.2</b>	<b>Future Municipal Class Environmental Assessment Requirements</b>	<b>135</b>
<b>10.3</b>	<b>Future Provincial Class Environmental Assessment Requirements</b>	<b>136</b>
<b>10.4</b>	<b>Official Plan Policies</b>	<b>136</b>
<b>10.5</b>	<b>Plan Monitoring</b>	<b>141</b>
<b>10.6</b>	<b>Effects and Mitigation Measures</b>	<b>143</b>



## List of Exhibits

Exhibit 1:	Study Area _____	3
Exhibit 2:	MCEA Planning and Design Process Flowchart _____	5
Exhibit 3:	Approximate Limits of the Study Area within the Greenbelt Plan Area _____	17
Exhibit 4:	Oak Ridges Moraine Plan Area _____	18
Exhibit 5:	Schedule 'A', Map 'A4' _____	20
Exhibit 6:	Highway 407 East Extension (Brooklin) _____	25
Exhibit 7:	Significant Groundwater Recharge Areas (CTC, 2015) _____	32
Exhibit 8:	Highly Vulnerable Aquifers (CTC, 2015) _____	33
Exhibit 9:	Existing Brooklin TMP Study Area Road Network _____	53
Exhibit 10:	Trip Distribution for Trips Starting in Brooklin TMP Study Area (AM Peak Period) _____	56
Exhibit 11:	Recreational / Vacation Travel _____	57
Exhibit 12:	Existing Capacity Deficiencies (AM Peak Hour) _____	59
Exhibit 13:	Baldwin Street Total Traffic, South of Campbell Street (AM Peak Hour) _____	60
Exhibit 14:	Intersections in Turning Movement Count Program _____	61
Exhibit 15:	2031 Capacity Deficiencies (AM Peak Hour) _____	67
Exhibit 16:	Brooklin Screenline Locations _____	69
Exhibit 17:	Alternative 1, "Do Nothing" _____	83
Exhibit 18:	Alternative 2, "Widen Lake Ridge Road and Thickson Road" _____	84
Exhibit 19:	Alternative 3, "Widen Cochrane Street" _____	85
Exhibit 20:	Alternative 4, "Widen Ashburn Road" _____	86
Exhibit 21:	Recommended Brooklin Land Use Plan (Schedule K) _____	93
Exhibit 22:	Recommended Brooklin Major Central Area Land Use Plan (Schedule K1) _____	94
Exhibit 23:	Highway 7/12 Proposed Alternative Solutions _____	96
Exhibit 24:	Recommended Arterial Road Network _____	100
Exhibit 25:	Typical Arterial Road Cross-Sections _____	101
Exhibit 26:	Recommended Collector Road Network _____	104
Exhibit 27:	Typical Collector Road Cross-Section _____	106
Exhibit 28:	Recommended Solution Capacity Deficiencies _____	107



## List of Tables

Table 1:	Cultural Heritage Resource Sensitivities _____	43
Table 2:	Existing Travel Mode Share (%) – 2006 and 2011 TTS _____	54
Table 3:	Baldwin Street, Percentage Truck Traffic, South of Campbell Street ____	55
Table 4:	Existing Overall Intersection Peak Hour Level of Service _____	62
Table 5:	Brooklin Screenline Descriptions and "Do Nothing" Results _____	70
Table 6:	Future Overall Intersection Do Nothing Peak Hour Level of Service (2031) – Signalized Intersections _____	71
Table 7:	Evaluation Criteria – Categories and Indicators _____	88
Table 8:	Roadway Implementation Plan – Screenline Capacity Improvement Projects _____	127
Table 9:	Roadway Implementation Plan – Network Connectivity Projects _____	129
Table 10:	Roadway Implementation Plan – Long-Term Arterial Corridor Protection (beyond Horizon Year 2031) _____	131
Table 11:	Active Transportation / A.O.D.A & Access Management – Implementation Plan _____	133
Table 12:	Multi-Modal Development – Implementation Plan _____	134
Table 13:	MCEA Schedule for Screenline Capacity Improvement Projects _____	137
Table 14:	MCEA Schedule for Network Connectivity Projects _____	138
Table 15:	MCEA Schedule for Long-Term Arterial Corridor Protection Improvement Projects _____	140
Table 16:	MCEA Schedule for Active Transportation / A.O.D.A & Access Management Improvement Projects _____	140



## Appendices

### Appendix A Consultation

- A.1 Notifications
- A.2 Technical Advisory Committee (TAC) Meetings
- A.3 Community Advisory Council (CAC) Meetings
- A.4 Public Information Centre 1
- A.5 Public Information Centre 2
- A.6 Public Information Centre 3
- A.7 Public Information Centre 4
- A.8 Public Correspondence
- A.9 Agency Correspondence
- A.10 Aboriginal Correspondence

### Appendix B Highway 407 Interchange Review - Cochrane Street Area

### Appendix C Natural Heritage

### Appendix D Cultural Heritage

### Appendix E Archaeological Assessment

### Appendix F Transportation Demand Modelling and Traffic Assessment Report

- F.1 Traffic Data
- F.2 Existing Conditions Synchro Assessment and Synchro Reports
- F.3 Travel Demand Model
- F.4 Future Conditions Synchro Assessment and Synchro Reports
- F.5 Access Inventory

### Appendix G Detailed Transportation Alternative Solutions Evaluation

### Appendix H Mid-Block Arterial Staff Report





# Section 1

## Introduction and Study Background









# 1. Introduction and Study Background

## 1.1 Background and Purpose of the Transportation Master Plan

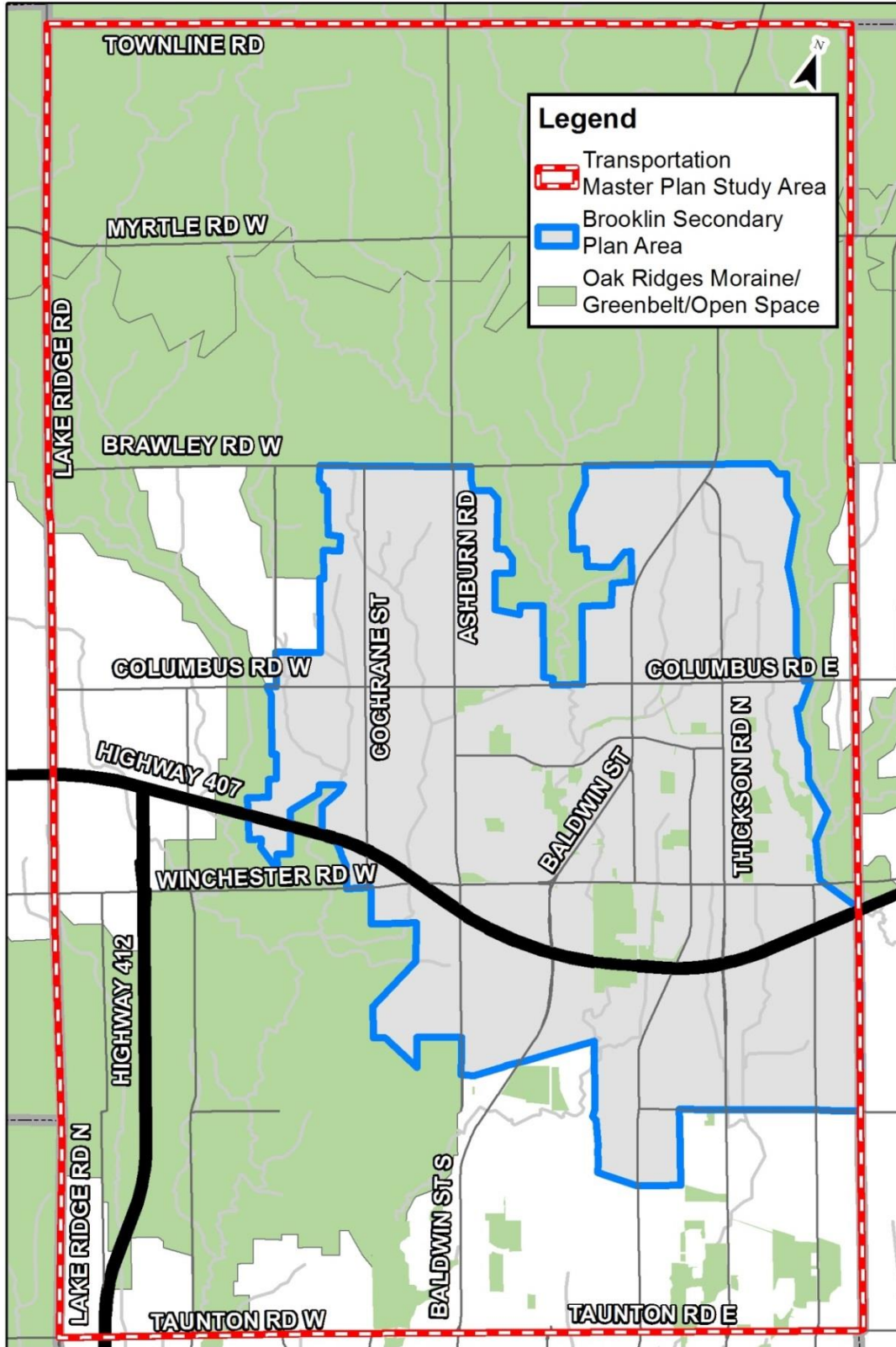
The Town of Whitby conducted an integrated and comprehensive study for the Brooklin area to determine land use planning and transportation needs for future growth in and around the existing community of Brooklin. The outcome of the study, referred to as the Brooklin Study, is a comprehensive Secondary Plan and Transportation Master Plan (TMP) for the Brooklin area. This document is specific to the TMP component of the combined study, however, relevant resource materials prepared as part of the Secondary Plan component are identified in this report for the reader's reference.

The Secondary Plan addresses the land use designations for the urban expansion areas north and west of Brooklin, the industrial lands adjacent to the future Highway 407 and the lands in the vicinity of the Conlin Road / Anderson Street intersection, as well as an update to the existing Brooklin Community Secondary Plan.

The TMP for the Brooklin area outlines the future transportation infrastructure and mobility requirements. The Brooklin TMP was conducted in accordance with the Municipal Engineers Association Class Environmental Assessment (EA) process. The work previously completed for the Northwest Brooklin Class EA, the purpose of which was to “give consideration to establishing an alternative route for provincial Highway 7/12 as it passes through Brooklin so that the Town of Whitby can gain care and control over Baldwin Street as it passes through Downtown Brooklin”, has been incorporated into the TMP. The study area for the TMP component is provided as **Exhibit 1**.

The purpose of the TMP is to:

- identify mobility infrastructure needs
- identify improvements to transportation policies and standards
- develop an implementation plan to prioritize infrastructure planning and construction
- integrate with the requirements of the Municipal Class Environmental Assessment



Source base mapping: Land Information Ontario (MNR)  
 E:\Projects\60278570\_Brooklin\_TMP\_Study\900-Work\920-929 (GIS-Graphics)\Design\01\_Reports\HWY\MXD\TMP\_StudyArea.mxd, michael.w.collins

Exhibit 1: Study Area



## 1.2 Municipal Class Environmental Assessment Process

The Municipal Engineers Association Class Environmental Assessment (Class EA) dated October 2000, as amended in 2007, 2011 and 2015, is an approved Class EA process under the Ontario Environmental Assessment Act. The Municipal Class EA recognizes that it is sometimes advisable to plan municipal infrastructure as part of an overall system rather than as a specific project, such as a roadway improvement project. The planning provisions of the Class EA describe the scope of a master plan as being broad and comprehensive, usually including analysis of an entire system such as a municipal transportation system, in order to develop a framework for future works and development.

The Brooklin TMP and Secondary Plan were carried out as an “integrated approach” as set out in Section A.2.9 of the Municipal Class EA, which combines Planning Act and Environmental Assessment Act requirements, and addresses Phases 1 and 2 of the Municipal Class EA (MCEA) process (referred to in **Exhibit 2**). The preparation of a comprehensive Secondary Plan and TMP for the Brooklin Area, through a joint Planning Act and EA process, will enable the Town to guide and manage the growth of future urban areas in an integrated and balanced manner and provide the foundation for the creation of a healthy and sustainable community.

The TMP establishes the framework for planning of future transportation projects through a recommended set of preferred alternatives and provides the context for the implementation of proposed modifications to transportation infrastructure. Subsequent Class EA projects and/or studies will be required for specific projects that have some potential for environmental impact, such as intersection improvements (Schedule B projects), and major transportation infrastructure projects such as road widenings and new roadways or extensions (Schedule C projects). Other projects that have only minimal potential for environmental effects can be categorized as Schedule A or A+ projects (i.e., routine maintenance or minor operational improvements). Routine measures are typically utilized to mitigate any effects brought about by these types of projects and they are either pre-approved under the Environmental Assessment Act or require a less rigorous environmental screening and documentation process.

More detailed investigation will be required to implement specific Schedule B and C projects that are recommended as part of this TMP. Specifically, Schedule B projects are required to fulfill Phases 1 and 2 of the Class EA process and prepare a project file for public and agency review. Schedule C projects are required to fulfill subsequent phases (i.e., Phases 3 and 4) of the Class EA process which includes the examination



## EXHIBIT A.2

## MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

*NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA*

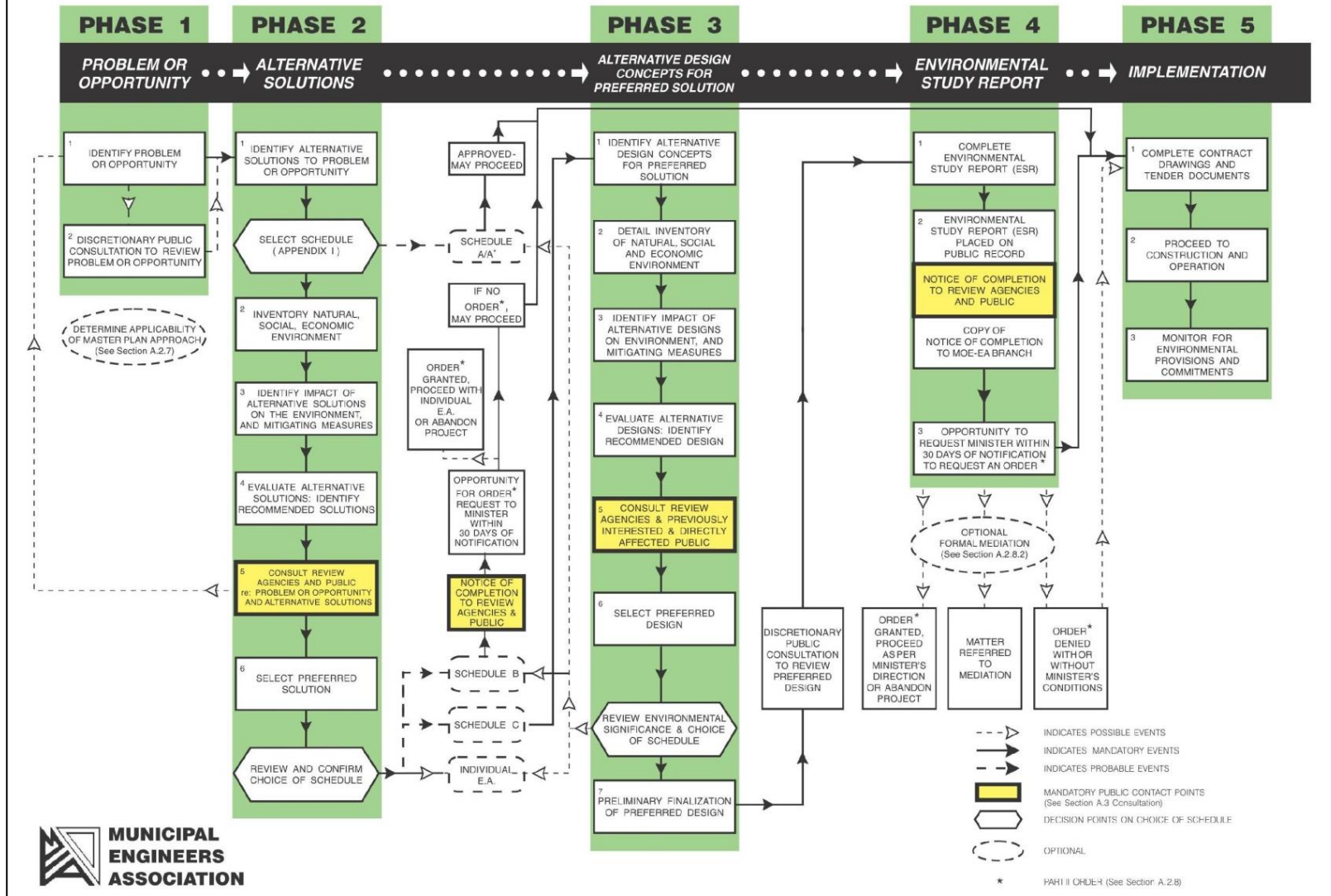


Exhibit 2: MCEA Planning and Design Process Flowchart



of design alternatives for the recommended project, identification of the preferred design and measures to mitigate the anticipated impacts of a project, additional consultation activities to allow for public and agency review and input and filing of an Environmental Study Report (ESR). In both cases, the public review period includes a Part II Order appeal mechanism where an individual can make a written request to the Minister of the Environment to extend the project to a higher level of EA investigation. A request for an order to comply with Part II of the EA Act (Part II Order) cannot be made on the TMP itself, but may be made on specific Schedule 'B' or 'C' projects identified in the Brooklin TMP that are subject to a Municipal Class EA.

The combined study approach is a cost effective way to undertake both studies, allowing for sharing of public notifications, data collection, and reports.

The study incorporated four stages as follows:

- Stage 1:** Background Studies and Visioning
- Stage 2:** Land Use and Transportation Network Options
- Stage 3:** Secondary Plan & Supporting Studies
- Stage 4:** Approval  
Council Adoption

Each Stage incorporates multiple tasks for both the Secondary Plan and the TMP, including consultation activities.

## 1.3 Project Direction

The Brooklin TMP was conducted by AECOM and the Town of Whitby Public Works Department. The Brooklin Secondary Plan was conducted by the Town of Whitby Planning Department and their consultant SGL (Sorensen Gravely Lowes Planning Associates Inc.).

### 1.3.1 Technical Advisory Committee

Technical input for the Brooklin TMP was guided by the Technical Advisory Committee (TAC) for the Brooklin Study. Representatives from the Regional Municipality of Durham, the Central Lake Ontario Conservation Authority, Ministry of Transportation, Township of Brock, Town of Ajax, City of Pickering, City of Oshawa, Town of Whitby,



Durham District School Board and Durham Catholic District School Board, Ministry of Natural Resources and Forestry, Durham Student Transportation Services were invited to participate on the TAC.

In total, four TAC meetings were held at key points during the study.

- The first TAC meeting was held at the Regional Municipality of Durham Headquarters on April 16, 2014;
- The second, third and fourth TAC meetings were all held at the Centennial Building, Town of Whitby on the following dates: January 28, 2015; March 3, 2016; and March 29, 2017.

Consultation materials are included in **Appendix A**. TAC Meeting materials are included in **Appendix A.1**.

## 1.4 Vision

The Secondary Plan includes a vision to guide and manage growth in and around Brooklin to year 2031 and beyond.

The Town's Cultural Plan Input report, completed as part of the Brooklin Study, identified the vision of Whitby's Future as follows:

"Whitby will be a 'Community of Choice' for families and business, embracing the future while respecting our proud heritage and natural environment, and promoting our strong sense of community identity."

This vision emerged from the community through the community engagement process used to develop the Whitby Community Strategic Plan.

Specifically with respect to Baldwin Street, there is a strong desire by the Town of Whitby and Brooklin residents to change the look and feel of Baldwin Street. The future vision of Baldwin Street through Downtown Brooklin is for a community-focused, pedestrian-oriented, business friendly and sustainable downtown. To achieve this vision and the planning objectives of the Town, Baldwin Street must change from a Provincial highway environment to a more people and business-friendly downtown core, primarily by removing large trucks and commuter / long-distance traffic and the



## Section 2

### Consultation and Public Engagement









## 2. Consultation and Public Engagement

An in-depth public engagement and consultation strategy was developed for the Brooklin TMP. This strategy included:

- Meetings with a Technical Advisory Committee (TAC) and a Community Advisory Committee (CAC)
- Numerous Public Information Centres (PICs);
- MetroQuest Surveys;
- Comment forms;
- Overall public feedback;
- Agency correspondence;
- Consultation and engagement geared towards Indigenous and Métis communities; and
- A dedicated study website established through the Town of Whitby website (<http://whitby.ca/en/townhall/brooklin-study.asp>).

An in-depth and detailed public engagement and consultation summary of the above mentioned items, including public feedback and agency correspondence are provided in **Appendix A**. Below is a summary of key consultation and public engagement activities.

### 2.1 Technical Advisory Committee (TAC)

Technical input for the Brooklin TMP was guided by the Technical Advisory Committee (TAC) for the Brooklin Study. Representatives from the Regional Municipality of Durham, the Central Lake Ontario Conservation Authority, Ministry of Transportation, Township of Brock, Town of Ajax, City of Pickering, City of Oshawa, Town of Whitby, Durham District School Board and Durham Catholic District School Board, Ministry of Natural Resources and Forestry, Durham Student Transportation Services were invited to participate on the TAC.



In total, four TAC meetings were held at key points during the study.

- The first TAC meeting was held at the Regional Municipality of Durham Headquarters on April 16, 2014;
- The second, third and fourth TAC meetings were all held at the Centennial Building, Town of Whitby on the following dates: January 28, 2015; March 3, 2016; and March 29, 2017.

All TAC Meeting materials are included in **Appendix A.2**.

## 2.2 Community Advisory Committee (CAC)

The Brooklin Study was assisted by a Community Advisory Committee (CAC), formed to help represent the interests and opinions of the community. Members of the CAC consisted of representatives from the Whitby Chamber of Commerce, the Brooklin Landowners Group, the Downtown Brooklin Business Association Development Steering Committee, the Sustainability Advisory Committee, and LACAC.

Four CAC meetings were held as part of the Brooklin Study.

- The first CAC meeting was held on June 19, 2014 to provide an overview of the study, the information presented at PIC #1, the feedback received from the public and the next steps in the study.
- The second CAC meeting was held on Thursday, November 20, 2014 to discuss the results of the Public Information Centre #1 and associated MetroQuest survey, as well as the vision for Brooklin and the principles for the Brooklin Secondary Plan.
- The third CAC meeting was held on February 23, 2016 to review the three land use options for the existing and expanded Brooklin Secondary Plan areas and the transportation network alternatives developed by the study team.
- The fourth CAC meeting was held on March 29, 2017 to review and discuss the Preferred Land Use Plan, the recommended transportation network, and the Draft Proposed Secondary Plan.

Minutes for each CAC meeting are included in **Appendix A.3**.



## 2.3 Public Information Centres

### 2.3.1 Study Notification and Public Information Centre #1

The first Public Information Centre (PIC) was held on April 2, 2014 at the Brooklin United Church. The Notice of Study Commencement and the PIC was mailed to those on the study Interested Parties list, published in the Whitby This Week and Brooklin Town Crier newspapers and posted on the Town's website. The purpose of the PIC was to introduce the Brooklin Study and provide a preliminary overview of existing conditions in the community. All materials related to Public Information Centre #1 are included in **Appendix A.4**.

### 2.3.2 Public Information Centre #2

The study's second PIC was held on February 24, 2015 at the Brooklin United Church. The purpose of PIC #2 was to:

- provide a brief overview of the findings of the Phase 1 Background Studies and of the Transportation Master Plan work completed to date;
- obtain feedback from the public on the proposed preliminary study principles;
- obtain public input on desired transportation improvements; and
- generate public ideas for locating future land uses in the new urban areas, creating possible land use and transportation concepts (Participant Workshop).

All materials related to Public Information Centre #2 are included in **Appendix A.5**.

### 2.3.3 Public Information Centre #3

The third PIC was held on March 9, 2016 at the Brooklin United Church. The Notice of the PIC was mailed to those on the study Interested Parties list, published in the Whitby This Week and Brooklin Town Crier newspapers and posted on the Town's website.

The purpose of PIC#3 was to:

- present the three land use options for the Expanded Area of the Draft Secondary Plan;
- present the three land use option for the Major Central Area of the Draft Secondary Plan;
- present the collector and arterial road network alternatives of the Draft Transportation Master Plan to support the land use options; and



- obtain feedback from the public on the proposed land use options and transportation network alternatives (Participant Workshop).

All materials related to Public Information Centre #3 are included in **Appendix A.6**.

### **2.3.4 Public Information Centre #4**

The fourth PIC was held on April 5, 2017 at the Brooklin United Church. The Notice of the PIC was mailed to those on the study Interested Parties list, published in the Whitby This Week and Brooklin Town Crier newspapers and posted on the Town's website.

The purpose of PIC #4 was to:

- present the preferred land use plan and preferred Major Central Area land use plan;
- present the preferred collector and arterial road network;
- present the Draft Secondary Plan, including the proposed Active Transportation Secondary Plan policies; and
- solicit feedback from the public on the preferred land use plan, Draft Proposed Secondary Plan, and preferred transportation network.

All materials related to Public Information Centre #4 are included in **Appendix A.7**.

## **2.4 Notice of Study Completion**

The Notice of Study Completion was mailed to those on the study Interested Parties list, published in the Whitby This Week newspaper on May 24, 2017 and Brooklin Town Crier newspaper on May 26, 2017 and posted on the Town's website. It was also distributed via standard mail delivery to agencies, residents, businesses and property owners situated within and surrounding the study area during the week of June 5, 2017. The TMP document was made available for public review and comment from June 16, 2017 until July 31, 2017.

Following the 30-day public review period and subsequent to the Council meeting which was held on June 13, 2017, all public and agency comments received were reviewed and considered in preparation of the Final TMP report, as appropriate. The Official Plan Amendment 108 regarding the Brooklin Community Secondary Plan was adopted by Council on October 30, 2017.



## Section 3

### Planning Context







## 3. Planning Context

### 3.1 Provincial Planning Objectives

#### 3.1.1 Provincial Policy Statement (PPS)

The 2014 Provincial Policy Statement was issued under Section 3 of the Planning Act, replacing the 2005 PPS, and provides policy direction related to land use planning and development in Ontario. A detailed set of policies are outlined in the PPS and are intended to address the following:

- Building Strong Communities;
- Wise Use and Management of Resources; and
- Protecting Public Health and Safety.

The PPS policies regarding infrastructure and public service facilities focus on a municipality's responsibility to:

- ensure that necessary infrastructure and public service facilities are available to meet current and future needs;
- optimize existing infrastructure and public service facilities to avoid premature development of new infrastructure and public service facilities; and
- locate infrastructure and public service facilities in a strategic manner in order to meet the needs of emergency management services.

With respect to transportation, the PPS also contains a series of policies that direct municipalities to:

- promote a land use pattern that minimizes the length and number of vehicle trips and supports the development of viable alternative transportation modes;
- integrate transportation and land use considerations through all stages of the planning process;
- use existing and planned infrastructure (including transportation infrastructure) efficiently; and
- provide a transportation system that is safe, energy efficient, facilitates the movement of goods and people, and has sufficient capacity for projected needs.



With respect to transportation and infrastructure corridors, the PPS directs municipalities to:

- plan and protect corridors and rights-of-way for transportation, transit, and infrastructure facilities to meet current and projected needs;
- not permit development in planned corridors should it limit the planned corridor's use; and
- consider the environmental impacts when planning for corridors and rights-of-way for significant transportation infrastructure facilities.

Policy direction in the 2014 PPS also requires the promotion of active transportation and transit-supportive development and providing for connectivity among transportation modes. In addition, planning for transportation infrastructure (i.e., trails, transit, etc.) in a coordinated manner amongst municipalities and other levels of government, agencies and boards is encouraged as part of the 2014 PPS.

### **3.1.2 Growth Plan for the Greater Golden Horseshoe (2017)**

Population and employment growth forecasts in the Region are provided in Places to Grow: Growth Plan for the Greater Golden Horseshoe (Growth Plan), issued by the province in 2006, as amended in 2013 and 2017. Under the Places to Grow Act, municipalities are required to utilize these forecasts for planning purposes.

The Growth Plan is a strategic Provincial vision for long-term growth in the Greater Golden Horseshoe and surrounding areas. The Growth Plan guides municipalities to optimize the use of existing and new infrastructure to support growth, and to coordinate infrastructure planning, land use planning and infrastructure investment. The Growth Plan mirrors policies found in the PPS with respect to transportation corridors.

Many policies in the Growth Plan deal with planning for transportation infrastructure, with an emphasis on encouraging municipalities to plan for transportation systems that are adequate for the level of anticipated growth, offer multi-modal access to destinations, provide safety for users, and are interconnected and planned for in a coordinated manner. The Growth Plan also focuses heavily on planning for greater density in urban areas that can support higher transit service levels and increase the modal share of transit. Further, municipalities are directed to integrate pedestrian and bicycle networks into transportation planning for both existing and new communities.





The 2017 update to the Provincial Growth Plan included updated 2031, 2036 and 2041 growth forecasts. Population in the Region is expected to increase from 970,000 in 2031, to 1,080,000 in 2036, and to 1,190,000 in 2041. Employment in the Region is expected to increase from 360,000 in 2031, to 390,000 in 2036, and to 430,000 in 2041. It should be noted that the previous Growth Plan density target (i.e., 50 residents and jobs per hectare) continues to apply for designated greenfield areas approved prior to July 1, 2017, which includes the Brooklin Secondary Plan greenfield area, until the next Municipal Comprehensive Review (i.e., Regional Official Plan Review). Once that review is completed and approved, the density target is to increase to 60 residents and jobs per hectare within these designated greenfield areas.

### 3.1.3 Greenbelt Plan (2017)

The study area is located within the Greenbelt Area as defined by Ontario Regulation 59/05 and is governed by the Greenbelt Plan (2017). The Greenbelt Plan “identifies where urbanization should not occur in order to provide permanent protection to the agricultural land use base and the ecological features occurring on the landscape.” The Greenbelt Plan includes lands within the Niagara Escarpment Plan (NEP) and the Oak Ridges Moraine Conservation Plan (ORMCP) and builds upon the protection set forth in these Plans. Development applications made under the Ontario Planning and Development Act, the Planning Act or the Condominium Act that were commenced on or after December 16, 2004, are required to conform to the Greenbelt Plan.

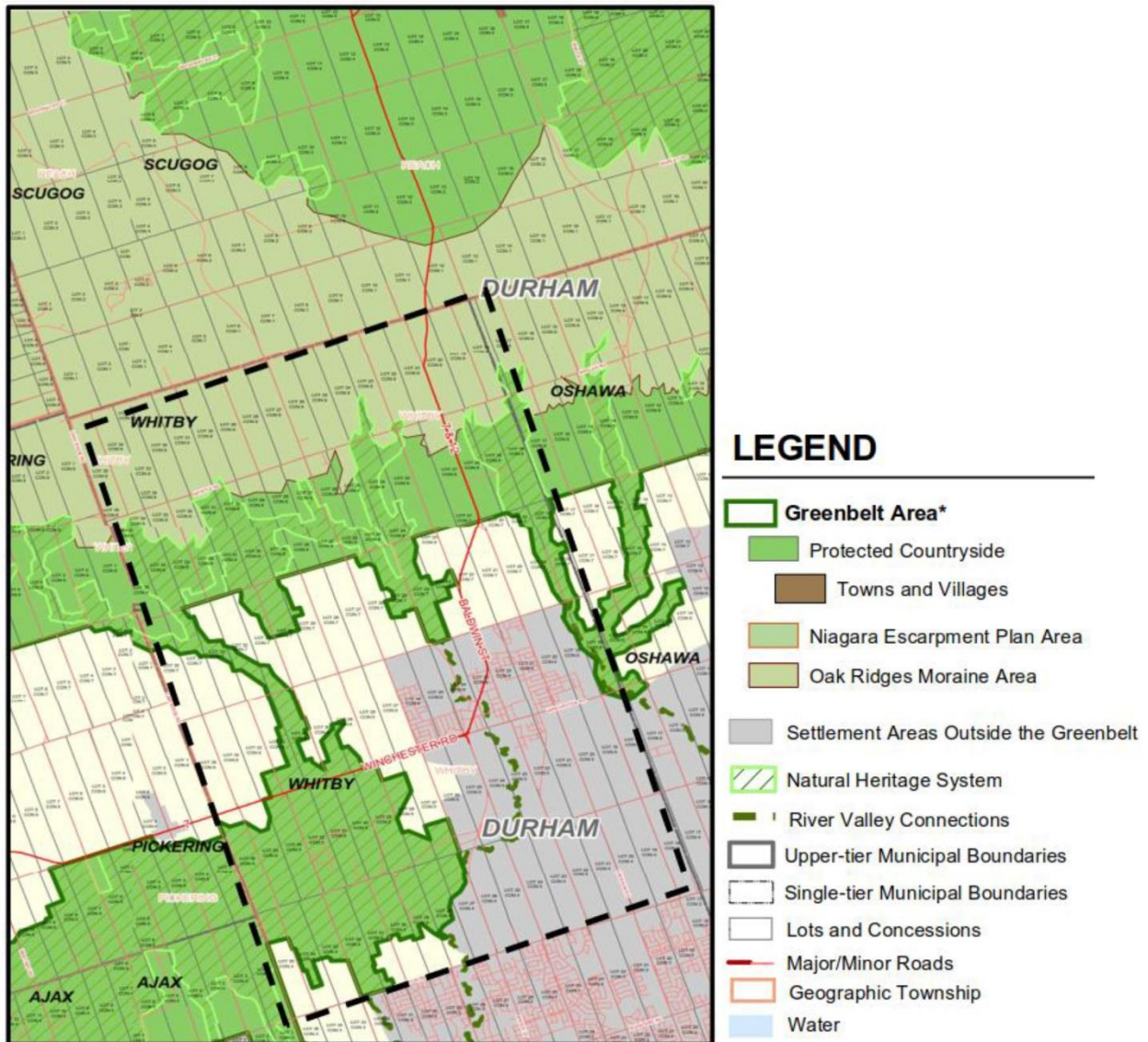
Approximately 1.8 million acres are protected under the Greenbelt Plan (including the NEP and the ORMCP area).

The designated Greenbelt Area spans in a westerly direction from the eastern limits of the Oak Ridges Moraine (i.e., near Rice Lake) to the Niagara River, is approximately 325 km in length, and comprises a maximum width of 80 km. An additional one million acres are protected through the Protected Countryside designation of the Greenbelt Plan, which follow existing designations, as documented within municipal Official Plans (OPs). The Protected Countryside includes Natural Heritage and Water Resource Systems, Agricultural Systems and Settlement Areas. The Agricultural System is comprised of specialty crop areas, prime agricultural areas (as designated in OPs) and rural areas. The Protected Countryside designation of the Greenbelt Plan Area within the TMP study area is further described in **Section 4.3.1**.

The balance of the study area lies within the Oak Ridges Moraine Area of the Greenbelt Plan, as discussed in **Section 3.1.4**. As part of the 2017 updates to the Greenbelt Plan,



the Greenbelt boundary in southwest Brooklin (west of Ashburn Road and south of Highway 7) has added the River Valley designation which includes the urban river connections in the area. The features of the Greenbelt Plan, as they pertain to the study area, are illustrated in **Exhibit 3**.



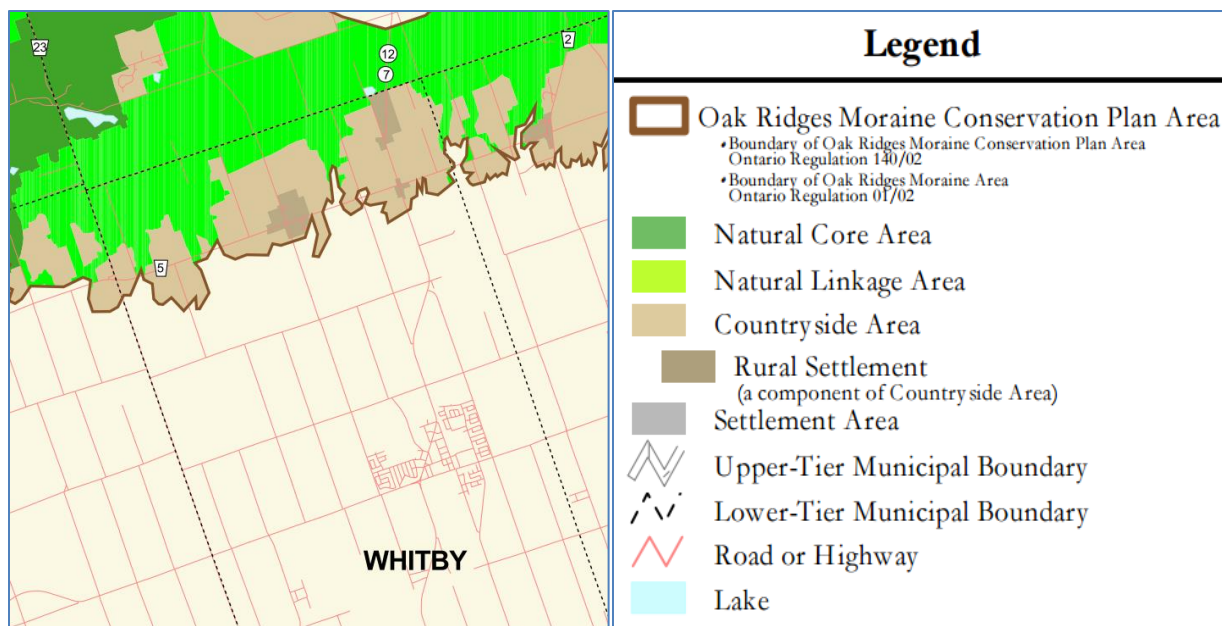
**Exhibit 3: Approximate Limits of the Study Area within the Greenbelt Plan Area**

### 3.1.4 Oak Ridges Moraine Plan (2017)

The north portion of the TMP study area is situated within the limits of the Oak Ridges Moraine, a geological feature which spans from Dufferin and Peel Regions in the west, easterly to Northumberland County. The moraine is a topographical feature that is



characterized by rolling hills of sand, gravel and till, which divide the drainage between the north and south (MNR, 1984). In December 2001, the province of Ontario approved the Oak Ridges Moraine Conservation Act (ORMCA), which enabled the release of the Oak Ridges Moraine Conservation Plan (ORMCP) as an Ontario Regulation (O. Reg. 140/02) in April 2002. The ORMCP was amended in May 2017 and amendments to O. Reg. 140/02 took effect on July 1, 2017. The ORMCP was established to protect this geological feature (e.g. the Oak Ridges Moraine) and its functions, and contains provision to which all municipal OPs must conform. The Oak Ridges Moraine Plan Area is shown in **Exhibit 4**.



**Exhibit 4: Oak Ridges Moraine Plan Area**

The ORMCP also provides guidance for all land use planning, development and site alteration activities, including Transportation Utilities and Infrastructure within the limits of the ORM. While the ORMCA prevails over Planning Act matters, it recognizes that the Environmental Assessment Act is the pre-eminent legislation for many projects and continues to apply in the area of the ORM. Since a portion of the study area is situated within the ORM, the ORMCP applies to this TMP study.

The ORMCP describes four land use designations, Natural Core Area, Natural Linkage Area, Countryside Area, and Settlement Area, and prescribes uses and restrictions for each. Three of the four land use designations are present within the north portion of the TMP study area and are further described in **Section 4.3.1**.



## 3.2 Regional Transportation Planning Context

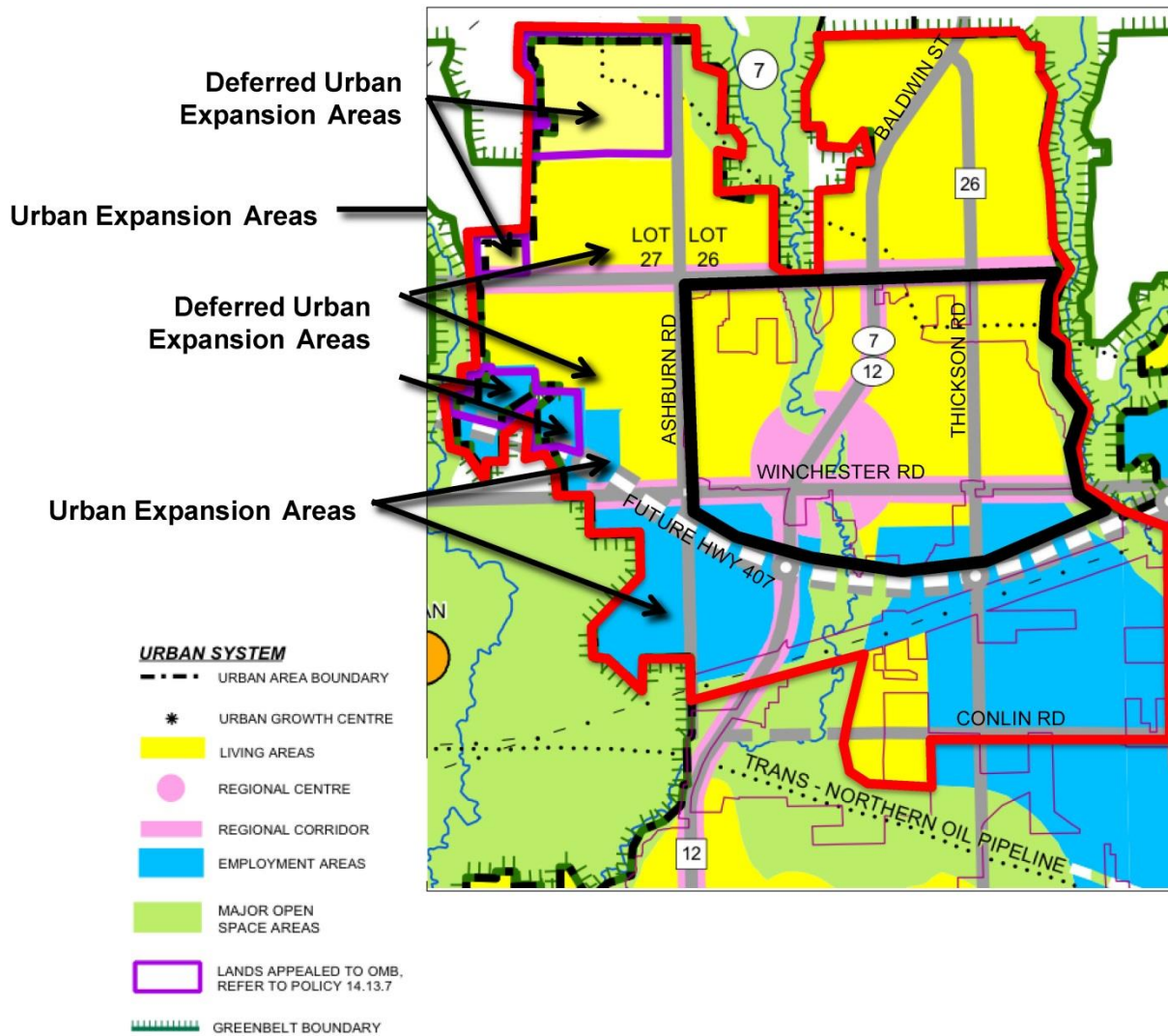
### 3.2.1 Regional Municipality of Durham Official Plan (2015 Consolidation)

According to the Regional Municipality of Durham's Official Plan (OP), the transportation system in Durham Region is to be integrated, safe, efficient and reliable for all users and modes and offer a variety of mobility choices for all Durham residents. On June 3, 2009, Regional OP Amendment No. 128 (ROPA 128) was adopted by Regional Council and submitted to the Ministry of Municipal Affairs and Housing (MMAH) for approval; this was created to conform the Region of Durham's OP with the Provincial Growth Plan for the GGH.

On October 27, 2010, a decision to approve and modify portions of the ROPA 128 was carried out by the MMAH. As part of the modifications to ROPA 128 by the MMAH, the proposed expansion changes were refused. This decision was appealed to the Ontario Municipal Board (OMB). On January 9, 2013, the OMB approved a settlement regarding ROPA 128 reached between the Region of Durham, the Province of Ontario and other key stakeholders. The Region of Durham expanded the Whitby urban boundary to add urban expansion areas through ROPA 128 in order to accommodate future population and employment forecasts to the year 2031. Portions of the urban expansion areas are deferred by the OMB and are pending further review.

As illustrated in Schedule 'A', Map 'A4' of the Regional OP (please refer to **Exhibit 5**), Downtown Brooklin, which surrounds Baldwin Street and Winchester Road, has been designated as a Regional Centre. Regional Centres are recognized as focal points of urban development and activities within area municipalities. Designated Employment land uses are situated in the south portion of the study area.

Baldwin Street, from Columbus Road West to the south beyond Winchester Road, is a designated Regional Corridor. Other designated Regional Corridors in the study area include Winchester Road and Columbus Road. Regional Corridors are planned in association with Mixed Use areas and are intended to support pedestrian use, higher order transit services and efficient links to Regional Centres. Baldwin Street/Winchester Road would link the Brooklin Regional Centre with other designated Regional Centres located at Winchester Road and Simcoe Street in Oshawa, and Taunton Road and Brock Street in Whitby.



**Exhibit 5: Schedule 'A', Map 'A4'**

### 3.2.2 Durham Region Transportation Master Plan (2005)

The Durham Region's Transportation Master Plan (TMP) was issued in 2005 and is currently being updated (completion anticipated in 2017) to reflect the updated Regional Municipality of Durham Official Plan as well as other Provincial, Regional and area municipal studies and plans that have been undertaken since that time. The TMP defines the policies, programs and infrastructure improvements required to address the Region's transportation needs.

The Region's TMP identifies a 'Transportation Centre' at Baldwin Street and Winchester Road to serve as a hub to intersect local transit service. A Transportation Centre is



defined as an area designated for high-density commercial, retail, or mixed-use development. These areas are to facilitate transfers between different modes of travel or between transit services and provide for sufficient parking and passenger facilities.

### **3.2.3 Town of Whitby Official Plan (2016 Consolidation)**

The Town of Whitby's Official Plan was adopted by the Whitby Council in 1994, approved by the Region of Durham in 1995 and consolidated in 2016. At the municipal level, the OP guides decision making on matters such as land use and development, as well as the delivery of infrastructure, services and facilities.

One of the guiding principles of the Town's Official Plan is to provide opportunities for a range of services within the community of Brooklin while maintaining and enhancing its natural and cultural heritage resources.

The Town of Whitby is currently undertaking a review of its Official Plan; Amendment 105 to the Whitby OP was adopted by Whitby Council on February 21, 2017 and the Amendment has been forwarded to the Region of Durham for approval.

Over the course of the review, a series of Proposed Draft Amendments were released for public and agency review and comment in relation to the Council-endorsed Final Policy Directions. There were four project phases, as follows:

- Project Phase 1 – Issues Identification and Directions
- Phase 2 – Policy Development
- Phase 3 – Official Plan Amendment Preparation
- Phase 4 – Official Plan Amendment Finalization

OP 90 (Pending Final Approval) identifies the Baldwin Street and Winchester Road area as an Intensification Area and makes specific references to the heritage and character of the downtown area, and pedestrian friendly street frontage.

### **3.2.4 Town of Whitby Transportation Master Plan (2010)**

The Town of Whitby's 2010 TMP is a framework to integrate regional and provincial transportation and environmental planning, policies and requirements for the entire Town.



As part of the TMP, Baldwin Street was identified as one of the primary north-south corridors providing access to the north portion of Durham Region, which attracts a large volume of commuter traffic through the downtown area of Brooklin. A significant volume of heavy truck traffic travels along Highway 7/12, and ultimately through the downtown area of Brooklin, and was noted to create ongoing conflicts with pedestrians, cyclists and other vehicular traffic along Baldwin Street in this area. Other deficiencies and/or opportunities noted as part of the TMP included the following:

- Physical property constraints within the historic portions of the community preclude the major expansion of the existing road network
- Local residents have reported concerns with vehicles speeding and ‘shortcutting’ on local routes to avoid congestion on surrounding roadways, given the existing shortage of high capacity east-west routes and/or access to them
- Protection of a future Highway 407 interchange at Cochrane Street is necessary to service future development lands and to relieve anticipated congestion leading to/from Brooklin and Highway 407<sup>2</sup>
- Localized intersection improvements are necessary to maximize the existing system and address local operating deficiencies and constraints at intersections

Other key conclusions of the Whitby 2010 TMP indicated that:

- Infrastructure in Brooklin has not kept pace with recent / significant population growth
- There is a need to address congestion issues on Baldwin Street through Downtown Brooklin related to a significant amount of commuter traffic
- There is an existing shortage of high capacity east-west routes or access to them
- There are public concerns associated with vehicle speeding and traffic infiltration on local routes to avoid congestion on surrounding roadways

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2. Appendix B of the TMP report includes a memorandum completed by AECOM, dated May 16, 2016 titled “Highway 407 Interchange Review, Cochrane Street Area” that outlines an assessment of potential interchange configurations at Highway 407 and Cochrane Street and Highway 407 and Ashburn Road in the Town of Whitby.



The following recommendations for modifications to the transportation network within the study area were made:

- Add a new north-south route to accommodate trips around Brooklin and service future development
- Protect extension of arterial and collector road network to accommodate new development
- Increase capacity of Brooklin roadways, including protection for widening of Lake Ridge Road, Cochrane Street and Columbus Road
- Include a new Mid-Block Arterial road south of Highway 407 and north of Conlin Road
- Protect for a 4-lane extension of Coronation Road from Taunton Road to north of Taunton Road
- Widen Baldwin Street, between Highway 407 and Taunton Road, from 4 to 6 lanes
- Widen Anderson Street from 2 to 4 lanes between Highway 407 East and north of Rossland Road (Glen Dhu Drive)
- Protection for a future Highway 407 interchange at Cochrane Street to service future development lands<sup>3</sup>

With respect to the new Mid-Block Arterial road corridor that was recommended in the 2010 TMP, as part of the 2010 TMP, numerous alternatives were assessed considering east-west travel in proximity to Anderson Street, Conlin Road and the northerly extension of Garden Street. The Town considered and assessed 12 different corridor alignments as part of the 2010 TMP, including mid-block alignments as well as an extension of Conlin Road. These alignments were evaluated based on criteria including transportation servicing, natural environment, economic environment, cost and engineering. The corridor that was identified as the preferred corridor, which was confirmed as part of the Brooklin TMP assessment, was determined to best meet future capacity needs, provide servicing to the future development, and the least impact to the environment, particularly with respect to minimizing impact to provincially significant wetlands.

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3. Appendix B of this report includes a memorandum completed by AECOM, dated May 16, 2016, titled "Highway 407 Interchange Review, Cochrane Street Area" that outlines an assessment of potential interchange configurations at Highway 407 and Cochrane Street and Highway 407 and Ashburn Road in the Town of Whitby.





## 3.3 Other Factors Shaping the Brooklin Transportation Master Plan

### 3.3.1 Winchester Road Municipal Class EA

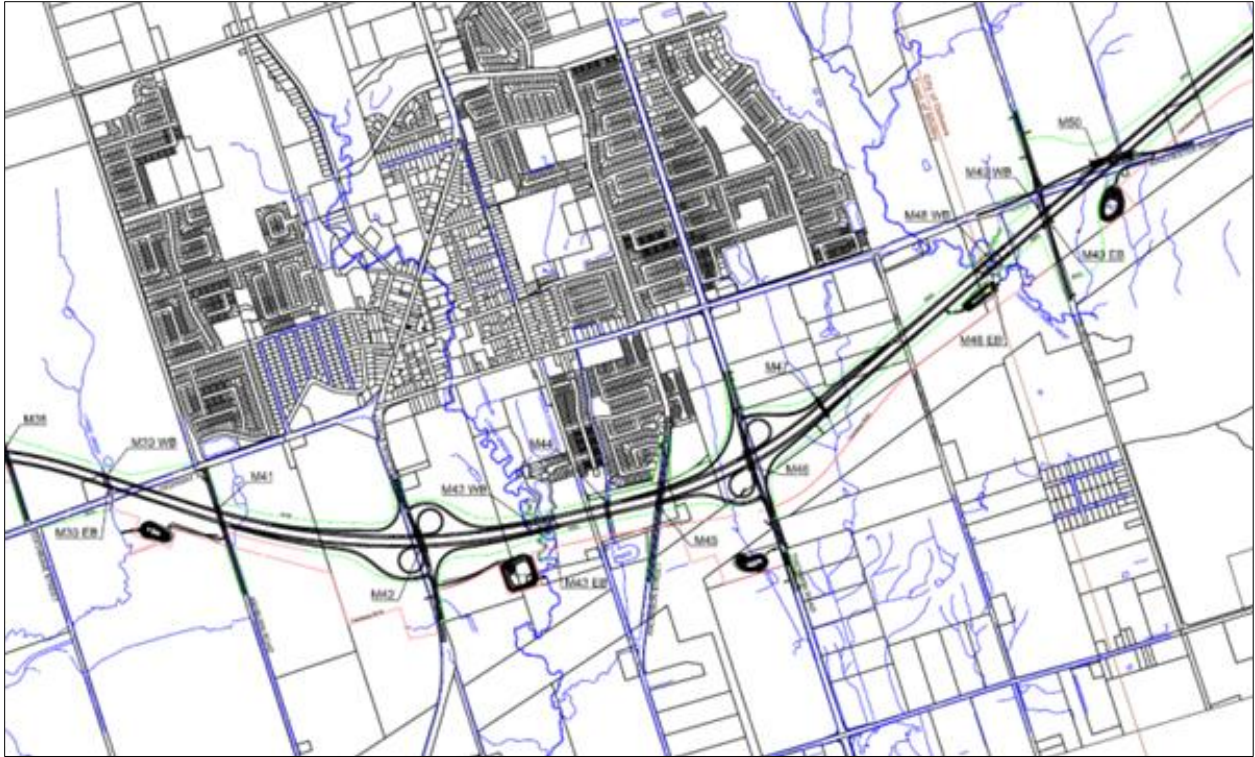
The Region of Durham completed the Winchester Road Municipal Class EA and Design Study in November 2013. The approved project consisted of the widening of Winchester Road to a three lane cross-section (one lane in each direction plus centre turning lane), from east of Baldwin Street to west of Anderson Street, and a four lane section (two lanes in each direction) from west of Anderson Street to Garrard Road.

### 3.3.2 Highway 407 East Extension

Highway 407 East is being built in two sections, as two separate projects. The first section included the mainline from Brock Road in Pickering to Harmony Road in Oshawa and the north-southwest Durham Link [Highway 412] that connects Highway 407 to Highway 401 and has been operating as a tolled highway since February 1, 2017. Interchanges with Highway 407 within the Town of Whitby are located at Lake Ridge Road, Baldwin Street (Highway 7/12), Thickson Road and Highway 412.

Highway 412 consists of a 10 km long, 4-lane divided highway located to the east of Lake Ridge Road, designed to provide a connection between Highway 407 and Highway 401. Highway 412 includes interchanges at Highway 407, Taunton Road and Highway 401, and partial interchanges at Highway 7 and Highway 2 (Dundas Street); an interchange at Rossland Road is deferred. Highway 407 consists of six lanes from Brock Road to Highway 412 and 4 lanes from Highway 412 to Harmony Road.

Both Highway 407 and Highway 412 are toll highways that are owned and controlled by the Province. **Exhibit 6** below outlines the layout of Highway 407 East through Brooklin.



**Exhibit 6: Highway 407 East Extension (Brooklin)**

### **3.3.3 Downtown Brooklin Transportation Study**

A transportation study for the downtown area of Brooklin was completed in 2014 to identify existing and future near-term transportation issues and develop solutions to address existing and anticipated needs. As per the recommendations in the Downtown Brooklin Transportation Study an Environmental Assessment to formally review and investigate closure / restricted access to / from Ferguson Avenue at Highway 7 was approved. Other recommendations include prioritization of road reconstruction and sidewalk installation, and consideration of roundabouts.

### **3.3.4 Feasibility Study: Alternate Route for Highway 7/12**

There is a strong desire by the Town of Whitby and Brooklin residents to change the look and feel of Baldwin Street through Downtown Brooklin. The future vision of Baldwin Street through Downtown Brooklin is for a community-focused, pedestrian-oriented, business friendly and sustainable downtown.

To achieve this vision, Baldwin Street must change from a Provincial highway environment to a people and business-friendly downtown core, primarily by removing



large trucks and commuter / long-distance traffic and the congestion, noise / air pollution, and dust that is associated with this traffic. Therefore, the Town of Whitby recommends moving through traffic and heavy trucks out of Downtown Brooklin to an alternate route to achieve the planning objectives of the Town.

In order to accomplish this, the Town of Whitby is seeking agreement from the Ministry of Transportation (MTO) to transfer ownership of Baldwin Street (Highway 7/12) through Downtown Brooklin to the Town of Whitby.

Through the Feasibility Study, a wide variety of potential alternate routes were identified. A high-level screening was completed to remove alternatives that could be easily identified to have significant impacts. A short-list of six preliminary alternative solutions was identified through the Draft Feasibility Study, including a “Do Nothing” alternative, two alternatives that use existing routes (Lake Ridge Road and either Brawley Road or Myrtle Road), one alternative that incorporates the Mid-Block Arterial (located south of Winchester Road and Thickson Road), and two new-routes that travel from Lake Ridge Road to Columbus Road to a location along Columbus Road west of Cochrane Street then across greenfield to Myrtle Road west of Duffs Road or to Baldwin Street north of Myrtle Road.

The Draft Feasibility Study Report was completed and submitted to MTO and Durham Region in late 2016. At the time of finalizing this TMP, the short-list of alternatives and the Feasibility Study report are under review by the MTO and Durham Region. Through the Feasibility Study, the Town is seeking agreement from MTO to proceed with an EA Study for an alternate route for Highway 7/12 that follows the Provincial Class EA process. Through the EA process the short-list of alternatives will be reviewed in greater detail and other alternate route alternatives may be considered.

### **3.3.5 Highway 407 Interchange Review Cochrane Street Area (Memorandum)**

A study was completed by AECOM in May 2016 to undertake a review of a potential future interchange at Highway 407 and Cochrane Street or Highway 407 and Ashburn Road in the Town of Whitby.

The Highway 407 East EA which was approved on May 26, 2010 stated: “A future interchange at Cochrane Street is not precluded and would be subject to approval of an independent EA and review and approval by MTO.” A conceptual plan of the Town of Whitby’s proposed interchange at Cochrane Street was included in the EA Report.



Cochrane Street is situated approximately 2 km east of Highway 412 and 2 km west of Baldwin Street. Ashburn Road is situated approximately 3 km east of Highway 412 and 1 km west of Baldwin Street. Highway 7 crosses over the Highway 407 corridor midway between Cochrane Street and Ashburn Road.

The Cochrane Street Interchange review provided an overview of the key design principles and guidelines that were considered in the development of the conceptual design alternatives for the Cochrane Street and Ashburn Road interchange locations and the identification of key advantages and disadvantages for each alternative design from a design, transportation operations and land use perspective. The study also identified additional work which is expected to be required by the Ministry of Transportation for their review and approval of an additional interchange on the Highway 407 Mainline between Highway 412 and Baldwin Street. More detail on the potential interchange configurations and conceptual design alternatives is provided in **Appendix B**.

### **3.3.6 Ministry of Transportation Ontario Origin-Destination (O-D) Survey 2010**

The MTO staff conducted an Origin-Destination (O-D) Survey on Highway 7/12 during the summer of 2010 (July and August). The O-D Survey included a station located on Highway 7 west of Baldwin Street, which captured travel patterns on Highway 7/12 through Downtown Brooklin.

The O-D Survey revealed that most commercial vehicle travel occurs on weekdays (10.5% commercial vehicle traffic on weekdays versus 4.5% on weekends). The O-D survey also indicated that the majority of long distance travel occurs during the weekend, where the average straight line trip length is 134 km. Straight line travel distances during weekdays were reported to average approximately 71 km, which is almost half the average weekend travel distance. Similarly, 41% of recreational / vacation travel occurred during the weekend, however only 21% of weekday travel was related to recreation / vacation purposes.



## Section 4

### Existing Environment







## 4. Existing Environment

As part of the identification and evaluation of alternative solutions, discussed in **Section 9**, the existing physical, natural, cultural and socio-economic environments are assessed and used to determine the potential impact or impacts that may result from revising the existing transportation network to accommodate future development and community growth. The following subsections provide an overview of the baseline conditions and describe the existing physical environment, natural heritage environment, socio-economic environment, cultural heritage and archaeological resources considered in this study.

This existing environment assessment was completed using the Northwest Brooklin Class EA Study area, for which the south limit is Winchester Road / Highway 7; the TMP Study Area south limit is Taunton Road. As part of the Combined Study, additional assessments were completed for the Secondary Plan study area, and these reports were referenced in the TMP assessment (see list of reports in **Section 4.6**). The alternative road networks assessed within the TMP are within these two study area boundaries.<sup>4</sup> The existing environment assessments were referenced when evaluating the road network alternatives, as discussed in **Section 9.2**.

### 4.1 Physical Environment

#### 4.1.1 Geology and Soils

The study area is situated within two physiographic regions; however, the majority falls within the South Slope physiographic region and the remaining portions within the Iroquois Plain physiographic region. The study area is underlain by thick successions of unconsolidated sediments, known as overburden, deposited during the Quaternary Period. Based on a review of the Ministry of Environment and Climate Change (MOECC) water well record information, overburden thickness ranges between approximately 0 m and 143 m, with an average thickness of about 37 m. Surficial geology consists of several deposits as described in Appendix C, including i) Modern alluvial deposits, ii) clay to silt-textured till deposits, iii) sandy silt to silty sand-textured tills, iv) coarse-textured (sand and

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4. Additional detail on Provincially Significant Wetlands is provided in this section of the report, as well as within Appendix H; this information is relevant to the Mid-Block Arterial corridor. Note that the Mid-Block Arterial Road was included in the 2010 TMP, and confirmed as part of the Brooklin Study TMP.



gravel) glaciolacustrine deposits, v) an isolated outcrop of ice-contact stratified deposits of sand and gravel, vi) fine-textured glaciolacustrine deposits of silt and clay, and vii) organic deposits. According to the OGS (2011), the Blue Mountain Formation of Upper Ordovician age underlies the study area.

Based on Canada Land Inventory Agricultural Capability Mapping prepared by the Ministry of Natural Resources and Forestry (MNR), the majority of undeveloped portions of the study area consist of Class “1” soils. This class of soil has the highest capability to support agricultural land use activities.

#### **4.1.2 Groundwater Resources**

A preliminary desktop study was carried out to characterize the existing hydrogeological conditions in the study area. Review of the MOECC database has identified a total of approximately 1,727 well records within the study area. A review of the water well records indicates that the wells extend to depths ranging from approximately 3 m to 223 mBGS, and are primarily completed within overburden sediments (57%). Records also indicate that 55% of groundwater use in study area is for domestic use, followed by monitoring or dewatering purposes (19%), farm and agricultural use (4%), industrial / commercial use (3%), municipal and/or public supply (1%). Approximately 12% of MOECC water well records did not specify the well use and therefore are classified as ‘Unknown’. Less than 4% of the MOECC water well records indicate the well is not used, accounting for dry wells. Static water levels within these well records range between about 10 m above ground surface (artesian) and 47 m below ground surface. A copy of the preliminary hydrogeological assessment information is provided in **Appendix C.1**.

#### **4.1.3 Source Water Protection**

The study area is situated within the Central Lake Ontario (CTC) Source Protection Area, representing the eastern component of the CTC Source Protection Region in South-central Ontario. Within this area, policies related to a list of prescribed activities have been established by the Credit Valley, Toronto and Region, and Central Lake Ontario Source Protection Plan<sup>5</sup> for the purposes of protecting municipal drinking water sources. As part of this source water protection work, the vulnerability of these sources to a threat presented by an activity that occurs on land has been assessed.

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5. CTC Source Protection Region, 2015: Approved Source Protection Plan: CTC Source Protection Region.





The five (5) types of vulnerable areas that may have associated Source Water Protection Policies include:

1. Intake Protection Zones (IPZs): according to the CTC Source Protection Plan, there are no surface water or associated IPZs for municipal purposes located within or near the study area.
2. Wellhead Protection Areas (WHPAs); according to the CTC Source Protection Plan, no WHPAs or groundwater takings for municipal purposes within or in close proximity to the study area were identified.
3. DNAPL<sup>6</sup> Threat Areas: according to the CTC Source Protection Plan, there are no DNAPL Threat Areas located within or in close proximity to the study area.
4. Significant Groundwater Recharge Areas (SGRAs): SGRAs are characterized by highly permeable soils at surface, such as sand and/or gravel, which allows water to readily pass from the ground surface to an aquifer that provides water for potable means and/or supplies groundwater to a cold water ecosystem. According to the CTC Source Protection Plan, there are SGRAs associated with portions of coarse-textured glaciolacustrine deposits within the study area. The SGRA are generally located southwest of Winchester Road and Ashburn Road, in southeast portion of the study area in the vicinity of Conlin Road and Thicksen Road, north of the Community of Brooklin between Ashburn Road and Thicksen Road, northwest of Heron Road and Myrtle Road and northeast of Myrtle Road and Highway 7/12 in the vicinity of Myrtle and Myrtle Station, as shown in **Exhibit 7**.
5. Highly Vulnerable Aquifers (HVAs): A highly vulnerable aquifer (HVA) is one that is susceptible to contamination due to its location near ground surface, or the type of material found in the ground around the aquifer. Aquifers that are located near ground surface and have less of a barrier between the ground surface and groundwater system below are considered to be HVA. According to the CTC Source Protection Plan, HVA exist throughout the study area, as shown in **Exhibit 8**. Activities within HVAs are not considered to represent a significant threat to municipal drinking water sources and therefore do not have associated land use or activity policies.

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6. DNAPL is a dense non-aqueous phase liquid. It is a liquid that is denser than water (sinks to the bottom) and is immiscible.

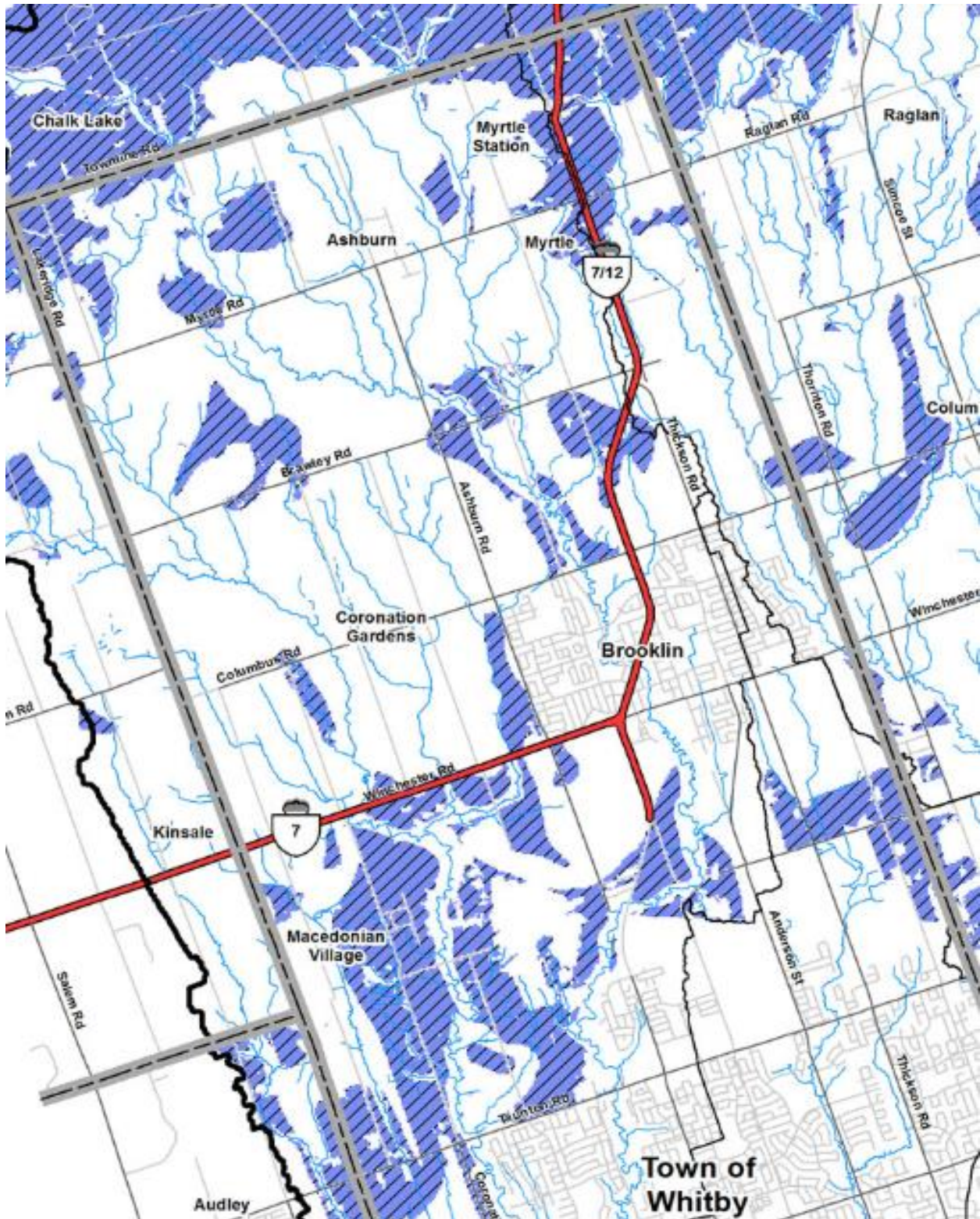


Exhibit 7: Significant Groundwater Recharge Areas (CTC, 2015)

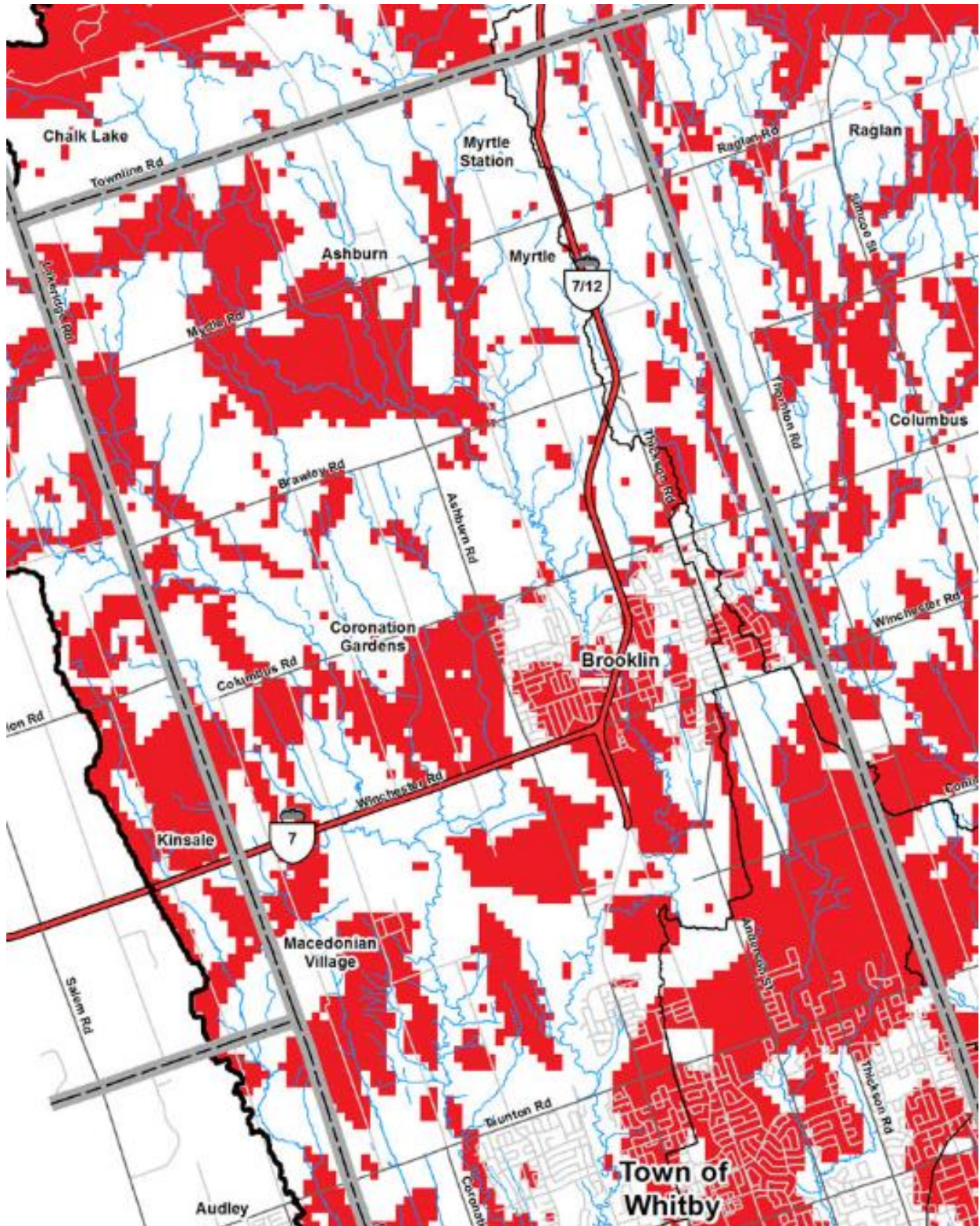


Exhibit 8: Highly Vulnerable Aquifers (CTC, 2015)



## 4.2 Natural Heritage Environment

The Natural Heritage Environment Assessment for the Northwest Brooklin Class EA, which includes the majority of the Brooklin TMP study area, is included in **Appendix C**. As part of the Combined Secondary Plan / TMP study Beacon Environmental completed a Natural Heritage Assessment Report for the Secondary Plan Area, which includes the lands north of Conlin Road, south of Brawley Road, east of Country Lane and west of Thornton Road.<sup>7,8,9</sup> The assessment of natural heritage features was based on a desktop review of secondary source information available for the majority of the study area, including:

- MNR Natural Resource Values Information System (NRVIS) mapping
- MNR Natural Heritage Information Centre (NHIC) Rare Species and Natural Area Records
- Conservation Ontario 2013 Aquatic Species at Risk distribution mapping
- Digital ortho-imagery
- Central Lake Ontario Conservation Authority (CLOCA) reports, including Ecological Land Classification mapping and flora and fauna records
- MNR fisheries information
- Watershed and subwatershed studies
- Oak Ridges Moraine Conservation Plan
- Greenbelt Plan
- Brooklin Secondary Plan Area Natural Heritage Assessment Report and Watershed Planning, Hazard Lands and Stormwater Management Report mapping

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7. Natural Heritage Assessment Background Report, Beacon Environmental and R.J. Burnside and Associates Ltd.; peer reviewed by North-South Environmental Inc. and Blackport & Associates, December 2014. The Report is located on the Town of Whitby website at the following link: [http://whitby.ca/en/resources/pl-misc\\_naturalheritageassessmentbackgroundreport.pdf](http://whitby.ca/en/resources/pl-misc_naturalheritageassessmentbackgroundreport.pdf)
  8. (Revised) Natural Heritage Assessment Background Report, Beacon et al; December 2016/April 2017. The Revised Report is located on the Town of Whitby website at the following link: <http://whitby.ca/en/townhall/brooklin-study.asp>
  9. Natural Heritage Assessment Report Appendices are located on the Town of Whitby website at the following link: [http://whitby.ca/en/resources/pl-misc\\_naturalheritageassessmentbackgroundreportappendices.pdf](http://whitby.ca/en/resources/pl-misc_naturalheritageassessmentbackgroundreportappendices.pdf)



### 4.2.1 Watercourses

The study area is situated predominantly within the Lynde Creek Watershed and located entirely within the Regional Municipality of Durham under the jurisdiction of the Central Lake Ontario Conservation Authority (CLOCA). Lynde Creek and its tributaries flow approximately 326 km south towards Lake Ontario, from its headwaters in the Oak Ridges Moraine. The Lynde Creek Watershed also supports healthy fish communities; however, urbanization and intensive agricultural land uses have degraded aquatic habitats. Portions of the study area also overlap small sections of Oshawa Creek Watershed in the east, Pringle Creek Watershed in the southeast and Goodman Creek in the south.

### 4.2.2 Fish and Fish Habitat

Based on the Ministry of Natural Resources and Forestry's (MNR's) Natural Resources and Values Information System (NRVIS) mapping (2011), tributaries of Lynde Creek present within the study area are generally characterized as coldwater streams. Historically, Lynde Creek formerly consisted of a predominantly cold-water system; however, changes in urban land use resulted in the increase of stream temperatures in some areas of the watershed. Currently the Lynde Creek Watershed is characterized as a mixed system of cool and warm-water streams (CLOCA, 2007). Despite urbanization and intensive agricultural land use that increases stream temperature and decreases water quality, the Lynde Creek Watershed generally supports both warm and coldwater fish communities. Common fish species identified within CLOCA's jurisdiction include Eastern Blacknose Dace, Common Shiner, White Sucker and Creek Chub (CLOCA, 2006). Redside Dace has also been recorded by CLOCA as recently as 2006 in the Main and Heber Down subwatershed (CLOCA, 2006). Overhanging grasses and shrubs, as well as undercut banks, are an important part of Redside Dace habitat, as are in-stream boulders and large woody debris (COSEWIC, 2007).

It is recognized that there are a number of Redside Dace habitats within the study area that have the potential to be impacted depending on the corridor selected for an alternate Highway 7/12 route or new collector / arterial road or road widening. Permit and funding requirements for Redside Dace compensation, if applicable, will be determined through the future EA Study.



### 4.2.3 Vegetation

The study area occurs within Ecoregion 6E (Lake Simcoe – Rideau Ecoregion). Cultural communities, which represent approximately 11% of the study area, are regenerating habitat in the process of succeeding from meadows and thickets to forest communities (CLOCA, 2008). Some of these cultural communities may provide important habitat for rare species; however, the majority are dominated by non-native and invasive plant species (CLOCA, 2008). Approximately 5% of the study area is covered by forest communities which perform important environmental functions and contain habitat for woodland species. Aquatic and wetland communities make up the approximately 10% of the study area.

### 4.2.4 Wildlife

Based on background review, the majority of wildlife identified within the study area is common and tolerant to disturbance. Nine mammal species were identified within the study area (Dobbyn, 1994). A total 121 bird species were recorded within or in the vicinity of the study area (Birds Ontario, 2010). Many of these birds are associated with human-modified landscapes, such as urban or suburban areas or agricultural fields, whereas some are typically found in woodland and forest habitats. A total of 16 amphibian and reptile species were identified within the study area. Habitat for these species may be present within the study area (refer to Appendix C for more details).

### 4.2.5 Species at Risk

A Species at Risk (SAR) record screening was originally conducted in 2014 for the Northwest Brooklin Study Area. MNRF provided a response on January 15, 2013 indicating that they had records of six SAR within the Northwest Brooklin study area, including Butternut (*Juglans cinerea*), Redside Dace (*Clinostomus elongatus*), Barn Swallow (*Hirundo rustica*), Eastern Meadowlark (*Sturnella magna*), Chimney Swift (*Chaetura pelagica*) and Bobolink (*Dolichonyx oryzivorus*). CLOCA also had an additional record of Canada Warbler (*Wilsonia Canadensis*) within the study area. A more recent search of the MNRF NHIC Rare Species database (last query completed on May 24, 2017), was completed for the Brooklin TMP study area. Based on background review completed to date, a total of 13 SAR records were identified within or in the vicinity of the Brooklin TMP Study Area, including seven species listed as Endangered and six species listed as Threatened under the *Endangered Species Act, 2007* (ESA); these species receive individual and habitat protection under the ESA. The remaining five species are considered to be Species of Conservation Concern (SOCC; those species listed as Special Concern under the ESA and/or have provincial S-ranks of S1-S3).



It should be noted that several of the records found are considered to be historical (i.e., older than 20 years); therefore, these species such as Northern Bobwhite (*Colinus virginianus*), Loggerhead Shrike (*Lanius ludovicianus*), Henslow's Sparrow and Red Mulberry (*Morus rubra*), are unlikely to still occur within the study area. Relevant agencies (i.e., MNRF, CLOCA, DFO) should be contacted for Species at Risk records to update Species at Risk information provided below for any future EA study.

#### **4.2.6 Designated Natural Areas**

According to the MNRF's NRVIS mapping (2011), there are Areas of Natural and Scientific Interest (ANSI), Provincially Significant Wetlands (PSW), Environmentally Sensitive Areas (ESAs), a Conservation Area, the Locally Significant Dagmar Station Wetland and significant woodlands within the study area. No Provincial Parks are located in the study area. Portions of the northern half of the study area are situated on lands designated as part of the Greenbelt, including protected countryside and natural heritage system, and the Oak Ridges Moraine, respectively. South of Winchester Road, north of Taunton Road there are Provincially Significant Wetlands (PSWs).

The MNRF evaluates ANSIs to determine whether they are provincially or regionally (Locally) Significant. Provincially or regionally significant candidate ANSIs are recommended by the MNRF for provincially or regionally significant ANSI status, pending status approval.

#### **4.2.7 Significant Wetlands**

As described in the MNRF's Ontario Wetland Evaluation System Manual (3rd edition; December, 2010), wetlands are lands that are seasonally or permanently flooded by shallow water as well as lands where the water table is close to the surface, where the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water tolerant plants. Evaluation and identification of wetlands as Provincially Significant is completed through a standardized assessment process developed by the MNRF, the Ontario Wetland Evaluation System (OWES). Wetlands are evaluated by assigning values to four key components including the biological, social, hydrological and special features of the wetland or wetland complex. Based on scoring, a wetland can fall into one of two classes: Provincially Significant or Locally Significant (i.e., non-Provincially significant). Provincially Significant Wetlands (PSW) are protected under the Provincial Policy Statement 2014 (PPS).



According to the Ontario Regulation 42/16, development is prohibited in wetlands, including areas within 120 m of PSWs and wetlands greater than 2 hectares in size, and areas within 30 m of wetlands greater than 0.5 hectares in size.

#### **4.2.7.1 Provincially Significant Wetlands**

The Provincially Significant Heber Down Wetland Complex (85 ha) is within the TMP study area. According to the MNRF NHIC Natural Areas Report (2010), this wetland complex consists of 16 wetlands comprising swamp (96%) and marsh (4%) communities. The Heber Down Wetland Complex serves critical hydrological functions that are important to the downstream ecological health of Lynde Creek. It also provides important habitat for breeding area – sensitive bird species such as Broad-winged Hawk, Black and White Warbler, Scarlet Tanager and rare plant species (CLOCA, 2008).

The Provincially Significant Whitby-Oshawa Iroquois Beach Wetland Complex is within the TMP study area, along Conlin Road between Baldwin Street and Simcoe Street. This Provincially Significant Wetland encompasses 198 ha, consisting of many small wetlands that are less than 0.5 ha in size. This wetland complex contains important amphibian breeding areas and uncommon wetland plant communities and has hydrological significance (CLOCA, 2008).

The Provincially Significant Wetlands are in close proximity to the Mid-Block Arterial Corridor, a new road recommended within the 2010 TMP and the Brooklin TMP. No potential impacts are anticipated to these natural features as result of the alternatives assessed within the TMP study; however, any revisions to the Mid-Block Arterial corridor alignment would take the PSWs into consideration.

#### **4.2.7.2 Locally Significant Wetlands**

The Locally Significant Dagmar Station Wetland (44.4 ha) is present within the northwest portion of Brooklin. This wetland provides important winter cover for many wildlife species, with local significance for Deer. In addition, Bullfrogs and Snapping Turtles have been previously recorded in this wetland by field observers (NHIC, 2010). This Locally Significant Wetland is encouraged to be conserved under Section 5.3.3.4 of the Whitby Official Plan (Town of Whitby, 1994).





#### 4.2.7.3 Environmentally Sensitive Areas (ESAs)

Based on CLOCA Environmental Sensitivity Mapping, Environmentally Sensitive Areas (ESAs) were classified into sensitivity categories between high and low. ESAs with high and medium-high sensitivities are highly sensitive to disturbance and are considered to contain greater ecological significance. Several high sensitivity and medium sensitivity ESAs are present within the study area. The medium sensitivity ESA correlates to the boundary of the Oak Ridges Moraine which contains a major recharge area that may be impacted by major alterations or changes in land use (CLOCA, 2008). Portions of the Oak Ridges Moraine also contain significant wildlife habitat, significant forests and significant terrain features that are identified as areas of high sensitivity (CLOCA, 2008). The Region of Durham recognizes the highest levels of sensitivity (high and medium-high) as worthy of protection. ESAs are also designated as key natural heritage and hydrological features and part of the Greenbelt Natural Heritage System. The introduction of new roadways within the north portion of the study area is expected to traverse up to four of these identified sensitive areas.

#### 4.2.8 Oak Ridges Moraine

Details of the Oak Ridges Moraine are discussed in **Section 3.1.4**. With respect to new transportation facilities, the ORMCP notes that, “new transportation and utility corridors or facilities shall only be allowed in Natural Core Areas and Natural Linkage Areas if they are shown to be necessary and there is no reasonable alternative”. It is further noted that new transportation facilities will have to meet stringent review and approval standards. Limitations are also set on impervious surfaces in areas outside Settlement Areas.

### 4.3 Socio-Economic Environment

The majority of the existing socio-economic environment assessment was completed using the Brooklin Secondary Plan Area, for which the north limit is Brawley Road and the south limit is Conlin Road; the TMP Study Area north limit is Townline Road and the south limit is Taunton Road (**Exhibit 1**). As part of the Combined Study, additional assessments were completed for the Secondary Plan study area, and these reports were referenced in the TMP assessment (see list of reports in **Section 4.6**).



### 4.3.1 Land Use

Existing communities within the study area include Brooklin which is a community located primarily in a rural area of the Town, north of the urban area of Whitby, at the south junction of Highway 7/12. Located within the Lynde Creek Watershed, the hills and forests that occupy the north of the community (between Myrtle Road and Townline Road) are part of the Oak Ridges Moraine. Three land use designations are present within the north portion of the TMP study area: Natural Linkage Area, Countryside Area, and Settlement Area (ORMCP, 2017). Three designated Rural Settlement Areas are present in association with the hamlets of Ashburn, Myrtle and Myrtle Station. The balance of the ORMCP area is generally occupied by designated Natural Linkage and Countryside Areas.

Natural Linkage Areas protect linkages between key natural heritage features. In addition, Countryside Areas consist of agricultural and/or rural lands that provide a transition between Natural Core Areas, Natural Linkage Areas and Settlement Areas. As such, only very restricted new resource management, recreational, transportation, infrastructure and utility uses are permitted within these features. Development near these key natural heritage features and hydrologically sensitive features is only allowed if it will not adversely affect these elements.

From Ashburn Road easterly to the Oshawa Creek West Branch, and Winchester Road northerly to Columbus Road West, the study area consists of Settlement Areas Outside of the Greenbelt Plan, with the exception of a River Valley connection, which generally spans in a north-south direction from Columbus Road southerly to Conlin Road.

The Protected Countryside designation of the Greenbelt Plan is situated along the north portion of the TMP study area, and intermittently extends to the south. The Protected Countryside also traverses the west portion of the study area, and is generally situated in association with Lynde Creek. The villages of Ashburn, Myrtle and Myrtle Station are designated Towns and Villages of the Greenbelt Plan.

Designated land uses for the Brooklin Secondary Plan area are illustrated on Schedule A of the Town's Official Plan. In general, the downtown core of Brooklin (i.e., along Baldwin Street, between Cassels Road East and Way Street) consists of designated Major Commercial uses, beyond which a Mixed Use, Major Open Space, Residential and Hazard Lands comprise the balance of land uses within the limits of the designated Major Central Area of Brooklin. The Major Central Area is intended to be the centre of human activity within the Town. These Designated Areas are designed to maintain and enhance the existing cultural and heritage resources, while accommodating a range of



activities for residents and visitors to the municipality (i.e., shopping, office / business services, institutional, higher residential densities, transit, recreation and special purpose commercial uses).

Within the Brooklin Secondary Plan area, the general locations for high and medium density residential opportunities are shown on Schedule “K” (**Exhibit 21**). Main permitted uses within a Low Density Residential area include single detached, semi-detached and duplex residential buildings. Medium and High Density Residential areas are for residential units between 30 and 115 units.

Lands designated as Mixed Use Areas, mainly located at the intersection of Columbus Road with Baldwin Street and Cochrane Street and around the Major Central Area, permit integrated mixed use developments which include residential uses in association with office, limited retail, personal service, community and/or institutional uses.

Existing commercial areas are concentrated along Winchester Road and along Baldwin Street in Downtown Brooklin whereas the “Institutional” and “Major Commercial” land uses are being planned for lands north of Taunton Road between Anderson Street and Baldwin Street. The Major Commercial designation comprises of large, multi-function commercial areas where a full range of retail, entertainment, cultural, recreational, community, personal service and office uses are permitted. Planned development within the Major Commercial designation located in the southwest quadrant of Baldwin Street and Winchester Road West will include a Public Square which is intended to provide an internal focal point for the Major Commercial area and function as in urban park, servicing the immediate neighbourhood and visitors to the Brooklin Major Central Area. A portion of the Brooklin Major Central Area is designated Heritage Commercial and considered Brooklin’s historic downtown business district, where development is encouraged to focus along the street edges of Winchester Road and Baldwin Street to establish a pedestrian oriented public realm.

The total space occupied by commercial uses within the Brooklin Secondary Plan area is as follows:

- Department Stores: 392,000 ft<sup>2</sup>
- Food/Supermarket: 49,000 ft<sup>2</sup>
- All Other: 31,000 ft<sup>2</sup>

General Industrial areas, located adjacent to the future Highway 407, are intended for the manufacturing, processing, assembly, servicing, storing of goods and raw materials, warehousing and uses for similar and related purposes such as utility yards and functions,



and transportation terminals whereas the Prestige Industrial Areas (north of Highway 407, just south of Winchester Road) comprise lands having prime exposure to the major freeways such as Highway 407. The use of land in Prestige Industrial areas generally include light industrial uses within enclosed buildings, professional, corporate and industrial oriented office buildings, data processing centres, research and development facilities and limited commercial uses such as banks and restaurants.

Major Open Space designation, as shown on Schedule “K” of the Brooklin Secondary Plan provide for active and/or passive recreational and conservation uses including parks, trails, conservation areas and greenways. According to MNR’s NRVIS Mapping (2011) and the Ontario Provincial Parks website there are no Provincial Parks or Conservation Reserves within the study area. The eight local parks within the study area, occupying 1.5 ha of land, are scattered around the residential areas and generally close to the schools<sup>10</sup>. There are two district parks occupying around 4.0 ha<sup>11</sup>.

Agricultural lands are located south of Highway 407 where Future Urban Development areas are currently being planned. Areas designated as Agriculture on Schedule A are predominantly used for agricultural activities and farm related uses. Fish, wildlife and forest management uses as well as conservation projects and erosion control projects may be permitted within the Oak Ridges Moraine Secondary Plan Area.

The land use designations for the urban expansion areas north and west of Brooklin, the industrial lands adjacent to the future Highway 407 and the lands in the vicinity of the Conlin Road / Anderson Street intersection are addressed in more detail in the Brooklin Community Secondary Plan.

### **4.3.2 Existing Community Features and Facilities**

The existing facilities within the study area include places of worship, schools, libraries, community centres and emergency services.

There are currently eight public elementary schools and one public secondary school within the study area. There are currently seven places of worship in Brooklin.

The Brooklin Community Centre and Library is located at 8 Vipond Road which includes both a library and the following community amenities: seniors' activity room, youth center, dedicated pre-school program space, gymnasium, craft room, multi-purpose

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10. Based on 2014 information presented at PIC#1

11. Based on 2014 information presented at PIC#1



room including a gymnasium, banquet room, meeting rooms, and a branch library. There is also the Brooklin Community Centre located at 45 Cassels Road East. This facility was formally the Bible Christian Church, followed by the Township hall. In addition, there is also the Spencer’s Community Centre located at 7035 Country Lane.

There is an existing Fire Station on the east side of Baldwin St. North, just north of Carnwith Drive East. The Emergency Medical Services (EMS) and Regional Police Services are located at the intersection of Taunton Road West and Anderson Street.

## 4.4 Cultural Heritage

Unterman McPhail carried out a desktop review of historical mapping to identify cultural heritage resources in the study area, including hamlets, structures and roadscapes. In addition, the Stage 1 AA, discussed in **Section 4.3**, documented the results of a comprehensive review of heritage properties that are listed and/or designated within the study area. Based on the above, various cultural heritage resources were identified in the study area, as summarized herein.

### Heritage Conservation District

It is noted that there are many heritage properties situated within the boundaries of the designated Heritage Conservation District (HCD) of Downtown Brooklin. It is noted that the Town of Whitby released the Brooklin Heritage Conservation District Plan to guide future planning within the limits of these boundaries.

### Culturally Sensitive Areas

Cultural heritage resource sensitivities situated outside of the Brooklin HCD were identified, as summarized in **Table 1**.

**Table 1: Cultural Heritage Resource Sensitivities**

Historical Hamlets/ Railway Stations	Churches	Cemeteries	Schoolhouses
- Ashburn - Brooklin - Myrtle - Myrtle Station - Dagmar Station	- Myrtle United Church	- Burns Presbyterian Cemetery - Myrtle Village Methodist Cemetery - Hubbell’s Cemetery - Dryden Baptist Cemetery	- Ashburn Schoolhouse - Spencer School



Several roadsides were also identified as having heritage value, and included gravel of 1 to 2 lane paved roads within the study area that consisted of little to no shoulders, grassy ditches, hedgerows and tree lines that maintain the rural character of the landscape. These include:

- Townline Road
- Myrtle Road original township concession road survey allowance, between Concession 8 and 9
- Brawley Road original township concession road survey allowance, between Concession 7 and 8
- Columbus Road original township concession road survey allowance, between Concession 6 and 7
- Winchester Road East, from HCD boundary to Thickson Road, original township concession road survey allowance between Concession 6 and 7

### Listed and/or Designated Heritage Properties

A review of properties listed with the Town of Whitby municipal register and/or designated under Parts I or IV under the Ontario *Heritage Act* was carried out. In total, 120 designated heritage properties and 15 significant heritage properties are situated within the study area. A map outlining the location of each of these properties is provided within **Appendix E** as part of the Stage 1 AA report (refer to **Section 4.3**). A copy of the Cultural Heritage Resource Data Survey memorandum is provided in **Appendix D**. In addition, a Cultural Heritage Resource Survey was completed for the combined Secondary Plan / TMP study.<sup>12</sup>

#### 4.4.1 Aboriginal Peoples

##### First Nations

The study area is situated within the Williams Treaty territory. This territory generally consists of three (3) large parcels of land in southern and central Ontario that were acquired by the Government of Canada in 1923, and comprises a total land area of approximately 5,238,413 hectares (12,944,400 acres).

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12. Cultural Heritage Resources Survey, Wayne Morgan; peer reviewed by Unterman McPhail Associates, December 2014. The Report is located on the Town of Whitby website at the following link: [http://whitby.ca/en/resources/pl-misc\\_culturalheritageresourcesurvey.pdf](http://whitby.ca/en/resources/pl-misc_culturalheritageresourcesurvey.pdf)



## Métis

A desktop search of Métis Harvesting Territories in Ontario indicated that the study area appears to be situated outside of Métis Traditional Harvesting Territory. However, the study area is noted to be in proximity to the Oshawa and Durham Region Métis Council and situated within the region represented by the Oshawa and Durham Region Métis Council Community.

## 4.5 Archaeological Assessment

Archeoworks Inc. carried out a Stage 1 Archaeological Assessment (AA) for the Brooklin area to identify areas with a high potential for recovery of archaeological resources. A desktop review of existing conditions indicated that large portions of the study area have the potential for the recovery of archaeological resources. It was noted that areas of obvious disturbance, such as residential development, railroad alignments, paved roadways, and areas where previous assessment have fulfilled Stage 2 AA requirements were considered exempt from further archaeological concern. However, given that large portions of the study area have not previously undergone AA activities, are undisturbed and/or agricultural in nature and in proximity to a watercourse and/or heritage properties, the potential for the recovery of archaeological resources is present within various areas. These areas are illustrated on Maps 10 and 11 of the Stage 1 AA, provided in **Appendix E**. In addition, a second Stage 1 AA was completed for the Combined Secondary Plan / TMP study.<sup>13</sup>

## 4.6 Other Background Studies

In addition to the technical studies mentioned above, the following background reports prepared by the Town's consultant SGL describe other existing conditions (e.g., population, facilities, etc.) within the study area:

- Stage One Overview and Policy Gap Analysis (SGL, January 2015): This report provided an analysis of the existing Brooklin Secondary Plan Policies, as well as a summary of all of the background reports

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13. Stage 1 Archaeological Assessment for the Brooklin Secondary Plan Area Environmental Assessment, Archeoworks; submitted to Ministry of Tourism, Culture and Sport (MTCS), December 2014. The Report is located on the Town of Whitby website at the following link: [http://whitby.ca/en/resources/pl-misc\\_stageonearcheologicalassessment.pdf](http://whitby.ca/en/resources/pl-misc_stageonearcheologicalassessment.pdf)



- Brooklin Secondary Plan Area Natural Heritage Assessment Background Report (Beacon Environmental)
- Background Report: Cultural Plan Input
- Cultural Heritage Resource Survey (Wayne Morgan Heritage Planner – prepared for Brooklin Landowners Group)
- Municipal Servicing Overview Report (GHD – prepared for Brooklin Landowners Group)
- Stage 1 Arch Assessment (Archeoworks Inc. – for Brooklin Landowners Group)
- Background Report: Stage One Overview and Policy Gap Analysis
- Background Report on Watershed Planning, Hazard Lands and Stormwater Management (GHD, Stonybrook)
- Community Facility Needs Analysis (SGL, December 2014)

Each of the above reports is available through the Town of Whitby website for the Brooklin Study, which is located at the following link:

<http://whitby.ca/en/townhall/brooklin-study.asp>.





## Section 5

### Transportation Network - Existing Conditions and Future Needs







## 5. Transportation Network – Existing Conditions and Future Needs

As part of the identification and evaluation of alternative solutions, discussed in **Section 7** and **Section 8**, the existing and planned transportation network was assessed and used to determine the future transportation needs to horizon year 2031 and the potential impact or impacts that may result from revising the existing transportation network to accommodate future development and community growth.

**Appendix F** provides the detailed report for the transportation demand management and traffic assessment completed in support of the TMP. Within **Appendix F** is a detailed discussion of the existing transportation network with respect to active transportation, transit, arterial road network and collector road network components considered in this study. A summary of the existing conditions is provided in **Section 5.1**. A detailed discussion of the future transportation needs with respect to the future growth forecasts and future traffic operations is also included in **Appendix F**, and is also summarized in **Section 5.2**.

### 5.1 Existing Transportation Network

This section provides a general summary of the existing transportation network conditions. Details are provided in **Appendix F**.

#### Active Transportation

Outside of the urbanized areas, the road network is typically formed by rural cross-sections with few accommodations for pedestrians and cyclists. Within the urbanized area, sidewalks are typically situated on one side of local roadways and both sides of collector and arterial roadways. There are notable gaps where the sidewalk is not continuous along the major arterial roadways including Baldwin Street, Winchester Road and Thicksen Road. There are few designated cycling facilities, and many significant barriers for cyclists, including the Highway 407 corridor, major utility corridors and various creek crossings.



## Transit

There are two Durham Region Transit (DRT) bus routes (Route 302 and Route 310) that service Highway 7/12 between Winchester<sup>14</sup> Road and Carnwith Drive. Route 302 “Brock/Brooklin” currently circulates as a one-way counter-clockwise loop route through Brooklin, and connects to the Whitby GO Station via Baldwin Street and Brock Street. A portion of the route travels along Baldwin Street / Highway 7/12, between Carnwith Drive and Highway 7 / Winchester Road. Route 310 “Winchester” circulates as a one-way clockwise loop route through Brooklin, and connects to the UOIT / Durham College North Campus in Oshawa via Winchester Road. There are limited DRT stops and coverage gaps that make transit travel difficult within Brooklin.

GO Transit provides rail service along the Lakeshore East Line from Union Station in Toronto to Oshawa. North Whitby residents may access the Whitby GO Station via park-and-ride, DRT bus (Route 302), or the GO Bus. North Whitby is served by GO Bus Route 81 “Port Perry/Whitby”, and Route 52/52A “407 East”. Route 81 provides north-south service along Highway 12 / Brock Street connecting Beaverton, Port Perry, Brooklin, Downtown Whitby and the Whitby GO Station. Route 52/52A provides east-west service along Highway 7 / Winchester Road connecting Brooklin to York University and UOIT / Durham College and downtown Oshawa.

## Provincial and Regional Road Network

The road network in the study area includes provincial, regional, and local facilities, providing connectivity to other areas of Whitby as well as neighbouring municipalities and regions. Some arterial roadways are owned and maintained by Durham Region. The provincial highways are maintained by MTO.

The Regional arterial roadways form block grids and function as the main thoroughfares connecting to the Provincial highways and intersecting with other Municipal arterial and collector roadways. Major highways / arterial roadways such as Highway 7/ Winchester Road West, Highway 12, Winchester Road East (Regional Road 3), Baldwin Street (Regional Highway 12), Myrtle Road (Regional Road 5) and Thicksen Road (Regional Road 26) are continuous throughout the urbanized areas and are intended to provide general mobility within the Town of Whitby as well as connections to adjacent municipalities and regions.

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14. Durham Region Transit website accessed on June 27, 2016: [www.durhamregiontransit.com](http://www.durhamregiontransit.com). Note that transit services undergo periodic review and revision, and the details included in the section are representative of the services in place at the time of writing.



Within the study area, Highway 407 and Highway 412 are provincial toll facilities that opened to the public in June 2016, with the toll implemented in January 2017. Interchanges are located along Highway 407 at Highway 412, Highway 12 (Baldwin Street, south of Highway 7), and at Thickson Road. Along Highway 412 interchanges are located at Lake Ridge Road and Taunton Road. The north and south areas of Brooklin are also connected by highway overpasses that are provided along Ashburn Road and Anderson Street, and by an underpass along Cochrane Street. There is a commuter lot planned to be located near the Baldwin Street / Highway 407 Interchange.

### **Municipal Road Network**

Brooklin is located in the northern half of the Town of Whitby. The Town of Whitby is primarily responsible for collector and local roadways as well as some of the arterial road network. The arterial roadways that are under Town jurisdiction within the Brooklin TMP study area are described below:

**Brawley Road** – This is an east/west Type A arterial roadway with a two-lane rural cross-section that is located north of the Brooklin community, outside of the urban area boundary. Brawley Road forms an unsignalized intersection with Highway 7/12 approximately 190 m north of the Highway 7/12 / Thickson Road T-intersection.

**Ashburn Road** – A north-south Type B arterial between south of Robmar Street and north end of Whitby. The two-lane roadway has a posted speed limit of 60 km/h with on-road cycling facilities connecting to the Greenbelt cycling route.

**Cochrane Street** – Within the study area this is a north/south two-lane rural arterial roadway located west of the Brooklin community; it is a Type B arterial between Winchester Road (Highway 7) and Highway 407, and a Type C arterial north of Highway 407 to Brawley Road. Cochrane Street includes an off-leash dog park south of Winchester Road.

**Columbus Road** – Within the study area, Columbus Road is an east/west Type B arterial roadway with a rural two-lane cross-section (unpaved shoulders). There are no continuous pedestrian facilities and the posted speed limit is 50 km/h.

**Carnwith Drive** – This is an east-west arterial between Ashburn Road and Rockland Crescent. The roadway consists of varying cross-sections with a posted speed limit of 50 km/h. Adjacent to elementary schools, the posted speed limit is 40km/h during times of school arrival and dismissal. Pedestrian facilities are provided on both sides of the street and on-road cycling was recently constructed to the east of Baldwin Street.



**Conlin Road** – A east-west arterial between west of Anderson Street and east end of Whitby. The two-lane roadway has a posted speed limit of 60 km/h. There are currently no existing pedestrian facilities; however, there are on-road cycling facilities.

**Garden Street** – A north/south arterial located between Consumers Drive and north of Robert Attersley Drive. It has a posted speed limit of 50 km/h.

**Garrard Road** – A discontinuous north/south Type C arterial located between Myrtle Road and Townline Road; between Columbus Road and the Highway 407 right-of-way; and between Dundas Street and Winchester Road. This two-lane road has a posted speed of 50 km/h.

**Coronation Road** – A north/south Type C arterial between Brawley Road and Myrtle Road; and between Rossland Road and Columbus Road. It has a posted speed of 50 km/h and no existing pedestrian and/or cycling facilities.

**Cachet Boulevard** – A north/south Type C arterial located between Winchester Road and Columbus Road. It has a posted speed of 50 km/h and pedestrian and/or on-road cycling facilities. Brooklin's collector roadways provide connections between local roads within the residential / commercial areas and the arterial road system. Compared to arterial roadways, they generally carry lower traffic volumes. The existing collector roadways that are under Town jurisdiction within the Brooklin TMP study are described below.

**Cassels Road** – Within the study area, Cassels Road is an east/west collector roadway to the east of Baldwin Street with an urban two-lane cross-section which provides access to residential and commercial land uses. To the west of Baldwin Street Cassels Road changes to a local roadway.

**Campbell Street / Vipond Road** – This is an east/west collector roadway with an urban two-lane cross-section located between Baldwin Street and Ashburn Road. Campbell Street forms a signalized T-intersection with Baldwin Street, and provides some parking areas adjacent to commercial properties. Vipond Road has on-road cycling facilities. Both sections of this roadway have pedestrian facilities.

**Watford Street** – This is a north/south collector roadway with an urban two-lane cross-section, pedestrian facilities, on-road cycling facilities, and on-street parking allowed. Watford Street continues south of Winchester Road as Anderson Street.



**Montgomery Avenue** – This is a north/south collector roadway with an urban two-lane cross-section, pedestrian facilities, on-road cycling facilities south of Carnwith Drive, and on-street parking allowed. Montgomery Avenue continues north of Columbus Road as Cedarbrook Trail.

**Ferguson Avenue** – This is a north/south collector roadway with a rural two-lane cross-section located between Winchester Road and Vipond Road. There are no pedestrian or cycling facilities.

**Croxall Boulevard** – This is a north/south collector roadway with a rural two-lane cross-section located between Carnwith Drive and Columbus. There are pedestrian, but no cycling facilities. Local roadways are primarily for local circulation and access. They typically carry lower volumes of traffic and provide travel options within the neighbourhoods. They also provide access to individual properties in residential and commercial areas. Local roadways generally accommodate on-street parking, and sidewalks on at least one side.

The Brooklin existing road network is shown in **Exhibit 9**.

## 5.2 Land Use Options and Transportation Network Alternatives

Details on the land use options are available in the “Brooklin Study – Land Use Options and Transportation Network Alternatives” (Options Report), December 2015 report.<sup>15</sup> The proposed land use options, along with the preferred transportation network alternatives solution, discussed in more detail in **Section 7.1.5**, were presented to the Brooklin residents in early 2016 at PIC#3.

As part of the Brooklin Secondary Plan Sorensen Gravely Lowes (SGL) prepared three preliminary Land Use Options for the Brooklin Existing and Expanded Secondary Plan Areas (SPA). Land Use Option 2 was used as input to the transportation model as a conservative assessment of higher-order transportation network needs (i.e., arterial road needs) and to allow for the transportation assessment to proceed concurrently with the development of the land use options.

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15. Brooklin Land Use Options and Transportation Network Alternatives Report, December 2015. The Report is located on the Town of Whitby website at the following link:  
[http://whitby.ca/en/townhall/resources/pl-misc\\_brooklinlanduseandtransportationoptionsreport.pdf](http://whitby.ca/en/townhall/resources/pl-misc_brooklinlanduseandtransportationoptionsreport.pdf)





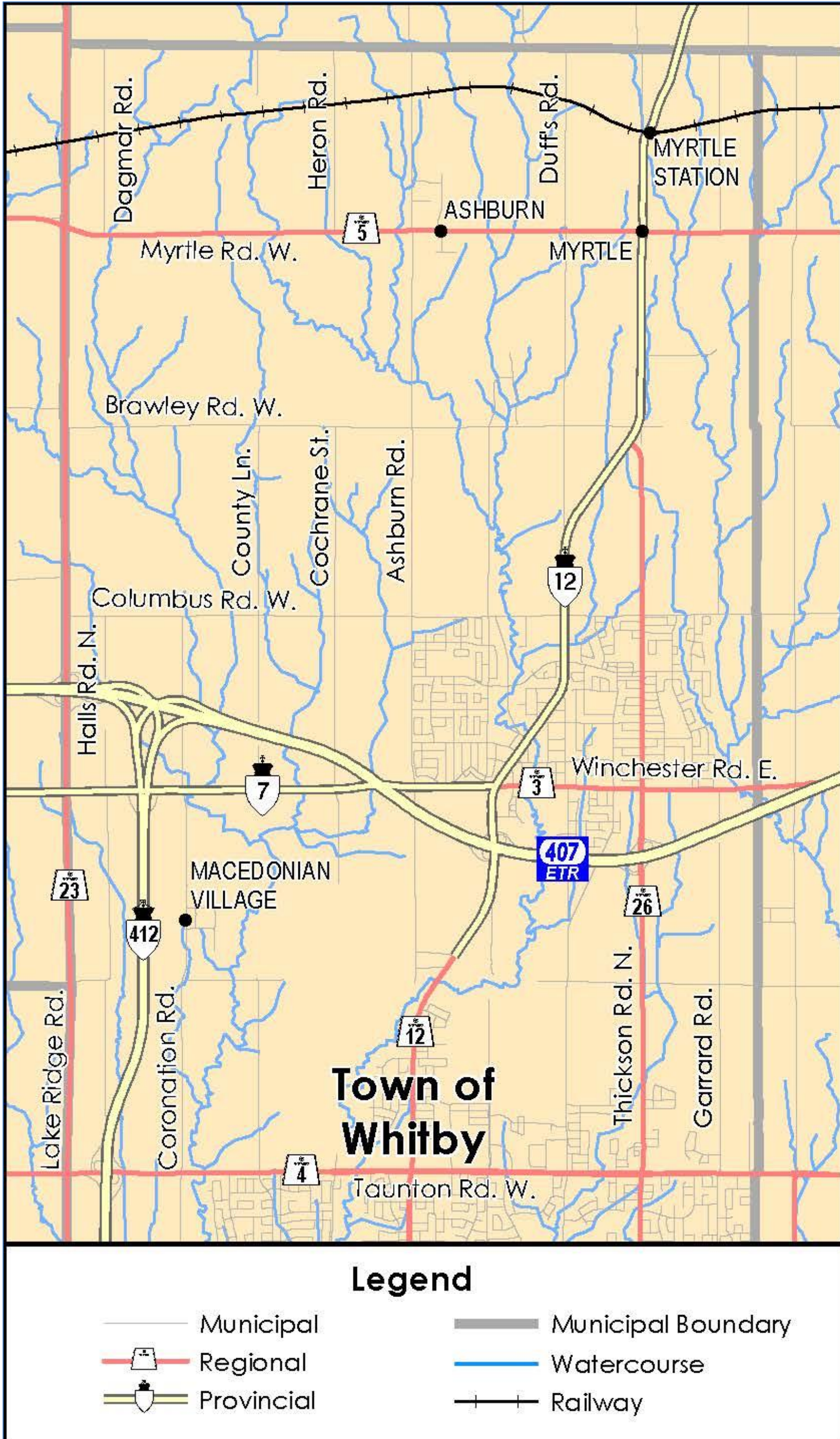


Exhibit 9: Existing Brooklin TMP Study Area Road Network





### 5.3 Historic Traffic Growth and Mode Share

Traffic count information extracted from the 2006 and 2011 Cordon Counts<sup>16</sup> and from traffic data collected by the Town of Whitby was evaluated at a screenline level to identify prevalent travel patterns. The observed traffic from 2006 and 2011 demonstrate the change in traffic trends within the Brooklin area. From 2006 to 2011, no growth in traffic was experienced for eastbound / westbound traffic, while the northbound / southbound traffic shows 3 to 4% growth. However, when the time period of analysis is expanded to include 2001-2011, 5 to 6% yearly growth is observed for east-west traffic. Overall, the analyzed data shows slower growth between 2006 and 2011. Long-term construction along Highway 7 may have played a role in suppressing traffic growth during the 2006 – 2011 five-year period.

Information collected from the Transportation Tomorrow Survey (TTS)<sup>17</sup> assists transportation planners in understanding the trip choices, purposes, and daily origins and destinations of travelers. TTS data collected for the years 2006 and 2011 is summarized in **Table 2**, below, for the community of Brooklin and the North Whitby Area (TMP study area), the Town of Whitby and Durham Region.

**Table 2: Existing Travel Mode Share (%) – 2006 and 2011 TTS**

Travel Modes	TMP Study Area* 2006 TTS	TMP Study Area* 2011 TTS	Whitby 2006 TTS	Whitby 2011 TTS	Durham 2006 TTS	Durham 2011 TTS
<b>Auto</b>	84%	80%	80%	80%	80%	80%
<b>Transit</b>	5%	5%	9%	10%	8%	9%
<b>Walk / Cycle</b>	3%	5%	8%	7%	8%	7%
<b>Other</b>	8%	10%	4%	4%	5%	4%

Note: \* TMP Study Area = Brooklin & North Whitby

16. Cordon Counts are traffic counts from the Greater Toronto Area which are undertaken by Regional Governments and the Province of Ontario. Cordon Counts are conducted every two to five years. 2014 Cordon Count data was not available when the data analysis was initially completed in support this study. Once the data became available, the data was reviewed to identify potential impacts on the completed assessment. However, the review determined that the new 2014 data may not a useful benchmark of historical growth due to impacts from long-term 407 East construction.
17. The Transportation Tomorrow Survey (TTS) is a telephone survey consisting of interviews of a randomly selected sample of households in the GTHA and surrounding areas. The purpose of the survey is to collect information on the travel habits of residents and provide a database for long-range transportation planning. The survey is conducted every five years; the most recent TTS Survey data that was available at the time the TMP assessment was conducted is from 2011.



Based on the 2006 and 2011 TTS, person trips in the Brooklin TMP study area have increased by 34% from 2006 to 2011 (i.e., over 3,700 additional person trips). The transit mode share in the study area has remained static and the walking / cycling mode share has increased by 2% from 2006 to 2011.

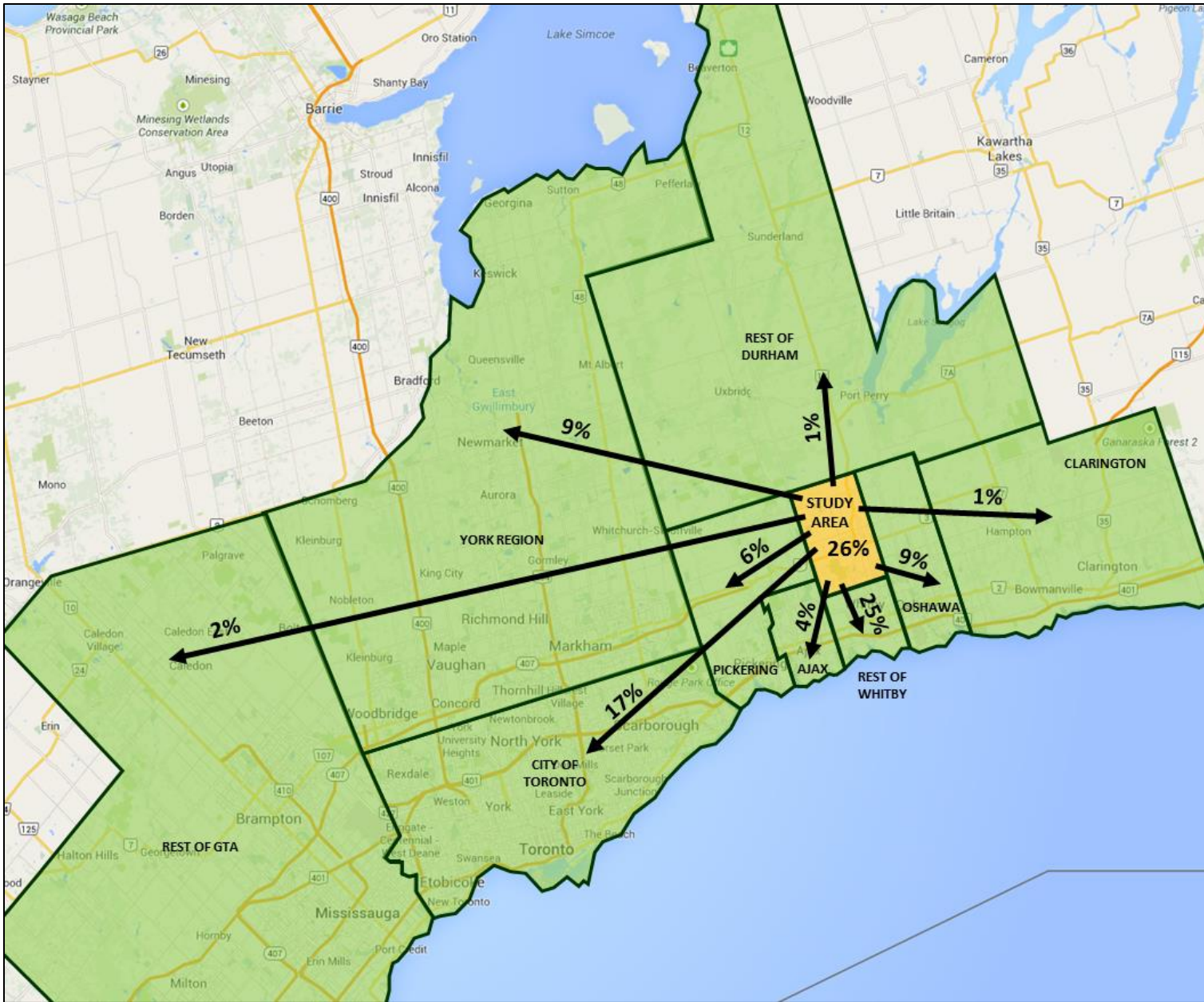
According to the 2011 TTS data, the majority of AM peak period trips originating in the Brooklin TMP study area are destined to areas within Durham Region and the City of Toronto. 51% of all AM peak period trips stay within Whitby, with over half of these trips (26%) remaining within the Brooklin TMP study area. 21% of the AM trips distribute through the rest of Durham, with the majority destined to Pickering, Ajax and Oshawa, and 17% are destined to Toronto. **Exhibit 10** present the existing trip distribution patterns for trips made by North Whitby residents.

## 5.4 Heavy Vehicle (Truck) Traffic, Commuter Traffic and Summer Travel Patterns

As discussed in **Section 3.3.6**, MTO conducted an Origin-Destination (O-D) Survey on Highway 7/12 during the summer of 2010 (July and August) to assess travel patterns. Turning movement count data collected between 2010 and 2015, summarized in **Table 3**, is consistent with data collected by MTO in the 2010 O-D survey; a slight increase in AM Peak Hour truck traffic is shown with the data collected as part of the TMP study in comparison with the previously collected MTO data. The 2015 daily truck percentages are lower than those found in 2012, and the AM Peak hour truck percentages are higher than those found in 2011. Construction along Highway 7 may have led to the higher truck percentages observed in 2012.

**Table 3: Baldwin Street, Percentage Truck Traffic, South of Campbell Street**

Year	Direction	Daily (6:00 – 18:00)	AM Peak Hour
2015	NB	4.5%	9.6%
2015	SB	4.3%	6.6%
2012	NB	9.3%	9.4%
2012	SB	8.2%	7.0%
2011	NB	4.4%	5.4%
2011	SB	4.3%	4.2%
2010	NB	4.3%	8.6%
2010	SB	4.8%	7.2%

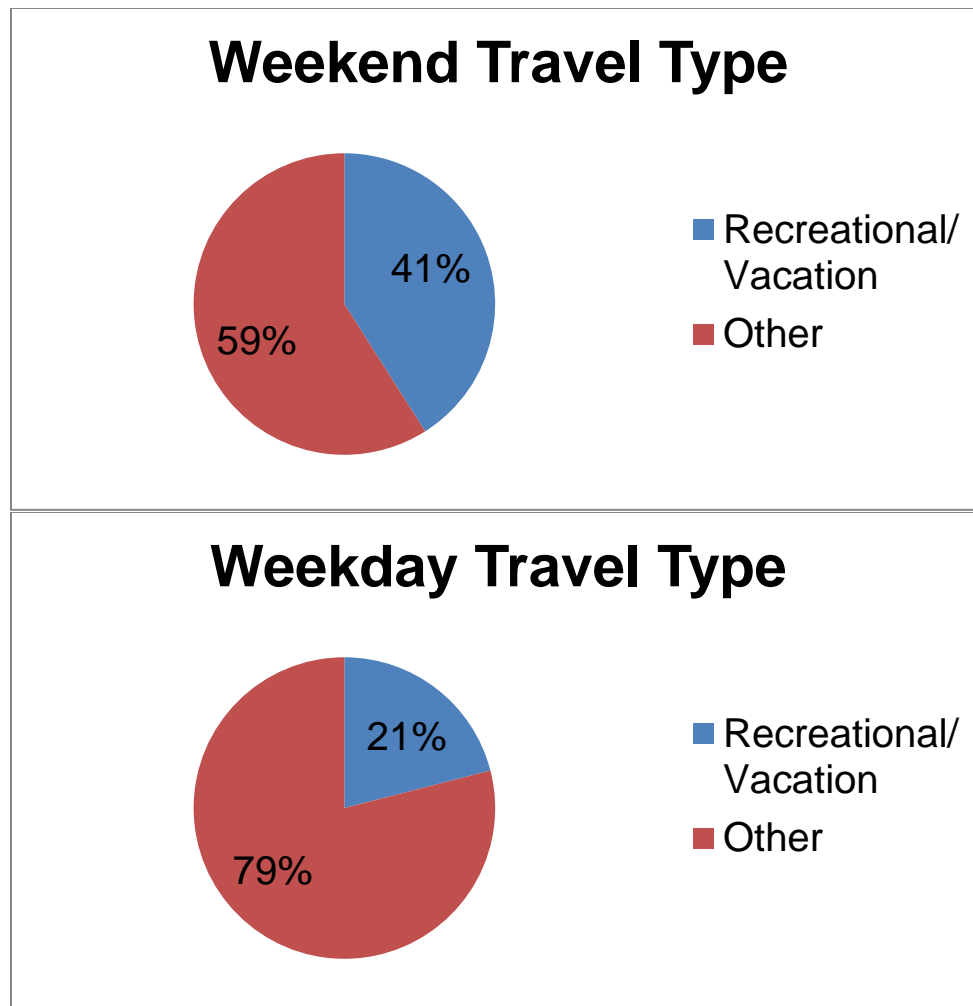


**Exhibit 10: Trip Distribution for Trips Starting in Brooklin TMP Study Area (AM Peak Period)**



Overall, it is evident that trucks represent a significant proportion of both daily and AM peak hour traffic along Baldwin Street through Downtown Brooklin. This is not unexpected given the street’s current role as a component of the Provincial highway network.

Highway 7/12, which run through the downtown core of Brooklin, is a heavily travelled route during the summer, providing a key north/south linkage to Port Perry and other cottage destinations to the north and east. The findings of the O-D survey also indicated that the majority of long distance travel occurs during the weekend, where the average straight line trip length is 134 km. Straight line travel distances during weekdays were reported to average approximately 71 km, which is almost half the average weekend travel distance. Similarly, 41% of recreational / vacation travel occurred during the weekend, however only 21% of weekday travel was related to recreation / vacation purposes, as depicted in **Exhibit 11**.



**Exhibit 11: Recreational / Vacation Travel**



## 5.5 Existing Traffic Congestion and Capacity Deficiencies

The 2011 Cordon Counts and Brooklin area traffic counts (2010-2015) were employed to identify existing capacity issues in the Brooklin TMP study area, and are summarized in **Exhibit 12**. The magnitude of existing traffic congestion, including key bottlenecks and areas of congestion, was identified; volume/capacity (v/c) ratios are used to indicate the level of congestion on a road.<sup>18</sup>

Based on the capacity analysis, several major roads in the study area are congested under present conditions. The existing transportation conditions assessment<sup>19</sup> indicated that Baldwin Street / Highway 7/12 is already at or near capacity in the peak direction of travel. The assessment showed a volume to capacity (v/c) ratio of 1.23 for the AM Peak Hour for southbound traffic travelling towards Winchester Road / Highway 7. Baldwin Street also carries a moderate amount of truck traffic (4% to 10% on a daily basis) which contributes to the congested conditions.

Columbus Road and Taunton Road were also identified to experience capacity issues under existing conditions.

A more detailed summary of the growth in traffic on Baldwin Street south of Campbell Street is shown in **Exhibit 13**.

Traffic data from 2010 to 2015 reveals:

- 5% annual growth in northbound traffic (2010-2015)
- 2% annual growth in southbound traffic (2010-2015)

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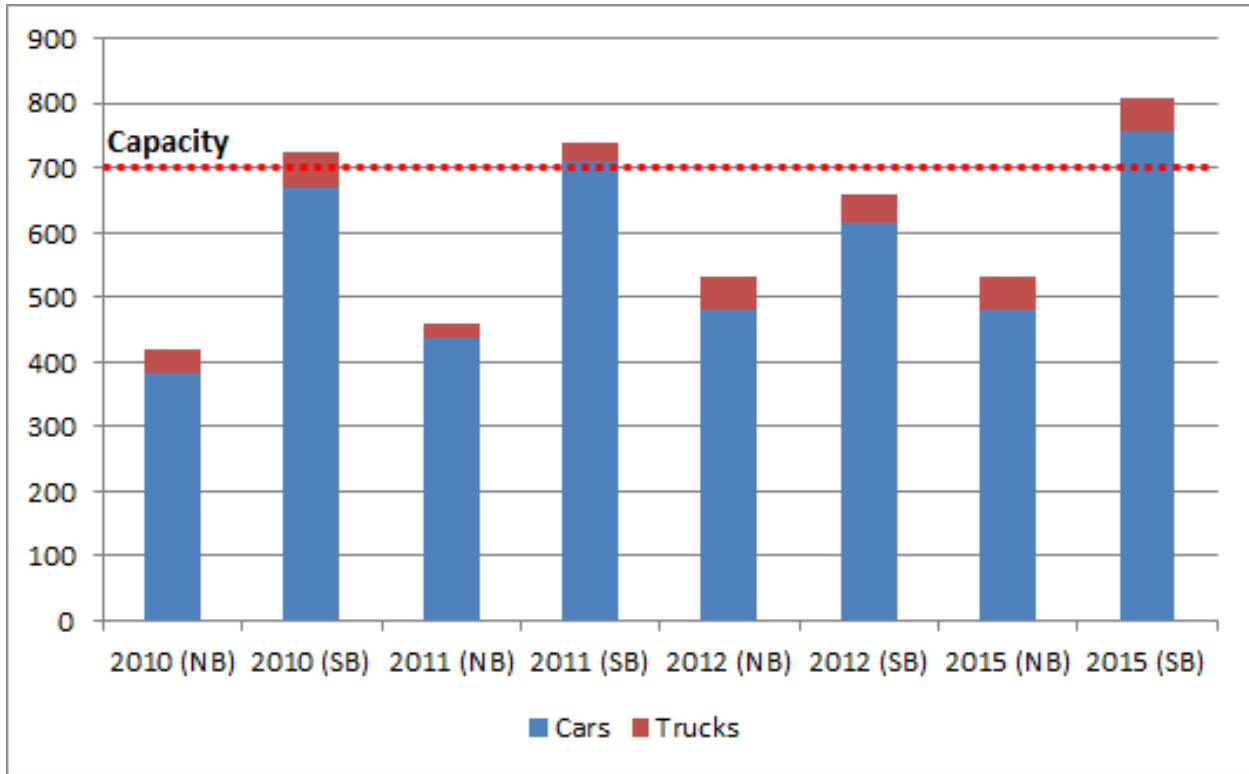
18. A v/c Ratio > 0.8 is considered congested, and a v/c Ratio > 0.9 is considered at or near capacity (Stop-and-Go conditions). v/c ratio of 1.00 suggests that the traffic on a road segment is equal to the vehicle capacity of the road segments. A 0.9 v/c ratio is typically used to identify capacity deficiencies that may need to be addressed through network improvements. Link-level v/c ratios serve to highlight and identify potential network bottlenecks. A link v/c of 0.9 or greater indicates likely congested conditions with one or more turning movements operating near capacity at adjoining intersection(s). More detailed operational level analysis is required to confirm the level of delay and potential issues at intersections. See **Section 5.4.1** and **Section 5.5.5** of this report, as well as **Appendix F**, for intersection operation details.

19. Existing conditions are based on 2011 traffic data and existing lane configuration at the time the assessment was completed. In **Exhibit 12**, red arrows indicate both stop-and-go and over-capacity conditions (v/c equal or greater than 0.90 and 1.00, respectively), while yellow arrows indicate a links that are congested (v/c equal or greater than 0.80).



**Exhibit 12: Existing Capacity Deficiencies (AM Peak Hour)**





**Exhibit 13: Baldwin Street Total Traffic, South of Campbell Street (AM Peak Hour)**

### 5.5.1 Existing Traffic Operations – Baldwin Street

Within the study area, Baldwin Street / Highway 7/12 is effectively an urban arterial roadway with a two-lane cross-section between Winchester Road and Way Street due to the ability to park on the street. In the section north of Baldwin Street between Way Street and the North Street / Queen Street intersections, it is a four-lane arterial roadway. A map identifying the locations of the existing conditions traffic operation analysis on Baldwin Street is shown in **Exhibit 14**. Existing signalized intersections are marked with a red dot, while unsignalized intersections are marked with a yellow dot.

An existing conditions assessment was completed to confirm operations along Baldwin Street. Details of the existing conditions intersection operations analysis, including peak hour volumes and existing lane configurations are provided in **Appendix F.2**.

A summary table of the operational results for existing conditions (signalized intersections only) is provided in **Table 4**; a more detailed summary table of the Synchro Reports and all of the Synchro reports worksheets are included in **Appendix F.2**.



**Exhibit 14: Intersections in Turning Movement Count Program**



**Table 4: Existing Overall Intersection Peak Hour Level of Service**

Signalized Intersection	AM Delay (sec)	AM LOS	AM v/c	PM Delay (sec)	PM LOS	PM v/c
<b>Baldwin Street / Winchester Road</b>	28.1	C	0.65	29.7	C	0.64
<b>Baldwin Street / Campbell Street</b>	10.9	B	0.57	10.4	B	0.50
<b>Baldwin Street / Carnwith Drive</b>	12.1	B	0.43	10.7	B	0.43
<b>Baldwin Street / Columbus Drive</b>	16.5	B	0.50	27.0	C	0.62

Based on the assessment results, the majority of intersection movements at intersections along Baldwin Street have satisfactory operations during existing peak periods<sup>20</sup>, with the following exceptions for signalized intersections:

- the northbound through movement at the intersection of Baldwin Street / Winchester Road (PM peak) is operating at a LOS D with a v/c of 0.81.
- the EB shared through/right movement at the Baldwin Street / Columbus Drive intersection (PM peak) is operating at a LOS D with a v/c of 0.96.

For unsignalized intersections:

- the shared westbound left/through/right turn movement at the Baldwin Street / Cassels Road intersection has a v/c ratio of 0.48, but a LOS F, in the AM peak hour, and a v/c ratio of 0.31 and LOS E in the PM peak hour. The low v/c ratio but LOS F/E operating conditions indicates lower volumes on the approach, but a longer wait for each vehicle to be able to complete its movement.

A significant northbound queue during the afternoon peak period has been observed by Town staff and is a regular concern of area residents and business owners / customers. The congestion contributes to poor pedestrian and cyclist conditions and reduces the welcoming feeling of the downtown.

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20. In the absence of recent data, a traffic counting program was commissioned on June 24, 2015 for the subject intersections. It is possible that not all schools were in session on this date, which may contribute to lower overall traffic volumes, especially in the AM peak hour.



## 5.6 Future Transportation Needs

This section provides a summary of the transportation demand modelling that has been conducted to assess future travel demands and capacity deficiencies in the 2031 horizon year. Details of the future transportation needs assessment are included in **Appendix F**.

The proposed land use options and the resulting population and employment growth that have been developed through the Secondary Plan study for the Brooklin area have been input to the transportation demand model in order to assess future travel demands and capacity deficiencies in the 2031 horizon year. A brief overview of the growth forecasting approach is provided in **Section 5.6.2**, followed by a description of the EMME-based transportation demand model and the resulting forecast of capacity issues in the Do Nothing scenario in **Section 5.6.3** and **Section 5.6.4**. The results of the horizon year traffic operations analysis are presented in **Section 5.6.5**.

### 5.6.1 Planned Road Network Infrastructure Improvements

The 2031 Base (“Do Nothing”) road network was developed using multiple sources of information, including the current Durham Region Capital Program and 9-Year Forecast set for construction, the Town of Whitby Transportation Master Plan (2010), Town of Whitby Official Plan (2010), Highway 407 East Phase 1 Study, the Winchester Road Environmental Study Report (2013), in addition to discussions with the Town of Whitby and the Region of Durham.

The 2031 “Do Nothing” road network includes Highway 407 East, Highway 412 and Highway 418, which are tolled facilities. Highway 407 East and Highway 412 interchanges within the study area include Baldwin Street, Thickson Road, Taunton Road, Highway 7 and Lake Ridge Road.

The Mid-block Arterial was identified in the Town of Whitby 2010 TMP as a recommendation to provide additional east-west capacity between the Town of Whitby/City of Oshawa border and Baldwin Street. As part of the current demand modelling work for this TMP update, preliminary assessments were conducted to confirm the need for additional east-west capacity, based on the updated model road network and Secondary Plan land use. Screenline details are provided in **Appendix F** which confirm the recommendations of the 2010 TMP to include the Mid-Block Arterial corridor.



Additional details on the 2031 Base network assumptions are provided in **Section 4.3.9** of **Appendix F**.

## 5.6.2 Population and Employment Growth Forecasts

The Town of Whitby worked with the Secondary Plan Study consultant, SGL, to develop land use options for the Brooklin Secondary Plan Area (SPA). The location and intensity of growth within the study area will influence the future transportation and opportunities within Brooklin. As a result, it is important to account for the projected growth in population and employment in the study area as part of the transportation analysis and forecasting exercise.

Based on the available land use information, population and employment totals were generated for each of the following locations:

- **Existing SPA:** The existing SPA includes the existing built community surrounding Downtown Brooklin (bounded by Hwy 407 to the south, Columbus Road to the north, Ashburn Road to the west, and Cachet Boulevard to the east). The population and employment figures provided for this area account for additional intensification opportunities within Downtown Brooklin and surrounding areas. The employment and population figures taken from the Secondary Plan were therefore added to the 2031 population and employment totals from the Durham Region model, which already reflect the planning provisions of the current plan for the Existing SPA.
- **Expanded SPA** - The Expanded SPA corresponds to lands where there is currently little or no development. For these traffic zones, the proposed total land use areas and resulting population and employment for the entire zone at full build-out were developed as part of the Secondary Plan study. As such, the provided population and employment totals were directly used, replacing the Durham Region model's population and employment totals for these zones.
- **Zones outside of the SPA** - Population and employment totals remain unchanged from the Durham Region model's 2031 forecasts for all remaining zones.

The population and employment numbers that were developed through the Secondary Plan study for the Existing SPA and the Expanded SPA correspond to the full-build out of the designated lands within the Brooklin community. Since full-build out is not expected to occur by 2031, these totals technically represent growth that is expected beyond the 2031 horizon year. Although the surrounding land use and the model



horizon year is defined as the year 2031, the full build-out growth was maintained within the Brooklin area in order to allow for a more forward looking assessment of capacity needs within the study area<sup>21</sup>. As a result, the forecasting results that are presented in this report could technically be considered as a “post-2031” scenario for the Brooklin area, depending on the pace of development. Considering the 2031 population and employment forecasts from the Secondary Plan study present full build-out of the Existing SPA and the Expanded SPA, the forecasts used in this assessment are in some cases greater than those utilized in Durham Region’s TMP Update (2017).

### 5.6.3 Forecasting Future Transportation Demands

In order to identify future transportation needs for Brooklin, future traffic forecasts were conducted using the Durham Region Travel Demand Model.<sup>22</sup> The model was designed to provide AM peak hour forecasts of future volumes within Durham Region under forecasted land use growth and transportation network improvement scenarios.

Since the Durham Region Travel Demand Model was designed as a forecasting tool for Region-wide traffic, the model was refined prior to being utilized for assessing transportation deficiencies for the community of Brooklin, including adjusting local demands to better correlate with observed traffic data<sup>23</sup>. The Durham Model also accounts for the impacts of tolled facilities such as Highway 407, Highway 412 and Highway 418.

Please refer to **Appendix F.3** for more details on the refinements that were applied to the model and the resulting level of validation to base year traffic count data.

- 
21. The study team agreed that it was prudent to consider full build-out in the Brooklin area from a corridor protection and capacity needs analysis perspective.
  22. The Durham Region Travel Demand Model was developed for the Durham Long Term Transit Study (LTTS), and was most recently updated in 2013 for the Durham Region Development Charge (DC) Study Update
  23. MTO O-D survey data was not used in the Brooklin Study modelling work. Sensitivity tests were performed to determine the importance and value of incorporating the O-D survey data into the model. These tests determined that incorporating the O-D survey data into the model would not have a significant impact on the conclusions of the study. This approach was reviewed and accepted by MTO. Rationale provided in support of this approach is included in **Appendix F.3**.



## 5.6.4 Future Do Nothing Assessment

Details on the approach used to forecast the travel demand generated by the land use options and the forecasted travel demands and capacity deficiencies in the 2031 AM peak hour under the “Do Nothing” roadway network are provided in **Appendix F**. A summary of the results is provided below.

### 5.6.4.1 Future Roadway Capacity Deficiencies – Volume-to-Capacity Analysis

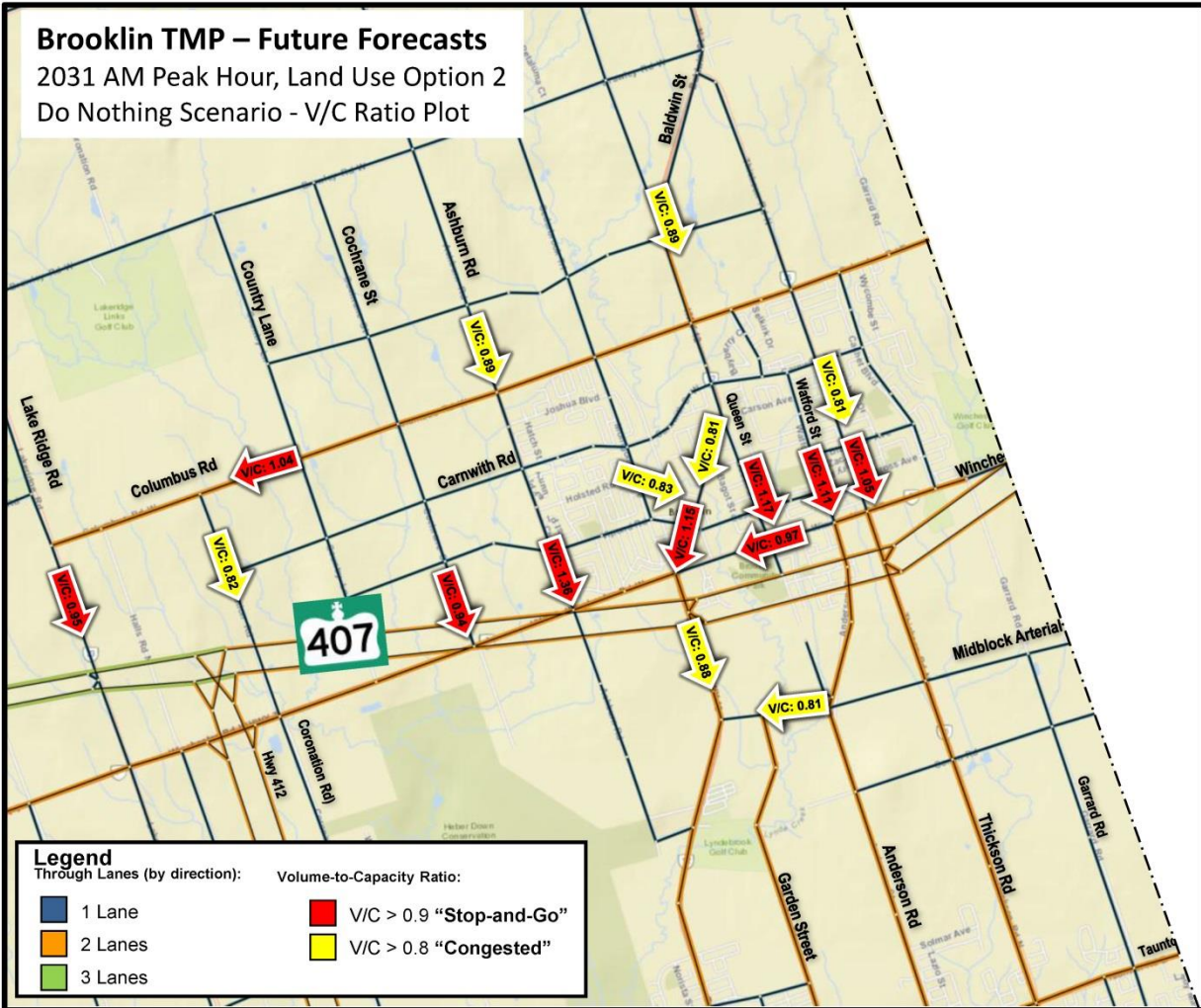
Similar to the existing conditions assessment (refer to **Section 5.5**), future capacity deficiencies were determined using volume-to-capacity ratio analysis (v/c ratio), which presents traffic conditions on road segments based on the available capacity of the roads.<sup>24</sup>

The preliminary 2031 “Do Nothing” AM Peak Hour traffic forecasts revealed several capacity deficiencies for north-south roads within the study area, mainly focused in the downtown core. Baldwin Street from the north of Winchester Road to Columbus Road, is forecasted to operate with “Stop-and-Go” conditions, and is expected to continue to carry a significant amount of through traffic.

The future forecast east-west travel demands have increased from the 2011 base year, but are generally accommodated by road network improvements and new infrastructure implemented in the 2031 base network (refer to **Section 5.6.1**). The only exceptions are Columbus Road to the east of Coronation Road and Winchester Road to the west of Queen Street. The addition of Highway 407 East is expected to provide some relief to east-west routes in the study area.

The forecasted road network capacity deficiencies are presented in **Exhibit 15**<sup>25</sup>.

- 
24. A v/c Ratio > 0.8 is considered congested, and v/c Ratio > 0.9 is considered at or near capacity (Stop-and-Go conditions).
  25. The modelling exercise currently includes the proposed east-west collector in all model scenarios (although this link is not shown in **Exhibit 3** of **Appendix F**). This link had been included to provide local network connectivity as opposed to through traffic capacity. In practice the model routes more traffic to Columbus Road due to the fact that it is a higher class road and it has remaining capacity. The removal of this link from the model network is expected to have limited impacts on modelled capacity deficiencies on the major road network; however, upon selection of the preferred land use option, the model network will be revised and updated to reflect any revisions to this proposed connection. The proposed realignment of Baldwin Street to T-into Thickson Road is not included in the Do Nothing alternative. It is included together with alternatives that propose further improvements to Thickson Road (i.e., widening to four lanes between Winchester Road and Baldwin Street).



**Exhibit 15: 2031 Capacity Deficiencies (AM Peak Hour)**

The bulleted list below summarizes the future capacity deficiencies projected by the travel demand macro-model.

- North-south road segments forecasted to be congested (v/c ratio > 0.8)
  - Coronation Road north of Highway 7
  - Ashburn Road north of Columbus Road
  - Baldwin Street north of Columbus Road
  - Baldwin Street south of Hwy 407
- East-west road segments forecasted to be congested (v/c ratio > 0.8)
  - Mid-Block Arterial east of Garden Street





- North-south road segments forecasted to be near or at capacity (v/c ratio > 0.9, Stop-and-Go conditions):
  - Baldwin Street north of Highway 7 / Winchester Road
  - Lake Ridge Road north of Highway 407 East
  - Cochrane Street north of Highway 7
  - Ashburn Road north of Highway 7
  - Queen Street north of Winchester Road
  - Watford Street north of Winchester Road
  - Thickson Road north of Winchester Road
- East-west road segments forecasted to be near or at capacity (v/c ratio > 0.9, Stop-and-Go conditions):
  - Columbus Road east of Coronation Road
  - Winchester Road east of Baldwin Street

### Screenline Analysis

The 2031 “Do Nothing” network forecasts were also evaluated through screenline<sup>26</sup> level analysis on the Brooklin road network. Similar to the link level analysis above, the total traffic crossing each screenline can be compared to the available capacity of the roads on the screenline by calculating a v/c ratio. A v/c ratio of 0.9 or greater is typically used to identify critical capacity deficiencies that may merit the consideration of providing additional capacity across the screenline (i.e., widening existing roads or adding new roads).

The screenline locations and descriptions are summarized in **Exhibit 16** and **Table 5**. Screenlines were developed to capture broader traffic patterns across the TMP study area and traffic that is more locally focussed on the north-south roads in the Brooklin downtown area. Consequently, the key screenlines that capture north-south traffic that cross Columbus Road and Highway 7 / Winchester Road were separated into Town-wide level (extending from Lake Ridge Road to Thickson Road) and downtown level screenlines (extending from Cochrane Street to Thickson Road).

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26. A screenline is an imaginary boundary that spans over a series of roads where crossing traffic can be analyzed with respect to the available road capacity

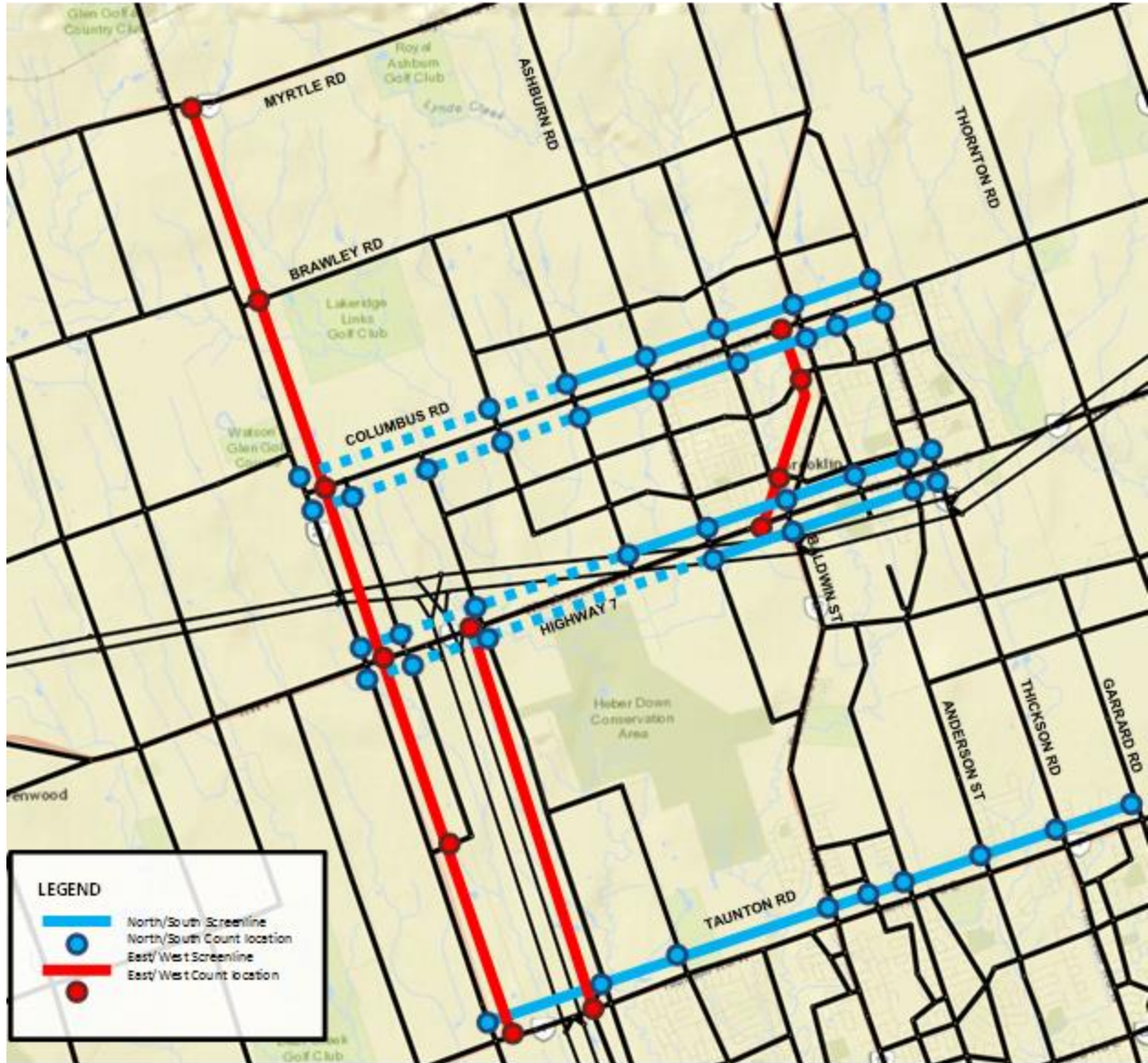


Exhibit 16: Brooklin Screenline Locations



**Table 5: Brooklin Screenline Descriptions and "Do Nothing" Results**

Northbound/Southbound Screenlines/Description	V/C Ratio	Additional Lanes Required <sup>27</sup>
North of Taunton Road (Lake Ridge Road to Garrard Road)	0.44	0
South of Highway 7 / Winchester Road (Lake Ridge Road to Garrard Road)	0.53	0
<b>Downtown-level:</b> South of Highway 7 / Winchester Road (Ashburn Road to Thickson Road)	0.58	0
North of Highway 7 / Winchester Road (Lake Ridge Road to Thickson Road)	<b>0.84</b>	<b>0</b>
<b>Downtown-level:</b> North of Highway 7 / Winchester Road (Cochrane Street to Thickson Road)	<b>1.11</b>	<b>2</b>
South of Columbus Road (Lake Ridge Road to Thickson Road)	0.54	0
<b>Downtown-level:</b> South of Columbus Road (Cochrane Street to Thickson Road)	0.55	0
North of Columbus Road (Lake Ridge Road to Thickson Road)	0.54	0
<b>Downtown-level:</b> North of Columbus Road (Cochrane St to Thickson Road)	0.69	0
Eastbound/Westbound Screenlines/Description	V/C Ratio	Additional Lanes Required <sup>28</sup>
East of Lake Ridge Road (Myrtle Road to Taunton Road)	0.52	0
West of Baldwin Street (Columbus Road to Highway 7)	0.22	0
East of Highway 412 (Highway 7 to Taunton Road)	0.85	0

27. Number of lanes to achieve v/c of 0.9. Assuming a typical arterial lane capacity of 800 vehicles per hour per lane.

28. Number of lanes to achieve v/c of 0.9. Assuming a typical arterial lane capacity of 800 vehicles per hour per lane.



**Table 5** shows that most screenlines do not show future capacity issues. The only exception is the local level North of Highway 7 / Winchester Rd screenline which has a forecasted v/c of 1.11. This implies that two additional arterial lanes of traffic are required between Cochrane Street and Thickson Road to provide enough capacity to reduce the v/c ratio to below the critical 0.9 target, or acceptable conditions. This could be through widening an existing road that crosses the screenline, constructing a new road, or by diverting traffic to other alternate routes.

### 5.6.5 Future Traffic Operations on Baldwin Street (Do Nothing)

The “Future Do Nothing” traffic conditions assessment for the Horizon 2031 year was completed using the raw data included in **Appendix F.1** and applying the annual growth factors which have been obtained from screenline analyses in EMME.

A summary of operational results for the Future Do Nothing conditions is presented in **Table 6** for signalized intersections during horizon year 2031 (AM and PM peak hours). The projected peak hour volumes used in the analysis and a more detailed summary table of the Synchro Reports and all of the Synchro reports worksheets are included in **Appendix F.4**.

**Table 6: Future Overall Intersection Do Nothing Peak Hour Level of Service (2031) – Signalized Intersections**

Intersection	AM Delay (sec)	AM LOS	AM v/c	PM Delay (sec)	PM LOS	PM v/c
<b>Baldwin Street / Winchester Road</b>	38.6	D	0.84	63.5	E	0.85
<b>Baldwin Street / Campbell Street</b>	27.6	C	0.93	11.9	B	0.65
<b>Baldwin Street / Carnwith Drive</b>	13.2	B	0.59	11.8	B	0.60
<b>Baldwin Street / Columbus Drive</b>	16.5	B	0.61	25.3	C	0.64

There are two intersections for which the overall intersection v/c ratio is above 0.80 – Baldwin Street / Winchester Road and Baldwin Street / Campbell Street. There are several individual movements at signalized intersections estimated to operate either at level of service (LOS) F and / or a v/c ratio over 0.80. As the above assessment applies future traffic volumes to the existing Do Nothing model, there are potentially



improvements that can be introduced to improve intersection operations without revising the intersection geometry. A sensitivity test was conducted that showed optimizing the signal timing plans improve the v/c ratios.

### **Unsignalized Intersections**

There are several individual movements at unsignalized intersections estimated to operate either at level of service (LOS) F and / or a v/c ratio over 0.80; the individual movements and intersections are:

- Baldwin Street/Cassels Road:
  - The eastbound shared left/through/right movement is expected to operate at a LOS F during the AM and PM peak hours. Note that unlike the AM peak hour, the v/c ratio for this movement exceeds 1.00 in the PM peak hour; and
  - The westbound shared left/through/right movement is expected to operate at a LOS F during the AM and PM peak hours with v/c ratio far exceeding 1.00.
- Baldwin Street/Way Street:
  - The eastbound shared left/right movement is estimated to operate at an unacceptable LOS F but with v/c ratio 0.47.

The “Future Do Nothing” traffic conditions assessment identifies a potential need for diverting the long-distance vehicular trips to other alternative route(s) away from the study section of Baldwin Street to reduce total traffic volumes, as well as a potential need for intersection improvements at the locations identified to have capacity deficiencies.

### **5.6.6 Summary of Future Transportation Needs**

Based on the information collected to date, impacts to the Brooklin community can be summarized as follows

- There is considerable long distance through traffic predicted for the future conditions on Highway 7/12 – Baldwin Street travelling through Downtown Brooklin
- Highway 407 East is expected to alleviate some Highway 7 / Winchester Road congestion, however north-south capacity deficiencies remain, especially on Cochrane Street, Ashburn Road, Baldwin Street, Anderson Street and Thicksen



Road<sup>29</sup>. In particular, the North of Highway 7 / Winchester Road screenline between Cochrane Street and Thickson Road is expected to operate above theoretical capacity with a v/c ratio of 1.11.

- Baldwin Street requires one additional lane of capacity to achieve acceptable conditions. With a constrained right-of-way, additional road capacity on Highway 7/12 – Baldwin Street is not possible without impacts on parking in Downtown Brooklin. The removal of the existing on-street parking is not a viable solution as parking is desirable to support the local businesses. Providing additional capacity on parallel roads may provide an opportunity to alleviate this issue.
- Infiltration and diversion of traffic into adjacent neighbourhoods will potentially persist / increase as people attempt to avoid congested roadways, particularly Baldwin Street.
- Promotion of a pedestrian and business-friendly downtown is better supported through removal of congestion caused by long distance auto and truck through traffic and adoption of applicable road standards
- Diverting long distance through and commuter trips from Highway 7/12 – Baldwin Street to acceptable alternate routes has the potential to defer or alleviate the need to undertake capacity improvements on Baldwin Street in Downtown Brooklin.

There is considerable community and Council support for reducing congestion in Brooklin. This includes reducing congestion resulting from through traffic in Downtown Brooklin, by diverting Highway 7/12 traffic to alternate route(s).

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29. Note that the macro-model and the identified transportation needs were assessed in 2014, prior to the opening of the Highway 407 toll facility.



## Section 6

### Problem and Opportunity Statement









## 6. Problem and Opportunity Statement

The Problem/Opportunity Statement is developed in Phase 1 of the Class EA process and establishes the key problems that the study is trying to solve. The following summarizes the preliminary problems that were identified through Phase 1 of the study:

- Significant population growth is anticipated for Brooklin
- Transportation improvements are being planned that will influence travel patterns throughout the study area
- Road capacity deficiencies are present in Brooklin. Baldwin Street through Downtown Brooklin is already approaching capacity during the AM and PM peak hours. Capacity issues are expected on other north-south roadways in the Downtown Brooklin area. These issues are expected to worsen as the Brooklin area grows in the future.
- Baldwin Street is expected to continue to carry a significant amount of long-distance through traffic and a moderate amount of truck traffic
- An increase in traffic using neighbourhood streets is expected

In order to address the significant population growth anticipated for Brooklin, the existing and expected transportation deficiencies in the downtown area and transportation improvements being planned in the area, this TMP will assess future transportation system needs, provide recommendations for new and/or improved infrastructure and recommend transportation policies that the Town can use to manage transportation infrastructure in Brooklin.

Having regard for community and Council input, and the summary of impacts identified in **Section 5**, the Problem / Opportunity Statement is as follows:

“With impending significant population growth, and to support a community-focused, pedestrian-oriented, business friendly, and sustainable downtown, the longer-distance through traffic, heavy-truck traffic, and some commuter traffic is no longer suited to travel through Downtown Brooklin. Diversion of Provincial Highway 7/12 to a suitable alternative has the potential to alleviate congestion and improve the social environment of the downtown core. Transportation policies and infrastructure improvements are required to encourage alternative sustainable modes of travel throughout Brooklin (transit, walking, and cycling) and to accommodate the transportation infrastructure needs associated with growth identified in the Brooklin Secondary Plan Area.”





## Section 7

### Proposed Alternative Solutions







## 7. Proposed Alternative Solutions

### 7.1 Development of the Proposed Alternative Solutions

The Future (2031 AM peak period) Do Nothing assessment indicates that there is a future roadway network capacity deficiency within the study area, particularly on the existing and planned north-south roadways that are located to the north of Highway 7 / Winchester Road and to the north of Columbus Road. The future planned east-west roadways appear sufficient to accommodate the future traffic projections given the recent widening of Highway 7, planned improvements to Columbus Road (widening to four lanes) and Winchester Road (addition of centre turning lane and road widening to the east), the Mid-Block Arterial, as well as the Highway 407 extension. It is noted that Garden Street is also part of the future planned road network and is expected to connect Taunton Road to the Mid-Block Arterial.

The Do Nothing Solution plus three broad strategies were considered in the process of developing the proposed alternative solutions that would alleviate future roadway network capacity deficiencies and address the Problem and Opportunity Statement that was previously identified in **Section 6**. The three strategies include:

- Transportation Demand Management Strategy
- Enhanced Transit
- Network Alternatives

The Do Nothing Alternative and each of the three strategies were first assessed qualitatively to determine the merit of developing specific alternative solutions for further quantitative assessment and evaluation. The details of this assessment are provided in **Appendix F**. A short description of the Do Nothing Alternative and each of the strategies is provided below.

#### 7.1.1 Do Nothing

The Do Nothing alternative is an assessment of the future transportation network where the future population and employment development areas are considered (i.e., future population and employment demands are added to the network), but no changes are



made to the active transportation network, transit services or the road network (beyond already planned improvements).

The Do Nothing strategy is considered as an alternative for comparison purposes and is also used to highlight the non-transportation / technical merits associated with not building new infrastructure, such as reduced or no impact to the natural, social, and cultural environment. Furthermore, as part of the MCEA process, this alternative must always be considered in order to highlight whether the proposed infrastructure improvement alternatives provide sufficient benefits to outweigh the potential negative impacts to the environment. For these reasons, the Do Nothing scenario is carried forward for further quantitative assessment.

### 7.1.2 Transportation Demand Management (TDM)

On its own, TDM Strategies will provide some measure of capacity relief to the transportation network. These strategies can include:

- Development of commuter parking lots, particularly to accommodate trips to common destinations such as GO Transit stations, Post-Secondary institutions, and other City centres and employment nodes
- Continued promotion of transit, active transportation, and ride sharing programs such as Smart-Commute Durham
- Promotion of teleworking and flexible work hours in order to encourage less peak period trip making
- Improved active transportation network and trip end facilities

On their own, TDM strategies are not expected to address the future road network needs for the study area<sup>30</sup>. However, it is expected that TDM will be a core component of the combined package of the transportation policy and network improvements that are recommended by this TMP. Consequently, TDM strategies are assumed to be a part of all of the alternatives that are carried forward for further quantitative assessment

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30. Based on the findings of Halton-Peel Boundary Area Transportation Study (2010) which evaluated the effect of TDM with a the assumption that the combined effect of TDM programs implemented throughout the GTA, such as allowing employees to work from home, the promotion of carpooling by the Smart Commute Transportation Management Associations, compressed work weeks and flexible work hours, a 5% reduction in the work trip generation rate at the trip origin end (PM peak hour model) was estimated. This is not a significant decrease and would only slightly improve operation.



and evaluation in **Section 8**; TDM guiding principles strategies and policies are outlined in more detail in **Section 9.5**.

### 7.1.3 Enhanced Transit

There is potential to increase the existing transit mode share of 5% for the AM peak period to a 9% to 10% transit mode share, consistent with the overall transit mode split for the 2011 AM peak period for Durham Region and the Town of Whitby as a whole. This increase in transit usage would translate to a corresponding reduction in auto vehicle travel in the AM peak period of approximately 5% to 6% vehicles. Although this reduction in vehicle trips is beneficial for reducing congestion and supported by this TMP, it is not sufficient to accommodate the future transportation needs of the community as a stand-alone solution. For example, in the Do Nothing scenario, the critical North of Highway 7 / Winchester Road screenline is forecast to be over capacity by over 11% (i.e., v/c of 1.11) in the vicinity of Baldwin Street in the 2031 AM peak. A decrease of over 20% is required in order to bring this critical screenline to the target v/c threshold of 0.9.

Transit services in the Town of Whitby are under the jurisdiction of Durham Transit and GO Transit. The Town can provide input and make recommendations to these agencies; however, the Town is not in a position to revise or enhance services at their own discretion. A significant increase in transit usage (i.e., doubling of the Town of Whitby's current 10% total) within the Brooklin study area will require a significant increase in both the number of routes that serve the community and in the frequency of buses.

For these reasons, it is recommended that Enhanced Transit Strategies be incorporated into all of the network solutions that are recommended as part of this TMP (where possible); recommended Transit Strategies are outlined in **Section 9.4**. Although specific Transit Strategies will not be carried forward as part of the alternative solutions for further quantitative assessment and evaluation, the ability of each of the alternative network solutions to support and accommodate transit users are considered qualitatively during the evaluation process.

### 7.1.4 Network Alternatives

Four overall network improvement strategies and their related alternatives were examined in order to generate a "long list" of solutions that could potentially serve north-south capacity needs in the vicinity of Downtown Brooklin and address the Problem and



Opportunity Statement for this study. The four strategies and the associated “long list” of alternatives were first qualitatively assessed and screened in order to determine the “short list” of alternatives that could reasonably and feasibly address the study area’s needs to 2031. The strategies include:

- Revise the existing network;
- Add new arterial roadways;
- Retain Highway 7/12 designation on Baldwin Street; and
- Change Highway 7/12 designation through Downtown Brooklin from a Provincial facility to a Town of Whitby road.

Details of these four strategies, a discussion of the merits of the potential “long list” of alternatives within these four overall network improvement strategies, the screening results are outlined in **Appendix F**. The resulting “short list” of alternatives that are being carried forward for further detailed assessment and evaluation are identified in **Section 7.1.5**.

Further to the above, the intersection of Thickson Road and Baldwin Street is proposed to be realigned such that Thickson Road is the through road. This is a preferred arrangement from a traffic / transportation point of view. This proposed intersection realignment should be considered through a future road widening environmental assessment or intersection improvement project.

Overall, the screenline analysis demonstrated a need for a new route to cross Highway 407 and / or connect to Highway 7 in order to address identified future capacity issues in the north-south direction to the north of Highway 7 / Winchester Road. The new route would have to be located east of Cochrane Road and west of Thickson Road to provide the most benefit to the overall network. Given the existing and planned development in this area, it is not feasible to include a new arterial route as an alternative solution (without significant impacts to the developable area of land and the land use planning vision for the study area).

Through the screening process, a short-list of potential network alternatives was identified to be carried forward for further assessment and evaluation. In all short-listed alternatives, the intersection of Thickson Road and Baldwin Street is revised so that Thickson Road is the through road.





### 7.1.5 Short-list of Network Alternatives

Based on the network improvement strategy to revise the existing network, the resulting short-list of proposed alternative solutions roadway improvements is as follows:

- **Alternative 1: “Do Nothing”** (includes already planned improvements)
- **Alternative 2: “Widen Lake Ridge Road and Thickson Road”**
- **Alternative 3: “Widen Cochrane Street”**
- **Alternative 4: “Widen Ashburn Road”**

All identified widenings alternatives are to widen existing two-lane arterial cross-sections to four-lane cross-sections. It should be noted that all arterials roads should be protected to allow for potential future widening/improvements. This may include additional travel lanes, cycling facilities, transit lanes, high occupancy vehicle lanes, etc. Arterial roads are the principal mobility corridors to/from/within the community and shall include consideration of all road users. The timing of any road widening will be based on need for servicing and/or capacity improvements.

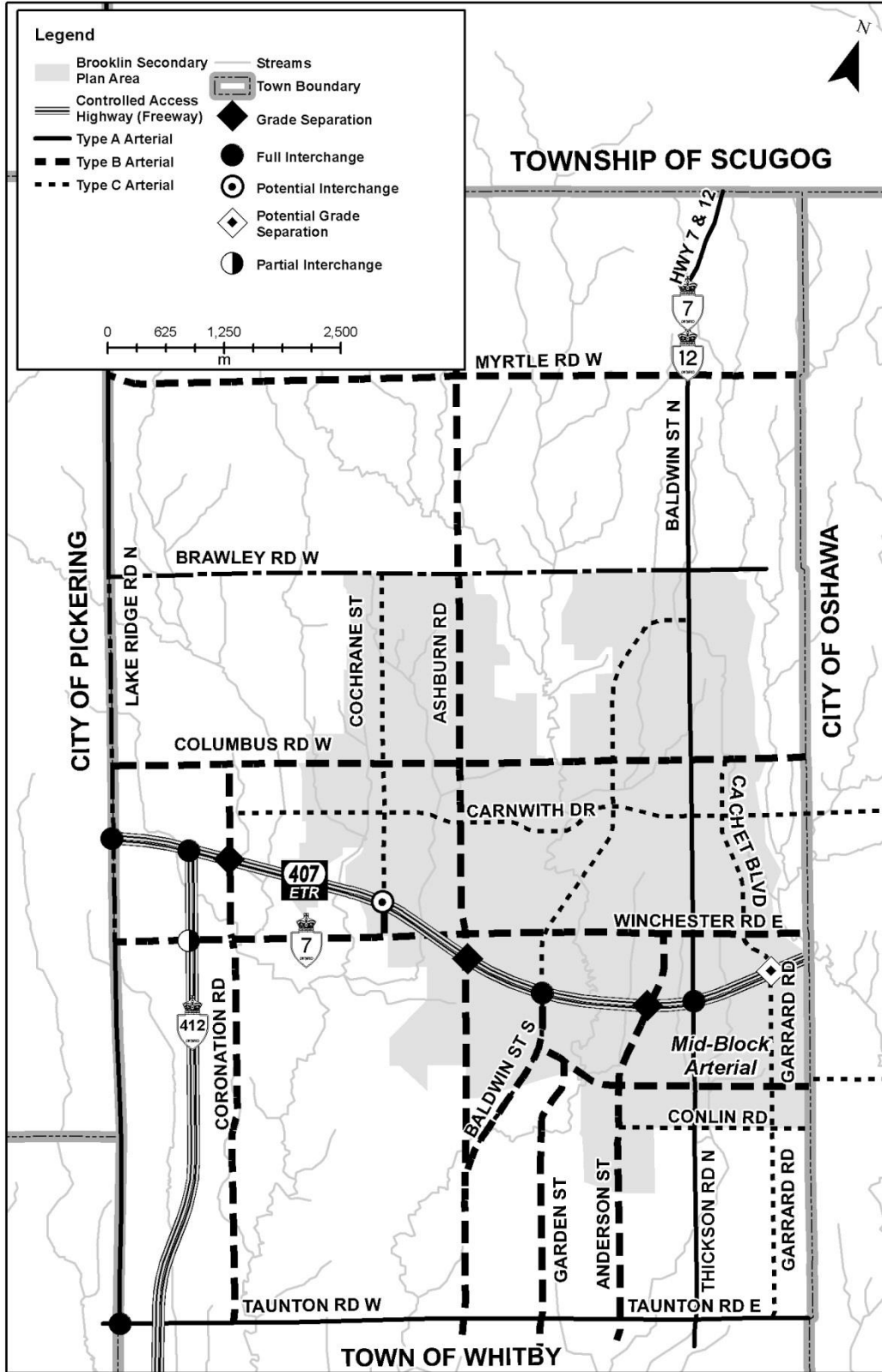
The Do Nothing Alternative is shown in **Exhibit 17**. Alternatives 2, 3, and 4 are shown in **Exhibit 18, Exhibit 19, and Exhibit 20**, respectively. A description of each of Alternatives 2, 3, and 4 is as follows:

- **Alternative 2 – Widening Thickson Road to four lanes from Winchester Road to Brawley Road and widening Lake Ridge Road to four lanes from Highway 7 to Brawley Road:** With this alternative there is potential to alleviate some future congestion through Downtown Brooklin. Associated with this alternative is the potential to realign the Baldwin Street / Thickson Road intersection, allowing for the through movement to be on Thickson Road, and for Baldwin Street to tee into Thickson Road.
- **Alternative 3 – Widening Cochrane Street to four lanes from Highway 7 to Carnwith Drive:** This option builds on Alternative 2 and includes the widening of Thickson Road to four lanes from Winchester Road to Brawley Road and Widening Lake Ridge Road to four lanes from Highway 7 to Brawley Road. In addition, this option assumes an interchange at Cochrane Street / Highway 407, and connectivity to the new Mid- Block Arterial south of Winchester Road. This alternative identifies potential to alleviate some future congestion through Downtown Brooklin. This option also provides an opportunity to reduce the amount of traffic using



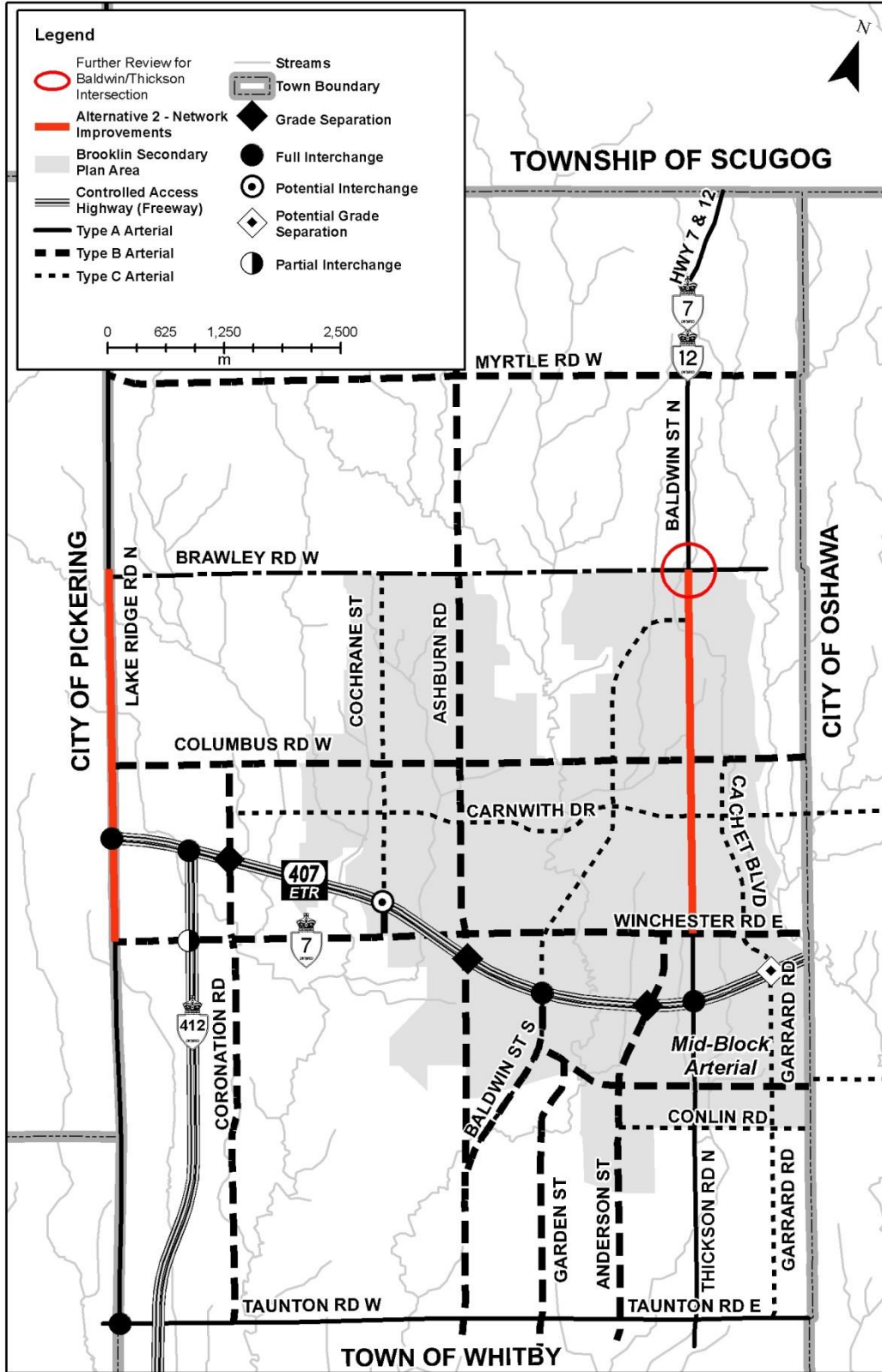
neighbourhood streets west of Baldwin Street. Alternative 3 was found to have merit and was carried forward for further assessment.

- **Alternative 4 – Widening Ashburn Road to four lanes from Highway 7 to Carnwith Drive:** This option builds on Alternative 2 and includes the widening of Thicksen Road to four lanes from Winchester Road to Brawley Road and Widening Lake Ride Road to four lanes from Highway 7 to Brawley Road. In addition, this option assumes connectivity to the new Mid-Block Arterial Road, but no connection to Highway 407. Alternative 4 was tested using the demand model, and it was identified that there was some potential to alleviate future congestion through Downtown Brooklin and provide an opportunity to reduce the amount of traffic using neighbourhood streets west of Baldwin Street. This alternative was found to have merit and was carried forward for further assessment.



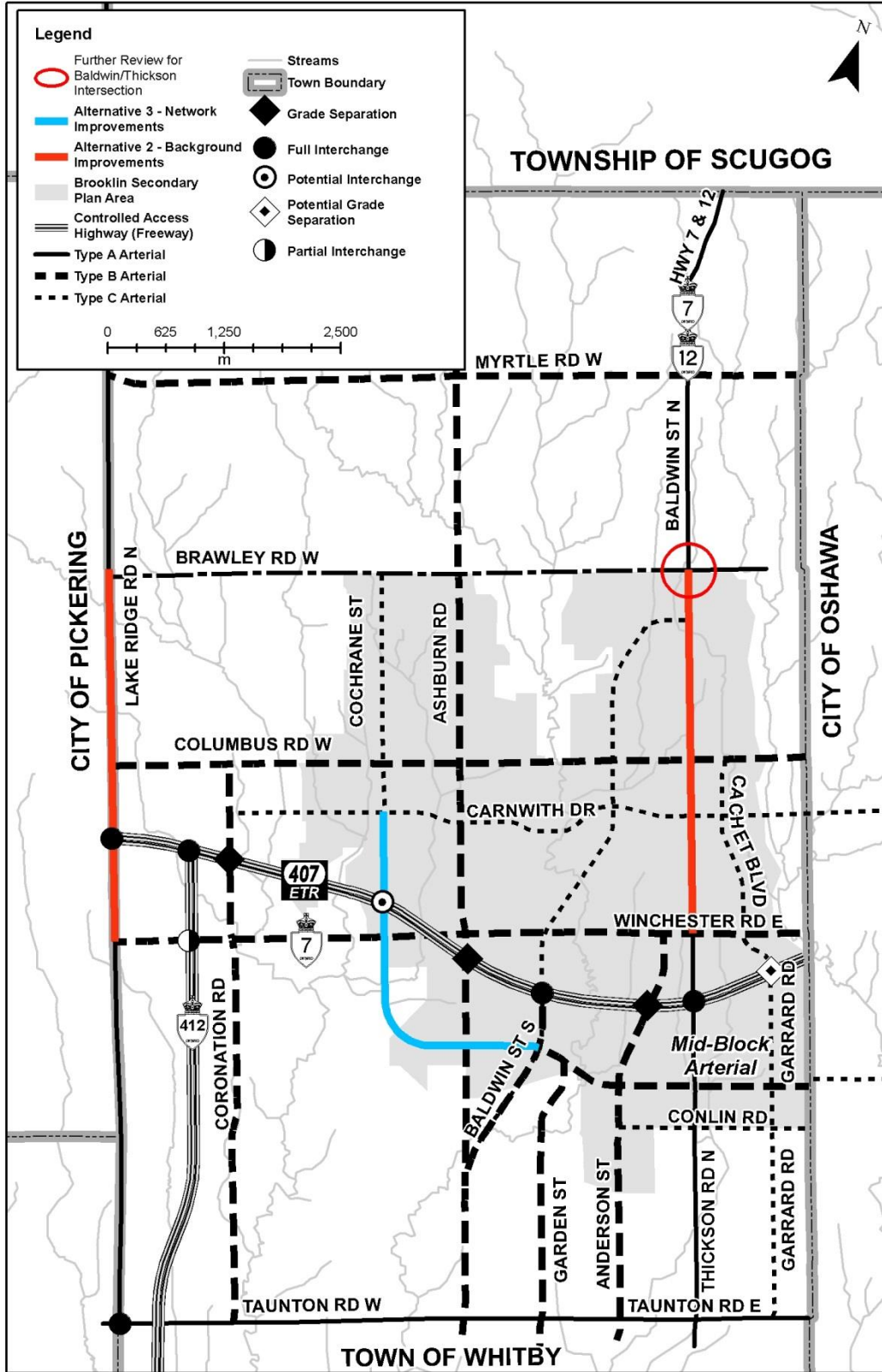
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Exhibit 17: Alternative 1, "Do Nothing"



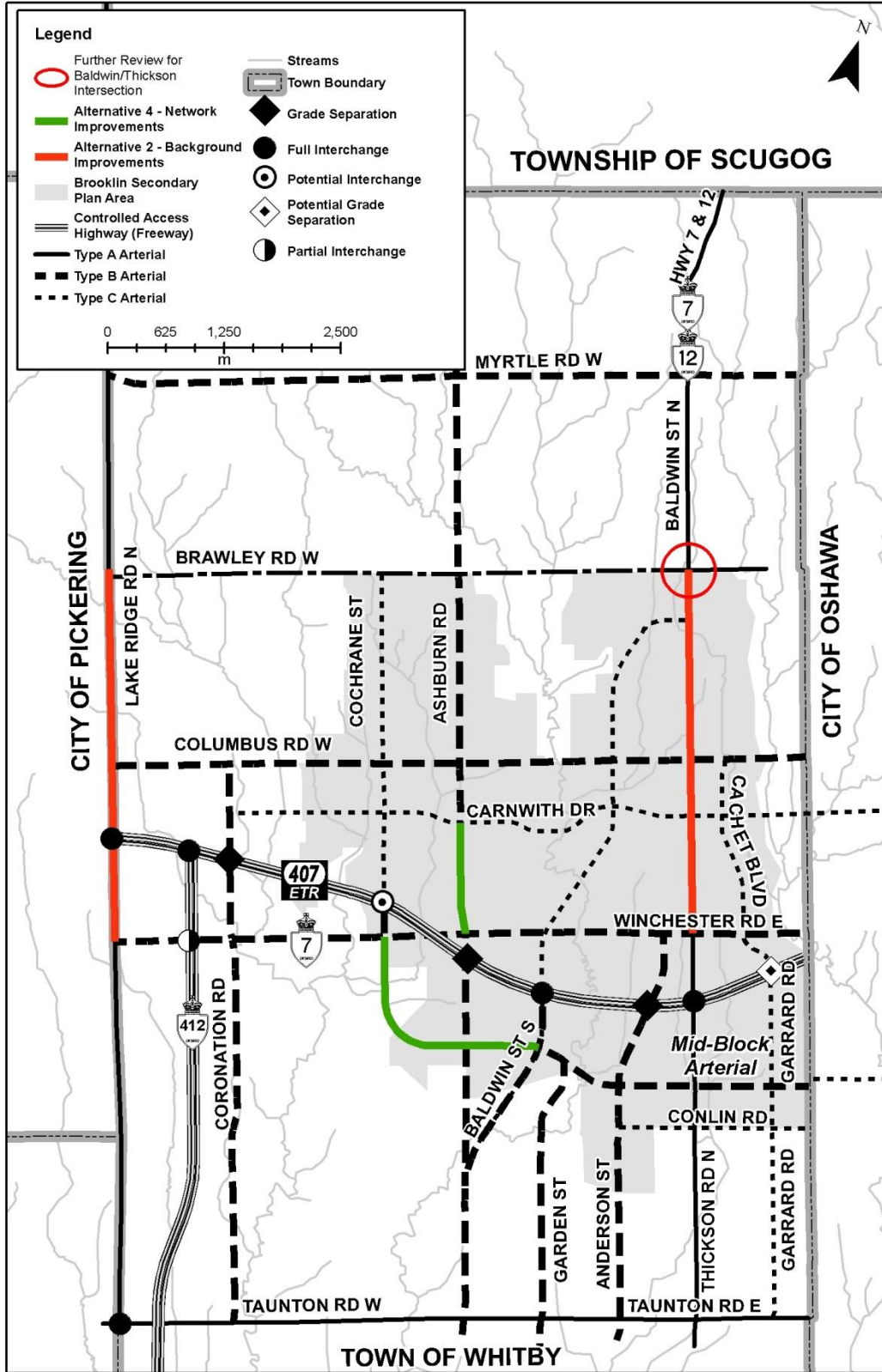
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Exhibit 18: Alternative 2, “Widen Lake Ridge Road and Thickson Road”



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Exhibit 19: Alternative 3, "Widen Cochrane Street"



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**Exhibit 20: Alternative 4, "Widen Ashburn Road"**



## Section 8

### Alternative Solutions Evaluation









# 8. Alternative Solutions Evaluation

## 8.1 Evaluation Criteria

The evaluation criteria categories and indicators, shown in **Table 7**, were developed in consultation with the Town. These criteria have been developed by considering the requirements of the Municipal Class EA process, public feedback received to date, and the experience of the project team. The evaluation criteria are designed to assist with the differentiation of the benefits and impacts of each of the alternatives.

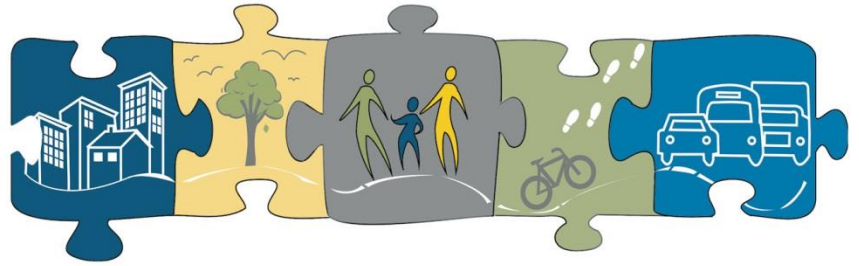
**Table 7: Evaluation Criteria – Categories and Indicators**

Categories	Indicators
<b>Transportation/ Technical</b>	<ul style="list-style-type: none"> <li>• Road network capacity</li> <li>• Road network performance (2031 AM peak hour)</li> <li>• Road safety</li> <li>• Road network continuity and connectivity</li> <li>• Community accessibility and mobility</li> <li>• Transit serviceability</li> <li>• Potential to support sustainable modes of transportation such as cycling and walking</li> <li>• Potential traffic infiltration to residential areas</li> </ul>
<b>Natural Environment</b>	<ul style="list-style-type: none"> <li>• Fish/Fish Habitat</li> <li>• Wetlands</li> <li>• Significant Woodlots</li> <li>• ANSIs</li> <li>• Species at Risk/Habitat Areas</li> </ul>
<b>Socio-Economic Environment</b>	<ul style="list-style-type: none"> <li>• Area aesthetics</li> <li>• Impacts to businesses</li> <li>• Residential and community structure</li> <li>• Property requirements</li> <li>• Recreational land uses and trails</li> <li>• Consistency with Official Plan policies</li> <li>• Existing and proposed land uses</li> <li>• Accommodation of pedestrian/cyclist movements</li> <li>• Noise Impacts</li> </ul>
<b>Cultural Environment</b>	<ul style="list-style-type: none"> <li>• Potential to impact cultural heritage landscapes</li> <li>• Potential to impact built heritage resources</li> <li>• Potential to impact archaeological resources</li> </ul>
<b>Cost Factors</b>	<ul style="list-style-type: none"> <li>• Capital, operating, property, and maintenance costs compared to anticipated user benefits.</li> </ul>



## 8.2 Evaluation Matrix and Preferred Alternative

Both summary and detailed evaluation matrices are included in **Appendix G**. Based on the evaluation of alternatives it is recommended that Lake Ridge Road and Thickson Road, north of Winchester Road / Highway 7, be widened by 2031 and it is further recommended that Cochrane Street be widened to accommodate north-south movements and service the prestige industrial area, as identified in Alternative 3. The widening of Ashburn Road (Alternative 4) is not identified as the preferred alternative, however, it is recommended that Ashburn Road be protected for potential future widening beyond 2031. The staging of widening within the designated right-of-way will be determined as development proceeds and as part of future environmental assessment studies.



## Section 9

### The Recommended Alternative







## 9. The Recommended Alternative

### 9.1 Preferred and Recommended Land Use Plan

In December 2015, the Town's consultant SGL developed three land use options in conjunction with the transportation network alternatives based on the background technical work undertaken in Stage One of the Brooklin Study.

The proposed land use options were then evaluated against a list of evaluation criteria and were evaluated from the perspective of:

- Urban planning;
- Transportation;
- Natural heritage;
- Hydrogeology;
- Watershed planning and stormwater management; and
- Municipal finance.

Following the consideration of public and stakeholder input through PICs, on-line MetroQuest surveys, submission of comments and evaluation of the three land use options, the Preferred Land Use Plan and the Draft Proposed Secondary Plan were prepared. The Preferred Land Use Plan is a hybrid of the preferred elements within the three proposed land use plans, as follows:

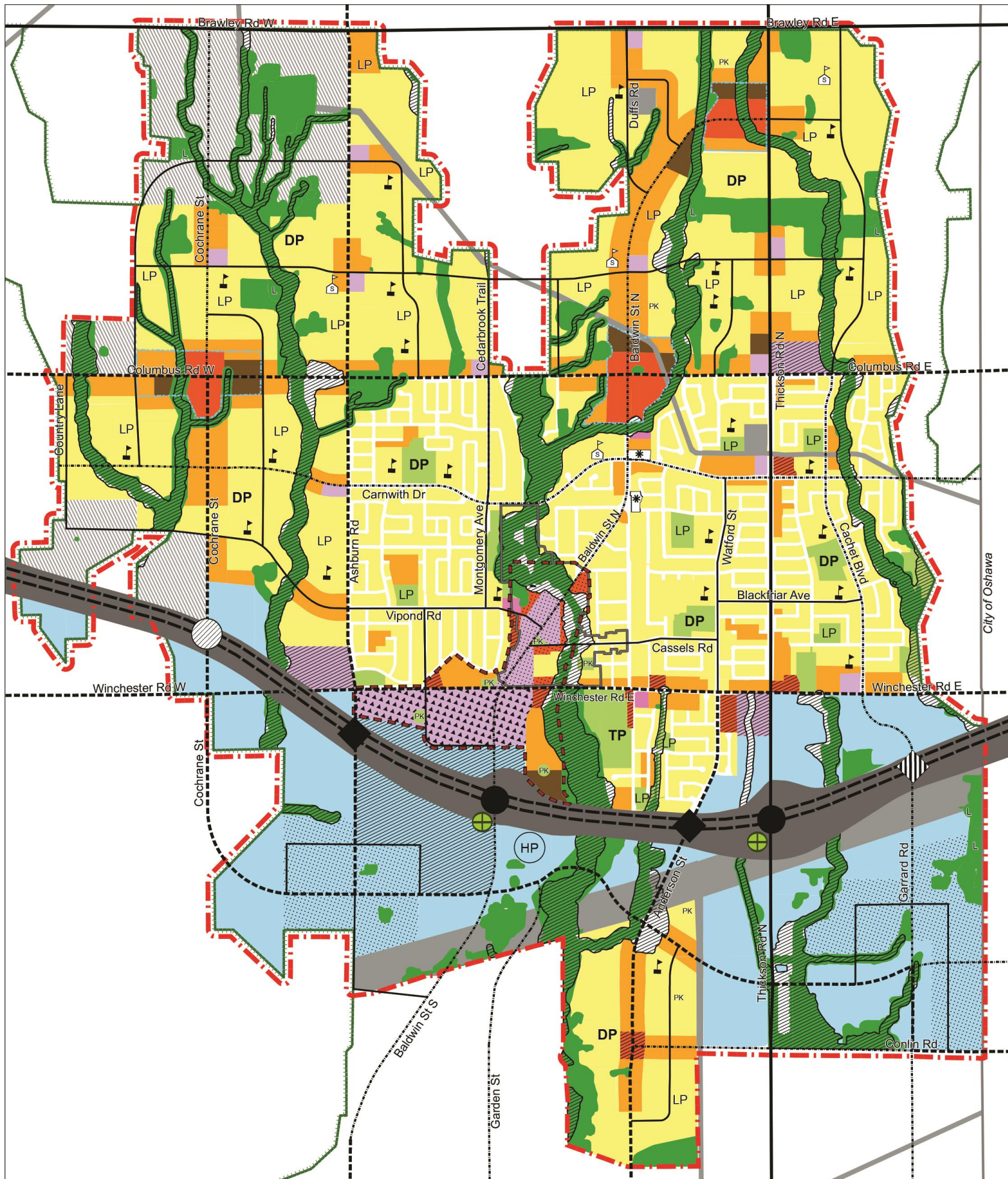
- Three Community Central Area nodes were preferred in order to minimize impact to the Downtown. As well, the location of the three community central areas along Regional corridors with a hybrid of clustering medium and high density residential along Columbus Road and Baldwin Street best met the urban structure requirements of Regional Corridors. Clustering medium and high density residential around the three Community Central Areas was also preferred to support walkability.
- Medium Density Residential located along Columbus Road and Baldwin Street and along the arterial roads in the Conlin Road / Anderson Street area to support higher density uses along Regional Corridors.
- The collector road network refined to meet intersection spacing requirements of the Region of Durham.



- The alignment of Baldwin Street intersecting with Thickson Road, with Thickson Road as the through road, with revised intersection spacing from Brawley Road to meet intersection spacing requirements.
- The distribution of the four District Parks with the location of the northeastern most District Park located on the east side of the stream corridor closer to the secondary school and the location of the northwestern most district park closer to both Baldwin Street on the east side and the northern secondary school site, to enhance the east west open space linkage.
- The distribution of secondary school sites with one secondary school site on Ashburn Road north of Columbus Road and a second site on Baldwin Street north of the east-west collector. It is noted that the Durham Catholic District School Board requested a site along Baldwin Street.
- The distribution of elementary school sites to meet a reduced requirement (i.e., three fewer sites) from the Durham District School Board.
- The elementary school site in the Conlin Road / Anderson Street neighbourhood located on the east side of Anderson Street in the preferred land use plan.
- Two Special Purpose Commercial designations, with the Columbus Road and Thickson Road designation focused at the northeast corner.
- In the Downtown Brooklin Major Central Area, the land uses south of Winchester Road have a predominantly Major Commercial designation rather than a mix of Major Commercial and Mixed Use designations.
- North of Winchester Road, the Major Central Area boundary and land uses include revised terminology for the designation along Baldwin Street to Heritage Commercial to better reflect the context.

The Preferred Brooklin Land Use Plan and the Preferred Brooklin Major Central Area Land Use Plan along with the Draft Proposed Secondary Plan were presented to Council in June 2017. The growth in population and employment anticipated with this Preferred Land Use Plan was used to update the previous demand macro-model assessment to confirm the Preferred Road Network, as discussed in **Section 9.2**.

The Preferred Land Use plans were finalized based on public and agency comments received during the 30-day review period following the June 2017 Council meeting. The Recommended Brooklin Land Use Plan (Schedule K of the Secondary Plan) is provided in **Exhibit 21**, while the Recommended Brooklin Major Central Area Land Use Plan (Schedule K1 of the Secondary Plan) is shown in **Exhibit 22**.



**LEGEND:**

Low Density Residential	General Industrial	Natural Heritage System	Controlled Access Highway (Freeway)
Medium Density Residential	Lands subject to Durham Regional Official Plan Policy 14.13.7	Linkage in NHS	Type A Arterial
High Density Residential	Major Open Space	Natural Hazards	Type B Arterial
Local Commercial	District Park	Utility	Type C Arterial
Special Purpose Commercial	Local Park	Health Precinct Special Policy Area	Collector Road
Heritage Commercial	Parkette	Community Central Area	Greenbelt Plan Boundary
Major Commercial	Town Park	Major Central Area	Full Interchange
Mixed-Use 1 - Community Central Area	Institutional	Heritage Conservation District Boundary	Potential Interchange (Subject to Further Study)
Mixed-Use 2 - HCD	Secondary Schools	Secondary Plan Boundary	Grade Separation
Mixed-Use 3	Elementary Schools	Lands Subject to Policy 11.5.32.3	Potential Grade Separation
Prestige Industrial			Future Transitway Station
Business Park			

**Brooklin  
Community  
Secondary Plan  
Official Plan  
Town of Whitby**

Schedule **K**



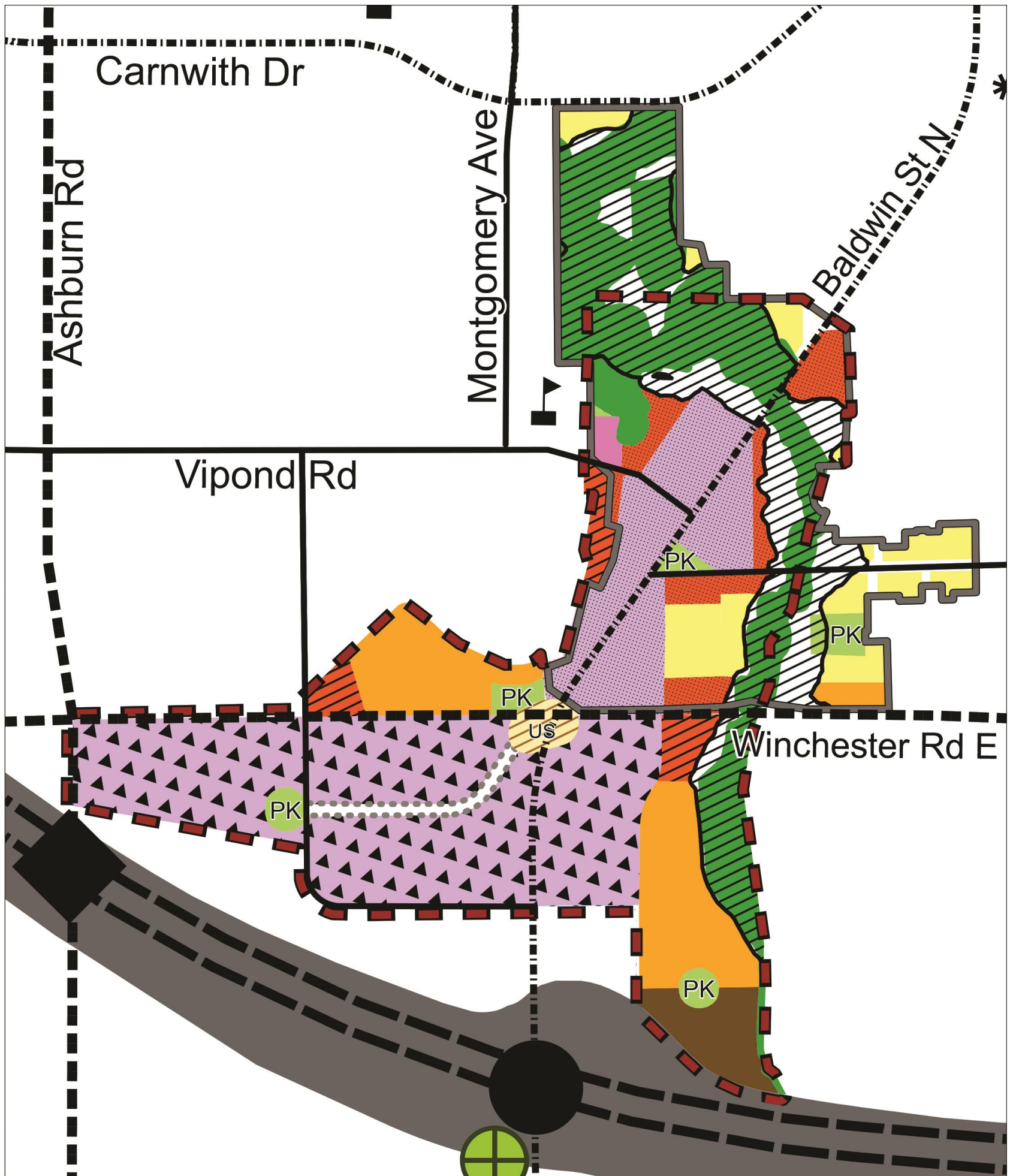
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**RECOMMENDED**

Exhibit 21: Recommended Brooklin Land Use Plan (Schedule K)



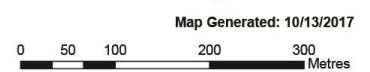




**LEGEND:**

- |                            |  |                                     |
|----------------------------|--|-------------------------------------|
| Low Density Residential    | Major Open Space                                 | Controlled Access Highway (Freeway) |
| Medium Density Residential | Parkette   | Type B Arterial                     |
| High Density Residential   | Urban Square                                     | Type C Arterial                     |
| Heritage Commercial        | Natural Heritage System                          | Collector Road                      |
| Major Commercial           | Natural Hazards                                  | Full Interchange                    |
| Mixed-Use 2 - HCD          | Institutional                                    | Grade Separation                    |
| Mixed-Use 3                | Major Central Area                               | Future Transitway Station           |
|                            | Heritage Conservation District Boundary          |                                     |
|                            | Pedestrian Promenade with Ground Floor Animation |                                     |

**Downtown Brooklin**  
**Major Central Area**  
**Brooklin**  
**Community**  
**Secondary Plan**  
**Official Plan** Schedule  
**K1**  
**Town of Whitby**



**RECOMMENDED**

Exhibit 22: Recommended Brooklin Major Central Area Land Use Plan (Schedule K1)





## 9.2 Preferred and Recommended Road Network

### 9.2.1 Alternate Route for Highway 7/12 Corridor

As described in **Section 3.3.4**, the Town of Whitby is seeking agreement from the MTO to transfer ownership of Baldwin Street (Highway 7/12) through Downtown Brooklin to the Town of Whitby. As a result, Provincial Highway 7/12 must be relocated either to an alternate existing road, or to a new route constructed within the Town (or potentially outside of the Town boundaries, if appropriate).

Official Plan Amendment #105, adopted by Council on February 21, 2017, includes the following policy regarding an alternate route to Baldwin Street through Downtown Brooklin:

“8.1.3.1.6 In accordance with the Durham Regional Official Plan, Lake Ridge Road and Thickson Road / Highway 12 north of Brawley Road shall be the preferred north-south haul routes for commercial vehicles. Through the Class Environmental Assessment process, the Municipality shall investigate the need and feasibility of establishing an alternative route to Baldwin Street for goods and people movement to avoid excessive through traffic in Downtown Brooklin and the urban area, in consultation with the Region and the Province.”

This TMP does not include the identification of an alternative route for Provincial Highway 7/12 through Downtown Brooklin, however, potential alternate routes have been identified through a Feasibility Study. The intention of the Feasibility Study is to illustrate to the Ministry of Transportation, who has jurisdiction over Highway 7/12, that there are alternate routes available and that an Environmental Assessment (EA) should be initiated to determine the preferred alternate route. The strategy to transfer ownership of Baldwin Street to the Town supports the Problem and Opportunity Statement for the TMP and will assist the Town with developing a pedestrian-oriented, business-friendly, and sustainable downtown, by providing an alternate route for longer-distance through traffic, heavy-truck traffic, and some commuter traffic.

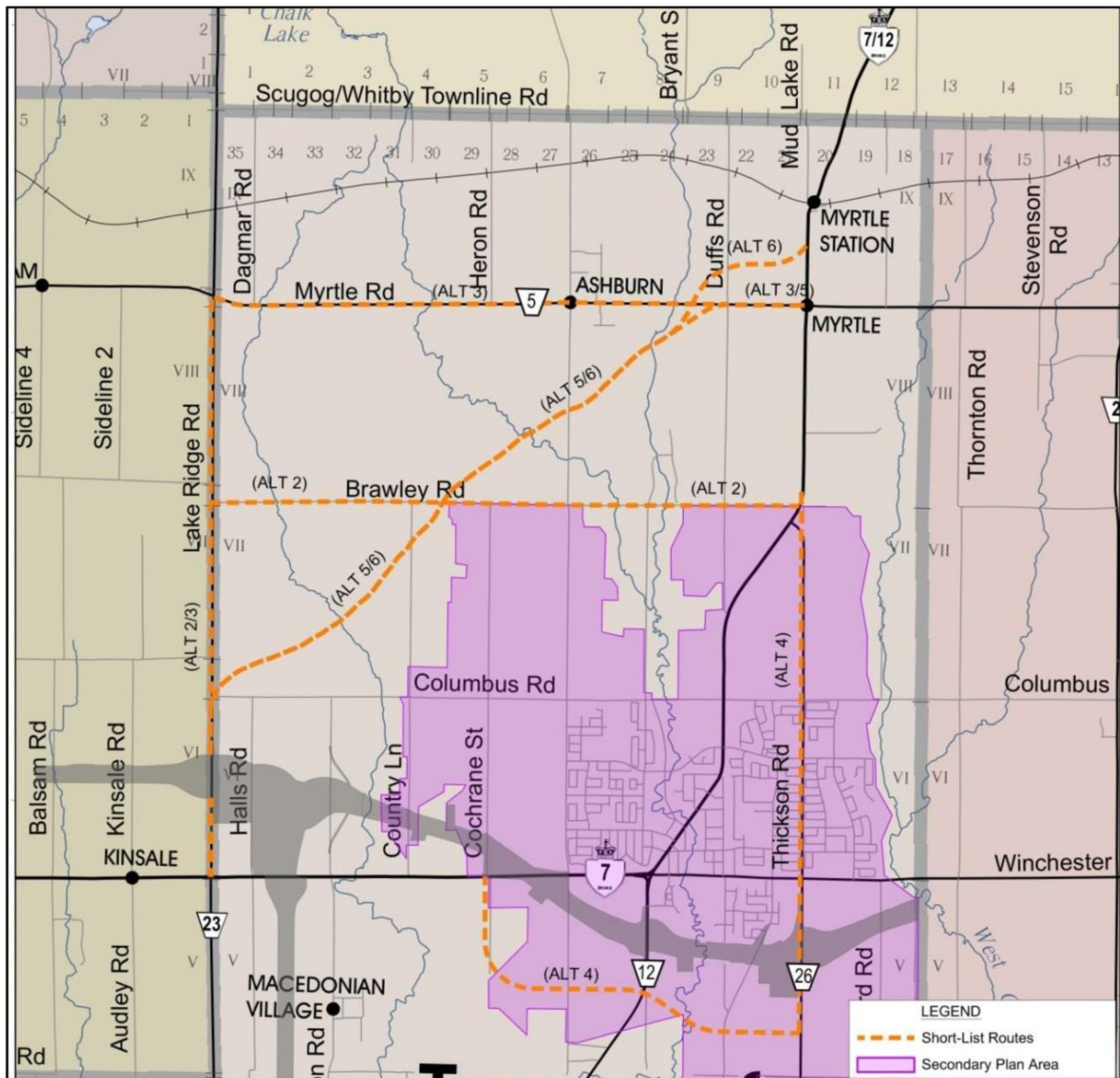
Through the Feasibility Study numerous alternatives within Whitby are being proposed to be considered through an EA process, including:

- Do Nothing (Alt. 1);
- Highway 7 to Lake Ridge Road to Brawley Road to Baldwin Street (Alt. 2);
- Highway 7 to Lake Ridge Road to Myrtle Road to Baldwin Street (Alt. 3);



- Highway 7 to Cochrane Street to the Mid-Block Arterial to Thickson Road to Baldwin Street (Alt. 4);
- Highway 7 to Lake Ridge Road to Columbus Road to New Route from west of Cochrane Street to Myrtle Road, west of Duffs Road; continue on Myrtle Road to Baldwin Street (Alt. 5); and
- Highway 7 to Lake Ridge Road to Columbus Road to New Route from west of Cochrane Street to Baldwin Street, north of Myrtle Road (Alt. 6).

These alternatives are depicted in **Exhibit 23**.



**Exhibit 23: Highway 7/12 Proposed Alternative Solutions**



Subject to the finalization of the Feasibility Study, the next step in the process is to initiate a Provincial Class EA to consider the alternatives. An Environmental Assessment is a legislated process that requires extensive public consultation / participation and analyses of impacts, opportunities and solution strategies. Social impacts, natural environment, transportation criteria, the ability / cost to construct the required facility, properties impacts, etc. will all be taken into consideration as part of the Environmental Assessment, for all alternatives considered.

Once the Environmental Assessment Study is initiated there will be a number of public meetings held at key milestones. Public consultation with the community is a key component to a successful Environmental Assessment. As part of the Feasibility Study evaluation of various alternate routes, the Brooklin Study land use and transportation network options were considered. Two main objectives in relocating the Provincial Highway 7/12 facility will be to maintain a direct connection to Highway 7/12 to the north of Brooklin, as well as to avoid current and future residential areas.

The future Provincial Class EA study will likely be classified as a Group 'A' Route Planning Class EA as this would be a new highway facility. Group 'A' is applicable as an alternate route would not substantially follow the existing Highway 7/12 right of way. The Provincial Class EA would be initiated for a controlled access, four-lane highway with at-grade intersections and/or roundabouts to provide an alternate route to the existing Highway 7/12 through Brooklin. The study would follow the Class Environmental Assessment for Provincial Transportation Facilities (2000).

The options proposed to be carried forward to an EA are mostly outside of the Secondary Plan area and are not expected to impact the preferred Brooklin plan. While diversion of Highway 7/12 to a suitable alternative route will improve the social environment of Downtown Brooklin, achieving key objectives of the Brooklin Study, the conclusion of an EA is not required to finalize the Brooklin Study. Although a successful Environmental Assessment study for the Highway 7/12 corridor route will need to be completed, the preferred Land Use Plan and the Draft Proposed Brooklin Community Secondary Plan policies can be completed as jurisdiction is not considered in the process. It is expected that once an alternate route for Highway 7/12 is confirmed, jurisdiction of roads within Downtown Brooklin will be municipal or Regional, allowing for improved access.



## 9.2.2 Arterial Road Network

### 9.2.2.1 Guiding Principles

The following guiding principles were developed in relation to arterials roads;

- All arterials roads should be protected to allow for potential future widening / improvements. This may include additional travel lanes, cycling facilities, transit lanes, high occupancy vehicle lanes, etc.
- Arterial roads are the principal mobility corridors to/from/within the community and shall include consideration of all road users.
- New and reconstructed arterial roads shall be built with sidewalks on both sides and cycling provided through on-road facilities and/or off road multi-use paths. The location of multi-use paths will be determined based on connectivity to active transportation routes and maximizing safety and use.
- Secondary schools will be located along an arterial road to take advantage of transit and active transportation travel modes.

### 9.2.2.2 Recommendations

**Section 8.2** outlined the evaluation of arterial road network alternatives to be implemented by horizon year 2031. **Exhibit 24** shows the Recommended Arterial Road Network map and includes the following recommendations related to major arterial road network projects to be implemented to meet future capacity needs:

- Widen Lake Ridge Road and Thickson Road between Winchester Road and Brawley Road West and Cochrane Street from the Highway 407 corridor to Columbus Road West. These roads are to be widened from the existing two-lane facilities to four-lane facilities by horizon year 2031. It is expected that Cochrane Street will be widened south of the Highway 407 corridor to Winchester Road and extended from Winchester Road to connect to Baldwin Street and ultimately to the Mid-Block Arterial. These improvements are identified in red in **Exhibit 24**.
- The Mid-Block Arterial road, north of Conlin Road, extending westerly from the Oshawa boundary, connecting to Baldwin Street, as shown in orange **Exhibit 24**, is a minor refinement of the route identified in the Town's 2010 Transportation Master Plan in consideration of environmental constraints, the hydro corridor and the constructed Highway 407. The Mid-Block Arterial road alignment will be finalized through a future Environmental Assessment process.



The identified widenings alternatives (i.e., Lake Ridge Road, Thickson Road, and Cochrane Street) are to widen existing two-lane arterial cross-sections to four-lane cross-sections. The timing of road widening projects will be based on need for servicing and/or capacity improvements (see **Section 10**).

**Exhibit 24** identifies the following recommendations related to major arterial road network projects to be implemented to improve overall connectivity and meet Town objectives related to Baldwin Street:

- Locate the Baldwin Street / Thickson Road T-intersection approximately 525 metres south of Brawley Road to improve intersection spacing. The exact location and configuration will be determined through a future EA study. Impacts to adjacent property owners will be reduced / mitigated as much as possible through design. Roundabout operation may be considered for this intersection. This improvement is identified in blue in **Exhibit 24**.
- Continue working with MTO to ultimately gain care and control of Baldwin Street. This improvement is identified in green in **Exhibit 24**.

Note that the alignments shown in Exhibits are conceptual and not intended to be scaled drawings.

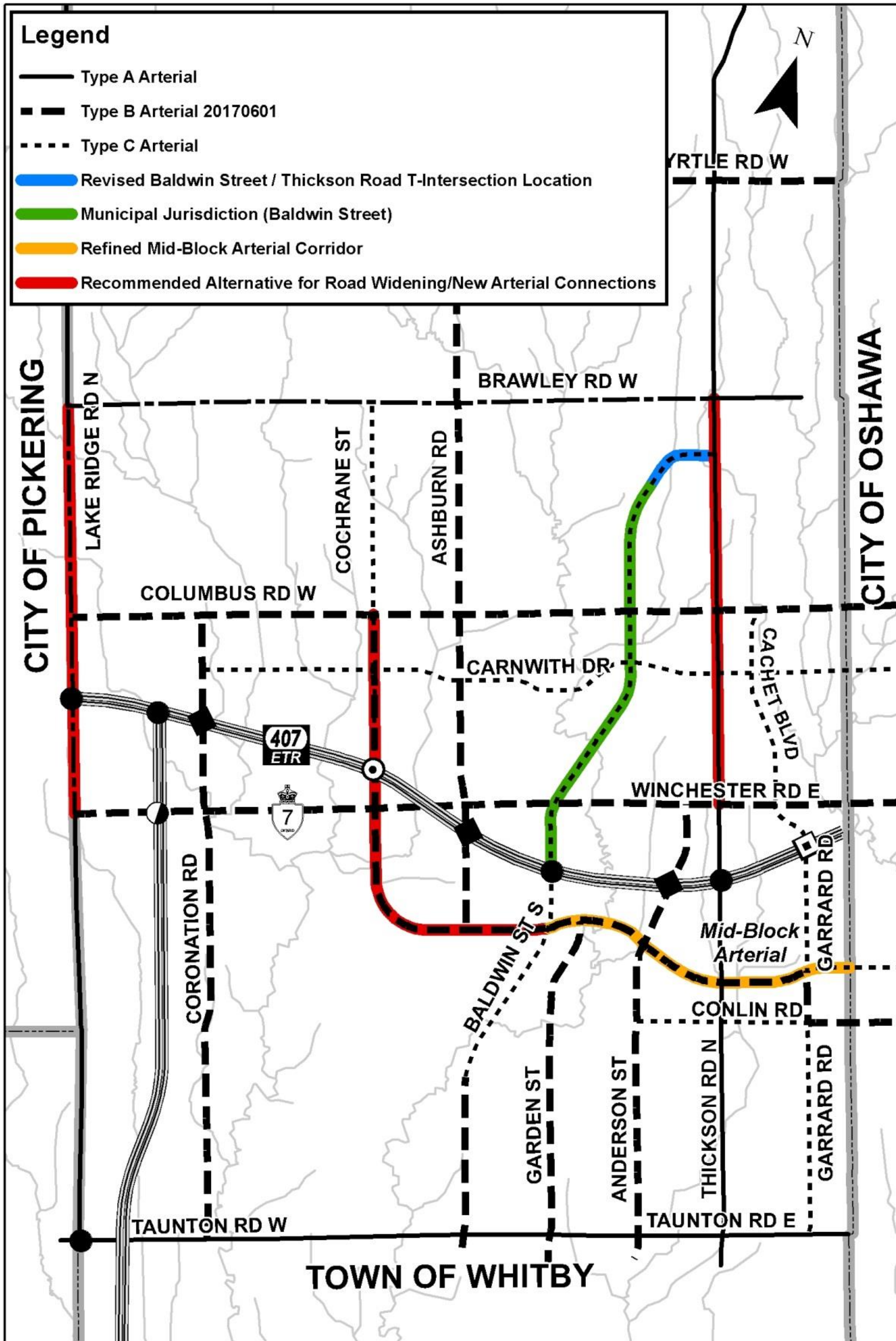
As shown in **Exhibit 24**, but not highlighted, the following corridors and interchange locations should be protected to implement the recommendations related to arterial road network projects and to improve overall connectivity:

- Carnwith Drive extended west to Country Lane, and in the longer-term extended east to the Oshawa border
- Highway 407 East Full Access Interchange at Cochrane Street
- Highway 407 Grade Separation at Garrard Road
- Highway 7/12 Alternate Route

The typical cross-sections of a three-lane and a four-lane arterial roadway are provided in **Exhibit 25**. The right-of-way for an arterial road includes sidewalks on both sides, or a sidewalk on one side with a multi-use path (MUP) on the other side (as shown in the below images). Boulevards separate the road facility from the sidewalks and MUPs. On-road bike lanes may be provided where space is available, such as with a three-lane arterial road. On-Street parking is not typically provided on arterial roadways, however, may be accommodated as needed, or if space permits.



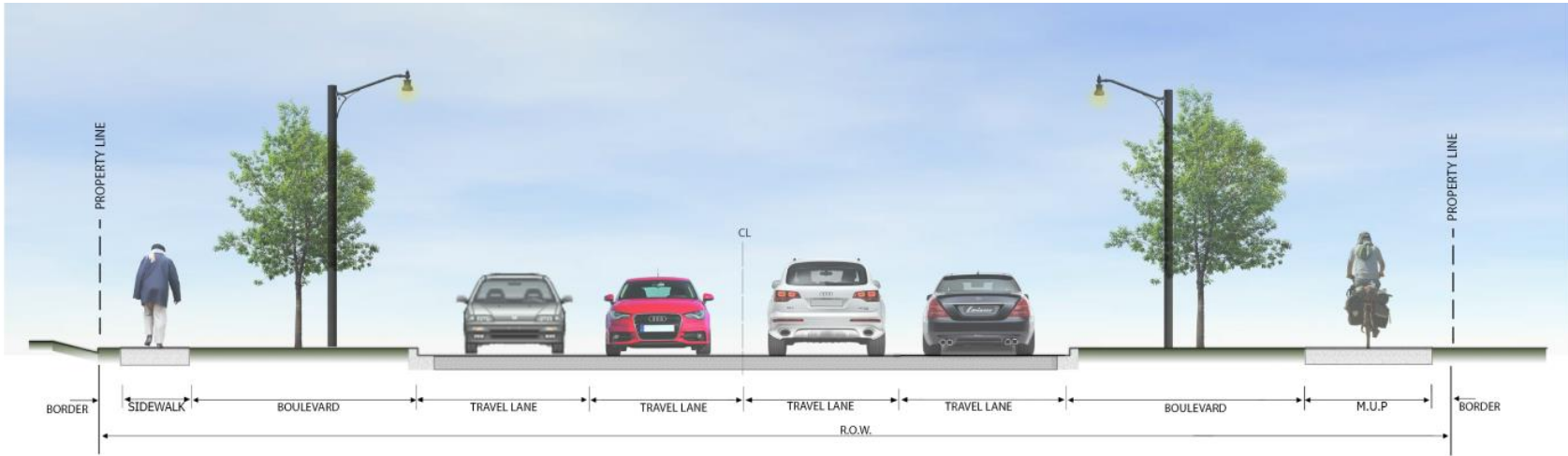




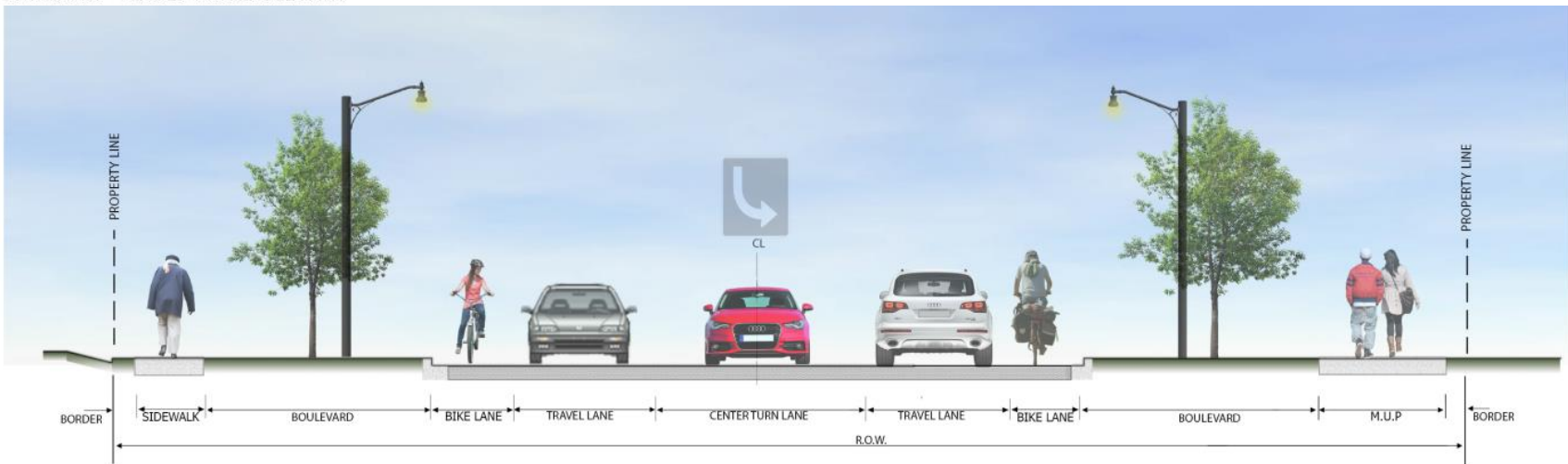
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Exhibit 24: Recommended Arterial Road Network





30m R.O.W. - 4 LANES + MULTIUSE PATH



30 R.O.W. - 3 LANES PLUS BIKE LANES

## Exhibit 25: Typical Arterial Road Cross-Sections



### 9.2.2.3 Mid-Block Arterial Corridor Assessment

The Mid-Block Arterial corridor identified in both the Town of Whitby 2010 TMP, and the Brooklin Study November 2015 Options Report is one solution being recommended to meet future transportation needs. It should be noted that this alignment is preliminary in nature may not be the final recommended road alignment. The corridor represents the recommended arterial network based on the work completed as part of this TMP, including the corridor's ability to support the Recommended Land Use.

It was determined as part of the 2010 TMP that additional east-west capacity was required beyond the addition of Highway 407 and the existing Conlin Road and Winchester Road in this area. The improvement recommendations of the 2010 TMP have been incorporated into this study and completed modelling work for the 2031 horizon year confirmed the need for additional east-west capacity. In addition, for the 2031 horizon year the Mid-Block Arterial is modelled as a two-lane facility, Highway 407 (from Highway 412 to the Whitby east border) is modelled as a four lane freeway facility, Winchester Road (from Anderson Street to Garrard Road) is modelled as a four-lane facility and Winchester Road (from Baldwin Street to Anderson Street) is modelled as a two-lane facility with increased capacity to represent a third lane (i.e., a centre two-way left-turn lane). While the screenline analysis supports the need for four travel lanes south of Winchester Road/Highway 407, it does not support the need for six travel lanes prior to 2031. However, the analysis of future conditions indicates a v/c ratio above 0.8. The Town will maintain flexibility to widen the Mid-Block Arterial corridor to four lanes beyond the 2031 horizon year. Designating the Mid-Block Arterial as a Type B facility allows for a two-lane facility upon opening day, while providing flexibility to protect for widening at least a portion of this corridor to four lanes for a time period beyond the 2031 horizon year.

An alternate connection was considered as part of this study, namely a connection between Baldwin Street and Conlin Road in place of the Mid-Block Arterial. This alternate alignment does not provide the additional east-west capacity that was identified as a future network requirement. Widening of this alternate alignment to obtain the additional capacity had also been considered; however, there are other factors to consider, such as the proximity of provincially significant wetlands. The cost of widening Conlin Road could be higher than constructing a new facility (i.e., the Mid-Block Arterial), especially considering the proximity of Conlin Road to provincially significant wetlands. Additional details on Provincially Significant Wetlands and Geomorphology conditions in the area of a potential future Lynde Creek crossing to accommodate an east-west link are discussed in **Appendix C**.



Some potential issues with the 2010 TMP preferred route Option K, including conflicts with Hydro towers, and potential conflict with the existing St. Thomas Street/Anderson Street intersection were identified through this study. The Mid-Block Arterial corridor alignment shown in **Exhibit 24** has been refined from that shown in the November 2015 Options Report, and will continue to be refined, to mitigate conflicts with the natural environment, the hydro corridor and recognizing MTO intersection spacing criteria. **Appendix H** includes a Staff Report providing additional input on the Mid-Block Arterial Corridor and the Town's intention to conduct an Environmental Assessment to select the final corridor alignment.

### 9.2.3 Collector Road Network

**Exhibit 26** shows the recommended collector road network map with the new collector roads identified in red. Based on the public and stakeholder input, the following components related to the Collector Road Network have been revised from the options considered:

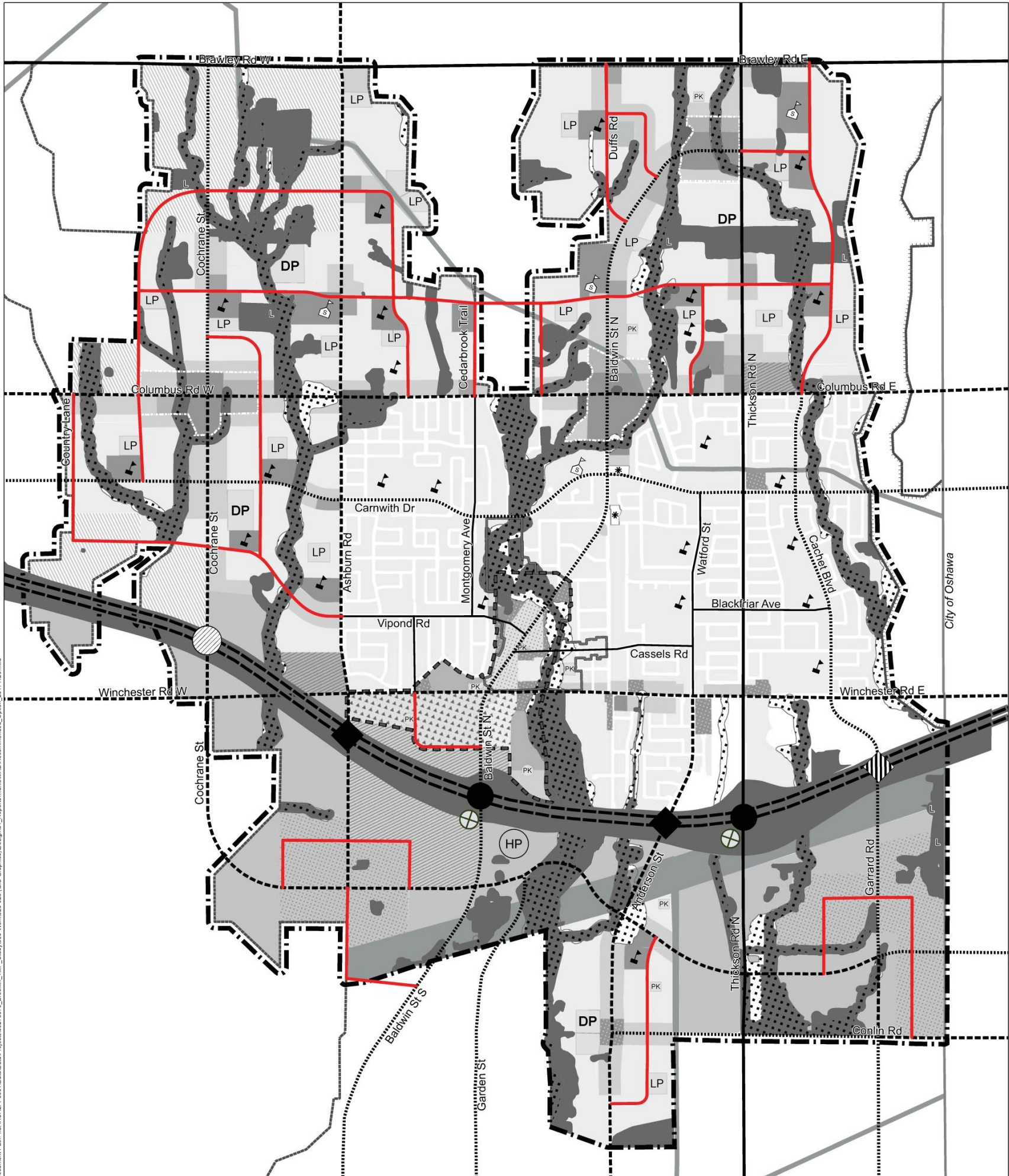
- The intersection spacing of collector roadways with arterial roadways was further refined to better meet Durham Region intersection spacing guidelines; some exceptions occurred such as in areas where there are natural environmental limitations;
- Collector roads were included south of Winchester Road to service the industrial and residential lands; and
- School locations were refined to provide access from collector roads.

#### 9.2.3.1 Guiding Principles

The following guiding principles were developed in relation to collector roads;

- Collector (and local roads) shall be designed in a grid system, where possible, to disperse traffic and lower volumes on each road in this area. A grid system improves pedestrian connectivity and enhances access to schools and transit. Design should be consistent with Durham Regions intersection spacing criteria and Arterial Corridor Guidelines.
- The right-of-way for a collector road includes sidewalks on both sides. A multi-use path on one side may be considered, rather than a sidewalk.





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**LEGEND:**

- |                            |   |  |  |
|----------------------------|---|--|--|
| Low Density Residential    | Lands subject to Durham Regional Official Plan Policy 14.13.7 | Natural Heritage System                          | Controlled Access Highway (Freeway)              |
| Medium Density Residential | Major Open Space  | Linkage in NHS                                   | Type A Arterial                                  |
| High Density Residential   | District Park   | Natural Hazard                                   | Type B Arterial                                  |
| Local Commercial           | Local Park  | Utility  | Type C Arterial                                  |
| Special Purpose Commercial | Parkette  | Health Precinct Special Policy Area              | Collector Road                                   |
| Heritage Commercial        | Town Park   | Community Central Area                           | Recommended Collector Road                       |
| Major Commercial           | Institutional   | Major Central Area                               | Greenbelt Plan Boundary                          |
| Mixed-Use 1 Community      | Secondary Schools   | Heritage Conservation District Boundary          | Full Interchange                                 |
| Mixed-Use 2 Mid-Rise       | Elementary Schools  | Secondary Plan Boundary                          | Potential Interchange (Subject to Further Study) |
| Prestige Industrial        | Subject to Site Specific Development Application              | Subject to Site Specific Development Application | Grade Separation                                 |
| Business Park              |   |  | Potential Grade Separation                       |
| General Industrial         |   |  | Future Transitway Station                        |

**Brooklin  
Secondary Plan  
Official Plan  
Town of Whitby** Schedule  
**K**



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**Exhibit 26: Recommended Collector Road Network**







- Boulevards separate the road facility from the sidewalks.
- On-road bike lanes and on-street parking may be provided as needed / planned.
- Where applicable, assess and implement appropriate traffic calming measures to reduce unnecessary traffic infiltration and maintain acceptable travel speeds.

### 9.2.3.2 Recommendations

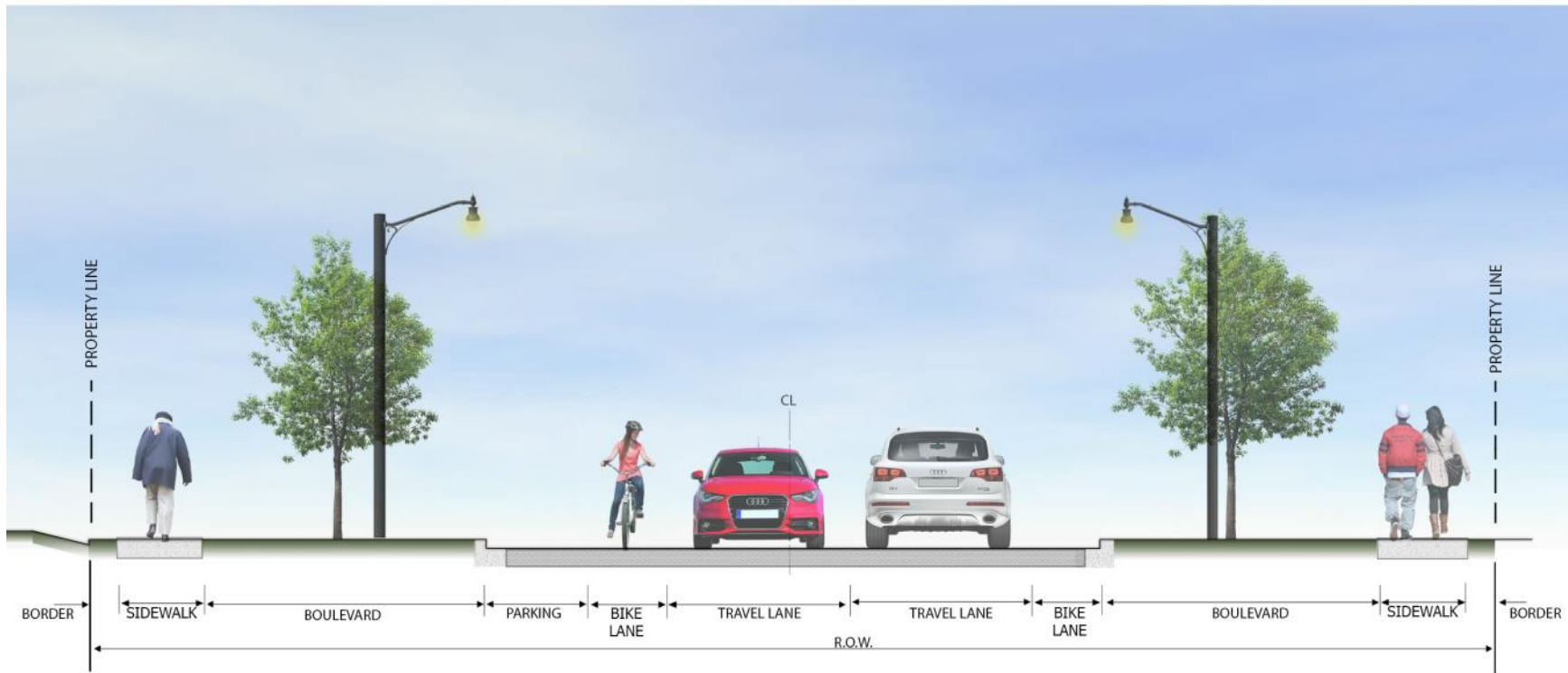
There are several recommended collector road connections, including a new north-south collector road east of Thickson Road that connects Columbus Road to Brawley Road. West of the Greenbelt, mid-block north-south collector roads are provided east of Ashburn Road, between Ashburn Road and Cochrane Street and between Cochrane Street and Country Lane. Vipond Road is extended west to Country Lane and a new east-west collector road is included north of Columbus Road to connect the neighbourhoods. The identified collector road network supports future residential and/or commercial development, including access to schools and parks.

The typical cross-section of a two-lane residential/industrial collector roadway is provided in **Exhibit 27**. The right-of-way for a collector road includes sidewalks on both sides. Boulevards separate the road facility from the sidewalks. On-road bike lanes and on-street parking may be provided as needed/planned.

### 9.2.4 Update to the Demand Macro-Model

The demand model used in the preliminary evaluations of alternatives was updated to reflect the Preferred Land Use Plan and Preferred Road Network. No screenline has a volume-to-capacity ratio over 0.9, indicating that there is no screenline-level deficiency that requires additional lanes of capacity.

Some deficiencies exist at the link-level. In the downtown area, the southbound Baldwin Street link is predicted to operate at v/c 0.98. This is a significant improvement over v/c 1.15 in the Do Nothing scenario. The capacity deficiencies for the recommended solution are presented in **Exhibit 28**.



ECTOR - RESIDENTIAL/INDUSTRIAL

**Exhibit 27: Typical Collector Road Cross-Section**

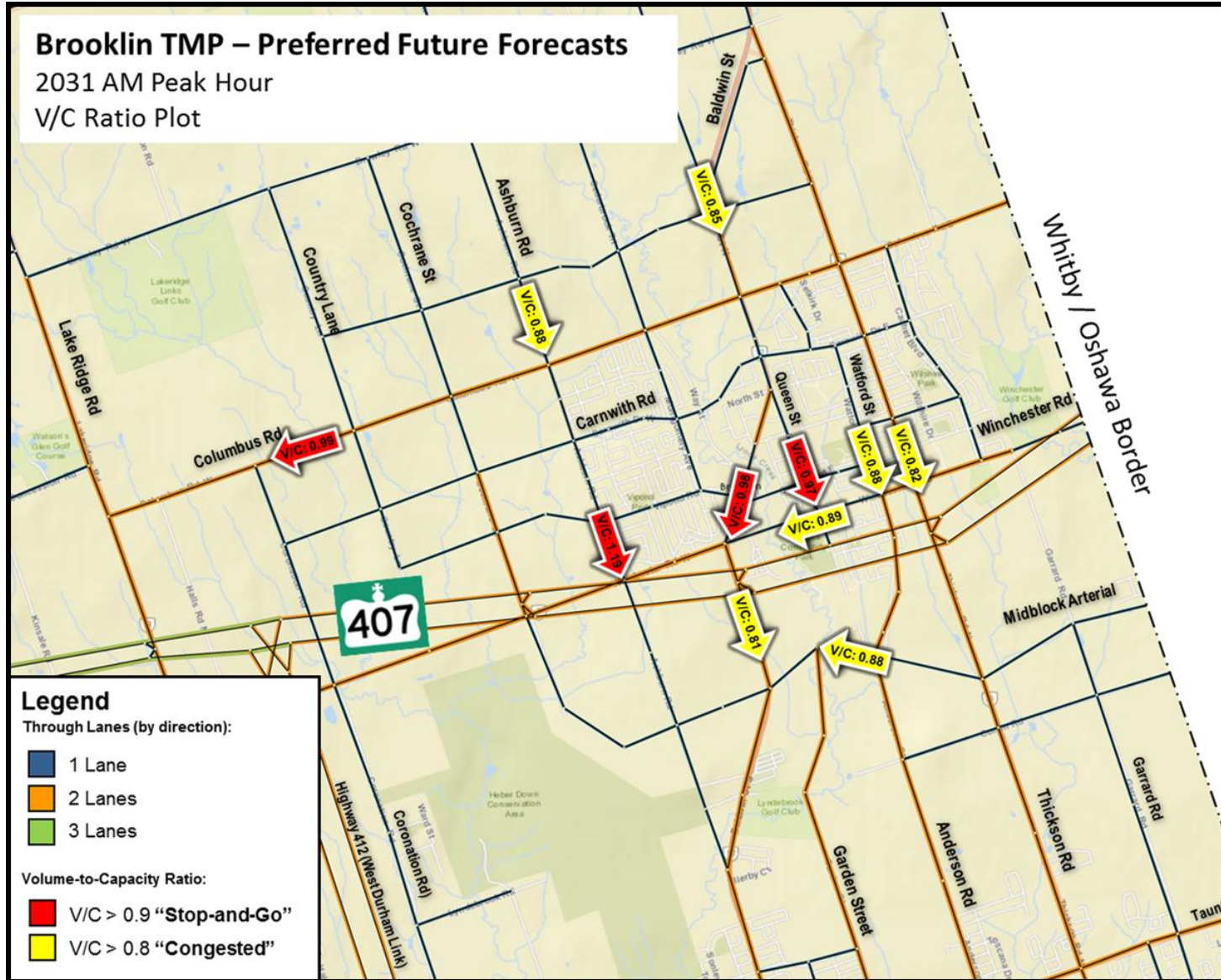


Exhibit 28: Recommended Solution Capacity Deficiencies



## 9.3 Active Transportation

At the time of documenting the Transportation Master Plan a separate Active Transportation Plan study is being undertaken, which will recommend an active transportation network along with the criteria for determining the type of facility and amenities on specific road sections. Feedback received on the active transportation network through the Transportation Master Plan process, such as through public meetings / workshops, will be made available for reference in this separate study. One additional consideration will be the final alignment of the alternative Highway 7/12 corridor, which may result in the need for special consideration for accommodating active transportation facilities identified in the Regional Cycling Plan (2012) and the Town of Whitby Cycling and Leisure Trails Plan (2010). The Regional Trail network will be integrated with the Active Transportation Plan.

### 9.3.1 Guiding Principles

The active transportation network shall align with existing Town studies, initiatives, programs and policies (i.e., Active Transportation Plan, etc.). All roads will be required to incorporate active transportation within the right-of-way. Sidewalks located on both sides of local roads, and set back from the curb edge, are preferred to support a walkable and safe community. Trails should be located adjacent to the natural areas, creeks / waterways system, and connect to the active transportation network.

Subdivision plans will be required to maximize the movement of people while minimizing infrastructure. Neighbourhood / subdivision plans must minimize conflicts while considering mobility corridors and/or active transportation routing which best connects origins and destinations within the Secondary Plan area and beyond. Subdivision plans will be required to consider and integrate all modes of transportation, all users and abilities, and will be supported by acceptable studies and accepted engineering principles. Where possible, local and collector roads or rights-of-ways may be reduced if active transportation connections and improved transit or micro-transit are provided to move people through the community.

In consideration of the above, and building on the 2010 TMP, the following Active Transportation guiding principles were identified through this study:

- Create a “streets for people” environment where all users feel safe and secure, particularly in the Downtown. This will involve removing barriers to travelling to/from and between destinations, enhancing crossing locations, and encouraging active transportation and transit use.



- For all new developments, auto trips generated may not exceed the capacity of the adjacent road system; therefore, integration of mobility choices (i.e., cycling amenities, public/private shuttle services, transit etc.) will be planned for and implemented.
- New and reconstructed arterial roads shall be built with sidewalks on both sides and cycling provided through on-road facilities and/or off road multi-use paths. The location of multi-use paths will be determined based on connectivity to public transit, active transportation routes, and maximizing safety and use.
- An active transportation network which connects destinations within and beyond the neighbourhood such as schools, parks, the downtown, commercial areas and employment areas shall be planned. In this regard, an active transportation network plan shall be prepared for each Comprehensive Block Plan and implemented through the development approvals process. Once complete, the Town's Active Transportation Plan will be a reference guide for the development approvals process.
- The active transportation network may be provided within road rights-of way as well as on trails within the natural heritage system. Active transportation connections across barriers (natural and infrastructure) shall be planned at appropriate walking/cycling intervals to reduce barriers and connect neighbourhoods and increase accessibility for all ages and abilities.
- Plans of Subdivision shall be designed to integrate and optimize travel by transit and active transportation, optimize access to transit through active transportation, promote efficient and convenient transit stop locations, facilitate the efficient operation of transit vehicles, and connect destinations within and beyond the subdivision. Dedicated rights-of-way to support active transportation and/or all transit (e.g., micro-transit, emerging technologies, etc.) may be required.
- Where possible, upon approval by the Town, road and right-of-way widths may be reduced if active transportation connections and improved transit are provided to move people through the community. Sufficient right-of-way widths must still be provided to construct all required cross-section elements through the corridor and at intersections.
- All new local roads shall consider sidewalks on both sides and set back from the curb, to support a safe and connected pedestrian environment. Exceptions may be considered in Low Density Residential areas on short streets and crescents, which do not lead to trails, schools or parks and provided accessibility requirements are met.



- Install cycling infrastructure such as bicycle parking at key destinations, as well as at key transit stops/shelters.
- To establish a walkable community consider wider sidewalks and enhanced pedestrian crossings within Downtown Brooklin.

Infrastructure constructed for active transportation should be implemented in such a way to create an extensive network that allows for safe and efficient access to any point within the study area.

### 9.3.1.1 Recommendations

There are several locations where additional active transportation links should be considered. Most notable, is the potential for trail connections along creeks / streams / natural corridors within the Town. Within Brooklin, there are several rivers and creeks that generally run north-south, bisecting several major streets. Inclusion of an off-street MUP or trail along these water features could serve to give less comfortable cyclists a separated path that could connect several destinations. Similarly, there is a hydro corridor that runs across the southern section of the study area and an oil pipeline corridor in the north that should be considered for separated facilities. Where possible, inclusion of a MUP or trail should be considered for all significant rivers, creeks, or utility corridors within Brooklin. It is also noted that crossings of the natural barriers should be provided to connect communities and destinations to the trails.

To the north of the study area, there is an environmentally sensitive area that is not being considered for development. In this area there are to be no crossings with the possible exception of a single new collector road in the location of the existing pipeline crossing, north of Columbus Drive. This connecting link is important in the active transportation network as it allows for efficient passage of pedestrians and cyclists across the sensitive area. Therefore, it is recommended that when this road is built, significant active transportation infrastructure is included with its construction. If the road is not constructed for vehicular traffic, an active transportation corridor should be implemented.

The central business district of Brooklin located near the intersection of Winchester Road and Baldwin Street experiences some of the highest pedestrian volumes within the study area, it is recommended that as part of the future Active Transportation Plan a more detailed analysis be undertaken to determine the appropriate facilities type for both cyclists and pedestrians. Traffic calming and parking studies can be used in areas



such as this to determine the appropriate mix of vehicular, cyclist, and pedestrian traffic as well as enhance key destination features that create a sense of place. In particular the roads that should be studied are Baldwin Street between Winchester Road and Way Street and Vipond Road between Baldwin Street and Montgomery Avenue.

A summary of active transportation recommendations follows:

- Examine inclusion of MUPs or bike lanes on arterial streets when they undergo reconstruction;
- Create connections along and across creeks/streams/natural corridors wherever possible, and at comfortable intervals;
- Utilize the existing hydro corridor for a significant east-west trail connection;
- Utilize the oil pipeline corridor as a crossing through the northern environmentally sensitive area;
- Consider and include active transportation infrastructure on all road construction projects;
- Further investigate appropriate infrastructure for cyclists and pedestrians within the Brooklin central business district; and
- Ensure that the needs of cyclists and pedestrians are considered in all transportation related studies and developments.

## 9.4 Transit

It is recognized that the planning and operation of transit services is not under the Town's jurisdiction, however, the Town will work with Durham Region and Durham Region Transit (DRT), the Province and Metrolinx, and the Federal Government to ensure that continuous and necessary transportation investments are made within the Town and that development will be transit supportive. The Town will advocate for the provision of improved conventional bus service, as well as micro-transit or demand responsive transit, to existing urban areas where service gaps currently exist. The Town will also encourage transit services to new growth areas during the initial stages of development when it is critical that alternatives to the automobile are available at the time of occupancy before auto-oriented habits are established.



### 9.4.1 Guiding Principles

All transportation systems will be integrated with transit and walkable transit solutions will be a key consideration when developing communities. Subdivisions shall be designed to optimize transit utilization and active transportation and be integrated with destinations. Building on the 2010 TMP, the following transit-related guiding principles were identified through this study:

- For all new developments, auto trips generated may not exceed the capacity of the adjacent road system; therefore, integration of mobility choices (i.e., cycling amenities, public/private shuttle services, transit etc.) will be planned for and implemented
- Priority shall be given to ensuring that public transit facilities, such as stops, shelters and dedicated lanes are part of the overall design of the arterial road network over the long term.
- While the arterial roads shown on Schedule 'D' [Official Plan Schedule D] are intended primarily to allow for the ease of motor vehicle traffic throughout the Region and the Municipality, regard shall be had in their design to the other public interest objectives established by this Plan, which require that higher density development be established along arterial roads in a pedestrian-oriented and transit-supportive environment.
- Plans of Subdivision shall be designed to integrate and optimize travel by transit and active transportation, optimize access to transit through active transportation, promote efficient and convenient transit stop locations, facilitate the efficient operation of transit vehicles, and connect destinations within and beyond the subdivision. Dedicated rights-of-way to support active transportation and/or all transit (e.g., mass, micro, emerging technologies, etc.) may be required.

### 9.4.2 Recommendations

The following recommended long-term transit infrastructure / improvements as per Metrolinx's "Big Move" Regional Transportation Plan (RTP) are seen as key opportunities for the Town.

- **Taunton Road Rapid Transit (RT):** The Big Move RTP included a new rapid transit service along the Taunton Road corridor, running from Milliken GO Station in Toronto to Downtown Oshawa and from Downtown Oshawa to Highway 407, in the 25-year plan.





- **Highway 407 / 407 Transitway:** Bus Rapid Transit (BRT) service (provided on the Highway 407 controlled access expressway, in mixed traffic, with congestion management) will be provided in the initial phase with provision for future conversion to Light Rail Transit (LRT) along Highway 407 (“407 Transitway”) to serve longer distance travelers. A transitway station is proposed within the study area at Baldwin Street. In the interim period before the 407 Transitway is constructed, the transitway station will function as an interface between transit (BRT station) and commuters (vehicle parking lot).

The noted major transportation improvements that fall within the Region of Durham to be implemented as part of the 15-year plan are as follows:

- Express Rail: Lakeshore - Hamilton to Oshawa GO
- Regional Rail: Seaton – Seaton to Union Station/Summerhill
- Regional Rai: Oshawa GO to Bowmanville
- Rapid Transit: Highway 2 – Scarborough Centre to Downtown Oshawa
- Rapid Transit: Brock Road – Downtown Pickering to Highway 406
- Rapid Transit: Oshawa Connector – Oshawa GO to Downtown Oshawa
- BRT on Controlled Access Expressway: Highway 401 – Halton to Durham

As identified in Durham Region’s 2017 TMP, four main transit service elements are needed to achieve full service in the urban, rural and developing areas of the Region:

- Rapid Transit,
- High-Frequency Network (HFN),
- Other Transit Spines, and
- Regular Routes.

Although outside of the Brooklin Transportation Master Plan study area, two rapid transit corridors have been strategically identified in the Region of Durham:

- **Highway 2: Rapid Transit in Reserved Bus Lanes** – The Highway 2 corridor connects five municipalities, multiple regional centers, and major population/employment nodes. Proposed as a Rapid Transit Corridor with exclusive lanes, the frequency is anticipated in 5-minute intervals. Two main constraints



influence the implementation of the entire rapid transit corridor: (1) narrow right-of-ways in Pickering Village and Downtown Whitby, and (2) the operation of a one-way-pair in Downtown Oshawa. Further studies are anticipated to determine the ultimate configuration and phasing of the rapid transit network along Highway 2.

- **Simcoe Street** – Based on access to major population and employment generators, Simcoe Street and its mixed land use along the 9.5 km corridor prompt an ideal scenario for the development of a rapid transit corridor. While the challenge of a narrow right of way exists at some segments, the reconfiguration of Simcoe Street to accommodate dedicated bus lanes is preferred. In the preferred scenario, dedicate curbside bus lanes would be made available, which would reduce capacity for two-lanes plus left turn lanes as this provides significant person-carrying capacity.

These corridors have been selected providing the capacity, connectivity, and location to employment and population in the region. The future conversion of the noted to light rail transit, or higher-capacity facilities beyond 2031 should be assessed.

The Town will continue to encourage DRT to increase routes and service frequencies within the urban areas of Brooklin. The Town will advocate for the provision of conventional bus service, and the consideration of micro-transit or demand responsive transit, to existing urban areas where service gaps currently exist (i.e., no service within typical walking distance of 400 m) and to expand services to new growth areas during the initial stages of development. It is critical that alternatives to the automobile are available at the time of occupancy before auto-oriented habits are established.

The Transit Strategies identified in the 2010 TMP are still applicable, and the recommendations from the 2010 TMP should continue to be planned for. These recommendations included the following:

- Develop a Transit Oriented Development policy
- Designate and support implementation of Higher Order Transit corridors
- Complete Special Study to investigate and plan for alternative people movers/micro-transit opportunities systems to/from key destinations
- Coordinate with the Region and DRT to implement a Transit Priority Plan
- Identify and protect for missing links that could benefit transit



Since the completion of the 2010 TMP, the Town has taken on a strong support role in facilitating transit use, incorporating the following items into the Recommended Land Use Plan, with corresponding policies incorporated in the Secondary Plan, ultimately creating a more transit-friendly community:

- Promoting higher density and mixed-use development in growth centres / intensification areas and along transit corridors.
- Focusing new office / commercial development in locations that can be more easily served by rapid transit or high frequency bus service.
- Requiring that new developments provide required physical infrastructure to support transit, such as bus pads and sidewalks, as early as possible during development. Development should be phased to support introduction of transit service during early development phases.
- Providing mid-block collectors in new growth areas for local bus routes.
- Expanding the pedestrian and cycling network to ensure improved transit access.
- Focusing TDM programs on the need for a modal shift to transit.

## 9.5 TDM

Transportation demand management (TDM) is the use of policies, programs, services and products to influence why, when, where and how people travel. TDM measures help shape the economic and social factors behind personal travel decisions, and are complemented by supportive land use and transportation supply<sup>31</sup>.

### 9.5.1 Guiding Principles

The guiding principles from the 2010 TMP for development of TDM strategies are still applicable and are intended to further the implementation of TDM strategies within the Town with the objective of reducing the peak period automobile mode share by 15%. The Town's TDM strategies from the 2010 TMP included the following:

- Land Use Management;
- Ride Sharing/Increased Automobile Occupancy;

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31. ACT Canada – The Case for TDM in Canada: Transportation Demand Management Initiatives and their Benefits. (2008)



- Parking Management; and
- Promotion of Alternative Modes.

Other initiatives by Region of Durham include the “Smart Commute Durham” initiative which is focused on promoting trip reduction strategies for work trips and the development of TDM initiatives and policies as part of the Durham Region Transit (DRT) Long Term Transit Strategy and the Commuter Lot Feasibility Study.

### 9.5.2 Recommendations

The TDM Strategies identified in the 2010 TMP are still applicable, and are confirmed as part of the Brooklin TMP. These recommendations included the following:

- Adopt a TDM Policy and appoint/hire a TDM Coordinator
- Develop a Trip Reduction Program for the Town Municipal Offices/Facilities
- Engage major employers, institutions and school boards to participate in trip reduction initiatives
- Encourage the development of Mobility Hubs
- Include TDM in the development process

Based on the information provided by Victoria Transport Policy Institute<sup>32</sup> which describes four major categories of TDM strategies according to how they affect travel, the Town will implement:

- **Improved Transportation Options** including strategies such as alternative work schedules, provision of park-and-ride facilities, improvements of walking / cycling facilities, carpooling and vanpooling, tele-work programs, etc.
- **Incentives to Use Alternative Modes and Reduce Driving** including strategies such as congestion pricing, high-occupancy-vehicle (HOV) priority, fuel taxes, parking pricing, etc.
- **Parking and Land Use Management** including strategies such as shared parking facilities, Transit-oriented developments (TOD), strategies to create more accessible, efficient and livable communities, etc.

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32. Victoria Transport Policy Institute – Transportation Demand Management – Available at: <http://www.vtpi.org/tdm/index.php#strategies>



## 9.6 Intersection Improvements

In the absence of existing signal timing plans, and assuming a 90 second cycle length, all of the signalized intersections are expected to operate without any major issues, while accommodating the project future traffic volumes. The southbound right-turn (SBR) and westbound through (WBT) movements at Winchester Road / Ashburn Road in the AM Peak period are projected to be operating close to capacity at Horizon year 2031. An optimized signal timing plan results in acceptable operating conditions.

For the assessment of unsignalized intersections at Horizon Year 2031, an additional left-turn lane may be required to accommodate the projected westbound left-turn (WBL) traffic volume at the Conlin Road / Anderson Street intersection. Currently this movement is a shared left / through / right lane. A signalized intersection at this location would remove the need to revise the intersection geometry.

The recommended TMP network identifies a realignment of the Thickson Road / Baldwin Street intersection. The assessment shows that to accommodate the projected horizon year 2031 traffic volumes traffic signals may be required, or alternately a roundabout may be implemented. The realignment also introduces a revised intersection at Thickson Road and Brawley Road. Currently the eastbound and westbound movements consist of shared left / through / right lanes. An additional left-turn lane at both approaches will help alleviate the high delays expected. Similar to the Thickson Road / Baldwin Street intersection, the implementation of a traffic signal or roundabout can be investigated to improve traffic operations.

### 9.6.1 Guiding Principles

The following guiding principles were identified through the TMP study, specifically related to the development of roundabouts:

- The Municipality shall require the construction of roundabouts in appropriate locations. Roundabouts will be considered for implementation in the following situations:
  - At proposed intersections where traffic signals or all-way stop control is warranted or expected to be warranted in the near future;
  - On arterial, collector or local road intersections with identified safety issues as replacement intersection control for signals or all-way stop control where potential for collisions may be reduced through roundabout operation;



- On arterial, collector or local roads as replacement intersection control for signals or all-way stop control where roundabout operation is considered superior to signal or all-way stop control (through comparison of projected future traffic operations at the proposed location);
- Within residential subdivisions at any intersection as a gateway feature, for traffic calming purposes, and/or for replacement of all-way or two-way stop controlled intersections (i.e., neighbourhood roundabouts that are smaller scale with limited property impacts).
- Where identified as a component of large-scale road improvement plan or new development plan
- On road construction projects where major rehabilitation and/or road widening is occurring.

### 9.6.2 Recommendations

- Baldwin Street at Thickson Road shall be realigned south of Brawley Road as shown on Recommended Brooklin Land Use Plan Schedule K (**Exhibit 21**). The design exercise for the realignment would be completed in a manner to mitigate impacts to the adjacent residential properties as best as possible, while still achieving the objective of having Thickson Road operate as the through road. A roundabout may be implemented at this location.
- Implement a signal at the Conlin Road / Anderson Street intersection to accommodate a heavy westbound left-turn movement.
- The Town will consider roundabout design through Town of Whitby standards and accepted engineering design criteria, particularly for neighbourhood roundabouts to be implemented as part of new subdivisions.
- Assess roundabouts for implementation at the following locations<sup>33</sup>:
  - St. Thomas Street / Queen Street / Winchester Road
  - Montgomery Avenue / Way Street / Columbus Road
  - Garden Street / Mid-Block Arterial
  - Garrard Road / Mid-Block Arterial

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33. Intersection improvements will be considered as part of road improvement projects or intersection improvement projects and will involve the approving authorities. Note that Durham Region presently does not support multi-lane roundabouts on Regional roads.



- Garrard Road / Conlin Road
  - Baldwin Street / Roybrook Avenue
  - Baldwin Street / Carnwith Drive
  - Baldwin Street / Thickson Road
  - (Future) Thickson Road / Brawley Road
- Roundabouts are also being considered as part of future developments and may be identified along corridors, including Ashburn Road and Columbus Road, and at intersections within future subdivisions.

## 9.7 Parking

In the Brooklin Downtown area, there are commercial, retail, and office land parcels located immediately adjacent to Baldwin Street between Roybrook Avenue and Way Street. Within the remainder of the downtown area, the primary land use is detached residential housing. There are several options for parking within the Brooklin downtown area including off-street private parking lots, which are intended for use by the commercial land uses, as well as on-street parking spaces and one municipal paid off-street parking lot. Additional detail on a parking assessment completed for the downtown core is provided in **Appendix F**.

### 9.7.1 Guiding Principles

The following guiding principles related to Parking were developed as part of this TMP:

- The Municipality may consider cash-in-lieu of parking where it can be demonstrated that the full parking requirement cannot be provided on-site or in an alternate location. In such cases, the Municipality and the Developer shall enter into an agreement providing for such payment and setting out the basis upon which it was calculated pursuant to the provisions of the Planning Act.
- The Municipality shall prepare a short and long-term parking strategy for Downtown Brooklin to accommodate the need for an increased number of parking spaces as commercial development occurs. Such a strategy may consider the use of surface parking and parking structures to accommodate parking needs.



- The Municipality shall work with property owners to encourage more efficient use of present private parking areas for existing commercial development and optimize the opportunity for new infill development and cohesive commercial main street development.

### 9.7.2 Recommendations

With the aim of meeting the future parking demand and balancing the needs of various road users (i.e., motorists, cyclists, and pedestrians) as well as the needs of residents and local business owners in the Whitby and Brooklin downtown areas, the Town of Whitby is undertaking a Parking Master Plan (PMP) for Whitby's Downtowns. The PMP is intended to consider proposed and potential future development in determining the extent and location of future parking demands for immediate (present to 5 years), medium-term (5 to 10 years), and long-term (10 to 20 years) time-frames. The PMP would also include developing a financial strategy (e.g., setting parking hourly charges, cash-in-lieu of parking for new developments, etc.) to support future parking needs.

Currently on-street parking in Downtown Brooklin is free; however, future implementation of on-street paid parking for Downtown Brooklin will be a consideration in the PMP.

## 9.8 Access Management Downtown Core

Access management is defined as the design, implementation and management of entry and exit points (i.e., driveways, entrances or exits) between roadways and adjacent properties.<sup>34</sup> Access management is performed with the objective of providing vehicular access to land developments along roadways in a manner that preserves the safe and efficient movement of people and goods.<sup>35</sup>

As part of the TMP study, an inventory of the commercial access driveways and the cross streets along Baldwin Street, between George Street (Colston Avenue) and Roybrook Avenue was completed and is presented in **Appendix F**. A summary table in **Appendix F.5** shows how the spacing of the existing driveways relative to each other and their adjacent intersections are compared against the recommendations of the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian

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34. Federal Highway Administration (FHWA) – Access Management in the Vicinity of Intersections (2010)

35. Traffic Engineering Handbook (7th Edition) – Access Management





Roadways (GDGCR) and the requirements of the relevant Town of Whitby's by-laws on access management. Some access driveways in Downtown Brooklin do not meet the TAC's recommended minimum corner clearance at the adjacent signalized intersections. In addition, some access driveways do not meet the TAC's recommended minimum spacing to the adjacent upstream or downstream access driveway and/or the recommended driveway width. The noted properties where access driveways do not meet the TAC guidelines are identified in **Appendix F**.

### 9.8.1 Guiding Principles

The following guiding principles related to Access Management were developed as part of this TMP:

- Maintaining adequate corner clearance between access driveways and signalized intersections assists to reduce traffic operational and safety issues such as:
  - driveway ingress / egress movements blocked by vehicles queued at a red light of the adjacent intersection;
  - traffic flow blocked by a left-turning motorist entering a driveway on the far side of the intersection, where the motorist is waiting for a gap in the opposite direction of travel, in the absence of an auxiliary lane for left-turning vehicles. The resulting traffic queue behind the left-turning vehicle could extend into the intersection area;
  - interference with right-turning traffic at the signalized intersections by right-in movements into a driveway on the near side of the intersection;
  - potential collisions.
- Maintaining minimum recommended spacing between adjacent driveways clearly identifies which property each driveway serves, and allows for sufficient space for the positioning of traffic signs, lighting poles, etc., to separate / limit the conflict areas for each driveway;
- Maintaining the recommended minimum driveway width improves the defined travel path for turning vehicles, reduce the length of pedestrian-vehicle conflict areas, and assists with maintaining full capacity for driveway ingress/egress movements.

### 9.8.2 Recommendations

With the objective of enhancing safety and mobility along the studied section of Baldwin Street through Downtown Brooklin, the Town should undertake a detailed study to



confirm the findings as identified in **Appendix F**, and develop a strategy which considers enhanced pedestrian crossings, possible turn restrictions, consolidation of driveways, and provision of auxiliary lanes where needed for safety. Future retrofitting or reconstruction projects would be used as an opportunity to mitigate the identified access management deficiencies.

Baldwin Street is currently designated as a Major Arterial, which is primarily designed to provide mobility and through movement, however, the number of crossing roads and driveways on the studied section of Baldwin Street through the Brooklin downtown area suggests that it should be re-designation to a lower functional level with higher level of land access without compromising safety and mobility. As described in **Section 3.3.4** and **Section 9.2.1**, the Town of Whitby is seeking agreement from the MTO to transfer ownership of Baldwin Street (Highway 7/12) through Downtown Brooklin to the Town of Whitby.

It is also recommended that the access to the commuter / carpool lot to be constructed south of Highway 407 and west of Baldwin Street be located on the section of Cochrane Street that is extended between Winchester Road and Baldwin Street (west of the Mid-Block Arterial), rather than locating the access point directly from Baldwin Street. This would assist with reducing the number of closely spaced intersections on Baldwin Street.

## 9.9 Accessibility for Ontarians with Disabilities Act (A.O.D.A.)

The Accessibility for Ontarians with Disabilities Act (A.O.D.A.) was enacted by the provincial government in 2005 to help make Ontario accessible to people with disabilities. The purpose is to develop, implement, and enforce standards for accessibility related to goods, services, facilities, employment, accommodation and buildings. The target date for reaching this goal is no later than January 2025.

In December 2012, the Ontario Regulation 191/11 on Integrated Accessibility Standards was filed under the A.O.D.A. In January 2013, this Regulation was amended to include accessibility requirements for the design of public infrastructure including sidewalks, walkways, stairs, curb ramps, tactile walking surfaces, pedestrian signals, and parking spaces. Accordingly, all new or upgraded infrastructure components that are implemented by the Town of Whitby as well as all other municipalities in the Province of Ontario must comply with the A.O.D.A. requirements. The latest version of the Regulation is accessible at the following website: <https://www.ontario.ca/laws/regulation/110191>.



Of note, the “Exterior Paths of Travel” section of the Regulation applies to all newly constructed and redeveloped exterior paths of travel that are outdoor sidewalks or walkways designed and constructed for pedestrian travel and are intended to serve a functional purpose and not to provide a recreational experience<sup>36</sup>. As part of the technical requirements for exterior paths of travel, the Regulation states that the exterior path must have a minimum clear width of 1,500 mm, but this clear width can be reduced to 1,200 mm to serve as a turning space where the exterior path connects with a curb ramp. Several locations along Baldwin Street do not appear to meet the noted requirements; additional details are included in **Appendix F**.

The Regulation also provides various criteria with regard to curb ramps such as their alignment and the provision of tactile walking surface indicators. While it appears that the curb ramps are aligned with the direction of travel, tactile walking surface indicators are not currently provided and / or not in compliance with the Regulation at several locations along Baldwin Street including the curb ramps located at the intersection of Baldwin Street and Way Street.

The Accessible Parking section of the Regulation states that off-street parking facilities must have a minimum number of parking spaces for the use of persons with disabilities, according to the noted requirements. The section also presents the requirement for provision of a 1,500 mm wide access aisle which can be shared by two parking spaces. The municipal off-street parking facility located at 3 Vipond Road meets the minimum number of accessible parking spaces but it does not currently meet the A.O.D.A. requirement on minimum width of access aisle for its designated accessible parking spaces.

With regard to on-street parking spaces, the Regulation requires the Municipalities to consult with the public, persons with disabilities, and their municipal accessibility advisory committees on the need, location, and design of accessible on-street parking spaces. As per the Regulation, as part of any new or redeveloping public parking facilities the Town must comply with the noted requirements for the off-street and on-street parking facilities.

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36. Ontario Regulation 413/12 made under the Accessibility for Ontarians with Disabilities Act, 2005. Available at: <https://www.ontario.ca/laws/regulation/r12413>



### 9.9.1 Guiding Principles

The following guiding principles related to meeting A.O.D.A. requirements were developed as part of this TMP:

- Comply with the A.O.D.A. requirements for all new or upgraded infrastructure components that are implemented by the Town of Whitby by the target date of January 2025.
- Consult with the public, persons with disabilities, and their municipal accessibility advisory committees on the need, location, and design of accessible on-street parking spaces.

### 9.9.2 Recommendations

With the objective of complying with A.O.D.A. requirements through Downtown Brooklin, the Town will undertake a detailed study to confirm the locations where A.O.D.A. requirements are not currently met, as identified in **Appendix F**. Future retrofitting or reconstruction project may then be used as an opportunity to mitigate the identified deficiencies. These projects will include:

- widening exterior paths of travel to meet the minimum clear width of 1,500 mm (this clear width can be reduced to 1,200 mm in certain instances);
- providing tactile walking surface indicators at several locations along Baldwin Street; and
- upgrading the municipal off-street parking facility (3 Vipond Road) to meet minimum width requirements for accessible aisles / designated accessible parking spaces.



## Section 10

### Implementation Plan







## 10. Implementation Plan

**Section 9** of this report identified the recommended infrastructure of the Recommended Road Network to support the Recommended Land Use Plan (Schedule K) and the associated future growth and development of Brooklin. These network revisions include new and upgraded arterials and collector roads, street rights-of-way to accommodate sidewalks, multi-use paths (MUPs), on-street bike lanes, and on-street parking, as well as recommendations for changes to the existing parking and access management practices within the downtown core.

Most of the new and upgraded infrastructure is expected to be implemented in conjunction with development as it occurs in the expanded Secondary Plan area. For this reason, implementation timelines and priorities will largely be tied to the pace and location of development. It is also recognized that the need to undertake future Class EA studies and detailed design activities will also play a role in the timing of each of project. Opportunities may also arise in order to accommodate other council priorities such as the need to coordinate work with other infrastructure projects or other considerations beyond the scope of this TMP.

### 10.1 Infrastructure Projects and Cost Estimates

#### 10.1.1 Screenline Capacity Improvement Projects

The major arterial road network projects listed in **Table 8** are recommended for implementation prior to Horizon Year 2031, in conjunction with full-build out of the Secondary Plan Recommended Land Use Plan to meet future road network capacity requirements. The projects include widening of existing arterial roadways and construction of new arterial roadways.

The Mid-Block Arterial Corridor was listed in the 2010 TMP, and it is re-listed in **Table 8** with an updated construction cost estimate. **Appendix H** includes a Staff Report providing additional input on the Mid-Block Arterial Corridor and the Town's intent to finalize Environmental Assessments to select the final corridor alignment; also refer to **Section 9.2.2** for additional detail on the Mid-Block Arterial Corridor assessment.







**Table 8: Roadway Implementation Plan – Screenline Capacity Improvement Projects**

**Rationale:** Recommended major arterial system to alleviate the 2031 identified screenline capacity deficiencies within the Town. These modifications to the roadways are above and beyond those already approved/planned by 2031 and include new alignments, widenings, and extensions.

Road Name	From	To	Description of Works	Estimated Costs for Whitby (\$Millions)	Estimated Costs for Region (\$Millions)	Anticipated Timing	Remarks/ Status
1. Widen Thickson Road	Winchester Road	Brawley Road	Widening from two to four lanes	-	\$16.4	Short-Term (by 2024)	Type A Arterial Roadway classification. Future Class EA would be led by Durham Region. Includes upgrading Baldwin / Thickson Road intersection signal; realignment of this intersection is a separate item. Note that timing anticipated by the Brooklin TMP study is that this would be implemented in the short-term by 2024; however, as per the Durham Region 2017 TMP, the timing is identified as “2022 – 2026. The Durham Region 2017 TMP identifies the limits to be from Winchester Road to Baldwin Street (Highway 7/12), and the widening to be from 2 to 4/5 lanes.
2. Widen Lake Ridge Road	Winchester Road	Brawley Road	Widening from two to four lanes	-	\$22.6	Short-Term (by 2024)	Type A Arterial Roadway classification. Future Class EA would be led by Durham Region. Note that timing anticipated by the Brooklin TMP study is that this would be implemented in the short-term by 2024; however, as per the Durham Region 2017 TMP, the timing is identified as “Beyond 2031”. The Durham Region 2017 TMP identifies the limits to be from Winchester Road (Highway 7) to Brawley Road.
3. Widen Cochrane Street	Winchester Road	Columbus Road	Widening from two to four lanes	\$10.2	-	Short-Term (by 2024)	Type B Arterial Roadway classification; includes widening of the bridge structure across Highway 407.
4. Extend Cochrane Street	Winchester Road	Baldwin Street	New Facility (two lanes)	\$5.5	-	Medium-Term (by 2031)	Type B Arterial Roadway classification. Also may be considered as part of Mid-Block Arterial.
5. Mid-Block Arterial 2-Lane Facility (north of Conlin Road)	Baldwin Street	Britannia Road (existing terminus) at Oshawa border	New Facility / Extension of Britannia Street corridor	\$30.8	-	Medium-Term (by 2031), or Dependent on Development	Project previously identified in the 2010 TMP. The majority of the proposed new roadway is a Type B arterial roadway, between Baldwin Street and Garrard Road. Between Garrard Road and the connection to Britannia Street in Oshawa, the facility is a Type C Arterial Road classification.
6. Columbus Road	Lake Ridge Road	Whitby/Oshawa Boundary	Widening from two to four lanes	\$29.3	-	Short-Term (by 2024)	Project previously identified in the 2010 TMP as a Corridor Protection project to be implemented in the 2011 to 2016 horizon. This project was included as a base assumption in the 2031 network for this TMP update.

Notes: NC – Not Costed; TBD – To Be Determined

Costing estimates based on benchmark costs and considered order of magnitude for planning purposes. Estimates include 20% grading, 5% to 10% for utility relocations (depending on project), 10% design and engineering, and 25% contingency. Property costs are excluded.

All arterial road corridors noted above to include provisions and considerations for active transportation and transit.

Costing to be refined in future studies.

Anticipated timing for projects 1, 2, 3, and 4 is based on a qualitative assessment, as population and employment data was available for conducting the horizon year 2031 assessment only.





### 10.1.2 Network Connectivity Projects

The road network and intersection improvement projects listed in **Table 9** are recommended for implementation prior to Horizon Year 2031, in conjunction with full-build out of the Secondary Plan Recommended Land Use Plan. The following roadways and intersections are necessary to improve overall connectivity; these connections should be addressed as the opportunity arises from development or redevelopment within the timeline of this TMP and as the TMP is updated.

Several projects that are included in the 2010 TMP are re-listed in **Table 9**, for example:

- Garden Street Extension, Mid-Block Arterial to Robert Attersley Drive
- Highway 407 East Full Access Interchange at Cochrane Street
- Highway 407 Grade Separation at Garrard Road

One generic project category is relisted in **Table 9**; more specific projects that would fall into this category are identified as separate projects:

- Brooklin Arterial and Collector Road network

The project previously listed as the Brooklin North/South Route in the 2010 TMP has been revised to consider other alignments and is now referenced as the Highway 7/12 Alternate Route within **Table 9**.

### 10.1.3 Long-Term Road Network Improvements

The long term (beyond horizon year 2031) transportation improvements for the road network are listed in **Table 10**. For these projects, either the 2031 future traffic forecasts did not reveal the need for these improvements within the horizon year of this TMP, or the project is located outside of the Secondary Plan area and is unlikely to proceed with future development within the 2031 horizon year. It is recommended that the Town protect for these corridors beyond 2031.

### 10.1.4 Active Transportation / A.O.D.A. and Access Management

The Town of Whitby is currently undertaking a separate Active Transportation Plan study. The implementation plan for improvements to the pedestrian, cycling, and other





**Table 9: Roadway Implementation Plan – Network Connectivity Projects**

**Rationale:** The following roadways are necessary to improve overall connectivity; these connections will be implemented as the opportunity arises from development or redevelopment within the timeline of this TMP and as the TMP is updated

Road Name	From	To	Description of Works	Estimated Costs for Whitby (\$Millions)	Estimated Costs for Region (\$Millions)	Anticipated Timing	Remarks/ Status
1. Baldwin Street and Thickson Road Intersection	Baldwin Street	Thickson Road	Realignment	Cost-sharing with Durham Region	\$2.3	Medium Term (by 2031)	Revise T-intersection so that Baldwin Street T's into Thickson Road; Thickson Road becomes the through road. Implement once Highway 7/12 alternate alignment approved, or as Thickson Road is widened, if possible. Significant potential impacts to adjacent residents and properties. Additional right-of-way is anticipated. Impacts will be mitigated as much as possible through design.
2. Carnwith Drive Extension (to Country Lane)	Ashburn Road (existing terminus)	Country Lane	Extension of Corridor	\$19.7	-	Dependent on Development	Extension through the Secondary Plan Area. Type C Arterial Road classification
3. Vipond Road Extension	Ashburn Road (existing terminus)	Country Lane	Extension of Corridor	\$19.3	-	Dependent on Development	Extension through the Secondary Plan Area. Collector Road classification
4. Collector Road North of Columbus Road	Secondary Plan boundary west of Cochrane Street	East of Thickson Road (to west of the Secondary Plan Boundary)	New Facility	\$55.6	-	Dependent on Development	Further study required to connect the east and west sections of this collector road between Cedarbrook Trail and Baldwin Street through the Greenbelt
5. Highway 7 / 12 Alternate Route	Highway 7	Highway 7/12	Corridor Protection	NC	-	Dependent on MTO Approval	Provincial Class EA to be conducted to determine alternate route.
6. Way Street	Price Street	Columbus Drive	Corridor Protection	NC	-	Short-Term (by 2024)	Review Way Street connectivity south of Carnwith Drive and at Columbus Road. Changes are not required based on capacity needs.
7. Garden Street Extension	Mid-Block Arterial	Robert Attersley Drive	Corridor Protection	\$21.3		Medium Term (by 2031)	Provides connectivity to the Mid-Block Arterial Corridor.
8. Highway 407 Grade Separation at Garrard Road			Corridor Protection	\$12.8		Medium Term (by 2031)	Provides connectivity across Highway 407, but no connection to Highway 407.
9. Highway 407 East Full Access Interchange at Cochrane Street			Corridor Protection	\$27.2		Medium Term (by 2031)	Provides connectivity to Highway 407, servicing for development and relief for the Baldwin Street / Highway 407 Interchange.
10. Intersection Improvements – Signals (per intersection)			Protection	\$0.3	-	Short-Term (by 2024)	Potential signals at the realigned Baldwin Street / Thickson Road intersection; refer to Item 8 – may incorporate a roundabout at this location. Potential Signals at the Future Thickson Road / Brawley Road intersection – may incorporate a roundabout at this location. Signals at Conlin Road / Anderson Street to accommodate future heavy westbound left-turn movement. Includes signals only, does not include road reconstruction.



Road Name	From	To	Description of Works	Estimated Costs for Whitby (\$Millions)	Estimated Costs for Region (\$Millions)	Anticipated Timing	Remarks/ Status
11. Intersection Improvements – Roundabouts			Protection	NC	-	Medium Term (by 2031)	<p>Implement roundabouts at the following locations:</p> <ul style="list-style-type: none"> <li>- St. Thomas Street / Queen Street / Winchester Road</li> <li>- Montgomery Avenue / Way Street / Columbus Road</li> <li>- Garden Street / Mid-Block Arterial</li> <li>- Garrard Road / Mid-Block Arterial</li> <li>- Garrard Road / Conlin Road</li> <li>- Baldwin Street / Roybrook Avenue</li> <li>- Baldwin Street / Carnwith Drive</li> <li>- Baldwin Street / Thickson Road</li> <li>- (Future) Thickson Road / Brawley Road</li> </ul> <p>See Town budget for additional roundabouts that are being considered/planned for. Additional intersection may be required as part of development. Intersection improvements will be considered as part of road improvement projects or intersection improvement projects and will involve the approving authorities. Note that Durham Region does not currently support multi-lane roundabouts on Regional Roads.</p>
12. Brooklin Arterial and Collector Road network			Protect extension of road network to accommodate new development	NC	-	Dependent on Development	<p>Timing of improvement would occur in conjunction with development of Brooklin Secondary Plan or increased congestion in Downtown Brooklin. Several individual projects are listed in this table, including: Carnwith Drive Extension (to Country Lane), Vipond Road Extension, and Collector Road North of Columbus Road. Longer-term projects are listed in <b>Table 10</b>, including Carnwith Drive Extension (to Oshawa border). This item includes the following Collector Roads specifically identified in the TMP: 1) north-south collector road east of Thickson Road from Columbus Road to Brawley Road; 2) mid-block north-south collector roads located east of Ashburn Road, between Ashburn Road and Cochrane Street, and between Cochrane Street and Country Lane; 3) collector roads within the industrial area, located south of Winchester Road and north of Conlin Road.</p>

Notes: NC – Not Costed; TBD – To Be Determined

Costing estimates based on benchmark costs and considered order of magnitude for planning purposes. Estimates include 20% grading, 0% to 10% for utility relocations (depending on project), 10% design and engineering, and 25% contingency. Property costs are excluded.

All arterial road corridors to include provisions and considerations for active transportation and transit.

Costing to be refined in future studies.

Anticipated timing for projects is based on a qualitative assessment, as population and employment data was available for conducting the horizon year 2031 assessment only.



**Table 10: Roadway Implementation Plan – Long-Term Arterial Corridor Protection (beyond Horizon Year 2031)**

**Rationale:** The following roadways are necessary to improve overall connectivity; these connections should be addressed as the opportunity arises from development or redevelopment within the timeline of this TMP and as the TMP is updated.

Road Name	From	To	Description of Works	Estimated Costs for Whitby (\$Millions)	Estimated Costs for Region (\$Millions)	Anticipated Timing	Remarks/ Status
1. Ashburn Road	Winchester Road	Brawley Road	Widening from two to four lanes	\$9.7	-	Long-Term (beyond 2031)	Protect corridor for widening beyond horizon year 2031
2. Carnwith Drive Extension (west beyond Country Lane)			Extension of Corridor	\$27.3	-	Long-Term (beyond 2031)	Extension outside of the Secondary Plan Area. Type C Arterial Road classification
3. Carnwith Drive Extension (to Oshawa border)	Rockland Crescent (existing terminus)	Oshawa border	Extension of Corridor	\$14.2	-	Long-Term (beyond 2031)	Extension outside of the Secondary Plan Area. Type C Arterial Road classification. This is a long-term improvement for continuity of the road network between Whitby and Oshawa.
4. Cochrane Street / Mid-Block Arterial	Winchester Road	Garrard Road	Widening from two to four lanes	\$30.0	-	Long-Term (beyond 2031)	The Town will maintain flexibility to widen the Cochrane Street / Mid-Block Arterial corridor to four lanes beyond the 2031 horizon.

Notes: NC – Not Costed; TBD – To Be Determined

Costing estimates based on benchmark costs and considered order of magnitude for planning purposes. Estimates include 20% grading, 5% to 10% for utility relocations (depending on project), 10% design and engineering, and 25% contingency. Property costs are excluded.

All arterial road corridors to include provisions and considerations for active transportation and transit.

Costing to be refined in future studies.

Timing for projects based on needs assessment; corridors were identified to be protected for future road network revisions beyond the 2031 Horizon Year.







active transportation infrastructure (i.e., signage, bicycle racks, etc.), and for management of the active transportation network, if required, will be outlined in the Active Transportation Plan along with a schedule of costs for implementing each of the recommended improvements. Recommendations identified in **Section 9.3** of the TMP should be considered for implementation within the Active Transportation Master Plan.

The recommendations within **Section 9.9** related to updates required to meet A.O.D.A. requirements that are related to Active Transportation are outlined in **Table 11**, in addition to requirements for future study to confirm mitigation measures required to correct access management issues.

### **10.1.5 Multi-Modal Development Implementation Plan**

Some of the recommendations within **Section 9** are related to program development, not specific infrastructure development. These activities are identified in **Table 12**, and are required to support the development of a multi-modal transportation network within Brooklin. Environmental Assessment approvals are not required to carry forward these activities.

The Transportation Master Plan must be flexible as technology is advancing at a rapid pace. There will be opportunities to leverage emerging technologies to improve mobility; however, how technology will be used in the future is still relatively unknown.

Real time transportation information through smartphone technology, on-demand transit services, ride-share and bike-share programs, connected and autonomous vehicles are just some of the technologies that are expected to advance to improve opportunities to move people and goods more effectively.

Although not specifically address within this TMP, the guidelines, policies and strategies related to goods movement that were identified within the 2010 TMP are still applicable. The proposed 2010 TMP recommendation to undertake a comprehensive goods movement study in cooperation with Durham Region, as identified in the 2010 TMP, should be carried forward.





**Table 11: Active Transportation / A.O.D.A & Access Management – Implementation Plan**

**Rationale:** The following revisions are necessary to improve the walking environment in Downtown Brooklin, and to meet A.O.D.A regulations.

Road Name	From	To	Description of Works	Estimated Costs for Whitby (\$Millions)	Estimated Costs for Region (\$Millions)	Anticipated Timing	Remarks/ Status
1. Baldwin Street	Winchester Road	George Street	Exterior paths of travel – clear width	NC	NC	Short-Term (by 2024)	As part of the technical requirements for exterior paths of travel, the exterior path must have a minimum clear width of 1,500 mm. Several locations along Baldwin Street do not appear to meet the noted requirement.
2. Baldwin Street	Winchester Road	George Street	Tactile walking surface indicators	NC	NC	Short-Term (by 2024)	While it appears that the curb ramps are aligned with the direction of travel, tactile walking surface indicators are not currently provided and / or not in compliance with the Regulation at several locations along Baldwin Street.
3. Baldwin Street	Winchester Road	George Street	Access Management	NC	NC	Short-Term (by 2024)	Future study to confirm turn restrictions, consolidation of driveways / provision of auxiliary turning lanes
4. Sidewalk implementation	Not applicable	Not applicable	Sidewalks	NC	NC	Dependent on future road projects	Implement sidewalks on both sides of collector and arterial roadways as part of future road projects.

Notes: NC – Not Costed

Costing to be refined in future studies. Timing for projects is primarily based on the A.O.D.A. requirements for all new or upgraded infrastructure components to be implemented by the target date of January 2025, and safety-related work should be incorporated as soon as possible.



**Table 12: Multi-Modal Development – Implementation Plan**

**Rationale:** The following activities are recommended to support the overall development of a multi-modal transportation network within Brooklin. Several activities were identified in the Whitby 2010 TMP, as noted within the remarks, and remain valid.

Development Activity	Description of Works	Anticipated Timing	Remarks/ Status
1. Traffic Calming and Parking Studies	Study	Short-Term with development / re-development	Studies can be used in identified areas to determine the appropriate mix of vehicular, cyclist, and pedestrian traffic as well as enhance key destination features that create a sense of place. In particular, the roads that should be studied are Baldwin Street between Winchester Road and Way Street and Vipond Road between Baldwin Street and Montgomery Avenue. Parking may be addresses as part of the ongoing Parking Master Plan.
2. Develop a Transit Oriented Development policy	Policy Development	Short-Term (by 2024)	Includes policies in Official Plan and Secondary Plan as appropriate. Policies have been developed as part of the 2017 Brooklin Study (combined Secondary Plan and TMP study). Activity identified in the 2010 TMP.
3. Designate and support implementation of Higher Order Transit corridors	Policy Development	Short-Term (by 2024)	Identify Transit Corridors and policies in Official Plan and Secondary Plan as appropriate. Policies have been developed as part of the 2017 Brooklin Study (combined Secondary Plan and TMP study). Note that the implementation of specific higher order transit projects does require EA approval. Activity identified in the 2010 TMP.
4. Complete Special Study to investigate and plan for alternative people movers/micro-transit opportunities systems to/from key destinations	Study	Medium-Term (by 2031)	Initial area of focus being within Whitby but outside of Brooklin, to be followed by a study for the Brooklin area. Emerging technologies will inform the development of the expanded urban boundary area for Brooklin, including connected and autonomous vehicles.
5. Coordinate with the Region and DRT to implement a Transit Priority Plan	Study	Short-Term (by 2024)	Assess area of potential transit delay in cooperation with DRT staff, as well as impact on surrounding road network. Activity identified in the 2010 TMP.
6. Identify and protect for missing links that could benefit transit	Study	Short-Term (by 2024)	Identify Transit Corridors in Official Plan and Secondary Plans. Transit Corridors have been identified by Durham Region in the 2017 TMP, and by the Town of Whitby in this TMP. Continue to study future possible transit links. Including those that may be used for autonomous shuttles.
7. Appoint/hire a TDM Coordinator	Staff Hire	Short-Term (by 2024)	This position would provide for specific focus on moving TDM programs forward within the community. Activity identified in the 2010 TMP.
8. Develop a Trip Reduction Program for the Town Municipal Offices/Facilities	Strategy Development	Short-Term (by 2024)	Activity identified in the 2010 TMP. Internal Strategy development by TDM Coordinator.
9. Engage major employers, institutions and school boards to participate in trip reduction initiatives	Strategy Development	Short-Term (by 2024)	Activity identified in the 2010 TMP. Internal Strategy development by TDM Coordinator. The following categories for TDM strategies should be included: <ul style="list-style-type: none"> <li>- Improved Transportation Options</li> <li>- Incentives to Use Alternative Modes and Reduce Driving</li> <li>- Parking and Land Use Management</li> </ul>
10. Encourage the Development of Mobility Hubs	Policy Development	Short-Term (by 2024)	Activity identified in the 2010 TMP. Includes policies in Official Plan and Secondary Plan as appropriate. Policies have been developed as part of the 2017 Brooklin Study (combined Secondary Plan and TMP study).
11. Include TDM in the development process	Policy Development	Short-Term (by 2024)	Activity identified in the 2010 TMP. Includes policies in Secondary Plan as appropriate. Policies have been developed as part of the 2017 Brooklin Study (combined Secondary Plan and TMP study).
12. Prepare a short- and long-term Parking Strategy for Downtown Brooklin	Study	Short-Term (by 2024)	Consider the use of surface parking and parking structures to accommodate parking needs. The strategy should engage property owners to encourage more efficient use of existing private parking areas for commercial development, and optimize the opportunity for new infill development and cohesive commercial main street development. The Town is undertaking a Parking Master Plan (PMP) in 2017 to achieve this objective.
13. Undertake a Goods Movement Study in cooperation with Durham Region	Study	Short-Term (by 2024)	Establish policies, performance measures and routings and incorporate preferred corridors in Official Plan updates. Activity identified in the 2010 TMP.

Notes: Costs have not been estimated and will be refined as part of the future study/project



## 10.2 Future Municipal Class Environmental Assessment Requirements

The Class Environmental Assessment for Municipal Road projects provides for four types of projects or activities:

- Schedule A – municipal maintenance, operational and emergency activities – preapproved; therefore, the municipality can proceed without further approval under the EA Act
- Schedule A+ – pre-approved; however, the public is to be advised prior to project implementation
- Schedule B – projects with the potential for some adverse environmental effects – these are approved subject to a screening process including consultation with directly affected public and agencies
- Schedule C – projects with the potential for significant environmental effects which must proceed under the planning and documentation procedures outlined in the Municipal Class EA document

The Brooklin TMP and Secondary Plan were carried out as an “integrated approach” as set out in Section A.2.9 of the Municipal Class EA, which combines Planning Act and Environmental Assessment Act requirements, and addresses Phases 1 and 2 of the Municipal Class EA (MCEA) process (referred to in **Exhibit 2**).

More detailed investigation will be required to implement specific Schedule B and C projects that are recommended as part of this TMP. Specifically, Schedule B projects are required to fulfill Phases 1 and 2 of the Class EA process and prepare a project file for public and agency review. Schedule C projects are required to fulfil subsequent phases (i.e., Phases 3 and 4 of the Class EA process) as part of separate studies which includes the examination of design alternatives for the recommended project, identification of the preferred design and measures to mitigate the anticipated impacts of a project, additional consultation activities to allow for public and agency review and input and filing of an Environmental Study Report (ESR). In both cases, the public review period includes a Part II Order appeal mechanism where an individual can make a written request to the Minister of the Environment to extend the project to a higher level of EA investigation. A request for an order to comply with Part II of the EA Act (Part II Order) cannot be made on the TMP itself, but may be made on specific



Schedule 'B' or 'C' projects identified in the Brooklin TMP that are subject to a Municipal Class EA.

The transportation infrastructure projects that require an additional Municipal Class EA study are listed in **Table 13, Table 14, Table 15** and **Table 16**. The EA schedule has been determined by considering the level of environmental impact and an estimate of the cost of each project.

### **10.3 Future Provincial Class Environmental Assessment Requirements**

With approval from MTO, the Town will initiate a Provincial Class EA study, likely classified as a Group 'A' Route Planning Class EA as this would be a new highway facility. The Provincial Class EA would be initiated for a controlled access, four (4)-lane rural highway with at-grade intersections and/or roundabouts to provide an alternate route to the existing Highway 7/12 through Brooklin. The study would follow the Class Environmental Assessment for Provincial Transportation Facilities (2000). Group 'A' is applicable as an alternate route would not substantially follow the Highway 7/12 right of way. Ministry staff will be extensively involved in the Provincial Class EA.

The Highway 7/12 EA Study is scheduled to be initiated in 2017, beginning with the development of the Terms of Reference (TOR). Completion of a Provincial Class EA / Route Planning Study for the new highway alignment is required so that a route can be protected, property can be purchased, and preliminary and detailed design work can proceed as funding is available.

### **10.4 Official Plan Policies**

The TMP is not a statutory document and therefore has no legal status. The core recommendations of this plan must be incorporated into the Official Plan in order to provide a statutory basis for the application and enforcement of the transportation policies contained in the TMP and to ensure long term protection for proposed new and widened transportation corridors (i.e., protection from encroachment due to development).

The Town of Whitby is currently undertaking a review of its Official Plan; Amendment 105 to the Whitby OP was adopted by Whitby Council on February 21, 2017 and the Amendment has been forwarded to the Region of Durham for approval. Updates include revisions to Section 8.1.3 Transportation Network (Policies).



**Table 13: MCEA Schedule for Screenline Capacity Improvement Projects**

Project Name	From	To	Description of Works	Schedule
1. Widen Thickson Road	Winchester Road	Brawley Road	Widening from two to four lanes	Schedule C
2. Widen Lake Ridge Road	Winchester Road	Brawley Road	Widening from two to four lanes	Schedule C
3. Widen Cochrane Street	Winchester Road	Columbus Road	Widening from two to four lanes	Schedule C
4. Extend Cochrane Street	Winchester Road	Baldwin Street	New Facility (two lanes)	Schedule C
5. Mid-Block Arterial 2-Lane Facility (north of Conlin Road)	Baldwin Street	Britannia Road (existing terminus) at Oshawa border	Extension of Britannia Street corridor	Schedule C
6. Columbus Road	Lake Ridge Road	Whitby/Oshawa Boundary	Widening from two to four lanes	Schedule C



**Table 14: MCEA Schedule for Network Connectivity Projects**

Project Name	From	To	Description of Works	Schedule
1. Baldwin Street and Thickson Road Intersection	Baldwin Street	Thickson Road	Realignment	Schedule C
2. Carnwith Drive Extension (to Country Lane)	Ashburn Road (existing terminus)	Country Lane	Extension of Corridor	Schedule C
3. Vipond Road Extension	Ashburn Road (existing terminus)	Country Lane	Extension of Corridor	Schedule C
4. Collector Road North of Columbus Road	Secondary Plan boundary west of Cochrane Street	East of Thickson Road (approximately to west of the Secondary Plan Boundary)	New Facility	Schedule C
5. Highway 7 / 12 Alternate Route	Highway 7	Highway 7/12	Corridor Protection	Provincial Class EA
6. Way Street	Price Street	Columbus Drive	Corridor Protection	Schedule A/A+
7. Garden Street Extension	Mid-Block Arterial	Robert Attersley Drive	Corridor Protection	Not classified; potentially Schedule C due to proximity to Lynde Creek and natural areas
8. Highway 407 Grade Separation at Garrard Road			Corridor Protection	Schedule C
9. Highway 407 East Full Access Interchange at Cochrane Street			Corridor Protection	Schedule C





Project Name	From	To	Description of Works	Schedule
10. Intersection Improvements - Signals			Protection – Baldwin Street / Thickson Road intersection, Future Thickson Road / Brawley Road intersection, and Conlin Road / Anderson Street	Schedule A/A+, and C
11. Intersection Improvements – Potential roundabouts			Protection – Potential to implement roundabouts at the following locations <sup>37</sup> : <ul style="list-style-type: none"> <li>- St. Thomas Street / Queen Street / Winchester Road</li> <li>- Montgomery Avenue / Way Street / Columbus Road</li> <li>- Garden Street / Mid-Block Arterial</li> <li>- Garrard Road / Mid-Block Arterial</li> <li>- Garrard Road / Conlin Road</li> <li>- Baldwin Street / Roybrook Avenue</li> <li>- Baldwin Street / Carnwith Drive</li> <li>- Baldwin Street / Thickson Road</li> <li>- (Future) Thickson Road / Brawley Road</li> </ul>	Schedule A/A+, B and C
12. Brooklin Arterial and Collector Road network			Protect extension of road network to accommodate new development	Schedule A/A+. B, and C

37. Intersection improvements will be considered as part of road improvement projects or intersection improvement projects and will involve the approving authorities. Note that Durham Region presently does not support multi-lane roundabouts on Regional roads.



**Table 15: MCEA Schedule for Long-Term Arterial Corridor Protection Improvement Projects**

Project Name	From	To	Description of Works	Schedule
1. Ashburn Road	Winchester Road	Brawley Road	Widening from two to four lanes	Schedule C
2. Carnwith Drive Extension (west beyond Country Lane)			Extension of Corridor	Not classified
2. Carnwith Drive Extension (to Oshawa border)	Rockland Crescent (existing terminus)	Oshawa border	Extension of Corridor	Schedule C
4. Cochrane Street / Mid-Block Arterial Widening to 4-Lane Facility	Winchester Road	Garrard Road	Widening from two to four lanes	Schedule C

**Table 16: MCEA Schedule for Active Transportation / A.O.D.A & Access Management Improvement Projects**

Project Name	From	To	Description of Works	Schedule
1. Baldwin Street	Winchester Road	George Street	Exterior paths of travel – clear width	Schedule A/A+
2. Baldwin Street	Winchester Road	George Street	Tactile walking surface indicators	Schedule A/A+
3. Baldwin Street	Winchester Road	George Street	Access Management	Schedule A/A+, B and C
4. Sidewalk implementation	Not applicable	Not applicable	Sidewalks	Not classified



The updated Goals identified for Transportation, under Section 8.1.1 of the Official Plan, include the following:

- To establish and maintain a safe, efficient, interconnected and accessible transportation network, supporting all modes of transportation including transit, automobiles, active transportation, and the efficient movement of goods.
- To encourage sustainable transportation initiatives, supporting active transportation, complete communities and healthy lifestyles.

The updated Objectives identified in Section 8.1.2 of the Official Plan, include the following:

- To provide a transportation network that is interconnected, multi-modal and accessible.
- To provide for the development of an efficient transportation network, minimizing negative social, and environmental impacts and economic costs and promoting opportunities for enhancement and improvement.

This Transportation Master Plan and its recommendations are supportive of these updated Policies, Goals and Objectives.

## 10.5 Plan Monitoring

This TMP outlines a strategy for infrastructure improvements and policy planning to attain its vision for the Brooklin area to have a transportation system that is effective, accessible, integrated, multimodal, balanced, optimized, affordable, sustainable, and coordinated. The success of this TMP as a long-range plan is dependent on a number of variables and the ongoing monitoring of relevant conditions, actions, and impacts. The Town must be aware of the progress made towards achieving its vision and objectives with respect to the transportation network through a monitoring framework that ensures priorities are added, modified or deleted as necessary.

This TMP is not intended to be a static document and must retain some measure of flexibility and be adaptable to changes in the travel behaviour, and other conditions in the Brooklin Area, as well as new technologies. As growth in population and employment changes over the next several years, the TMP should be updated to re-assess, amend, or update components of this TMP and be able to respond to changes that might affect demand or the emphasis placed on different modes of transportation.



It is recommended that this TMP be monitored every five years, taking into consideration the following:

- Progress towards achieving the Town's vision as outlined in the Secondary Plan and the Official Plan, as it relates to the Transportation Network;
- Emerging technologies which must be flexible and adaptable for future advancements in technology;
- New transportation issues that may arise in the future;
- Provincial and Town initiatives, policies and funding related to transportation infrastructure programs; and
- Rate of development and land use changes within the Brooklin area.

Moreover, it is recommended that the Town considers the following activities as part of a proactive monitoring program for the study area:

- **Pace of Growth:** Obtain annual population, employment and dwelling unit data to provide context for an assessment of whether the study area is growing at the rate anticipated. This information will in turn be used to assess whether the pace of TMP implementation and completion is proportional to the pace of development.
- **Traffic Counts:** Schedule regular traffic counts in the Brooklin area at key locations using ATRs and key intersections using Intersection Turning Movement Counts (TMC) to identify and confirm issues. Particularly at intersections where there are known issues, or at intersections adjacent to new development areas, regular intersection count is beneficial to:
  - Track changes over time;
  - Determine when or if intersection control revisions are required;
  - Determine if pedestrian signals or other pedestrian requirements are needed;
  - Assess truck volumes; and
  - Assess queues.
- **Land Use and Policy Changes:** Monitor future opportunities such as changes in land use and policy changes that may impact the transportation network changes recommended in the TMP.
- **Parking Utilization and Monitoring:** Monitor parking utilization within the study area and consider implementing parking management policies. A monitoring program should be included in the Parking Master Plan.



- **Transit Network:** Monitor the need for potential changes to the transit system by considering route performance and customer satisfaction. Potential changes to DRT transit route network should be considered on the basis of future development patterns and the timing of the road network changes that are implemented;
- **Active Transportation Network:** Monitor the status of improvements to the pedestrian and cycling networks through implementation of MUPs or trails for all significant rivers, creeks or hydro corridors within Brooklin. It is anticipated that streetscape improvements will be implemented through the development application and approval process, which may result in a patchwork of improvements in the near to medium-term. Annual reporting on the use of active transportation facilities and any increase in mode share to active transportation modes would assist with determining direct benefits of improved facilities. A monitoring program should be included in the Active Transportation Master Plan.
- **Transportation Tomorrow Survey (TTS):** The Town should continue to participate in the TTS, undertaken every 5 years, to provide an update of transportation patterns in Brooklin and surrounding areas and to ensure that up to date information is available to assess changing transportation trends in the community.

It is recommended that the TMP be reviewed and / or updated every 5 years in conjunction with statutory requirements to review the Official Plan. Given the close integration between land use planning, land use policy, and transportation, any future updates to the TMP should be undertaken in conjunction with Official Plan updates (including the Brooklin Community Secondary Plan). All major TMP updates should include a proactive and comprehensive public consultation program featuring formal public consultation, stakeholder workshops, and other innovative outreach strategies to solicit input from a wide cross-section of the community.

## 10.6 Effects and Mitigation Measures

As discussed earlier in **Section 10.2**, the transportation infrastructure projects that require an additional Municipal Class EA study were listed in **Table 13, Table 14, Table 15** and **Table 16**. The impacts and mitigation measures for the Schedule B projects will be identified and documented in the individual Project File Reports during further studies. The impacts and mitigation measures for the Schedule C projects will be identified and confirmed during Phases 3 and 4 of the MCEA process in separate studies and will be documented in the individual Environmental Study Reports.