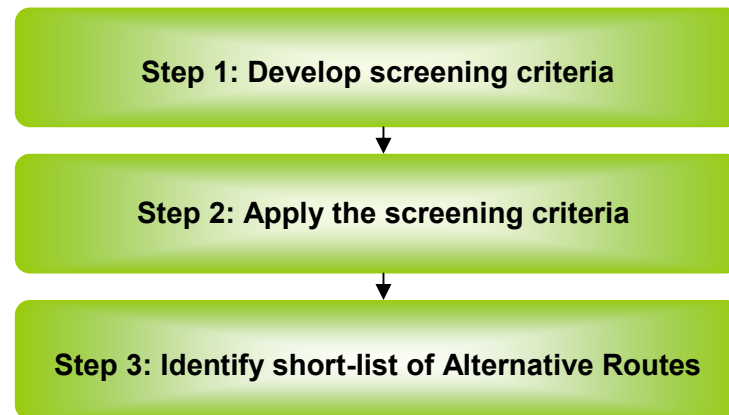


4. Screening of the Alternative Routes

The generated long list of alternative routes, illustrated in **Appendix A**, was screened to identify a short list of alternative routes. The screening process involved three key steps as illustrated in **Figure 4.1**.

Figure 4.1: Screening Process



4.1 Step No. 1 - Develop Screening Criteria

The primary focus of the screening phase was to minimize direct loss/effects on significant natural, social, and cultural areas and features, recognizing that the generation of the long list of alternative routes avoided these significant areas and features, where possible. Seven criteria were developed for screening the long list of alternative routes. These criteria were developed based on the preceding guiding principles and corresponding objectives. The seven screening criteria as well as their rationale for inclusion are provided in **Table 4.1**.

Table 4.1: Screening Criteria for Identifying the Short-List of Alternative Routes

SCREENING CRITERIA	RATIONALE
<i>Minimize route within Provincial Policy/ Plan Areas (e.g. Oak Ridges Moraine Conservation Plan, Greenbelt Plan)</i>	The study area contains Provincial Policy/Plan areas such as the Oak Ridges Moraine Conservation Plan (ORMCP) and the Greenbelt Plan, which aim to protect key environmental features and functions. The Oak Ridges Moraine contains the largest concentration of headwater streams in the Greater Toronto Area and acts as a recharge area for groundwater. The ORMCP aims to provide land use and resource management direction for the land, water and habitat within the Moraine. The purpose of the Greenbelt Plan is to guide urbanization in order to provide permanent protection to the agricultural land base and ecological features and functions. While both of these plans contain mechanisms for the development of infrastructure, the intent is to minimize the length of routes through each of these plan areas to the extent possible.
<i>Minimize direct loss of Areas of Natural Scientific</i>	The ANSIs, ESAs and DSWLs within the study area consist of significant natural features.

Table 4.1: Screening Criteria for Identifying the Short-List of Alternative Routes

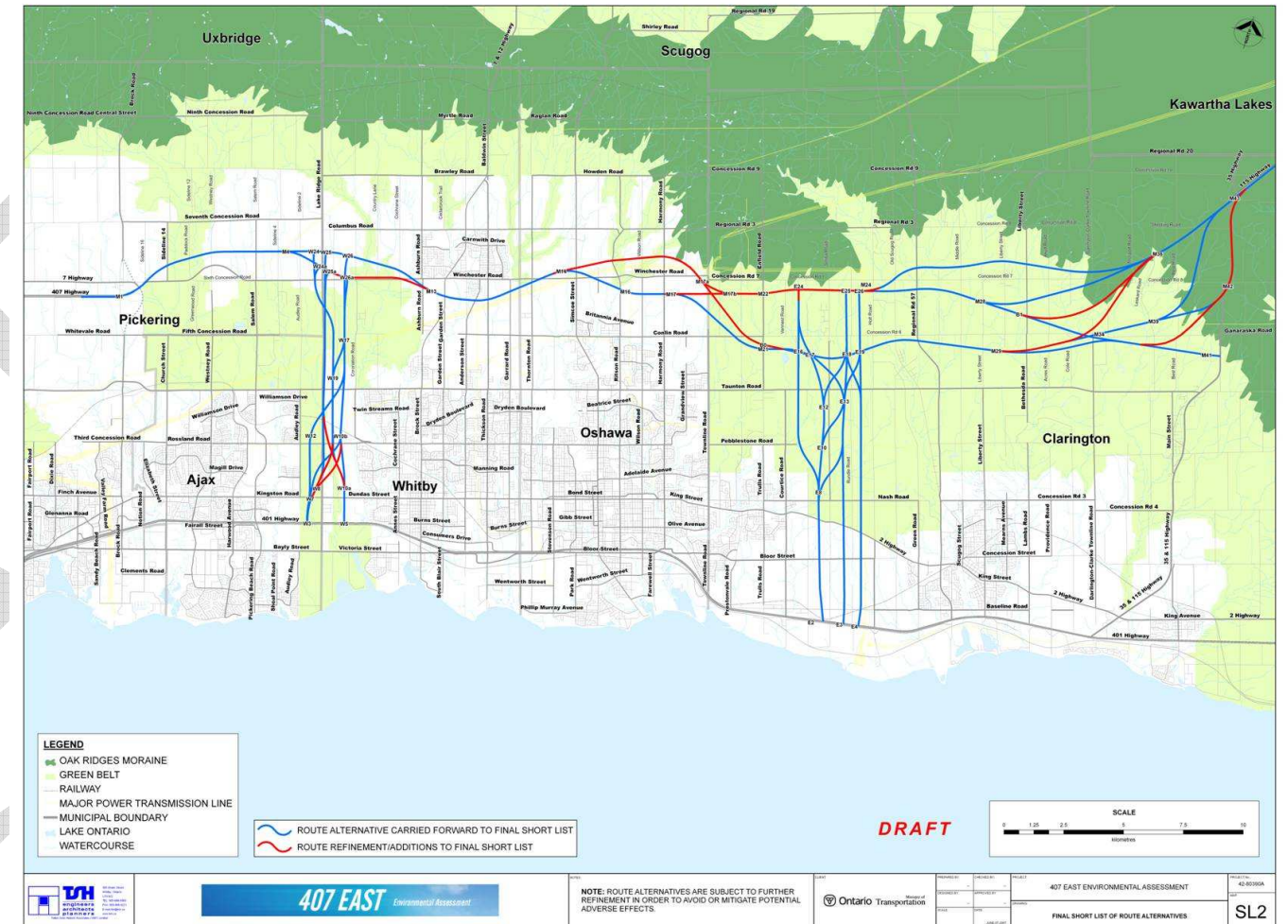
SCREENING CRITERIA	RATIONALE
<i>Interest (ANSIs), Environmentally Sensitive Area (ESAs) and Designated Significant Woodlots (DSWLs)</i>	<p>ANSIs are areas of land and/or water containing natural landscapes or features that have been identified by the Province of Ontario as having natural heritage, geological, scientific study or educational values. ANSIs are designated to preserve significant and sometimes unique and representative components of the environment.</p> <p>ESAs are areas that require special management attention to protect important scenic values, fish and wildlife resources, historical and cultural values, and other natural systems or processes. ESAs are often associated with features such as Provincially Significant Wetlands (PSWs), ANSIs, significant woodlands, valleylands or significant wildlife habitat. In particular, ESAs are scattered throughout the study area, but occur most abundantly along the Lake Iroquois Shoreline (e.g., Heber Downs and Stephens Gulch Conservation Areas, etc.).</p> <p>In addition, wetlands, ANSIs and other designated natural areas such as ESAs and Conservation Areas often function as wildlife refuge areas or facilitate wildlife movement opportunities. For these reasons such areas should be avoided where possible or encroachment minimized.</p> <p>Significance, as a measure of the importance of woodlots is based on several factors that could include size and shape; association to other features, linkages, diversity, management value and age; and presence of species at risk. At present, the Region of Durham has a draft plan of DSWLs. Although Provincial Policy Statement (PPS) 2.1.4 permits development in designated woodlots if it has been demonstrated that there will be no negative impacts on the features or their ecological functions, DSWLs should be avoided to the extent possible.</p>
<i>Minimize direct loss of Provincially Significant Wetlands (PSWs)</i>	The study area contains a number of PSWs. Wetlands provide varying degrees of ecological functions including groundwater recharge/discharge, flood attenuation, habitat for flora and fauna and water filtration. PSWs are features determined to provide the highest values amongst wetlands in Ontario and therefore should be avoided as much as possible or encroachment minimized.
<i>Minimize direct effects on Agricultural and Natural Resources</i>	<p>The study area contains agricultural areas that are designated as Prime Agricultural Areas through Section 2.3 of the PPS, which aims to protect soil classes 1, 2 and 3 and associated agricultural uses (i.e. dairy/livestock operations, field crop operations, division of agricultural communities, etc).</p> <p>Mineral aggregate resources and existing licensed aggregate resource facilities are also protected under Section 2.4 and 2.5 of the PPS for long-term use.</p> <p>As a result, Prime Agricultural Areas and mineral aggregate resources and existing licensed aggregate resource facilities should be avoided as much as possible or encroachment minimized.</p>
<i>Minimize number of stream crossings (e.g. potential HADDs)</i>	The study area contains numerous streams that flow south from the Oak Ridges Moraine to Lake Ontario. These stream crossings range from coldwater to coolwater to warmwater, each with characteristics that range in level of sensitivity and significance. According to the federal Fisheries Act, harmful alteration, disruption or destruction (HADD) of fish habitat must be avoided by an

Table 4.1: Screening Criteria for Identifying the Short-List of Alternative Routes

SCREENING CRITERIA	RATIONALE
	undertaking either through redesign, modifying the location or through mitigating and compensating habitat disturbance / loss. Therefore, by minimizing the number of stream crossings, the number of potential HADDs is reduced.
<i>Minimize effects on existing and planned development</i>	The study area contains both existing and planned development. Since the proposed route will require property for its implementation, the potential exists for the displacement of existing development and alteration of future development. Planned development relates to lands designated as growth areas within Regional and Local Official Plans.
<i>Maximize network efficiency</i>	<p>The proposed freeway and transitway corridors will provide important linkages to the existing freeway and arterial road networks in Durham Region. These linkages provide opportunities and choice for travel within and through the Region and connections to the identified urban growth centres of Pickering, Oshawa and Peterborough. The length of route will have a direct bearing on the long term efficiency of the transportation network as longer routes will increase vehicle-kilometres of travel, increase fuel consumption and negatively affect air quality. Shorter routes are therefore preferred to longer routes.</p> <p>Proximity to built up areas will minimize out-of-way travel for potential users of the new corridors, improving the efficiency of travel and enhancing the potential for the transitway corridors to effectively integrate with Durham Region and GO Transit services. Closer proximity to the dense urban centres is therefore preferred.</p>

removed and other routes adjusted to comply with geometric requirements. As a result of this refinement process, a final short list of alternative routes was identified as illustrated in **Figure 4.2**.

Figure 4.2: Final Short List of Alternative Routes



4.2 Step No. 2 – Apply the Screening Criteria

Once the screening criteria were developed, the next step involved the application of the criteria to each of the long list of alternative routes. The intent of the screening process was to screen out (remove) alternative routes from further consideration which:

- Were no longer feasible to implement (for example a previously identified route may intrude into existing or planned land use); and/or
- Were significantly less desirable than other available alternatives on the basis of the results from applying the screening criteria.

The environmental features maps provided in **Appendix B** were used in the application of the screening criteria. The results from applying the screening criteria were documented in a series of tables provided in **Appendix C**.

4.3 Step No. 3 – Identify the “Short-Listed” Alternative Routes

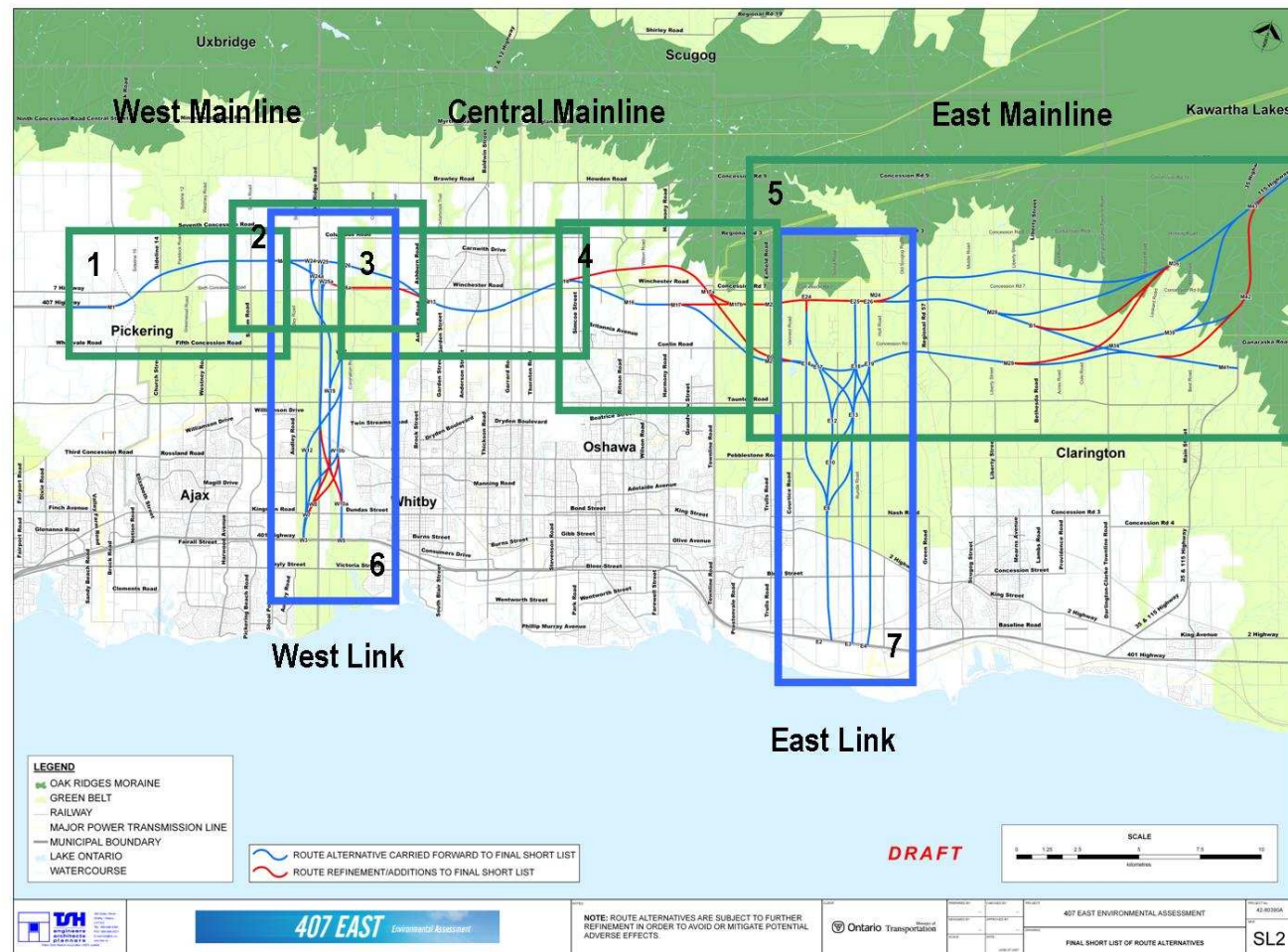
On the basis of the screening results presented in **Appendix C**, an initial short-list of alternative routes was identified. The initial short-listed alternative routes were refined through functional planning with some routes

Similar to the generated long list of alternative routes, the “short-listed” routes were grouped into Mainline and Link routes, with the West Mainline and Central Mainline further sub-divided into two separate sections. As a result, the final short-list of alternative routes is described within seven sections making up the Mainline and Link routes as listed below, illustrated in **Figure 4.3** and as described in subsequent sections:

- West Mainline
 - Section 1 – Brock Road to Audley Road
 - Section 2 – Audley Road to Ashburn Road
- Central Mainline
 - Section 3 - Ashburn Road to Simcoe Street
 - Section 4 – Simcoe Street to Enfield Road

- East Mainline
 - Section 5 – Enfield Road to Highway 35/115
- West Link
 - Section 6 - West Durham Link
- East Link
 - Section 7 - East Durham Link

Figure 4.3: Short List of Alternative Routes Section Map



4.3.1 Section 1 – Brock Road to Audley Road

Section 1 is the most westerly segment of the study area and starts from the existing 407 terminus at Brock Road and ends at Audley Road. The screening process resulted in only a single route being recommended for this

section because the other long list of alternative routes were generally within existing development areas (Greenwood Hamlet); therefore, they were not carried forward to the short-list.

4.3.2 Section 2 – Audley Road to Ashburn Road

Section 2 is the second segment of the West Mainline and has two “short-listed” alternative routes (WM1 and WM2) which both extend from Audley Road to Ashburn Road.

4.3.3 Section 3 - Ashburn Road to Simcoe Street

Section 3 is the first segment of the Central Mainline and spans from Ashburn Road to Simcoe Street. Similar to Section 1, the screening process resulted in a single route being recommended for this section because the other long list of alternative routes were generally within existing and planned development areas; therefore, they were not carried forward to the short-list.

4.3.4 Section 4 – Simcoe Street to Enfield Road

Section 4 is the second segment of the Central Mainline and has two “short-listed” alternative routes (CM1 and CM2). This segment of the Central Mainline begins at Simcoe Street and ends at Enfield Road.

4.3.5 Section 5 – Enfield Road to Highway 35/115

Section 5 is the East Mainline and has 12 “short-listed” alternative routes (EM1 to EM12). The East Mainline is the most easterly segment of the study area, commencing at Enfield Road and ending at Highway 35/115.

4.3.6 Section 6 - West Durham Link

Section 6 is the West Durham Link extending from the existing Highway 401 to the proposed 407 Mainline extension. Since the northern terminus of the West Durham Link with the 407 Mainline is within Section 2 (from Audley Road to Ashburn Road), the number of short-listed alternative routes for the West Durham Link was initially 18 to take into account connections to both WM1 and WM2. However, the 18 short-listed alternative routes were reduced to nine once the technically recommended route for Section 2 was selected as part of the assessment and evaluation of the mainline alternative routes.

4.3.7 Section 7 - East Durham Link

Section 7 is the East Durham Link extending from the existing Highway 401 to the proposed 407 Mainline extension in Clarington. Since the northern terminus of the East Durham Link with the 407 Mainline is within Section 5 (from Enfield Road to Highway 35/115), the number of short-listed alternative routes for the East Durham Link was initially 26 to take into account connections to both a southern mainline route as well as a northern mainline route. However, the 26 short-listed alternative routes were reduced to thirteen once the technically recommended route for Section 5 was selected as part of the assessment and evaluation of the mainline alternative routes.