



Ministry of Transportation

# 407 East Environmental Assessment

## Alternative Methods Technical Report (Cultural Heritage)

# FINAL DRAFT

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## 1. Introduction

This report documents the assessment and evaluation of the short-listed alternative routes identified for the 407 East Environmental Assessment (EA) from the Cultural Heritage perspective. Following completion of the screening phase, alternative routes were short-listed for detailed assessment and/or comparative evaluation. The short-listed routes were broken down into 5 sections:

- West Mainline
  - Brock Road to Audley Road – 1 route
  - Audley Road to Ashburn Road – 2 route alternatives
- Central Mainline
  - Ashburn Road to Simcoe Street – 1 route
  - Simcoe Street to Enfield Road – 2 route alternatives
- East Mainline
  - Enfield Road to Highway 35/115 – 12 route alternatives
- West Link
  - West Durham Link – 9 route alternatives
- East Link
  - East Durham Link – 13 route alternatives

This report is one of nine stand-alone documents that outline the evaluation of the alternative routes process from the perspective of each discipline. These reports will be used in concert with one another as supporting documents to the Alternative Methods Report. The following 9 discipline specific reports have been prepared and made available for comment:

- Natural Environment
- Noise
- Socio-economic
- Air Quality
- Agricultural
- Waste Contamination
- Archaeology
- Cultural Heritage
- Technical

The evaluation of alternative routes was a three-step process. The first step entailed a detailed field inventory of conditions associated with each alternative route. Each environmental feature was examined to determine the extent of impact and the findings of these were outlined within each of the disciplines Field Investigations Reports. The second step was to assess the findings of the field investigations against the established Criteria and Indicators listed in Table 1 (Appendix A of Alternative Methods Report) for each of the 5 Factor Areas (Natural, Social, Economic, Cultural and Technical). After determining the initial potential effects, standard mitigation, avoidance, enhancement and compensation measures were applied in order to determine the Net Effects.

The third step was the evaluation itself. This step involved a comparative analysis of the alternative routes considered to select a preferred alternative. At this stage, the relative importance of the environmental features was determined.

### 1.1 Cultural Heritage Study Team

A study team consisting of Unterman McPhail Associates staff undertook the Cultural Heritage Resource assessment and evaluation of route alternatives. The actual individuals and their specific roles are provided as follows:

- *Richard Unterman, MA, Project Manager, Survey and Evaluation*
- *Jean Simonton, BES, B. Arch. Heritage Consultant, Survey and Evaluation*

## 2. Assessment and Evaluation of the Alternative Routes

### 2.1 Methodology

The assessment and evaluation of the alternative routes was conducted in three steps:

#### Step 1: Confirm Evaluation Criteria and Indicators/Measures

The approved 407 East EA Terms of Reference (ToR) set out the draft criteria and indicators in **Table 5.2** for evaluating the 'alternative methods' in the EA. In addition, **Supporting Document C** of the 407 East EA ToR provided proposed data sources and measures for each of the indicators. As a result, the draft criteria, indicators, and measures provided for in the ToR were reviewed and modified appropriately to suit the evaluation of the alternative routes.

Specifically, the criteria, indicators and measures were modified in consultation with review agencies and the public to ensure that an appropriate level of scrutiny and rigour was applied in evaluating the "short listed" routes. By doing so, the results of the evaluation phase consist of clearly defined net effects for each "short listed" route that were suitable for comparison.

#### Step 2: Undertake the Net Effects Analysis

With the evaluation criteria, indicators and measures confirmed through the preceding step, a net effects analysis of the "short-listed" alternative routes was carried out consisting of the following activities:

- Identify potential effects (based on measures) on the environment;

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- Develop and apply avoidance/ mitigation/ compensation/ enhancement measures; and
- Determine net effects on the environment.

**Step 3: Carry Out the Comparative Evaluation**

In Step 3, the net effects identified for each “short-listed” route segment in Step 2 were compared to one another in order to identify a “recommended route segment”. The comparison of net effects was completed using a “Reasoned Argument” or “Trade-off” method, as provided for in the approved 407 East EA ToR.

The Cultural Heritage Resource assessment was completed based on the results of the field survey to collect information on built heritage resources and cultural heritage landscapes that could be effected through displacement or disruption impacts based on the route alignment of the various alternatives. Individual built heritage resources 40 years of age and older such as residences, barns, schools or churches were identified. Roadscapes, farm complexes, cemeteries and agricultural lands 40 years of age and older were identified as cultural heritage landscapes for the purposes of the assessment.

The Cultural Heritage Resource assessment methodology evaluated the total number of direct or indirect impacts which might result from the route alternative location. It compared the delineated route alternatives on a measure of quantitative impacts plus professional opinion on the value of the resources against the other route alternatives.

The principal rationale in the selection of the preferred alternative for Cultural Heritage (Built Heritage and Cultural Heritage Landscape) was the number of resources to be impacted through direct or indirect effects. Where the number of impacts was determined to be within a range plus or minus two to three resources, then the impact was deemed similar. The route alternative with the greatest number of impacts was deemed to have the highest impacts on the cultural heritage environment.

Loss or disruption of cultural heritage resources will be permanent. A Cultural Heritage Documentation Report for archival purposes will be prepared prior to the undertaking. The Documentation Report will include a site and area history, photographic survey of the cultural heritage resource and potentially where deemed required as-found measured drawings of the floor plan(s). Removal of a built cultural heritage resource to a new location will be considered where the cultural heritage resource is deemed to be of local heritage significance, based on the significance of the resource(s).

**2.2 West Mainline – Brock Road to Audley Road****2.2.1 Net Effects Analysis**

In the West Mainline section between Brock Road and Audley Road, a single route alternative exists. The cultural heritage analysis identified fourteen (14) cultural heritage resources including

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residences, roadscapes, farm complexes and agricultural lands **and one(1) built heritage resources** that will be displaced or disrupted by the route alternative.

**2.3 West Mainline – Audley Road to Ashburn Road****2.3.1 Net Effects Analysis**

In the west mainline section between Audley Road and Ashburn Road, two route alternatives exist; WM1 and WM2.

**WM1**

Alternative WM1 will displace or disrupt eight (8) cultural heritage landscapes and two (2) built heritage resources.

**WM2**

Alternative WM2 will displace or disrupt nine (9) cultural heritage landscapes and two (2) built heritage resources.

**2.3.2 Evaluation Results**

Based on the identification of impacts, eight (8) cultural heritage landscapes and two (2) built heritage were recognized and will be displaced or disrupted by Alternative WM1 as compared to nine (9) cultural heritage landscape and two (2) built heritage resources for Alternative WM2. As a result, both routes were considered to have the same moderate impacts as similar resources would be impacted and a comparable number of resources would be impacted. Therefore, there is no distinction between the routes from a cultural heritage perspective.

**2.4 Central Mainline – Ashburn Road to Simcoe Street****2.4.1 Net Effects Analysis**

For the Central Mainline section between Ashburn Road and Simcoe Street, a single route alternative exists. The cultural heritage analysis identified fourteen (14) cultural heritage landscapes and zero (0) built heritage resources that will be displaced or disrupted by the route alternative.

## 2.5 Central Mainline – Simcoe Street to Enfield Road

### 2.5.1 Net Effects Analysis

In the Central Mainline section between Simcoe Street and Enfield Road, two route alternatives exist; CM1 and CM2.

#### CM1

Alternative CM1 will displace or disrupt eighteen (18) cultural heritage landscapes and zero (0) built heritage resources.

#### CM2

Alternative CM2 will displace or disrupt sixteen (16) cultural heritage landscapes and zero (0) built heritage resources.

The cultural heritage resources, both built heritage resources and cultural heritage landscapes were identified for individual significance. All resources were considered equal in value no matter what the physical integrity or historical value. For example roadscape, an important part of the rural cultural environment are evaluated equally to farm complexes in terms of value to the cultural heritage.

### 2.5.2 Evaluation Results

Both routes were considered to have the same moderate impacts as similar resources would be impacted and a comparable number of resources would be impacted. Therefore, there is no distinction between the routes from a cultural heritage perspective.

## 2.6 East Mainline – Enfield Road to Hwy 35/115

### 2.6.1 Net Effects Analysis

In the East Mainline section between Enfield Road and Highway 35/115, twelve (12) route alternatives exist; EM1 to EM12.

#### EM1

Alternative EM1 will displace or disrupt twenty-three (23) cultural heritage landscapes and two (2) built heritage resources.

#### EM2

Alternative EM2 will displace or disrupt twenty-five (25) cultural heritage landscapes and one (1) built heritage resource.

#### EM3

Alternative EM3 will displace or disrupt twenty-five (25) cultural heritage landscapes and one (1) built heritage resource.

#### EM4

Alternative EM4 will displace or disrupt twenty-three (23) cultural heritage landscapes and zero (0) built heritage resources.

#### EM5

Alternative EM5 will displace or disrupt twenty-three (23) cultural heritage landscapes and one (1) built heritage resource.

#### EM6

Alternative EM6 will displace or disrupt twenty-two (22) cultural heritage landscapes and one (1) built heritage resource.

#### EM7

Alternative EM7 will displace or disrupt twelve (12) cultural heritage landscapes and two (2) built heritage resources.

#### EM8

Alternative EM8 will displace or disrupt nineteen (19) cultural heritage landscapes and two (2) built heritage resources.

#### EM9

Alternative EM9 will displace or disrupt nineteen (19) cultural heritage landscapes and two (2) built heritage resources.

#### EM10

Alternative EM10 will displace or disrupt seventeen (17) cultural heritage landscapes and three (3) built heritage resources.

#### EM11

Alternative EM11 will displace or disrupt thirty-three (33) cultural heritage landscapes and two (2) built heritage resources.

#### EM12

Alternative EM12 will displace or disrupt twenty-three (23) cultural heritage landscapes and four (4) built heritage resources.

### 2.6.2 Evaluation Results

In evaluating the impacts associated with the East Mainline route alternatives, the cultural heritage resources, both built heritage resources and cultural heritage landscapes were identified for individual significance. All resources were considered equal in value no matter what the physical integrity or historical value. For example roadscape, an important part of the rural cultural environment are evaluated as equal to farm complexes in terms of value to the cultural heritage environment and to the potential impacts that may occur from linear corridor development. .

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Route EM7 resulted in the fewest impacts to cultural heritage landscapes twelve (12) and built heritage resources two (2). These impacts were considered LOW in comparison with all other route alternatives. Route EM11 resulted in the greatest impacts to cultural heritage landscapes thirty-three (33) and built heritage resources two (2). These impacts were considered HIGH in comparison with all other route alternatives. All other route alternatives were considered moderate; impacting between seventeen (17) and twenty-five (25) cultural heritage landscapes. As the range of built heritage resources differed from only zero (0) to four (4) resources it was considered to small a range to be considered a single determining factor. The cumulative number of cultural heritage resources was the determinate. Therefore the preferred alternative is Route EM7.

## 2.7 West Link

### 2.7.1 Net Effects Analysis

West Mainline route alternatives WM1 was determined as the preferred alternative. Therefore, in the west link section, between Highway 401 and Highway 407 nine route alternatives exist; WL1 to WL9.

#### WL1

Alternative WL1 will displace or disrupt nine (9) cultural heritage landscapes and two (2) built heritage resources.

#### WL2

Alternative WL2 will displace or disrupt nine (9) cultural heritage landscapes and six (6) built heritage resources.

#### WL3

Alternative WL3 will displace or disrupt eight (8) cultural heritage landscapes and one (1) built heritage resources.

#### WL4

Alternative WL4 will displace or disrupt ten (10) cultural heritage landscapes and two (2) built heritage resources.

#### WL5

Alternative WL5 will displace or disrupt eight (8) cultural heritage landscapes and three (3) built heritage resources.

#### WL6

Alternative WL6 will displace or disrupt seven (7) cultural heritage landscapes and two (2) built heritage resources.

#### WL7

Alternative WL7 will displace or disrupt seven (7) cultural heritage landscapes and three (3) built heritage resources.

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#### WL8

Alternative WL8 will displace or disrupt five (5) cultural heritage landscapes and two (2) built heritage resources.

#### WL9

Alternative WL9 will displace or disrupt eight (8) cultural heritage landscapes and two (2) built heritage resources.

### 2.7.2 Evaluation Results

The West Link demonstrated a greater numerical range from high to low for both cultural heritage landscapes and built heritage resources. This resulted in being able to qualify impacts for each resource type within an individual link.

In evaluating the impacts associated with West Link route alternatives. Route WL8 resulted in the fewest impacts to cultural heritage landscapes five (5) and built heritage resources two (2). These impacts were considered LOW and MODERATE respectively in comparison with all other route alternatives. Route WL2 resulted in the greatest impact to cultural heritage resources in comparison with all other route alternatives. These impacts were considered HIGH for built heritage resources six (6) and MODERATE for cultural landscape resources nine (9). Route WL3 has low impacts to built heritage resources one (1) but results in moderate impacts to cultural heritage landscapes eight (8). Route WL4 has the highest impacts to cultural heritage landscapes ten (10) but results in moderate impacts to built heritage resources two (2). For all other routes, (WL1; WL5; WL 6; WL7) impacts to cultural heritage resources were considered moderate. Route WL8 is the preferred alternative with respect to the displacement or disruption of cultural heritage resources. The cultural heritage resources, both built heritage resources and cultural heritage landscapes were identified for individual significance. All resources were considered equal in value no matter what the physical integrity or historical value. For example roadscape, an important part of the rural cultural environment are evaluated as equal to farm complexes in terms of value to the cultural heritage

## 2.8 East Link

### 2.8.1 Net Effects Analysis

East Mainline route alternative EM7 was determined as the preferred route alternative. Therefore, in the East Link section, between Highway 401 and Highway 407, thirteen (13) alternatives exist; EL1 to EL 13.

#### EL1

Alternative EL1 will displace or disrupt twelve (12) cultural heritage landscapes and two (2) built heritage resources.

#### EL2

Alternative EL2 will displace or disrupt twelve (12) cultural heritage landscapes and two (2) built heritage resources.

**EL3**

**Alternative EL3 will displace or disrupt** thirteen (13) cultural heritage landscapes and two (2) built heritage resources.

**EL4**

Alternative EL4 will displace or disrupt fifteen (15) cultural heritage landscapes and three (3) built heritage resources.

**EL5**

Alternative EL5 will displace or disrupt twelve (12) cultural heritage landscapes and three (3) built heritage resources.

**EL6**

Alternative EL6 will displace or disrupt fourteen (14) cultural heritage landscapes and four (4) built heritage resources.

**EL7**

Alternative EL7 will displace or disrupt eleven (11) cultural heritage landscapes and four (4) built heritage resources.

**EL8**

Alternative EL8 will displace or disrupt twelve (12) cultural heritage landscapes and four (4) built heritage resources.

**EL9**

Alternative EL9 will displace or disrupt ten (10) cultural heritage landscapes and four (4) built heritage resources.

**EL10**

Alternative EL10 will displace or disrupt thirteen (13) cultural heritage landscapes and four (4) built heritage resources.

**EL11**

Alternative EL11 will displace or disrupt fourteen (14) cultural heritage landscapes and four (4) built heritage resources.

**EL12**

Alternative EL12 will displace or disrupt fifteen (15) cultural heritage landscapes and three (3) built heritage resources.

**EL13**

Alternative EL13 will displace or disrupt thirteen (13) cultural heritage landscapes and three (3) built heritage resources.

**2.8.2 Evaluation Results**

In evaluating the impacts associated with the route alternatives, Routes EL1, EL2, and E9 resulted in the fewest impacts to cultural heritage landscapes and built heritage resources in comparison to all other route alternatives. These impacts were considered LOW. Routes EL4, EL11 and EL12 resulted in the greatest impacts to cultural heritage resources and these impacts were considered HIGH. For all other routes (EL3; EL5; EL6; EL7; EL8; EL10; EL13) impacts were considered MODERATE. Routes EL1, EL2 and EL9 are the preferred route alternatives.

**3. Summary****West Mainline:**

The net effects are moderate for both routes. Therefore, Routes WM1 and WM2 are tied for first in preference with respect to cultural heritage impacts.

**Central Mainline:**

The net effects are moderate for both routes. Therefore, Routes CM1 and CM2 are tied for first in preference with respect to cultural heritage impacts.

**East Mainline:**

The net effects for Route EM7 are low relative to all other routes with respect to built heritage resources and cultural heritage landscapes. Therefore, Route EM7 is the preferred route alternative.

**West Link:**

The net effects for Route WL3 are low relative to all other routes with respect to built heritage resources and with respect to cultural heritage landscapes the net effects for Route WL8 are low relative to all other routes. Route WL8 is the preferred route alternative as it least impacts cultural heritage resources.

**East Link:**

The net effects for Route EL1, EL2 and EL9 are low relative to all other routes with respect to built heritage resources and cultural heritage landscapes. Therefore, Routes EL1, EL2 and EL9 are tied for first in preference.