



Ministry of Transportation

# 407 East Environmental Assessment

Alternative Methods Technical Report  
(Technical)

## FINAL DRAFT

August 2007

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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 Technical 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 Technical Study Team

A study team consisting of TSH, MRC and URS staff undertook the Technical assessment and evaluation of route alternatives. The actual individuals and their specific roles are provided as follows:

- *Mike Delsey P. Eng., – TSH Project Director, Highway Planning*
- *Brenda Jamieson, P. Eng. – TSH Project Manager, Highway Planning and Design*
- *Tim Sorochinsky, P. Eng. – URS Project Manager, Highway Planning and Design*
- *Karen Cooper, P. Eng. – URS Project Engineer, Highway Planning and Design*
- *Michael Chiu – MRC Project Manager, Highway Planning and Design*
- *Brent Gotts – MRC Project Engineer, Highway Planning and Design*

## 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

Prior to undertaking the net effects analysis, the evaluation criteria, indicators, and measures previously developed were confirmed for application to each of the alternative routes.

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.

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The following final list of criteria, indicators and measures were used for the net effects analysis and comparative evaluation of route alternatives from a Technical perspective:

**Criteria: Traffic Nuisance**

Factor Area: Social Environment

Indicator: Potential for diversion of longer distance travel to/from local roadways.

Data Source: Traffic volume projections from Region of Durham and local municipalities.

Measure: Qualitative assessment of Level of traffic infiltration experienced in adjacent areas.

**Criteria: Overall Transportation System Performance**

Factor Area: Technical Considerations

Indicator: Out of Way Travel

Data Source: Travel Demand Forecasting Model results

Measure: Qualitative assessment of directness of route alternative

Indicator: Support for Transit Services

Data Source: Travel Demand Forecasting Model results

Measure: Qualitative assessment of proximity of alternative to built up areas

**Criteria: Transportation System Compatibility**

Factor Area: Technical Considerations

Indicator: Transportation Network Compatibility

Data Source: Durham Transportation Master Plan, Durham Transit Improvement Plan, GO Transit Expansion Plans and Greater Toronto Area Airport Authority Expansion Plans

Measure: Qualitative measure of compatibility of alternative with existing/planned road network and provincial highway network

**Criteria: Transportation System Connectivity**

Factor Area: Technical Considerations

Indicator: Ability of each alternative to support or connect to existing or proposed travel modes

Data Source: Federal, provincial, GO Transit and municipal studies and reports regarding existing and proposed transportation system improvements

Measure: Number of possible connection nodes between alternative and other modes (existing and planned)

**Criteria: Accessibility**

Factor Area: Technical Considerations

Indicator: Accessibility of alternative to population and employment centres

Data Source: Official plans, base mapping and aerial photography

Measure: Qualitative measure of proximity of alternative to trip origin/destinations

**Criteria: Emergency Access**

Factor Area: Technical Considerations

Indicator: Impact of alternative on emergency access to adjacent lands

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Data Source: Emergency services locations (ambulance stations, hospitals, etc.) and base mapping

Measure: Qualitative impact of change in emergency access/routing

**Criteria: Cost**

Factor Area: Technical Considerations

Indicator: Examines the construction costs associated with each alternative.

Data Source: MTO, Region and Municipal data on unit costs for construction

Measure: Quantitative construction cost based on unit cost per kilometre of new corridor

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

The results of the net effects analysis are summarized in the following sections of this report with the details documented in tabular format in Supporting Documents 1 to 5 of the Alternative Methods Report.

**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 results of the net effects analysis are summarized in the following sections of this report with the details documented in tabular format in Supporting Documents 1 to 5 of the Alternative Methods Report.

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

The long list of alternative routes included four alternative routes for the 407 Mainline through the Brock Road to Audley Road area. However, the screening process, documented in the Alternative Methods Report, resulted in only one alternative route being carried forward to the short list. Hence, this route was the preferred route for this segment of the mainline.

The route length is 6.4 kilometres. The route is direct.

The route has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to the existing urban centres of Ajax and Pickering and the hamlets of Brougham and Greenwood.

The route is highly compatible with the existing and planned road network. The route is compatible with the proposed Brock Road realignment east of the Village of Brougham and the proposed Westney Road realignment east of the Hamlet of Greenwood. However, a realignment of Highway 7 will be required in the vicinity of the proposed Brock Road By-Pass.

The route can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Brock Road, Highway 407E/Westney Road, and at Highway 407E/Salem Road.

The route is highly accessible to population and employment centres. Full interchanges can be accommodated at Brock Road, Westney Road and Salem Road.

The route provides interchange access for emergency services via interchanges at Brock Road, Westney Road and Salem Road. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

## 2.3 West Mainline – Audley Road to Ashburn Road

### 2.3.1 Net Effects Analysis

#### WM1

The areas where traffic nuisance could be experienced are the communities of Kinsale, Macedonian Village and Brooklin. Low volumes of traffic in the vicinity of Lakeridge Road could be diverted east or west to the interchanges at Salem Road and Cochrane Street.

The route length for Alternative WM1 (measured between Audley Road and Ashburn Road) is 4.8 kilometres. The route is direct.

Alternative WM1 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to the existing urban centres of Ajax, Whitby and Pickering and the hamlets of Kinsale, Macedonian Village and Brooklin.

WM1 is highly compatible with the existing and planned road network. WM1 is generally north of Highway 7, and crosses Highway 7 west of Ashburn Road. For WM1, no road realignments are required.

Alternative WM1 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Salem Road, Highway 407E/West Link, and at Highway 407E/Cochrane Street.

WM1 provides high accessibility to population and employment centres. Full interchanges can be accommodated at Salem Road and at Cochrane Street with a freeway to freeway interchange connecting Highway 407E and the West Link either west of Lakeridge Road (node W24) or at Lakeridge Road (node W25). Partial diamond interchanges can be accommodated at Lakeridge Road and Cochrane Street with a freeway to freeway interchange connecting Highway 407E and the West Link east of Lakeridge Road (node W26). The partial interchange at Lakeridge Road would allow N/S-W and W-N/S traffic movements. The partial interchange at Cochrane Street would allow N/S-E and E-N/S traffic movements.

Alternative WM1 provides interchange access for emergency services via interchanges at Salem, the West Link and Cochrane Road. Concentrations of emergency services in Whitby are located south of Taunton Road, east of Lakeridge Road. Concentrations of emergency services in Ajax are located south of Rossland Road, west of Lakeridge Road. There is a police station/firehall on Brock Road north of Highway 7 and a firehall in Brooklin. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for WM1 is approximately \$118M.

#### WM2

The areas where traffic nuisance could be experienced are the communities of Kinsale, Macedonian Village and Brooklin. Low volumes of traffic in the vicinity of Lakeridge Road could be diverted east or west to the interchanges at Salem Road and Cochrane Street.

The route length for Alternative WM2 (measured between Audley Road and Ashburn Road) is 4.8 kilometres. The route is direct.

Alternative WM2 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is close to the existing urban centres of Ajax, Whitby and Pickering and the hamlets of Kinsale, Macedonian Village and Brooklin.

WM2 is moderately compatible with the existing and planned road network. Realignment of Highway 7 is required in order to accommodate the freeway to freeway interchange S-E ramp, the 170 metre right-of-way for Highway 407E and to achieve desirable separation between the intersection of Highway 7/Cochrane Street and the Highway 407E partial diamond interchange at Cochrane Street.

Alternative WM2 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Salem Road, Highway 407E/West Link, and at Highway 407E/Cochrane Street.

WM2 provides medium accessibility to population and employment centres. A full interchange can be accommodated at Salem Road and a partial interchange can be accommodated at Cochrane Street with a freeway to freeway interchange at Lakeridge Road (node W25) or east or west of Lakeridge Road (nodes W24 and W26). A partial diamond interchange can be accommodated at Lakeridge Road with a freeway to freeway interchange east of Lakeridge Road (node W26). The partial interchange at Lakeridge Road would allow N/S-W and W-N/S traffic movements. The partial interchange at Cochrane Street would allow N/S-E and E-N/S traffic movements.

Alternative WM2 provides interchange access for emergency services via interchanges at Salem, the West Link and Cochrane Road. Concentrations of emergency services in Whitby are located south of Taunton Road, east of Lakeridge Road. Concentrations of emergency services in Ajax are located south of Rossland Road, west of Lakeridge Road. There is a police station/firehall on Brock Road north of Highway 7 and a firehall in Brooklin. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network. A slightly greater response time will be required to access Cochrane Road from Highway 407E or realigned Highway 7, since both of these crossings will be grade separated.

The preliminary construction cost for Alternative WM2 is approximately \$120M. The higher construction cost for Alternative WM2 is associated with the realignment of Highway 7.

### 2.3.2 Evaluation Results

WM1 and WM2 are equally preferred in terms of **Overall Transportation System Performance**, **Transportation System Connectivity**, **Emergency Access** and **Cost** as summarized below:

- Both routes are equal in length and direct.
- Both routes have high potential to support or attract transit ridership.
- Both routes can accommodate transit stations at key interchange locations.
- Both routes can provide improved emergency access.
- The cost differential between Alternatives WM1 and WM 2 is less than 5%.

In terms of **Transportation System Compatibility**, WM1 has higher compatibility with the local transportation network, since no realignment of Highway 7 is required along this portion of the study area, whereas WM2 requires the realignment of Highway 7 to accommodate the West Link interchange and the 170 metre right-of-way for Highway 407E/transitway.

WM1 is preferred in terms of **Accessibility**, since there would be a full interchange at Cochrane Street for a freeway to freeway interchange either west or at Lakeridge Road and a partial diamond interchange at Cochrane Street for a freeway to freeway interchange east of Lakeridge Road. WM2

is less desirable, since it would require a partial interchange at Cochrane Street for all three freeway to freeway connection alternatives.

For the above noted reasons, Alternative WM1 is the preferred alternative for the West Mainline from Audley Road to Ashburn Road.

## 2.4 Central Mainline – Ashburn Road to Simcoe Street

### 2.4.1 Net Effects Analysis

The long list of alternative routes included seven alternative routes for the 407 Mainline through the Ashburn Road to Simcoe Street area. However, the screening process, documented in the Alternative Methods Report, resulted in only one alternative route being carried forward to the short list. Hence, this route was the preferred route for this segment of the mainline.

The route length is approximately 6 kilometres. The route is direct.

The route has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to the existing urban centre of Whitby and Oshawa and Brooklin.

The route is highly compatible with the existing and planned road network. No road realignments are required.

The route can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Brock Street/Baldwin Street, Highway 407E/Thickson Road and Highway 407E/Simcoe Street.

The route is highly accessible to population and employment centres. Full interchanges can be accommodated at Brock Street/Baldwin Street, Thickson Road and Simcoe Street.

The route provides interchange access for emergency services via interchanges at Brock Street, Thickson Road and Simcoe Street. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

## 2.5 Central Mainline – Simcoe Street to Enfield Road

### 2.5.1 Net Effects Analysis

It should be noted that there were no significant differences between Alternative Routes CM1 and CM2 in Overall Transportation System Performance, Transportation System Connectivity,

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Accessibility and Emergency Access. Thus, both routes were given a first-place ranking in those criteria, and these were not factors in a given route's ranking in Technical Considerations.

**CM1**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative CM1 is approximately 7.9 km. The route is direct.

Alternative CM1 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is close to the existing urban centre of Oshawa and Brooklin.

CM1 is moderately compatible with the existing and planned road network since a significant realignment of Winchester Road is required to accommodate the Simcoe Street Interchange and the proposed 407 Mainline alignment.

Alternative CM1 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Simcoe Street, Highway 407E/Harmony Road and Highway 407E/Enfield Road.

CM1 provides high accessibility to population and employment centres. Full interchanges can be accommodated at Simcoe Street, Harmony Road and Enfield Road.

Alternative CM1 provides interchange access for emergency services via interchanges at Simcoe Street, Harmony Road and Enfield Road. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative CM1 is approximately \$140M. The higher construction cost for Alternative CM1 is associated with the realignment of Winchester Road and the significant hydro relocation requirements given the less desirable crossing alignment of the hydro corridor (9 hydro towers directly impacted).

**CM2**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative CM2 is approximately 8.5 km. The route is direct.

Alternative CM2 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is close to the existing urban centre of Oshawa and Brooklin.

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CM2 is highly compatible with the existing and planned road network since only a minor realignment of Winchester Road is required to accommodate the Simcoe Street Interchange.

Alternative CM2 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Simcoe Street, Highway 407E/Harmony Road and Highway 407E/Enfield Road.

CM2 provides high accessibility to population and employment centres. Full interchanges can be accommodated at Simcoe Street, Harmony Road and Enfield Road.

Alternative CM2 provides interchange access for emergency services via interchanges at Simcoe Street, Harmony Road and Enfield Road. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative CM2 is approximately \$133M. The route only requires a minor realignment of Winchester Road and has a more desirable crossing of the hydro corridor resulting in reduced hydro relocation requirements (3 hydro towers directly impacted).

**2.5.2 Evaluation Results**

CM1 and CM2 are equally preferred in terms of **Overall Transportation System Performance, Transportation System Connectivity, Accessibility and Emergency Access** as summarized below:

- Routes are essentially equal in length and direct.
- Both routes have high potential to support or attract transit ridership.
- Both routes can accommodate transit stations at key interchange locations.
- Both routes can accommodate full moves interchanges at Simcoe Street, Harmony Road and Enfield Road.
- Both routes can provide improved emergency access.

In terms of **Transportation System Compatibility**, CM2 has higher compatibility with the local transportation network, since no significant realignment of Winchester Road is required, whereas CM1 requires a significant realignment of Winchester Road to accommodate the Simcoe Street Interchange and the proposed 407 Mainline alignment. Therefore, CM2 was ranked first.

In terms of **Cost**, CM2 ranked first since it has a lower relative cost. It only involves a minor realignment of Winchester Road and has a more desirable crossing of the hydro corridor resulting in reduced hydro relocation requirements. By contrast, CM1 requires a significant realignment of Winchester Road and has a less desirable crossing of the hydro corridor resulting in a higher overall cost for this alternative.

For the above noted reasons, Alternative CM2 is the preferred alternative for the Central Mainline from Simcoe Street to Enfield Road.

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

### 2.6.1 Net Effects Analysis

#### General

It should be noted that there were no significant differences between all of the 12 routes in Transportation System Connectivity and Emergency Access. Thus, each route was given a first-place ranking in those criteria, and these were not factors in a given route's ranking in Technical Considerations.

#### EM1

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EM1 is approximately 18 km. The route is direct.

Alternative EM1 has moderate potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is not situated close to major urban centres.

EM1 is moderately compatible with the existing and planned road network because improvements to the north-south arterial road network, beyond what is shown in Durham Region's Transportation Master Plan, would be required. Realignment of Old Scugog Road and Concession Road 7/8 are required and a longer extension of Darlington-Clarke Townline Road is required. Route EM1 does provide a seamless connection with Highway 115 to Peterborough.

Alternative EM1 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Enfield Road, Highway 407E/Regional Road 57, Highway 407E/Bethesda Road and Highway 35/115.

EM1 provides high accessibility to population and employment centres. Full interchanges are provided at Bethesda Rd. and Highway 35/115 and a partial or full interchange (depending on the choice of East Link route) is provided at Regional Road 57. Additionally, it allows for a full interchange at Taunton Road on the East Link.

Alternative EM1 has a high potential to improve emergency access/routing, with interchanges provided at Enfield Road, Regional Road 57, Bethesda Road and Highway 35/115. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EM1 is \$260M.

#### EM2

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EM2 is approximately 18 km. The route is direct.

Alternative EM2 has moderate potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is not situated close to major urban centres.

EM2 is moderately compatible with the existing and planned road network because improvements to the north-south arterial road network, beyond what is shown in Durham Region's Transportation Master Plan, would be required. Two realignments of Concession Road 7/8 are required and a longer extension of Darlington-Clarke Townline Road is required. Route EM2 does provide a seamless connection with Highway 115 to Peterborough.

Alternative EM2 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Enfield Road, Highway 407E/Regional Road 57, Highway 407E/Bethesda Road and Highway 35/115.

EM2 provides high accessibility to population and employment centres. Full interchanges are provided at Bethesda Rd. and Highway 35/115 and a partial or full interchange (depending on the choice of East Link route) is provided at Regional Road 57. Additionally, it allows for a full interchange at Taunton Road on the East Link.

Alternative EM2 has a high potential to improve emergency access/routing, with interchanges provided at Enfield Road, Regional Road 57, Bethesda Road and Highway 35/115. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EM2 is \$250M.

#### EM3

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EM3 is approximately 19 km. The route is direct.

Alternative EM3 has moderate potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is not situated close to major urban centres.

EM3 is moderately compatible with the existing and planned road network because improvements to the north-south arterial road network, beyond what is shown in Durham Region's Transportation Master Plan, would be required. Realignments of Concession Road 7 and Mosport Road are

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required and a longer extension of Darlington-Clarke Townline Road is required. Route EM3 does provide a seamless connection with Highway 115 to Peterborough.

Alternative EM3 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Enfield Road, Highway 407E/Regional Road 57, Highway 407E/Bethesda Road and Highway 35/115.

EM3 provides high accessibility to population and employment centres. Full interchanges are provided at Bethesda Rd. and Highway 35/115 and a partial or full interchange (depending on the choice of East Link route) is provided at Regional Road 57. Additionally, it allows for a full interchange at Taunton Road on the East Link.

Alternative EM3 has a high potential to improve emergency access/routing, with interchanges provided at Enfield Road, Regional Road 57, Bethesda Road and Highway 35/115. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EM3 is \$245M.

**EM4**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EM4 is approximately 20 km. The route is less direct than other alternatives.

Alternative EM4 has moderate potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is not situated close to major urban centres.

EM4 is highly compatible with the existing and planned road network because improvements to the north-south arterial road network, beyond what is shown in Durham Region's Transportation Master Plan, would be required. Realignment of Concession Road 7 and Concession Road 6/7 are required and a longer extension of Darlington-Clarke Townline Road is required. Route EM4 does provide a seamless connection with Highway 115 to Peterborough.

Alternative EM4 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Enfield Road, Highway 407E/Regional Road 57, Highway 407E/Bethesda Road and Highway 35/115.

EM4 provides high accessibility to population and employment centres. Full interchanges are provided at Bethesda Rd. and Highway 35/115 and a partial or full interchange (depending on the choice of East Link route) is provided at Regional Road 57. Additionally, it allows for a full interchange at Taunton Road on the East Link.

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Alternative EM4 has a high potential to improve emergency access/routing, with interchanges provided at Enfield Road, Regional Road 57, Bethesda Road and Highway 35/115. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EM4 is \$260M.

**EM5**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EM5 is approximately 23 km. The route is less direct than other alternatives.

Alternative EM5 has moderate potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is not situated close to major urban centres.

EM5 is highly compatible with the existing and planned road network because improvements to the north-south arterial road network, beyond what is shown in Durham Region's Transportation Master Plan, would be required. Realignment of Concession Road 7 and Concession Road 6/7 are required and a longer extension of Darlington-Clarke Townline Road is required. EM5 allows for the upgrading of Highway 35/115 north of Kirby to a higher class freeway standard. Route EM5 does provide a seamless connection with Highway 115 to Peterborough.

Alternative EM5 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Enfield Road, Highway 407E/Regional Road 57, Highway 407E/Bethesda Road and Highway 35/115.

EM5 provides moderate accessibility to population and employment centres. Full interchanges are provided at Bethesda Rd. and Highway 35/115 and a partial or full interchange (depending on the choice of East Link route) is provided at Regional Road 57. Additionally, it allows for a full interchange at Taunton Road on the East Link but also requires conversion of an existing full moves interchange at Concession Rd. 8 and Hwy 35/115 to a partial interchange (to-from the north).

Alternative EM5 has a high potential to improve emergency access/routing, with interchanges provided at Enfield Road, Regional Road 57, Bethesda Road and Highway 35/115. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EM5 is \$305M.

**EM6**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EM6 is approximately 16 km. The route is the least direct alternative resulting in out of way travel using of Highway 35/115.

Alternative EM6 has moderate potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is not situated close to major urban centres.

EM6 has a low degree of compatibility with the existing and planned road network because improvements to the north-south arterial road network, beyond what is shown in Durham Region's Transportation Master Plan, would be required. Realignment of Concession Road 7 and Concession Road 6/7 are required and a longer extension of Darlington-Clarke Townline Road is required. Route EM6 does not provide a seamless connection with Highway 115 to Peterborough and may preclude a potential future higher class freeway connection along Highway 35/115 to Highway 115.

Alternative EM6 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Enfield Road, Highway 407E/Regional Road 57, Highway 407E/Bethesda Road and Highway 35/115.

EM6 provides high accessibility to population and employment centres. Full interchanges are provided at Bethesda Rd. and Highway 35/115 and a partial or full interchange (depending on the choice of East Link route) is provided at Regional Road 57. Additionally, it allows for a full interchange at Taunton Road on the East Link.

Alternative EM6 has a high potential to improve emergency access/routing, with interchanges provided at Enfield Road, Regional Road 57, Bethesda Road and Highway 35/115. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EM6 is \$245M.

**EM7**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EM7 is approximately 19. km. The route is less direct than other alternatives.

Alternative EM7 has moderate potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is not situated close to major urban centres.

EM7 is highly compatible with the existing and planned road network because improvements to the north-south arterial road network, beyond what is shown in Durham Region's Transportation Master Plan, would be required. Realignments of Concession Road 6, Concession Road 6/7, and Mosport Road are required. Route EM7 does provide a seamless connection with Highway 115 to Peterborough.

Alternative EM7 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Enfield Road, Highway 407E/Regional Road 57, Highway 407E/Bethesda Road and Highway 35/115.

EM7 provides high accessibility to population and employment centres. Full interchanges are provided at Bethesda Rd. and Highway 35/115 and a partial or full interchange (depending on the choice of East Link route) is provided at Regional Road 57. Additionally, it allows for a full interchange at Taunton Road on the East Link.

Alternative EM1 has a high potential to improve emergency access/routing, with interchanges provided at Enfield Road, Regional Road 57, Bethesda Road and Highway 35/115. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EM7 is \$260M.

**EM8**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EM8 is approximately 20 km. The route is less direct than other alternatives.

Alternative EM8 has moderate potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is not situated close to major urban centres.

EM8 is highly compatible with the existing and planned road network because improvements to the north-south arterial road network, beyond what is shown in Durham Region's Transportation Master Plan, would be required. Realignments of Concession Road 6 and Concession Rd. 6/7 required are required. Route EM8 does provide a seamless connection with Highway 115 to Peterborough and allows for upgrading of Highway 35/115 to higher class freeway standards north of Kirby. EM8 results in Highway 35/115 and Highway 407 running nearly in parallel between Best Road and Highway 35/115.

Alternative EM1 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Enfield Road, Highway 407E/Regional Road 57, Highway 407E/Bethesda Road and Highway 35/115.

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EM8 provides high accessibility to population and employment centres. Full interchanges are provided at Bethesda Rd. and Highway 35/115 and a partial or full interchange (depending on the choice of East Link route) is provided at Regional Road 57. Additionally, it allows for a full interchange at Taunton Road on the East Link.

Alternative EM8 has a high potential to improve emergency access/routing, with interchanges provided at Enfield Road, Regional Road 57, Bethesda Road and Highway 35/115. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EM8 is \$260M.

**EM9**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EM9 is approximately 23 km. The route is less direct than other alternatives.

Alternative EM9 has moderate potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is not situated close to major urban centres.

EM9 is highly compatible with the existing and planned road network because improvements to the north-south arterial road network, beyond what is shown in Durham Region's Transportation Master Plan, would be required. Realignment of Concession Road 6 and Concession Rd. 6/7 are required and a longer extension of Darlington-Clarke Townline Road is required. EM9 allows for the upgrading of Highway 35/115 north of Kirby to a higher class freeway standard and provides a seamless connection with Highway 115 to Peterborough.

Alternative EM9 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Enfield Road, Highway 407E/Regional Road 57, Highway 407E/Bethesda Road and Highway 35/115.

EM9 provides high accessibility to population and employment centres. Full interchanges are provided at Bethesda Rd. and Highway 35/115 and a partial or full interchange (depending on the choice of East Link route) is provided at Regional Road 57. Additionally, it allows for a full interchange at Taunton Road on the East Link.

Alternative EM9 has a high potential to improve emergency access/routing, with interchanges provided at Enfield Road, Regional Road 57, Bethesda Road and Highway 35/115. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

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The preliminary construction cost for Alternative EM9 is \$310M.

**EM10**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EM10 is approximately 16 km. The route is the least direct alternative resulting in out of way travel using of Highway 35/115.

Alternative EM10 has moderate potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is not situated close to major urban centres.

EM10 has a low degree of compatibility with the existing and planned road network because improvements to the north-south arterial road network, beyond what is shown in Durham Region's Transportation Master Plan, would be required. Realignments of Concession Road 6 and Concession Road 6/7 are required and a longer extension of Darlington-Clarke Townline Road is required. Route EM10 does not provide a seamless connection with Highway 115 to Peterborough and may preclude a potential future higher class freeway connection along Highway 35/115 to Highway 115.

Alternative EM10 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Enfield Road, Highway 407E/Regional Road 57, Highway 407E/Bethesda Road and Highway 35/115.

EM10 provides high accessibility to population and employment centres. Full interchanges are provided at Bethesda Rd. and Highway 35/115 and a partial or full interchange (depending on the choice of East Link route) is provided at Regional Road 57. Additionally, it allows for a full interchange at Taunton Road on the East Link.

Alternative EM10 has a high potential to improve emergency access/routing, with interchanges provided at Enfield Road, Regional Road 57, Bethesda Road and Highway 35/115. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EM10 is \$235M.

**EM11**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EM11 is approximately 22 km. The route is less direct than other alternatives.

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Alternative EM11 has moderate potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is not situated close to major urban centres.

EM11 is moderately compatible with the existing and planned road network because improvements to the north-south arterial road network, beyond what is shown in Durham Region's Transportation Master Plan, would be required. Realignment of Concession Road 7 and Concession Rd. 6/7 are required and a longer extension of Darlington-Clarke Townline Road is required. Route EM11 allows for the upgrading of Highway 35/115 north of Kirby to a higher class freeway standard and provides a seamless connection with Highway 115 to Peterborough.

Alternative EM11 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Enfield Road, Highway 407E/Regional Road 57, Highway 407E/Bethesda Road and Highway 35/115.

EM11 provides moderate accessibility to population and employment centres. Full interchanges are provided at Bethesda Rd. and Highway 35/115 and a partial or full interchange (depending on the choice of East Link route) is provided at Regional Road 57. EM11 requires conversion of an existing full moves interchange at Concession Road 8 and Highway 35/115 to a partial interchange (to-from the north)

Alternative EM11 has a high potential to improve emergency access/routing, with interchanges provided at Enfield Road, Regional Road 57, Bethesda Road and Highway 35/115. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EM11 is \$305M.

**EM12**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EM12 is approximately 22 km. The route is less direct than other alternatives.

Alternative EM12 has moderate potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is not situated close to major urban centres.

EM12 is moderately compatible with the existing and planned road network because improvements to the north-south arterial road network, beyond what is shown in Durham Region's Transportation Master Plan, would be required. Realignment of Concession Road 6 and Concession Rd. 6/7 are required and a longer extension of Darlington-Clarke Townline Road is required. Route EM12 does provide a seamless connection with Highway 115 to Peterborough.

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Alternative EM1 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Enfield Road, Highway 407E/Regional Road 57, Highway 407E/Bethesda Road and Highway 35/115.

EM12 provides high accessibility to population and employment centres. Full interchanges are provided at Bethesda Rd. and Highway 35/115 and a partial or full interchange (depending on the choice of East Link route) is provided at Regional Road 57. Route EM12 requires conversion of an existing full moves interchange at Concession Road 8 and Highway 35/115 to a partial interchange (to-from the north)

Alternative EM12 has a high potential to improve emergency access/routing, with interchanges provided at Enfield Road, Regional Road 57, Bethesda Road and Highway 35/115. Overall, response time will be shortened for emergency service vehicles using Highway 407E. Response times for most non-Highway 407E trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EM12 is \$295M.

**2.6.2 Evaluation Results**

- Routes EM1-EM4, EM7 and EM8 were all given first-place rankings for Technical Considerations. Each of these routes were advantaged by first-place rankings in Accessibility and Cost.
- Routes EM1-EM3 were advantaged in Overall Transportation System Performance because of the directness of the routes. They were disadvantaged in Transportation System Compatibility, as improvements to the north-south regional road network would be required, beyond those identified in Durham's Transportation Master Plan (TMP).
- Routes EM4, EM7 and EM8 were disadvantaged in Overall Transportation System Performance, as they required a relatively large diversion from north to south across the East Mainline area; however, these routes were advantaged in Transportation System Compatibility, as they do not require significant improvements to the north-south regional road network beyond those identified in Durham's TMP.
- The 6 first-place routes were selected as they offered advantages over the remaining 6 routes, and their relative advantages and disadvantages reasonably offset each other.
- Routes EM5, EM9, EM11 and EM12 were given second-place rankings as they were disadvantaged, as compared with the first-ranked routes, in Accessibility, Cost, and Overall Transportation System Performance; however, they were advantaged, relative to the two last-ranked routes (Routes EM6 and EM10), in Overall Transportation System Performance, and Transportation System Compatibility.
- Routes EM6 and EM10 were ranked last, as they do not allow for a continuous connection to Highway 115. Thus, trips from Highway 407 to Highway 115, and vice versa, would involve an

intermediate section of Highway 35/115, which is a lower-class facility than the other two highways.

## 2.7 West Link

### 2.7.1 Net Effects Analysis

#### General

The evaluation of the West Mainline from Audley Road to Ashburn Road (see section 2.3) identified Alternative WM1 as the preferred alternative. Therefore, only West Link Alternatives that connect to WM1 were considered in the Reasoned Argument evaluation of West Link Alternatives.

For all West Link alternatives, there is low potential for diversion of longer distance travel to and from local roadways parallel to the West Link. Existing north/south roads in the area include Lakeridge Road (Regional Road), Halls Road and Audley Road, the latter two having future designations as Type B Arterial Roads.

#### WL1

A partial diamond interchange on Highway 407E will minimize diversion of longer distance travel from west to north and from north to west.

The route length for Alternative WL1 is 10.5 kilometres. The route is direct.

Route WL1 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. It is close to the existing urban centres of Ajax, Whitby and Pickering.

This alternative is moderately compatible with the existing and planned road network. Realignment of 4 kilometres of Highway 401 is required to accommodate the Highway 401/West Link interchange. There is less than desirable spacing between the proposed West Link interchange and the Salem Road interchange on Highway 401. Realignment of 1.6 kilometres of Halls Road is required to accommodate an interchange at West Link/Taunton Road. Realignment of 1.6 kilometres of Coronation Road is required to accommodate the Highway 407E/West Link interchange.

The alternative can accommodate transit stations at key interchange locations. Transit stations have been designated at West Link/Dundas Street, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link interchanges.

Alternative WL1 provides high accessibility to population and employment centres. Full interchanges can be accommodated at Highway 401/West Link, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link. Partial interchanges can be accommodated at West Link/Dundas Street, West Link/Highway 7 and Highway 407E/Lakeridge Road. The partial

interchange at Dundas Street would allow traffic movements from east and west to north and from north to east and west. The partial interchange at Highway 7 would allow traffic movements from south to east and west and from east and west to south. The partial interchange at Lakeridge Road would allow traffic movements from west to north and south and from north and south to west.

This alternative can provide interchange access for emergency services via interchanges at Dundas Street, Rossland Road, Taunton Road and Highway 7. Concentrations of emergency services in Whitby are located south of Taunton Road, east of Lakeridge Road. Concentrations of emergency services in Ajax are located south of Rossland Road, west of Lakeridge Road. Overall, response time will be shortened for emergency service vehicles using the West Link. Response times for most non-West Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for WL1 is approximately \$254M. Additional structures and longer road realignments result in higher costs.

#### WL2

A partial diamond interchange on Highway 407E will minimize diversion of longer distance travel from west to north and from north to west.

The route length for Alternative WL2 is 10.4 kilometres. The route is direct.

The route has high potential to support or attract transit ridership through a dedicated transitway and transit stations. It is close to the existing urban centres of Ajax, Whitby and Pickering.

This alternative is moderately compatible with the existing and planned road network. Realignment of 4 kilometres of Highway 401 is required to accommodate the Highway 401/West Link interchange. There is less than desirable spacing between the proposed West Link interchange and the Salem Road interchange on Highway 401. Realignment of 1.2 kilometres of Halls Road is required to accommodate an interchange at West Link/Rossland Road. Realignment of 1.6 kilometres of Coronation Road is required to accommodate the Highway 407E/West Link interchange.

This alternative can accommodate transit stations at key interchange locations. Transit stations have been designated at West Link/Dundas Street, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link interchanges.

Alternative WL2 has high accessibility to population and employment centres. Full interchanges can be accommodated at Highway 401/West Link, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link. Partial interchanges can be accommodated at West Link/Dundas Street, West Link/Highway 7 and Highway 407E/Lakeridge Road. The partial interchange at Dundas Street would allow traffic movements from east and west to north and from north to east and west. The partial interchange at Highway 7 would allow traffic movements from

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south to east and west and from east and west to south. The partial interchange at Lakeridge Road would allow traffic movements from west to north and south and from north and south to west.

This alternative can provide interchange access for emergency services via interchanges at Dundas Street, Rossland Road, Taunton Road and Highway 7. Concentrations of emergency services in Whitby are located south of Taunton Road, east of Lakeridge Road. Concentrations of emergency services in Ajax are located south of Rossland Road, west of Lakeridge Road. Overall, response time will be shortened for emergency service vehicles using the West Link. Response times for most non-West Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for WL2 is approximately \$254M. Additional structures and longer road realignments result in higher costs.

**WL3**

A partial diamond interchange on Highway 407E will minimize diversion of longer distance travel from west to north and from north to west.

The route length for Alternative WL3 is 10.5 kilometres. The route is direct.

Route WL3 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. It is close to the existing urban centres of Ajax, Whitby and Pickering.

This alternative is moderately compatible with the existing and planned road network. Realignment of 4 kilometres of Highway 401 is required to accommodate the Highway 401/West Link interchange. There is less than desirable spacing between the proposed West Link interchange and the Salem Road interchange on Highway 401. Realignment of 1.6 kilometres of Halls Road is required to accommodate an interchange at West Link/Rossland Road. Realignment of 1.6 kilometres of Coronation Road is required to accommodate the Highway 407E/West Link interchange.

This alternative can accommodate transit stations at key interchange locations. Transit stations have been designated at West Link/Dundas Street, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link interchanges.

Alternative WL3 has high accessibility to population and employment centres. Full interchanges can be accommodated at Highway 401/West Link, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link. Partial interchanges can be accommodated at West Link/Dundas Street, West Link/Highway 7 and Highway 407E/Lakeridge Road. The partial interchange at Dundas Street would allow traffic movements from east and west to north and from north to east and west. The partial interchange at Highway 7 would allow traffic movements from south to east and west and from east and west to south. The partial interchange at Lakeridge Road would allow traffic movements from west to north and south and from north and south to west.

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This alternative can provide interchange access for emergency services via interchanges at Dundas Street, Rossland Road, Taunton Road and Highway 7. Concentrations of emergency services in Whitby are located south of Taunton Road, east of Lakeridge Road. Concentrations of emergency services in Ajax are located south of Rossland Road, west of Lakeridge Road. Overall, response time will be shortened for emergency service vehicles using the West Link. Response times for most non-West Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for WL3 is approximately \$254M. Additional structures and longer road realignments result in higher costs.

**WL4**

A partial diamond interchange on Highway 407E will minimize diversion of longer distance travel from west to north and from north to west.

The route length for Alternative WL4 is 10.2 kilometres. The route is direct.

Route WL4 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. It is close to the existing urban centres of Ajax, Whitby and Pickering.

This alternative is moderately compatible with the existing and planned road network. Realignment of 4 kilometres of Highway 401 is required to accommodate the Highway 401/West Link interchange. There is less than desirable spacing between the proposed West Link interchange and the Salem Road interchange on Highway 401. Realignment of 4.9 kilometres of Halls Road is required to accommodate the West Link between Dundas Street and Concession 5. Realignment of 1.6 kilometres of Coronation Road is required to accommodate the Highway 407E/West Link interchange.

This alternative can accommodate transit stations at key interchange locations. Transit stations have been designated at West Link/Dundas Street, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link interchanges.

Alternative WL4 has high accessibility to population and employment centres. Full interchanges can be accommodated at Highway 401/West Link, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link. Partial interchanges can be accommodated at West Link/Dundas Street, West Link/Highway 7 and Highway 407E/Lakeridge Road. The partial interchange at Dundas Street would allow traffic movements from east and west to north and from north to east and west. The partial interchange at Highway 7 would allow traffic movements from south to east and west and from east and west to south. The partial interchange at Lakeridge Road would allow traffic movements from west to north and south and from north and south to west.

This alternative provides interchange access for emergency services via interchanges at Dundas Street, Rossland Road, Taunton Road and Highway 7. Concentrations of emergency services in Whitby are located south of Taunton Road, east of Lakeridge Road. Concentrations of emergency

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services in Ajax are located south of Rossland Road, west of Lakeridge Road. Overall, response time will be shortened for emergency service vehicles using the West Link. Response times for most non-West Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for WL4 is approximately \$258M. Additional structures and longer road realignments result in higher costs.

**WL5**

For Alternative WL5, an interchange at Lakeridge Road is precluded by the Highway 407E/West Link interchange at that location. Therefore, traffic in that area will infiltrate local roads to gain access to Highway 407E via the nearest interchange at Salem Road to the west and Cochrane Street to the east.

The route length for Alternative WL5 is 10.2 kilometres. The route is direct.

Route WL5 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. It is close to the existing urban centres of Ajax, Whitby and Pickering.

This alternative is moderately compatible with the existing and planned road network. Realignment of 4 kilometres of Highway 401 is required to accommodate the Highway 401/West Link interchange. There is less than desirable spacing between the proposed West Link interchange and the Salem Road interchange on Highway 401. Approximately 11 kilometres of regional and local road reconstruction is required between Dundas Street and Highway 7. Lakeridge Road will be realigned along the existing Halls Road alignment between Dundas Street and Highway 407E to accommodate the West Link. The right-of-way for realigned Lakeridge Road will be the same as existing, to maintain the regional arterial roadway function of Lakeridge Road.

This alternative can accommodate transit stations at key interchange locations. Transit stations have been designated at West Link/Dundas Street, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link interchanges.

Alternative WL5 has moderate accessibility to population and employment centres. Full interchanges can be accommodated at Highway 401/West Link, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link. Partial interchanges can be accommodated at West Link/Dundas Street and West Link/Highway 7. The partial interchange at Dundas Street would allow traffic movements from east and west to north and from north to east and west. The partial interchange at Highway 7 would allow traffic movements from south to east and west and from east and west to south. This alternative does not provide for a partial interchange at Lakeridge Road to/from Highway 407E.

This alternative provides interchange access for emergency services via interchanges at Dundas Street, Rossland Road, Taunton Road and Highway 7. Concentrations of emergency services in Whitby are located south of Taunton Road, east of Lakeridge Road. Concentrations of emergency

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services in Ajax are located south of Rossland Road, west of Lakeridge Road. Overall, response time will be shortened for emergency service vehicles using the West Link. Response times for most non-West Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for WL5 is approximately \$259M. Additional structures and longer road realignments result in higher costs.

**WL6**

For Alternative WL6, an interchange at Lakeridge Road is precluded by the Highway 407E/West Link interchange near that location. Therefore, traffic in that area will infiltrate local roads to gain access to Highway 407E via the nearest interchange at Salem Road to the west and Cochrane Street to the east.

The route length for Alternative WL6 is 10.6 kilometres. This route is direct.

Route WL6 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. It is close to the existing urban centres of Ajax, Whitby and Pickering.

This alternative is highly compatible with the existing and planned road network. Realignment of 3.2 kilometres of Highway 401 is required to accommodate the Highway 401/West Link interchange. Realignment of 6.4 kilometres of Halls Road is required to accommodate the West Link between Dundas Street and Highway 7.

This alternative can accommodate transit stations at key interchange locations. Transit stations have been designated at West Link/Dundas Street, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link interchanges.

Alternative WL6 has moderate accessibility to population and employment centres. Full interchanges can be accommodated at Highway 401/West Link, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link. Partial interchanges can be accommodated at West Link/Dundas Street and West Link/Highway 7. The partial interchange at Dundas Street would allow traffic movements from east and west to north and from north to east and west. The partial interchange at Highway 7 would allow traffic movements from south to east and west and from east and west to south. This alternative does not provide for a partial interchange at Lakeridge Road to/from Highway 407E.

This alternative provides interchange access for emergency services via interchanges at Dundas Street, Rossland Road, Taunton Road and Highway 7. Concentrations of emergency services in Whitby are located south of Taunton Road, east of Lakeridge Road. Concentrations of emergency services in Ajax are located south of Rossland Road, west of Lakeridge Road. Overall, response time will be shortened for emergency service vehicles using the West Link. Response times for most non-West Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for WL6 is approximately \$252M. Additional structures and longer road realignments result in higher costs.

### **WL7**

A partial diamond interchange on Highway 407E will minimize diversion of longer distance travel from west to north and from north to west.

The route length for Alternative WL7 is 10.3 kilometres. The route is direct.

Route WL7 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. It is close to the existing urban centres of Ajax, Whitby and Pickering.

This alternative is highly compatible with the existing and planned road network. Realignment of 3.2 kilometres of Highway 401 is required to accommodate the Highway 401/West Link interchange. Realignment of 5.2 kilometres of Halls Road is required to accommodate the West Link between Dundas Street and Concession 5. Realignment of 1.6 kilometres of Coronation Road is required to accommodate the Highway 407E/West Link interchange.

This alternative can accommodate transit stations at key interchange locations. Transit stations have been designated at West Link/Dundas Street, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link interchanges.

Alternative WL7 has high accessibility to population and employment centres. Full interchanges can be accommodated at Highway 401/West Link, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link. Partial interchanges can be accommodated at West Link/Dundas Street, West Link/Highway 7 and Highway 407E/Lakeridge Road. The partial interchange at Dundas Street would allow traffic movements from east and west to north and from north to east and west. The partial interchange at Highway 7 would allow traffic movements from south to east and west and from east and west to south. The partial interchange at Lakeridge Road would allow traffic movements from west to north and south and from north and south to west.

This alternative provides interchange access for emergency services via interchanges at Dundas Street, Rossland Road, Taunton Road and Highway 7. Concentrations of emergency services in Whitby are located south of Taunton Road, east of Lakeridge Road. Concentrations of emergency services in Ajax are located south of Rossland Road, west of Lakeridge Road. Overall, response time will be shortened for emergency service vehicles using the West Link. Response times for most non-West Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for WL7 is approximately \$250M. Additional structures and longer road realignments result in higher costs.

### **WL8**

A partial diamond interchange on Highway 407E will minimize diversion of longer distance travel from west to north and from north to west.

The route length for Alternative WL8 is 10.1 kilometres. The route is direct.

Route WL8 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. It is close to the existing urban centres of Ajax, Whitby and Pickering.

This alternative is highly compatible with the existing and planned road network. Realignment of 3.2 kilometres of Highway 401 is required to accommodate the Highway 401/West Link interchange. Realignment of 1.3 kilometres of Halls Road is required to accommodate the West Link/Rossland interchange. Realignment of 1.6 kilometres of Coronation Road is required to accommodate the Highway 407E/West Link interchange.

This alternative can accommodate transit stations at key interchange locations. Transit stations have been designated at West Link/Dundas Street, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link interchanges.

Alternative WL8 has high accessibility to population and employment centres. Full interchanges can be accommodated at Highway 401/West Link, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link. Partial interchanges can be accommodated at West Link/Dundas Street, West Link/Highway 7 and Highway 407E/Lakeridge Road. The partial interchange at Dundas Street would allow traffic movements from east and west to north and from north to east and west. The partial interchange at Highway 7 would allow traffic movements from south to east and west and from east and west to south. The partial interchange at Lakeridge Road would allow traffic movements from west to north and south and from north and south to west.

This alternative provides interchange access for emergency services via interchanges at Dundas Street, Rossland Road, Taunton Road and Highway 7. Concentrations of emergency services in Whitby are located south of Taunton Road, east of Lakeridge Road. Concentrations of emergency services in Ajax are located south of Rossland Road, west of Lakeridge Road. Overall, response time will be shortened for emergency service vehicles using the West Link. Response times for most non-West Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative WL8, approximately \$240M, is 4 to 8 percent lower than other alternatives. Fewer structures and shorter road realignments result in a lower cost.

### **WL9**

For Alternative WL9, an interchange at Lakeridge Road is precluded by the Highway 407E/West Link interchange at that location. Therefore, traffic in that area will infiltrate local roads to gain

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access to Highway 407E via the nearest interchange at Salem Road to the west and Cochrane Street to the east.

The route length for Alternative WL9 is 10.3 kilometres. The route is direct.

Route WL9 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. It is close to the existing urban centres of Ajax, Whitby and Pickering.

This alternative is moderately compatible with the existing and planned road network. Realignment of 3.2 kilometres of Highway 401 is required to accommodate the Highway 401/West Link interchange. Approximately 11.5 kilometres of regional and local road reconstruction is required between Dundas Street and Highway 7. Lakeridge Road will be realigned along the existing Halls Road alignment between Dundas Street and Highway 407E to accommodate the West Link. The right-of-way for realigned Lakeridge Road will be the same as existing, to maintain the regional arterial roadway function of Lakeridge Road.

This alternative can accommodate transit stations at key interchange locations. Transit stations have been designated at West Link/Dundas Street, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link interchanges.

Alternative WL9 has moderate accessibility to population and employment centres. Full interchanges can be accommodated at Highway 401/West Link, West Link/Rossland Road, West Link/Taunton Road and Highway 407E/West Link. Partial interchanges can be accommodated at West Link/Dundas Street and West Link/Highway 7. The partial interchange at Dundas Street would allow traffic movements from east and west to north and from north to east and west. The partial interchange at Highway 7 would allow traffic movements from south to east and west and from east and west to south. This alternative does not provide for a partial interchange at Lakeridge Road to/from Highway 407E.

This alternative provides interchange access for emergency services via interchanges at Dundas Street, Rossland Road, Taunton Road and Highway 7. Concentrations of emergency services in Whitby are located south of Taunton Road, east of Lakeridge Road. Concentrations of emergency services in Ajax are located south of Rossland Road, west of Lakeridge Road. Overall, response time will be shortened for emergency service vehicles using the West Link. Response times for most non-West Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for WL9 is approximately \$255M. Additional structures and longer road realignments result in higher costs.

### 2.7.2 Evaluation Results

## Alternative Methods Technical Report (Technical)

Overall, WL8 is preferred of the nine alternatives, with WL7 ranked in second place. The governing criteria/indicators are Traffic Nuisance, Transportation System Compatibility, Accessibility and Cost.

The net effects for Alternatives WL1, WL2, WL3, WL4, WL7 and WL8 are high for **Accessibility** since these alternatives provide populations in North Durham Region access to employment centres to the west via the partial interchange at Lakeridge Road. The net effects for WL5, WL6 and WL9 are ranked moderate for Accessibility since they cannot accommodate a partial interchange at Lakeridge Road.

The net effects for Alternatives WL6, WL7 and WL8 are highest for **Transportation System Compatibility**. These alternatives require a minimum length of realignment for Highway 401, regional roads and local roads. The net effects for Alternatives WL1, WL2, WL3, WL4 and WL5 are medium for Transportation System Compatibility since the resulting Highway 401/West Link interchange is in close proximity to the interchange at Salem Road. The net effects for Alternative WL9 are also medium for Transportation System Compatibility due to longer realignments of regional and local roads.

The net effects for Alternative WL8 are low for **Cost** since this alternative requires fewer structures and shorter realignments of existing roadways. Therefore WL8 is the preferred alternative in this category. The net effects for all other alternatives are moderate, since construction costs would be 4 to 8 percent more.

For these reasons, Alternative WL8 is slightly preferred over Alternative WL7.

## 2.8 East Link

### 2.8.1 Net Effects Analysis

#### General

The evaluation of the East Mainline from Enfield Road to Highway 35/115 (see section 2.6) identified Alternative EM9 as the preferred alternative. Therefore, only East Link Alternatives that connect to EM9 were considered in the Reasoned Argument evaluation of East Link Alternatives.

It should be noted that there were no significant differences between all of the 13 routes in Overall Transportation System Performance, Transportation System Compatibility, Transportation System Connectivity, and Emergency Access. Thus, each route was given a first-place ranking in those criteria, and these were not factors in a given route's ranking in Technical Considerations.

#### EL1

There is low potential for traffic diversion to neighbouring communities.

## Alternative Methods Technical Report (Technical)

The route length for Alternative EL1 is approximately 9 km. The route is direct.

Alternative EL1 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to existing urban centres at the south end.

EL1 is highly compatible with the existing and planned road network. Realignment of the South Service Road is required and minor realignments of Hancock Road and Solina Road are required. Additionally, reconfiguration of the Highway 401/Courtice Road interchange is required.

Alternative EL1 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Bloor Street, Highway 407E/Highway 2, and Taunton Road.

EL1 provides moderate accessibility to population and employment centres. A full interchange is provided at Highway 2 and a partial interchange (to and from the south) is provided at Taunton Road. It precludes a full interchange at Enfield Road on the 407 East Mainline. A partial interchange to and from the west would be required at Enfield Road.

Alternative EL1 has a high potential to improve emergency access/routing, with interchanges provided at Highway 2 and Taunton Road. Overall, response time will be shortened for emergency service vehicles using the East Link. Response times for most non-East Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EL1 is \$325M.

**EL2**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EL2 is approximately 9 km. The route is direct.

Alternative EL2 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to existing urban centres at the south end.

EL2 is highly compatible with the existing and planned road network. Realignment of the South Service Road is required and minor realignments of Hancock Road and Solina Road are required. Additionally, reconfiguration of the Highway 401/Courtice Road interchange is required.

Alternative EL2 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Bloor Street, Highway 407E/Highway 2, and Taunton Road.

## Alternative Methods Technical Report (Technical)

EL2 provides high potential to improve accessibility to population and employment centres. A full interchange is provided at Highway 2 and a partial interchange (to and from the south) is provided at Taunton Road.

Alternative EL2 has a high potential to improve emergency access/routing, with interchanges provided at Highway 2 and Taunton Road. Overall, response time will be shortened for emergency service vehicles using the East Link. Response times for most non-East Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EL2 is \$445M.

**EL3**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EL3 is approximately 9 km. The route is direct.

Alternative EL3 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to existing urban centres at the south end.

EL3 is highly compatible with the existing and planned road network. Realignment of the South Service Road is required and minor realignments of Hancock Road and Solina Road are required. Additionally, reconfiguration of the Highway 401/Courtice Road interchange is required.

Alternative EL3 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Bloor Street, Highway 407E/Highway 2, and Taunton Road.

EL3 provides high potential to improve accessibility to population and employment centres. A full interchange is provided at Highway 2 and a partial interchange (to and from the south) is provided at Taunton Road.

Alternative EL3 has a high potential to improve emergency access/routing, with interchanges provided at Highway 2 and Taunton Road. Overall, response time will be shortened for emergency service vehicles using the East Link. Response times for most non-East Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EL3 is \$485M.

**EL4**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EL4 is approximately 9 km. The route is direct.

## Alternative Methods Technical Report (Technical)

Alternative EL4 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to existing urban centres at the south end.

EL4 is highly compatible with the existing and planned road network. Realignment of the South Service Road is required and minor realignments of Rundle Road, Hancock Road and Solina Road are required. Additionally, reconfiguration of the Highway 401/Courtice Road interchange is required.

Alternative EL4 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Bloor Street, Highway 407E/Highway 2, and Taunton Road.

EL4 provides high potential to improve accessibility to population and employment centres. A full interchange is provided at Highway 2 and a partial interchange (to and from the south) is provided at Taunton Road.

Alternative EL4 has a high potential to improve emergency access/routing, with interchanges provided at Highway 2 and Taunton Road. Overall, response time will be shortened for emergency service vehicles using the East Link. Response times for most non-East Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EL4 is \$335M.

**EL5**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EL5 is approximately 9 km. The route is direct.

Alternative EL5 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to existing urban centres at the south end.

EL5 is highly compatible with the existing and planned road network. Realignment of the South Service Road is required and minor realignments of Rundle Road, Hancock Road and Solina Road are required. Additionally, reconfiguration of the Highway 401/Courtice Road interchange is required.

Alternative EL5 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Bloor Street, Highway 407E/Highway 2, and Taunton Road.

## Alternative Methods Technical Report (Technical)

EL5 provides high potential to improve accessibility to population and employment centres. A full interchange is provided at Highway 2 and a partial interchange (to and from the south) is provided at Taunton Road.

Alternative EL5 has a high potential to improve emergency access/routing, with interchanges provided at Highway 2 and Taunton Road. Overall, response time will be shortened for emergency service vehicles using the East Link. Response times for most non-East Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EL5 is \$350M.

**EL6**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EL6 is approximately 9 km. The route is less direct than other alternatives.

Alternative EL6 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to existing urban centres at the south end.

EL6 is highly compatible with the existing and planned road network. Realignment of the South Service Road is required and minor realignments of Rundle Road, Hancock Road and Solina Road are required. Additionally, reconfiguration of the Highway 401/Courtice Road interchange is required.

Alternative EL6 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Bloor Street, Highway 407E/Highway 2, and Taunton Road.

EL6 provides high potential to improve accessibility to population and employment centres. A full interchange is provided at Highway 2 and a partial interchange (to and from the south) is provided at Taunton Road

Alternative EL6 has a high potential to improve emergency access/routing, with interchanges provided at Highway 2 and Taunton Road. Overall, response time will be shortened for emergency service vehicles using the East Link. Response times for most non-East Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EL6 is \$350M.

**EL7**

There is low potential for traffic diversion to neighbouring communities.

## Alternative Methods Technical Report (Technical)

The route length for Alternative EL7 is approximately 9 km. The route is direct.

Alternative EL7 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to existing urban centres at the south end.

EL7 is highly compatible with the existing and planned road network. Realignment of the South Service Road is required and minor realignments of Rundle Road Hancock Road and Solina Road are required. Additionally, reconfiguration of the Highway 401/Courtice Road interchange is required.

Alternative EL7 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Bloor Street, Highway 407E/Highway 2, and Taunton Road.

EL7 provides high potential to improve accessibility to population and employment centres. A full interchange is provided at Highway 2 and a partial interchange (to and from the south) is provided at Taunton Road.

Alternative EL7 has a high potential to improve emergency access/routing, with interchanges provided at Highway 2 and Taunton Road. Overall, response time will be shortened for emergency service vehicles using the East Link. Response times for most non-East Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EL7 is \$350M.

**EL8**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EL8 is approximately 9 km. The route is direct.

Alternative EL8 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to existing urban centres at the south end.

EL8 is highly compatible with the existing and planned road network. Realignment of the South Service Road is required and minor realignments of Rundle Road, Hancock Road and Solina Road are required. Additionally, reconfiguration of the Highway 401/Courtice Road interchange is required.

Alternative EL8 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Bloor Street, Highway 407E/Highway 2, and Taunton Road.

## Alternative Methods Technical Report (Technical)

EL8 provides high potential to improve accessibility to population and employment centres. A full interchange is provided at Highway 2 and a partial interchange (to and from the south) is provided at Taunton Road.

Alternative EL8 has a high potential to improve emergency access/routing, with interchanges provided at Highway 2 and Taunton Road. Overall, response time will be shortened for emergency service vehicles using the East Link. Response times for most non-East Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EL8 is \$285M.

**EL9**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EL9 is approximately 9 km. The route is direct.

Alternative EL9 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to existing urban centres at the south end.

EL9 is highly compatible with the existing and planned road network. Realignment of the South Service Road is required and minor realignment of Rundle Road is required. Additionally, reconfiguration of the Highway 401/Holt Road interchange is required.

Alternative EL9 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Bloor Street, Highway 407E/Highway 2, and Taunton Road.

EL9 provides high potential to improve accessibility to population and employment centres. A full interchange is provided at Highway 2 and a partial interchange (to and from the south) is provided at Taunton Road.

Alternative EL9 has a high potential to improve emergency access/routing, with interchanges provided at Highway 2 and Taunton Road. Overall, response time will be shortened for emergency service vehicles using the East Link. Response times for most non-East Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EL9 is \$380M.

**EL10**

There is low potential for traffic diversion to neighbouring communities.

## Alternative Methods Technical Report (Technical)

The route length for Alternative EL10 is approximately 9 km. The route is direct.

Alternative EL10 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to existing urban centres at the south end.

EL10 is highly compatible with the existing and planned road network. Realignment of the South Service Road is required and minor realignment of Rundle Road is required. Additionally, reconfiguration of the Highway 401/Holt Road interchange is required.

Alternative EL10 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Bloor Street, Highway 407E/Highway 2, and Taunton Road.

EL10 provides high potential to improve accessibility to population and employment centres. A full interchange is provided at Highway 2 and a partial interchange (to and from the south) is provided at Taunton Road

Alternative EL10 has a high potential to improve emergency access/routing, with interchanges provided at Highway 2 and Taunton Road. Overall, response time will be shortened for emergency service vehicles using the East Link. Response times for most non-East Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EL10 is \$335M.

**EL11**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EL11 is approximately 9 km. The route is direct.

Alternative EL11 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to existing urban centres at the south end.

EL11 is highly compatible with the existing and planned road network. Realignment of the South Service Road is required and minor realignment of Rundle Road is required. Additionally, reconfiguration of the Highway 401/Holt Road interchange is required.

Alternative EL11 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Bloor Street, Highway 407E/Highway 2, and Taunton Road.

## Alternative Methods Technical Report (Technical)

EL11 provides high potential to improve accessibility to population and employment centres. A full interchange is provided at Highway 2 and a partial interchange (to and from the south) is provided at Taunton Road.

Alternative EL11 has a high potential to improve emergency access/routing, with interchanges provided at Highway 2 and Taunton Road. Overall, response time will be shortened for emergency service vehicles using the East Link. Response times for most non-East Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EL11 is \$330M.

**EL12**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EL12 is approximately 9 km. The route is direct.

Alternative EL12 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to existing urban centres at the south end.

EL12 is highly compatible with the existing and planned road network. Realignment of the South Service Road is required and minor realignments of Rundle Road and Holt Road are required. Additionally, reconfiguration of the Highway 401/Holt Road interchange is required.

Alternative EL12 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Bloor Street, Highway 407E/Highway 2, and Taunton Road.

EL12 provides high potential to improve accessibility to population and employment centres. A full interchange is provided at Highway 2 and a partial interchange (to and from the south) is provided at Taunton Road.

Alternative EL12 has a high potential to improve emergency access/routing, with interchanges provided at Highway 2 and Taunton Road. Overall, response time will be shortened for emergency service vehicles using the East Link. Response times for most non-East Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EL12 is \$420M.

**EL13**

There is low potential for traffic diversion to neighbouring communities.

The route length for Alternative EL13 is approximately 9 km. The route is direct.

## Alternative Methods Technical Report (Technical)

Alternative EL13 has high potential to support or attract transit ridership through a dedicated transitway and transit stations. This route alternative is situated close to existing urban centres at the south end.

EL13 is highly compatible with the existing and planned road network. Realignment of the South Service Road is required and minor realignments of Rundle Road and Holt Road are required. Additionally, reconfiguration of the Highway 401/Holt Road interchange is required.

Alternative EL13 can accommodate transit stations at key interchange locations. Transit stations have been designated at Highway 407E/Bloor Street, Highway 407E/Highway 2, and Taunton Road.

EL13 provides high potential to improve accessibility to population and employment centres. A full interchange is provided at Highway 2 and a partial interchange (to and from the south) is provided at Taunton Road.

Alternative EL13 has a high potential to improve emergency access/routing, with interchanges provided at Highway 2 and Taunton Road. Overall, response time will be shortened for emergency service vehicles using the East Link. Response times for most non-East Link trips will remain the same since there are no significant changes proposed for the local road network.

The preliminary construction cost for Alternative EL13 is \$420M.

### 2.8.2 Evaluation Results

- Routes EL7 and EL8 were ranked first in Technical Considerations as they were the only routes with first-place rankings under every criterion. Almost all routes were equivalent under every criterion except for cost. Under the assumption that provincially significant wetlands (PSWs) would be spanned, there were substantial differences in the estimated costs. As routes EL7 and EL8 involved relatively short traversals of PSWs, their costs were lower than the other routes.
- The remaining routes were ranked primarily by cost, resulting in second-place rankings for Routes EL4-EL6, EL10 and EL11. While Route EL1 was ranked second for cost, it was disadvantaged in Accessibility, and was thus ranked third. Also ranked third was Route EL9 due to cost.
- Routes EL2, EL12 and EL13 were ranked fourth because of high costs associated with PSW traversals.
- The last-ranked route was Route EL3, which had the highest cost as a result of long PSW traversals.

## 3. Summary

## Alternative Methods Technical Report (Technical)

On the basis of the technical considerations described in the preceding sections, the following preferred route or routes were identified for each section from a technical perspective:

- For the West Mainline from Brock Road to Audley Road, a single alternative route was identified through the long list to short list screening process. The route is direct, provides high support for transit services, is highly compatible with the existing and planned road network, and provides high accessibility to population and employment centres.
- For the West Mainline from Audley Road to Ashburn Road, Route WM1 is preferred. The route is direct, provides high support for transit services and provides high accessibility to population and employment centres. Furthermore, it has higher compatibility with the local transportation network, since no realignment of Highway 7 is required.
- For the Central Mainline from Ashburn Road to Simcoe Street, a single alternative route was identified through the long list to short list screening process. The route is direct, provides high support for transit services, is highly compatible with the existing and planned road network, and provides high accessibility to population and employment centres.
- For the Central Mainline from Simcoe Street to Enfield Road, Route CM2 is preferred. The route is direct, provides high support for transit services, is highly compatible with the existing and planned road network and provides high accessibility to population and employment centres. It does not require a significant realignment of Winchester Road, resulting in a lower relative cost. Furthermore, it results in a more desirable crossing of the hydro corridor, resulting in reduced hydro relocation requirements relative to Route CM1.
- For the East Mainline from Enfield Road to Highway 35/115, Routes EM1 to EM4, EM7 and EM8 were all given first-place rankings. Each of these routes were advantaged by first-place rankings in Accessibility and Cost. Routes EM1 to EM3 were disadvantaged in Transportation System Compatibility with second place rankings; however, this was offset by their first place rankings in Overall Transportation System Performance. Similarly, Routes EM4, EM7 and EM8 were disadvantaged in Overall Transportation System Performance but this was offset by their first place rankings in Transportation System Compatibility.
- For the West Durham Link, Route WL8 is preferred, while Route WL7 ranked a close second. Routes WL8 and WL7 are both direct routes. They provide high support for transit services, are highly compatible with the existing and planned route network and provide high accessibility to population and employment centres. However, Route WL8 has the lowest relative cost since it requires fewer structures and shorter realignments of existing roadways.
- For the East Durham Link, Routes EL7 and EL8 were ranked as first as they were the only routes with first-place rankings under every criterion. Almost all routes were equivalent under every criterion except for cost. As Routes EL7 and EL8 involved relatively short traversals of provincially significant wetlands, their costs were lower than the other routes.