

Winchester and Thicksen Road, a home building centre located at Winchester Road, a gas station and animal clinic located along Winchester Road.

The majority of this section of the Central Mainline crosses Class 1 – 3 lands. Smaller areas of Class 4 – 7 lands are crossed in this section and are located within the lower elevation areas and stream channels.

No specialty crop areas were affected in this area. Two (2) dairy/livestock operations would be affected. Seventeen (17) field crop operations would be affected, resulting in the loss of land and severance of property. Seven (7) farm properties greater than 20 ha would be impacted due to the loss of land and potential severance of property. Seven (7) parcels of land greater than 20 ha and three (3) parcels less than 20 ha would be created.

Two (2) high investment agricultural operations would be affected. These operations included two livestock operations located west of County Road 12 south of Highway 7 and east of County Road 12 south of Highway 7. Both operations comprise large barns, concrete silos and ancillary buildings. The proposed route will sever the farm buildings from portions of the land base for the farm operation on the west side of County Road 12. The farm on the east side of County Road 12 will be severed and portions of the farm buildings will be consumed.

No properties with the potential for site contamination will be directly impacted by this route segment in urban areas. However, one (1) property with the potential for site contamination will be directly impacted by this route segment in a rural area. The property is a landscaping and gardening supply centre with a high potential for site contamination.

One (1) former waste disposal site will be disturbed by this route segment, and has a high potential for site contamination. Under the EPA, no land used for the disposal of waste may be used for any other purpose, if the waste disposal site has been closed for less than 25 years, without a Minister's Order.

Cultural Environment

There are no known archaeological sites but more than 50% of the segment is identified as having archaeological potential. The potential for adverse effects to known archaeological sites is low while there is a potentially high net effect for areas of archaeological potential.

Fourteen (14) cultural heritage landscapes and zero (0) built heritage resources will be displaced or disrupted by this route alternative.

Technical Considerations

This route is highly accessible to population and employment centres. Full interchanges can be accommodated at Brock Street, Thicksen Road and Simcoe Street. Traffic nuisance could be experienced for the community of Brooklin.

Summary of net effects:

- High transportation compatibility
- High accessibility to population and employment centres

5.5 Section 4 – Central Mainline, Simcoe Street to Enfield Road

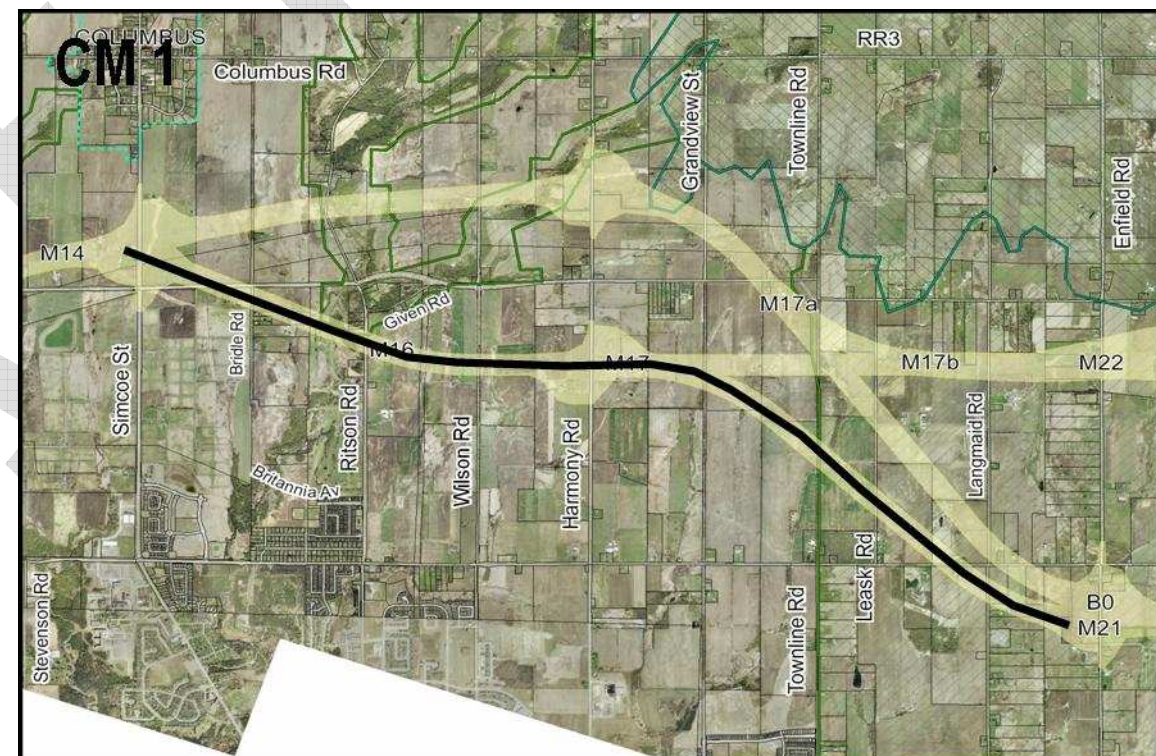
5.5.1 Net Effects Analysis

The following provides the key net environmental effects for the two routes within Section 4. Refer to the Specialist Reports in **Appendices E through M** and **Supporting Document #2** for additional information.

5.5.1.1 Route CM1

Route CM1 is illustrated in **Figure 5.6**.

Figure 5.6: Route Alternative CM1



Natural Environment

This route crosses a predominantly agricultural area where most of the natural vegetation features have been previously cleared/removed. Given the high level of anthropogenic influence in this setting, the most important natural feature is the valley system associated with Oshawa Creek East. It is noted that at the route crossing location, the valley system consists of discontinuous remnant patches of valley forest in a golf course setting.

The new valley crossing will result in the permanent removal of some valley vegetation that includes woodland and open golf course turf/scattered trees.

The ESA boundary breaks at the golf course (i.e. the ESA ends just north of the golf course and resumes south) so the valley crossing would be at the south tip of the ESA in this location. ESA avoidance might be possible with a slight route shift to the south.

Oshawa Creek East has high sensitivity fish and fish habitat. Overall potential impacts to fish and fish habitat will be greatly reduced by meander belt spanning structures, anticipated avoidance of instream works and implementation of stormwater management measures (e.g. water quality treatment, water quantity control and controlled discharge to creeks).

The crossing of Harmony Creek Tributary A near Townline Road is common to both route alternatives. Fish and fish habitat is confirmed about 750 m downstream of the route crossings and is yet to be confirmed at the route crossing. It is anticipated that appropriate crossing design will avoid impacts to the fish and fish habitat, should it be confirmed as present.

All other watercourses crossed by the route are agricultural field swales with no fish habitat.

Summary of net effects:

- 1 permanent watercourse crossing (Oshawa Creek East).
- At least 16 intermittent watercourse crossings.
- 2 online ponds within the route alternative footprint
- 354 m of high sensitivity fish habitat being crossed (Oshawa Creek East – meander bend and golf course – portions of valley more open). Assumes major bridge spanning both valleys – no piers in water.
- 590 m of watercourses with unconfirmed fish and fish habitat sensitivity within the route alternative footprint.
- 930 m of watercourses with low fish and fish habitat sensitivity within the footprint
- 10.0 ha of vegetation removed
- A single Butternut in very poor condition was observed in vegetation unit CLEA-1. However, the exact location of the Butternut relative to the route alternative must be confirmed to determine impact.
- Approximately 2.0 ha of unevaluated wetlands in 7 communities are located within the route alternative footprint.
- East of Townline Road the route encroaches into an area adjacent (within 120 m) of the Solina Bog PSW
- 1.4 ha of valley vegetation removed
- There are no known wildlife species of conservation concern or Species At Risk within 50 m of the route alternative.
- There is 1 new ESA crossing.
- There is 1 new crossing of a major wildlife movement corridor within a golf course setting.
- Route CM1 covers 218 ha of low permeability soil, crosses 20 ha of high permeability soil, is near to the Solina Wetland Complex, intersects 11 water wells within the route and associated interchange footprints, and, intersects 23 shallow water wells in low permeability soil and 10 shallow water wells in high permeability soil within 500 m of the route and associated interchange footprints.

Social Environment

There are low impacts with respect to the community fabric indicator for the south route extending from Simcoe Street to Enfield Road. A significant portion of a golf course will be displaced resulting in a lost recreational opportunity.

Property impacts are ranked high with this route, as there are a total of 60 property impacts, with 15 residential displacements.

There are 102 noise sensitive receptors that could potentially be impacted by this route alternative and 90 sensitive receptors that potentially could be impacted from an air quality perspective.

Summary of net effects:

- No encroachment on existing communities
- Displaces a significant portion of a golf course
- 60 properties affected, including 15 residential displacements
- 102 noise sensitive receptors
- 90 air quality sensitive receptors

Land Use/Economic Environment

There is a high degree of compatibility with Provincial/Municipal land use strategies as the route is partially identified in the Durham Regional Official Plan. The route has the opportunity for stimulating development opportunities for future employment lands in north Oshawa.

Route CM1 would result in the displacement of a significant portion of a golf course. The route severs the north third of a golf facility, removing approximately 7 holes of the 18 holes. Approximately 30 employees would be displaced as a result of this route alternative.

Mineral aggregate resources are not impacted by this route alternative.

The majority of this section of the Central Mainline crosses Class 1 – 3 lands. Smaller areas of Class 4 – 7 lands are crossed in this section and are located within the lower areas and stream channels.

No specialty crop areas or operations were observed or affected in this area. One livestock operation would be affected by this proposed route. Thirty-five (35) field crop operations would be affected, resulting in the loss of land and severance of property. Twenty four (24) farm properties greater than 20 ha would be impacted due to the loss of land and potential severance of property. Sixteen (16) parcels of land greater than 20 ha and 21 parcels less than 20 ha would be created.

Two high investment agricultural operations would be affected. One operation is a grain drying operation located west of County Road 2 (Simcoe Street) north of County Road 3. This route would result in a severance of a portion of the field operations from the main farm buildings and the total consumption of the farm buildings. The second is a livestock operation located north of Concession 6 and west of Langmaid Road.

No properties with the potential for site contamination will be directly impacted by this route segment in urban areas. However, one (1) property with the potential for site contamination will be directly impacted by this route segment in rural areas. The property is a registered waste generator with a low potential for site contamination. No (known) operating or closed waste management facilities will be disturbed.

Summary of net effects:

- High compatibility with the provincial/municipal and private land use development strategies
- Displaces one business (golf course)
- No specialty crop areas/operations affected
- One livestock operation and thirty-five field crop operations affected
- Two high investment agricultural operations affected
- One property with potential for site contamination directly impacted

Cultural Environment

There are no known archaeological sites but more than 50% of the segment is identified as having archaeological potential. The potential for adverse effects to known significant archaeological sites is low while there is a potentially high net effect for areas of archaeological potential.

Eighteen (18) cultural heritage landscapes and zero (0) built heritage resources will be displaced or disrupted by this route alternative.

Technical Considerations

- Route CM1 was ranked second for Technical Considerations.
- This route was tied for first for the following criteria: Overall Transportation System Performance, Transportation System Connectivity, Accessibility and Emergency Access.
- This route ranked second in Transportation System Compatibility because it requires a significant realignment of Winchester Road.
- Route CM1 ranked second under the Cost criterion. The estimated cost of the route, excluding property costs, is \$140 million. The route results in a less desirable crossing of the hydro corridor with 9 hydro towers directly affected.
- The route's second place ranking in Technical Considerations was a result of its second place rankings for Transportation System Compatibility and Cost.

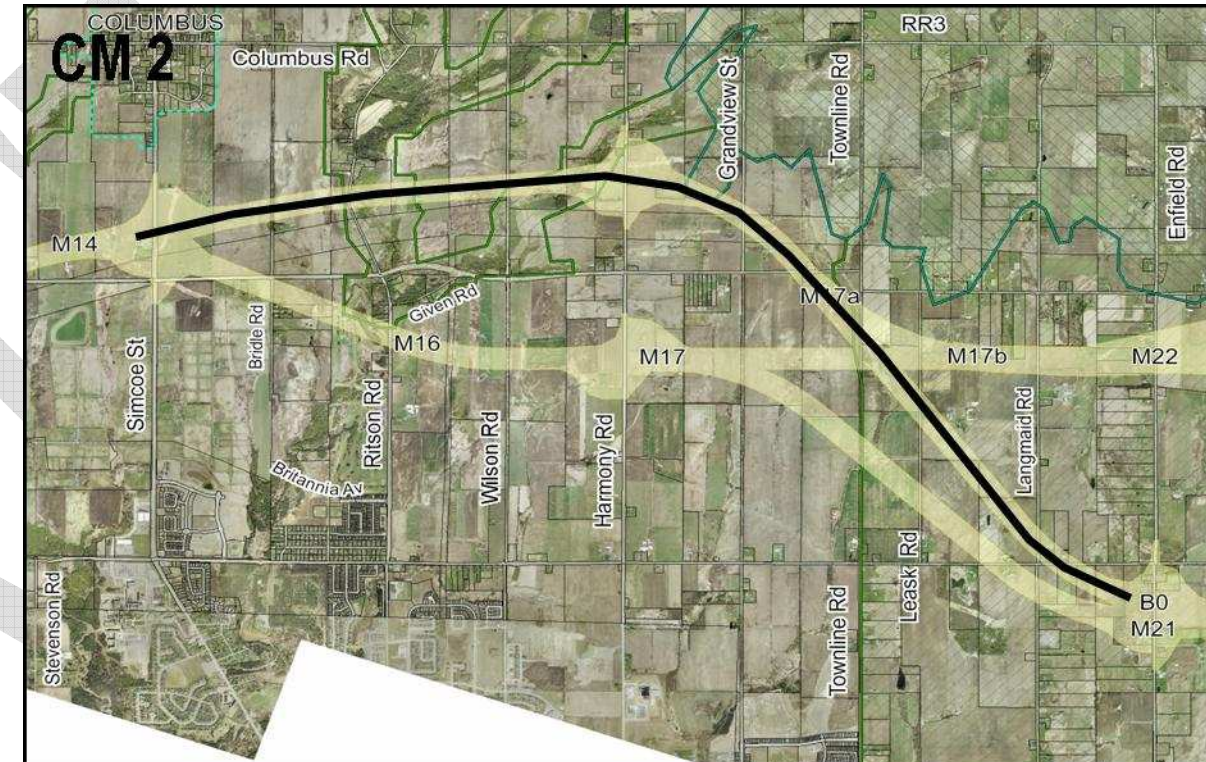
Summary of net effects:

- Direct route
- Major realignment of Winchester Road required
- Less desirable crossing of hydro corridor
- Higher relative cost

5.5.1.2 Route CM2

Route CM2 is illustrated in **Figure 5.7**.

Figure 5.7: Route Alternative CM2



Natural Environment

This route crosses a predominantly agricultural area where most of the natural vegetation features have been previously cleared/removed. Given the high level of anthropogenic influence in this setting, the most important natural features are the two valley systems associated with Oshawa Creek East and its tributary (Tributary E). These valley systems are designated as ESAs.

The two new valley crossings will result in the permanent removal of vegetation will introduce new disturbance at the valley crossings. Valley openings will be maintained but linkage quality may be reduced somewhat. Design measures to facilitate wildlife passage under the structures will be investigated during the design stage.

A portion of a relatively large deciduous woodlot (likely a sugar bush), located west of Grandview Street will be removed by the route.

Oshawa Creek East has high sensitivity fish and fish habitat and Tributary E has moderate sensitivity. Overall potential impacts to fish and fish habitat will be greatly reduced by meander belt spanning structures, anticipated avoidance of instream works and implementation of stormwater management measures (e.g. water quality treatment, water quantity control and controlled discharge to creeks).

Two tributaries have confluences with Tributary E within the footprint of the Harmony Road interchange. The potential for these tributaries to support direct fisheries and the sensitivity of any fish and fish habitat has not been confirmed. Based on the analysis it is likely that flow in these tributaries is intermittent and that the upper reaches are agricultural farm swales with no potential for direct fish use. The lower reaches of these tributaries occur in well-defined forested valleys and the potential for fish use may be greater. The route and interchange will likely require some modification to these tributaries.

The crossing of Harmony Creek Tributary A near Townline Road is common to both route alternatives. Fish and fish habitat is confirmed about 750 m downstream of the route crossings and is yet to be confirmed at the route crossing. It is anticipated that appropriate crossing design will avoid impacts to the fish and fish habitat, should it be confirmed as present.

All other watercourses crossed by the route are agricultural field swales with no fish habitat.

Summary of net effects:

- 2 permanent watercourse crossings (Oshawa Creek East and Tributary E) and major interchange abutting Tributary E valley and encompassing confluence of 2 tributaries of Tributary E.
- At least 14 intermittent watercourse crossings.
- 2 online ponds within route alternative footprint.
- 288 m of high sensitivity fish habitat in Oshawa Creek East being crossed at a relatively straight crossing in forest valley and thicket setting. Assumes major bridge spanning both valleys – no piers in water.
- 452 m of moderately sensitive fish habitat is within the route alternative footprint; this may be a challenging bridge/interchange configuration. Another 75 m of moderately sensitive fish habitat is affected by the Winchester Rd. realignment, east of Townline Road.
- 1470 m of low sensitivity fish habitat is within the route alternative footprint.
- 2105 m of unconfirmed sensitivity fish and fish habitat is within the route alternative footprint. Major enclosure anticipated within route alternative/interchange footprint.
- 13.6 ha of vegetation removed.
- Single Butternut tree in very poor condition observed in vegetation unit CLEA-1. However, the exact location of the Butternut relative to the route alternative must be confirmed to determine impact.
- Approximately 8.42 ha of unevaluated wetland vegetation in 15 communities of low to moderate quality.
- 5.4 ha of valley vegetation removed but no core/interior forest removed.
- There are no known wildlife species of conservation concern or Species At Risk within 50 m of route alternative.
- There are 2 new ESA crossings.
- The route alternative encroaches into the northern edge of the Solina Bog ESA.
- The route alternative crosses 2 creek valleys that currently provide good wildlife movement opportunities.
- Other tributary crossings are largely agricultural swales with variable (typically weak or no) connectivity to other natural areas.
- Route CM2 covers 228 ha of low permeability soil, crosses 32 ha of high permeability soil, is near to the Solina Wetland Complex, intersects 9 water wells within the route and associated interchange footprints, and, intersects 16 shallow water wells in low permeability soil and 12 shallow water wells in high permeability soil within 500 m of the route and associated interchange footprints.

Social Environment

There are low impacts with respect to the community fabric indicator for the north route extending from Simcoe Street to Enfield Road.

There are no recreational opportunities affected by this route.

Property impacts are ranked high with this route, as there are a total of 62 property impacts, with 17 residential displacements.

There are 70 noise sensitive receptors that could potentially be impacted by this route alternative and 45 sensitive receptors that could potentially be impacted from an air quality perspective.

Summary of net effects:

- No encroachment on existing communities
- 62 properties affected, including 17 residential displacements
- 70 noise sensitive receptors
- 45 air quality sensitive receptors

Land Use/Economic Environment

There is a moderate degree of compatibility with provincial/municipal land use strategies as the route is partially identified in the Durham Regional Official Plan. This route has the opportunity for providing transportation service and stimulating development opportunities for future employment lands in north Oshawa.

The route would result in no business displacements.

Mineral aggregate resources are not impacted by this route alternative.

The majority of this section of the Central Mainline crosses Class 1 – 3 lands. Smaller areas of Class 4 – 7 lands are crossed in this section and are located within the lower areas and stream channels.

No specialty crop areas or operations were observed or affected in this area. Two livestock operations would be affected by this proposed route. Thirty-two (32) field crop operations would be affected, resulting in the loss of land and severance of property. Twenty-three (23) farm properties greater than 20 ha would be impacted due to the loss of land and potential severance of property. Twenty-two (22) parcels of land greater than 20 ha and 20 parcels less than 20 ha would be created.

Two high investment agricultural operations would be affected. One is a grain drying operation located west of County Road 2 (Simcoe Street) north of County Road 3. This route would result in a severance of a portion of the field operations from the main farm buildings and the total consumption of the farm buildings. The other operation is a large livestock complex located south of County Road 3 and east of County Road 2.

No properties with the potential for site contamination will be directly impacted by this route segment in urban areas. However, one (1) property with the potential for site contamination will be directly impacted by this route segment in rural areas. The property is an agricultural equipment company and has a high potential for site contamination. No (known) operating or closed waste management facilities will be disturbed.

Summary of net effects:

- Moderate compatibility with the provincial/municipal and private land use development strategies
- No businesses displaced
- No specialty crop areas/operations affected
- Two livestock operations and thirty-two field crop operations affected
- Two high investment agricultural operations affected
- One property with potential for site contamination impacted

Cultural Environment

There are no known archaeological sites but more than 50% of the segment is identified as having high archaeological potential. The potential for adverse effects to known significant archaeological sites is low while there is a potentially high net effect for areas of archaeological potential.

Sixteen (16) cultural heritage landscapes and zero (0) built heritage resources will be displaced or disrupted by this route alternatives.

Technical Considerations

- Route CM2 was ranked first for Technical Considerations.
- This route was tied for first for the following criteria: Overall Transportation System Performance, Transportation System Connectivity, Accessibility and Emergency Access.
- This route ranked first in Transportation System Compatibility because it does not require a significant realignment of Winchester Road. Only a minor realignment is required.
- Route CM2 ranked first under the Cost criterion. The estimated cost of the route, excluding property costs, is \$133 million. The route results in a more desirable crossing of the hydro corridor with 3 hydro towers directly affected.
- The route's first place ranking in Technical Considerations was a result of its first place rankings for all criteria, including Transportation System Compatibility and Cost,

Summary of net effects:

- Direct route
- Minor realignment of Winchester Road required
- More desirable crossing of hydro corridor
- Lower relative cost

5.5.2 Comparative Evaluation

5.5.2.1 Reasoned Argument Results

The reasoned argument evaluation results for Section 4, the Central Mainline from Simcoe Street to Enfield Road, are summarized below, with the details provided in the Technical Specialist Reports in **Appendices E through M** and **Supporting Document #2**.

Natural Environment

Route CM1 was ranked first compared to Route CM2 from a Natural Environment Factor perspective because it has one less permanent watercourse crossing, only affects about one-third the length of unknown sensitive fish habitat, removes far less upland vegetation units with only 1 new valley crossing (ESA), affects far less core wildlife habitat, and has less net negative core natural area linkage effects.

Social Environment

Route CM2 was ranked first from a Social Environment Factor perspective because it is ranked 1ST or 2ND in the majority of its criteria, including most notably avoidance of recreational facilities.

Land Use/Economic Environment

Route CM2 ranked first in the Economic Factor area as it is most compatible with Provincial/Municipal Development Strategies and has the lowest net effect on Non-Farm Commercial Activities, namely the Businesses affected and employees displaced associated with the Kedron Dells Golf Course. The net effects for both routes are comparable from an agricultural perspective.

Technical Considerations

Route CM2 was ranked first compared to Route CM1 from a Technical Considerations Factor perspective because it does not require a significant realignment of Winchester Road, results in a more desirable crossing of the hydro corridor and has a lower cost.

Overall Ranking and Rationale for the Central Mainline

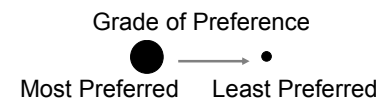
In summary, Route CM 2 is recommended for the following primary reasons:

- Fewer residential, business and recreational properties impacted
- Less significant noise and air quality effects
- Significantly less impact on the hydro corridor
- Does not require a significant realignment of Winchester Road

Table 5.4 provides a visual representation of the evaluation results.

Table 5.4: Visual Representation of Reasoned Argument Evaluation Results for Section 4, Central Mainline from Simcoe Street to Enfield Road

Factor Area	Alternative	CM1	CM2
Natural		●	●
Social		•	●
Land Use /Economic		•	●
Cultural		●	●
Technical		•	●
		Not Rec'd	Rec'd



5.5.2.2 Arithmetic Results

The arithmetic evaluation results for Section 4 confirmed that Route CM2 is the Technically Recommended Route from Simcoe Street to Enfield Road. Route CM2 ranked first in four of the five Factor areas based on the initial weightings and first overall with the various alternate weightings considered as part of the sensitivity testing. The arithmetic evaluation results are summarized in **Table 5.5**, with the details provided in **Supporting Document #2**.

Table 5.5: Arithmetic Evaluation Results for Section 4, Central Mainline from Simcoe Street to Enfield Road

Factor		Rankings Based on Initial Weights	
		Alternative CM1	Alternative CM2
Natural Environment (40%)		1	2
Social Environment (20%)		2	1
Land Use/Economic Environment (25%)		2	1
Cultural Environment (5%)		2	1
Technical Considerations (10%)		2	1
Overall Ranking		2	1
Sensitivity Analysis			
Factor		Rankings Based on Alternate Weights	
		Alternative CM1	Alternative CM2
Natural Environment	High (50%)	2	1
Natural Environment	Low (20%)	2	1
Social Environment	High (40%)	2	1
Social Environment	Low (10%)	2	1
Economic Environment	High (40%)	2	1
Economic Environment	Low (10%)	2	1
Cultural Environment	High (10%)	2	1

Table 5.5: Arithmetic Evaluation Results for Section 4, Central Mainline from Simcoe Street to Enfield Road

Cultural Environment	Low (5%)	2	1
Technical Environment	High (10%)	2	1
Technical Environment	Low (5%)	2	1
Stakeholder Weights		2	1
Overall Ranking		2	1

5.6 Section 5 – East Mainline, Enfield Road to Highway 35/115

5.6.1 Net Effects Analysis

The following provides the key net environmental effects for the 12 routes within Section 5. Refer to the Specialist Reports in **Appendices E through M** and **Supporting Document #3** for additional information.

5.6.1.1 Route EM1

Route EM1 is illustrated in **Figure 5.8**.

Figure 5.8: Route Alternative EM1



Natural Environment

There are 40 surface water features that need to be crossed along route EM1. Of these crossings there are 14 high quality streams, 13 moderate quality streams, 4 low quality streams, 4 ephemeral drainage features and 5 ponds.

This route affects 3980m of high sensitivity streams, of which 1190m would be spanned and 2790 would be crossed using culverts. Also, there are 4175m of moderate sensitivity fish habitat streams to cross using culverts