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UPDATED DRAFT

**PAVEMENT ENGINEERING FOR PLANNING REPORT
AREA OF CONTINUED ANALYSIS
DETROIT RIVER INTERNATIONAL CROSSING
WINDSOR, ONTARIO**

Submitted to:

URS Canada Inc.
75 Commerce Valley Drive East
Markham, Ontario
L3T 7N9

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March 14, 2008

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URS Canada Inc.
75 Commerce Valley Drive East
Markham, Ontario
L3T 7N9

Attention: Mr. M. Thompson, P. Eng.

**RE: PAVEMENT ENGINEERING FOR PLANNING REPORT
AREA OF CONTINUED ANALYSIS
DETROIT RIVER INTERNATIONAL CROSSING
WINDSOR, ONTARIO**

Dear Sirs:

This updated draft report presents the results of the review of the readily available geotechnical information for the pavement engineering component of the Detroit River International Crossing project together with the results of the analyses of the traffic data provided and planning level pavement design recommendations. The location of the Area of Continued Analysis for the project is shown on the Location Plan, Figure 1.

The purpose of this report is to provide pavement engineering input in support of the Detroit River International Crossing transportation corridor study. A group of consulting firms, lead by URS Canada Inc., is completing the work on behalf of the Ontario Ministry of Transportation (MTO). The MTO is one of the four principal members of the international partnership organized to study potential transportation corridors to permit more efficient transit of travelers and goods between the highway systems in the Windsor and Detroit areas.



We trust that this updated draft report provides all of the information that you presently require. If you require any additional information, or when you wish us to finalize this report, please contact this office.

Yours truly,

GOLDER ASSOCIATES LTD.

Michael E. Beadle, P. Eng.

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1.0 GENERAL DATA

1.1 Project Description

Current and projected cross-border traffic conditions in the greater Detroit and Windsor areas are such that a new crossing of the Detroit River is required. The pavement component of the project will generally consist of the upgrading of existing transportation routes and/or the construction of new roadways to connect Highway 401 in Ontario with the interstate highway system surrounding Detroit. The connection of the highway systems will require a new bridge crossing of the Detroit River and has the potential to include multiple overpass or underpass bridge structures and associated interchanges and/or grade separations along the connecting routes. Consideration may also be given to depressed pavement sections constructed between retaining structures to achieve grade separations. The Area of Continued Analysis (ACA) for the project is shown on the Key Plan, Figure 1.

At this time, six preliminary alternative transportation corridor configurations for the Ontario portion of the project have been established and are summarized as:

- Alternative 1a – one way service roads on either side of six lane freeway, at grade;
- Alternative 1b – one way service roads on either side of six lane freeway, below grade;
- Alternative 2a – six lane freeway at grade adjacent to Huron Church Road/Highway 3;
- Alternative 2b – six lane freeway below grade adjacent to Huron Church Road/Highway 3;
- Alternative 3 – cut and cover tunnel below reconstructed Huron Church Road/Highway 3 corridor; and
- Parkway Alternative - six lane freeway generally below grade between Highway 401 and Huron Church Road/E.C. Row Expressway interchange and at or above grade between Huron Church Road/E.C. Row Expressway interchange and Ojibway Parkway including 1.86 kilometres of short tunnels.

These alternatives are briefly discussed below:

1.1.1 Alternative 1A

Alternative 1A includes an at-grade freeway with below grade sections and one-way service roads on each side of the freeway. Interchanges are proposed at Highway 3, St. Clair College and Huron Church Road.

1.1.2 Alternative 1B

Alternative 1B includes a below grade freeway with one-way service roads on each side of the freeway. Interchanges are proposed at Highway 3, St. Clair College and Huron Church Road.

1.1.3 Alternative 2A

Alternative 2A includes an at-grade freeway with below grade sections which is predominantly aligned west of the existing Highway 3 and Huron Church Road. This section of Highway 3 and Huron Church Road would function as a service road to the freeway. Interchanges are proposed at Highway 3, Howard Avenue, Todd Lane/Cabana Road and Huron Church Road.

1.1.4 Alternative 2B

Alternative 2B includes a below grade freeway which is predominantly aligned west of the existing Highway 3 and Huron Church Road. This section of Highway 3 and Huron Church Road would function as a service road to the freeway. Interchanges are proposed at Highway 3, Howard Avenue, Todd Lane/Cabana Road and Huron Church Road.

1.1.5 Alternative 3

Alternative 3 is a cut and cover tunneled freeway with service roads (Highway 3 and Huron Church Road) constructed on top of the tunnel box. Interchanges are proposed at Highway 3, St. Clair College and Huron Church Road.

1.1.6 Parkway Alternative

The Parkway includes a below grade freeway with 1.86 kilometres of short tunnels. The freeway is predominantly aligned south of the existing Highway 3 and Huron Church Road. Existing Highway 3 and Huron Church Road would function as a service road to the freeway. Interchange ramps are proposed at Highway 3, Howard Avenue, St. Clair College, Todd Lane/Cabana Road and Huron Church Road.

1.2 Background Information

During the initial phases of the planning study, Golder Associates Ltd. (Golder Associates) compiled, reviewed and summarized the background geotechnical information available for the whole study area and the results were summarized in Golder Associates Draft "Interim Report on Pavements Engineering, Detroit River International Crossing, Windsor, Ontario" dated August 2005 which is attached in Appendix A.

The relevant information has been included in this report together with the pertinent information from Golder Associates Report No. 04-1111-060 entitled "Preliminary Foundation Investigation and Design Report, Detroit River International Crossing, Bridge Approach Corridor" Geocres No. 40J6-18 and dated June 2007.

1.3 Scope of Work

The scope of work to complete the Pavement Engineering Planning Report consists of:

- Concentrate the remainder of the Field Review in the Area of Continued Analysis (ACA).
- Assemble and compile borehole data, including information from the ongoing foundation investigations for the ACA.
- Analyze the traffic data provided by URS Canada Inc.
- Review the concept pavement designs, both rigid and flexible, provided by MTO in the Request for Proposal (RFP) for the project and suggest modifications, as appropriate. Emphasis has been placed on the Highway 401 extension with consideration also being given to the major City of Windsor streets.
- Carry out Life Cycle Costing of the pavement options.
- Prepare a Pavement Engineering Planning Report and submit in draft format for review and input.
- Finalize the report following receipt of comments from URS and MTO.

2.0 GEOTECHNICAL ENGINEERING CONDITIONS

2.1 Subsurface Data Review

Existing subsurface data was compiled and used to develop the soil classification maps attached in Appendix A for the whole study area. The information presented was gathered from Ministry of Transportation Ontario files (through the GEOCREs system), Golder Associates project files, Ontario Ministry of Natural Resources (MNR), and published papers and texts. These data were used to assist in constructing an electronic database of subsurface information and to map the soil classification throughout the Windsor area at the following approximate intervals of depth: 0.3, 1.5, 3.0, and 6.0 metres below existing ground surface at the borehole locations.

Subsurface data existing in Golder Associates and the Ministry of Transportation Ontario (MTO) GEOCREs library files for projects completed in Windsor and surrounding areas over the last 40 years were reviewed for this project using the following criteria:

- Available boreholes and test pits drilled or excavated from ground surface to a minimum depth of 3 metres, and
- One representative borehole or test pit per minimum area of 0.25 square kilometres, where available, within the City of Windsor and Towns of LaSalle and Tecumseh.

For the purposes of this report, the database has been adjusted to reflect the conditions within the Area of Continued Analysis. The database for the Area of Continued Analysis is provided in Appendix A.

2.2 Geology of the Windsor Area

The subsurface conditions in the Windsor area are characterized by regionally extensive, flat-lying soils including:

- Surface layers of miscellaneous fill materials in localized areas, generally associated with industrial and urban growth;
- Native deposits of sand and silt present at or near the surface in some locations, particularly in the west end of the City of Windsor and the Town of LaSalle;
- Beneath the sand, where present, extensive deposits of clayey silt to silty clay; and
- Bedrock throughout the study area is generally encountered at depths of 20 to 35 metres.

Figure 2 illustrates the Quaternary geology and outlines the general surficial sedimentary geology of the study area based on geologic interpretation of widely-spaced sample locations and an understanding of geomorphologic processes. It should be noted that only the natural sediments encountered closest to the surface are identified, and that other sediments may underlie these layers.

2.3 Sedimentary Geology

The study area is located in the physiographic region of Southwestern Ontario known as the St. Clair Clay Plains¹. Within this region, Essex County and the southwestern part of Kent County are normally discussed as a subregion known as the Essex Clay Plain. The clay plain was deposited during the retreat of the ice sheets during the late Pleistocene Era when a series of glacial lakes inundated the area. In general, the ice sheets deposited till in the area of Windsor and Detroit. Depending on the locations of the glacial ice sheets and depths of water in the ice-contact glacial lakes, the till may have been directly deposited at the contact between the ice sheet and the bedrock or, as the lake levels rose and the ice sheets retreated and floated, the soil and rock debris within and at the base of the ice may have been deposited through the lake water as lacustrine deposits. Glacial till, in its common usage, often indicates a very dense or hard condition resulting from consolidation and densification under the weight of the ice sheet. The mineral soil particles typically have a distribution of grain sizes ranging from cobbles to clay. However, in many areas of Windsor and Detroit, the soils described as “glacial till” were deposited through water and, as a result, have a softer consistency. A large end moraine of glacial till is mapped in the area of Windsor-Detroit, generally trending northwest to southeast near the outlet of Lake St. Clair as illustrated throughout Essex County near the terminus of Highway 401. In other areas, the lacustrine deposits overlie the hard glacial till. The major clay stratum, typically ranging in thickness from about 20 metres to 30 metres, exhibits a till-like structure exemplified by a random distribution of coarser particles within the primarily fine-grained silt and clay deposit.

Surficial layers or pockets of more typical layered lacustrine silty clay, silt or sand may be encountered overlying the extensive stratum of “till-like” silty clay. Silt and sand deposits, on the order of 2 to 4 metres thick, are often found near the ground surface in areas near the western side of Windsor and the southwestern limits of the Area of Continued Analysis.

¹ Chapman, L. J. and Putnam, D.F., *The Physiography of Southern Ontario*, 1984.

2.4 General Subsurface Conditions

The following sections describe the general subsurface conditions in the Area of Continued Analysis (ACA) at intervals of depth of approximately 0.3, 1.5, 3.0 and 6.0 metres below existing ground surface. The information was gathered from previous geotechnical investigations carried out by Golder Associates and others using the sources outlined in Section 2.1. The following descriptions of the subsurface conditions are generalized and should not be interpreted to be exact, nor used in the detail design of the pavement structure of the proposed corridor. Further detailed, site specific geotechnical investigation is required once the preferred corridor has been selected.

The subsurface database is provided in Appendix B and the locations of the previous boreholes summarized in the database are shown on Figure 3.

Beneath the existing pavement structure(s), topsoil and/or surficial fill materials, granular materials consisting of sand and gravel, sands and silty sands were identified at a depth of approximately 0.3 metres below existing ground surface in the E.C. Row Expressway/Ojibway Parkway area. More localized areas of sands and silty sands were also identified, predominantly adjacent to the E.C. Row Expressway between Ojibway Parkway and Huron Church Road. Elsewhere in the ACA, the subsurface conditions at approximately 0.3 metres below ground surface generally consist of silty clay to clayey silt with localized areas of surficial granular soils.

At approximately 1.5 metres depth, sands and sandy silts were identified in the E.C. Row Expressway/Ojibway Parkway area. Elsewhere within the ACA, the subsurface conditions consist of clayey silt to silty clay.

At approximately three metres depth, the subsurface conditions generally consist of clayey silt and/or silty clay in the ACA. Figure 5 illustrates the subsurface soil conditions at approximately three metres below existing ground surface in the ACA.

At approximately six metres depth, the subsurface conditions generally consist of clayey silt and/or silty clay throughout the ACA.

Groundwater levels are expected to be located about 2 to 3 metres below ground surface in the clayey silt and silty clay materials and will generally be defined by the location of the transition of the soil colour from brown to grey. It should be noted that one of the boreholes drilled for the foundations engineering component of the project encountered artesian groundwater pressures in the clayey silt. This borehole was drilled near the intersection of Ojibway Parkway and E.C. Row Expressway in the northwestern portion of the project.

2.5 Soil Characteristics Influencing Pavement Design

The subsurface conditions as described in this report have an important influence on the design of the pavement structures for the proposed transportation corridor. Two main factors affecting roadway pavement design are:

- frost susceptibility of the subgrade soil, which influences the design of the pavement structure component thicknesses; and
- soil erodibility, which influences the design of embankment surfacing and drainage ditches that may be proposed in the design of a proposed corridor.

2.6 Frost Susceptibility

The generalized subsurface conditions have been categorized as low, moderate or high frost susceptibility. At depths of about 1.2 to 1.5 metres, the subsurface conditions in the E.C. Row Expressway/Ojibway Parkway area indicate the presence of localized area of sands and silty sands, which are considered to have low to moderate frost susceptibility. This area also has areas of silty clay and clayey silt which are considered to have a low susceptibility to frost action. These are also the soils that occur at depth.

2.7 Soil Erodibility

It is anticipated that drainage ditches and embankments will be incorporated in the design of the proposed corridor. The subsurface conditions in the Area of Continued Analysis consist largely of clayey silt and silty clay with localized surficial areas of sand and gravel, sands and silty sand. The silty clay, clayey silt, sand and gravel and sands are considered to be slightly erodible and the silty sands are considered to be moderately erodible.

3.0 REVIEW OF AVAILABLE BACKGROUND INFORMATION

Following the review of the available geological mapping and information from our files to delineate, in a preliminary fashion, the general subsurface conditions in the area of the site, a detailed review of the files in our Windsor office was carried out to attempt to determine the characteristics of the existing pavements in the ACA. In addition, requests were made to the City of Windsor by URS and to the MTO by Golder Associates for any available background information regarding the existing pavement conditions in the study area. To date, no information has been provided by the City of Windsor.

3.1 Golder Associates Report 04-1111-060

Four deep boreholes, numbered 1, 7, 14 and 23, were advanced in conjunction with the foundation investigation portion of this project, and their locations are shown on the Location Plan, Figure 1. The following paragraphs summarize the subsurface conditions encountered in the upper portion of these boreholes as they relate to pavement design. The Records of Boreholes are provided in Appendix C.

3.1.1 Borehole Information

Borehole 1 – Highway 3 and Howard Avenue Area

About 0.3 metres of clayey topsoil was encountered at ground surface. The surficial topsoil had a natural moisture content of about 20 per cent.

Beneath the topsoil, a 3.6 metre thick layer of firm to very stiff silty clay was encountered. A single standard penetration test completed in the silty clay indicated an N value of 28 blows per 0.3 metres. The moisture content of the silty clay was about 15 to 18 per cent.

An extensive deposit of stiff clayey silt was encountered beneath the silty clay. The upper portion of the clayey silt had N values of 9 to 15 blows per 0.3 metres with moisture contents of about 16 to 18 per cent. In situ vane shear strength testing carried out in the upper portion of the clayey silt indicated undrained shear strengths of about 75 to 80 kilopascals (kPa) with vane sensitivities of 1.0 to 1.5. Below about 10 metres depth, the undrained shear strength was about 55 kPa with a vane sensitivity of 1.7. The clayey silt had corresponding average plastic and liquid limits of 13 and 25 per cent, respectively, based on two Atterberg limits determinations. The Atterberg limits data are shown on the Plasticity Chart, Figure 4.

Borehole 7 – Howard Avenue and Geraedts Drive Area

About 0.3 metres of clayey topsoil was encountered at ground surface. The surficial topsoil had an N value of 10 blows per 0.3 metres based on a standard penetration test partially completed in the topsoil with a natural moisture content of about 20 per cent.

Beneath the topsoil, a 3.6 metre thick layer of very stiff to hard clayey silt was encountered. The clayey silt had N values of 23 to 59 blows per 0.3 metres with moisture contents of about 13 per cent.

An extensive deposit of very stiff to firm clayey silt was encountered beneath the upper very stiff to hard clayey silt. The upper portion of the clayey silt had N values of 11 to 32 blows per 0.3 metres with moisture contents of about 14 to 19 per cent. In situ vane shear strength testing carried out in the upper portion of the clayey silt indicated undrained shear strengths of greater than 100 kPa above about 7 metres depth with a vane sensitivity of 1.3. Below about 7 metres depth, the undrained shear strength was about 55 to 70 kPa with vane sensitivities of 1.7 to 2.0. The clayey silt had corresponding average plastic and liquid limits of 12 and 25 per cent, respectively, based on three Atterberg limits determinations. The Atterberg limits data are shown on the Plasticity Chart, Figure 4.

Borehole 14 – Huron Church Road and Balmoral Drive Area

About 1.1 metres of silty clay fill was encountered at ground surface in borehole 14. The fill had an N value of 13 blows per 0.3 metres with an in situ moisture content of about 16 per cent. Beneath the silty clay fill, a 0.3 metre thick layer of silty sand and gravel fill was encountered.

A soft to very stiff layer of clayey silt about 4.1 metres thick was encountered beneath the fill. Silty clay layers were noted within the clayey silt. The clayey silt had N values of 4 to 14 blows per 0.3 metres with moisture contents of about 22 to 26 per cent. In situ vane testing in the clayey silt indicated undrained shear strengths of 115 to 120 kPa with vane sensitivities of 1.4 to 2.7. The clayey silt had corresponding plastic and liquid limits of 21 and 41 per cent, respectively, based on a single Atterberg limits determination. The Atterberg limits data are provided on Figure 4.

Beneath the upper soft to very stiff clayey silt, an extensive deposit of firm to stiff clayey silt was encountered at 5.5 metres depth or at about elevation 176.6 metres. The upper portion of the clayey silt had an N value of 7 blows per 0.3 metres with moisture contents of about 20 to 23 per cent. In situ vane shear strength testing carried out in the upper portion of the clayey silt indicated undrained shear strengths of 58 to 77 kPa with vane sensitivities of 1.7 to 3.2. The clayey silt had corresponding average plastic and liquid

limits of 15 and 31 per cent, respectively, based on two Atterberg limits determinations. The Atterberg limits data are shown on the Plasticity Chart, Figure 4.

Borehole 23 – E.C. Row Expressway and Ojibway Parkway Area

About 0.3 metres of silty sand fill was encountered at ground surface in borehole 23. Beneath the fill, about 0.3 metres of sandy topsoil and 1.1 metres of sandy silt was encountered.

A stiff to very stiff layer of clayey silt about 2.7 metres thick was encountered beneath the sandy silt. The clayey silt had N values of 6 to 15 blows per 0.3 metres with moisture contents of about 21 to 24 per cent. In situ vane testing in the clayey silt indicated undrained shear strengths of 105 to 120 kPa with vane sensitivities of 2.8 to 2.9. The clayey silt had corresponding plastic and liquid limits of 17 and 28 per cent, respectively, based on a single Atterberg limits determination. The Atterberg limits data are provided on Figure 4.

Beneath the upper stiff to very stiff clayey silt, an extensive deposit of soft to very stiff clayey silt was encountered at about 4.4 metres depth or about elevation 174.5 metres. This layer extended to about 20.7 metres depth or about elevation 158.2 metres. The upper portion of the clayey silt had N values of 1 to 5 blows per 0.3 metres with moisture contents of about 23 to 36 per cent. In situ vane shear strength testing carried out in the upper portion of the clayey silt indicated undrained shear strengths of 25 to 43 kPa with vane sensitivities of 1.8 to 3.5. The clayey silt had corresponding average plastic and liquid limits of 15 and 27 per cent, respectively, based on two Atterberg limits determinations. The Atterberg limits data are shown on the Plasticity Chart, Figure 4.

3.1.2 Field Vane and Piezocone Penetration Testing (CPT) Information

In addition to the above, rigorous in situ vane testing was carried out adjacent to each borehole and piezocone penetration testing (CPT) was carried out at regular intervals along the alignment. The locations of the CPTs and field vane testing are shown on the Plan, Figure 1. Summaries of the undrained shear strength measurements carried out during the investigation using field vane and CPT methods are provided on Figures 5, 6 and 7.

3.2 Ministry of Transportation Background Information

The MTO provided the available background information for sections of roadway under their jurisdiction in the form of Region Geotechnical Pavement Condition Reports. The relevant information from these are summarized in the following sections.

Highway 401 Eastbound Lanes - Walker Road to the terminus of Highway 401 (surveyed May 2005 and June 2007)

- Original grading carried out under Contract 55-138.
- Granular base and paving carried out under Contract 55-23 and consisted of 225 millimetres of plain jointed concrete pavement (JPCP) over 100 millimetres of Granular A and 125 millimetres of Granular C.
- Contract 73-172 consisted of an asphalt overlay consisting of 50 millimetres HL 4 modified, 40 millimetres HL 4 binder course and 40 millimetres of HL 1 surface course.
- Under Contract 90-41, four sections of pavement (total length of 700 metres) were resurfaced by milling 40 millimetres and paving 40 millimetres of HL 1 (reclaimed) in the driving lane. Prior to paving, all depressed transverse cracks were sawcut and reinstated with HL 4.
- Under Contract 2002-3002, the pavements were resurfaced between Station 9+995 and 14+000 by milling 50 millimetres and paving 50 millimetres of SuperPave 12.5 FC2.
- In 2004, microsurfacing was carried out.
- 2005 PCR = 95, 2007 PCR = 90

Highway 401 Westbound Lanes - Walker Road to the terminus of Highway 401 (surveyed May 2005 and June 2007)

- Original grading carried out under Contract 55-138.
- Granular base and paving carried out under Contract 55-23 and consisted of 225 millimetres of plain jointed concrete pavement (JPCP) over 100 millimetres of Granular A and 125 millimetres of Granular C.
- Contract 73-172 consisted of an asphalt overlay consisting of 50 millimetres HL 4 modified, 40 millimetres HL 4 binder course and 40 millimetres of HL 1 surface course.
- Under Contract 90-41, a 200 metre long section was resurfaced by milling 40 millimetres and paving 40 millimetres of HL 1 (reclaimed) in the driving lane. Prior to paving, all depressed transverse cracks were sawcut, the asphalt removed and the areas reinstated with HL 4.
- Under Contract 2002-3002, 5 kilometres of the pavements were resurfaced by milling 50 millimetres and paving 50 millimetres of SuperPave 12.5 FC2.

- In 2004, the western 0.6 kilometres was resurfaced with SMA and the remainder was microsurfaced.
- 2005 PCR = 93, 2007 PCR = 88

Highway 3 – West junction of Essex Road 34 to Highway 401 (surveyed September 2006 and May 2007)

- Existing pavement consisted of asphalt and/or concrete placed directly on subgrade. No details of the original construction were provided.
- The pavements were widened and resurfaced on the south side under Contract 76-115. The widening consisted of 150 millimetres of Granular A, 237 millimetres of HL 4 binder course and 40 millimetres of HL 1 surface course. The resurfacing consisted of HL 4 padding, HL 4 binder course and HL 1 surface course.
- The westerly 0.5 kilometres was resurfaced with 50 millimetres of DFC under Contract 98-19.
- Milling of 80 millimetres and paving 40 millimetres of HDBC and 40 millimetres of HL 1 was carried out at the Walker Road intersection in 1998 to address rutting.
- Dynapatching was carried out in 2002.
- Selective full depth repairs were carried out in the westbound lanes in 2004.
- Under Contract 2004-3009, the pavements were resurfaced by milling 50 millimetres and paving 60 millimetres of SuperPave 19.0 and 40 millimetres of SuperPave 12.5 FC2.
- Under Contract 2004-3039, intersection improvements were carried out at Outer Drive and Walker Road and the main line pavements were resurfaced by milling 50 millimetres and paving 60 millimetres of SuperPave 19.0 and 40 millimetres of SMA.
- 2006 PCR = 93, 2007 PCR = 89

Highway 3 (Huron Church Road) Eastbound Lanes – Highway 401 to Todd Lane (surveyed September 2006 and July 2007)

- No details of the original construction were provided.
- Resurfacing was carried out consisting of HL 5 padding to correct crossfall, 20 millimetres HL 2 padding and 40 millimetres of surface course.
- Widening consisted of 312 millimetres of Granular A in the shoulders, 350 millimetres of HL 5 and 40 millimetres of surface course.

- Under Contract 90-14, the westerly 0.7 kilometres was widened and resurfaced with 40 millimetres of HDDB and 40 millimetres of DFC.
- Under Contract 98-19, all but the westerly 0.7 kilometres was resurfaced with 50 millimetres of HDDB and 40 millimetres of DFC.
- Whitetopping carried out at Cousineau Road and Todd Lane under District Contracts 2002-3383 (driving lane) and 2002-3399 (passing lane).
- Under Contract 2003-3022, the pavements were resurfaced by milling 50 millimetres and paving 50 millimetres of SMA.
- 2006 PCR = 92, 2007 PCR = 80

***Highway 3 (Huron Church Road) Westbound Lanes – Highway 401 to Todd Lane
(surveyed September 2006 and July 2007)***

- No details of the original construction were provided.
- Resurfacing was carried out consisting of HL 5 padding to correct crossfall, 20 millimetres HL 2 padding and 40 millimetres of surface course.
- Widening consisted of 312 millimetres of Granular A in the shoulders, 350 millimetres of HL 5 and 40 millimetres of surface course.
- Under Contract 90-14, the westerly 0.7 kilometres was widened and resurfaced with 40 millimetres of HDDB and 40 millimetres of DFC. Widening plugs consisted of 200 millimetres of hot mix asphalt over 700 millimetres of Granular A.
- Under Contract 98-19, all but the westerly 0.7 kilometres was resurfaced with 50 millimetres of HDDB and 40 millimetres of DFC.
- Whitetopping carried out at Howard Avenue intersection District Contracts 32-99-05 to address rutting.
- Whitetopping carried out at Cousineau Road and Todd Lane under District Contracts 2002-3383 (driving lane) and 2002-3399 (passing lane).
- Under Contract 2003-3022, the pavements were resurfaced by milling 50 millimetres and paving 50 millimetres of SMA.
- Whitetopping repaired at Howard Avenue under District Contract 2003-3355.
- 2006 PCR = 93, 2007 PCR = 82

E.C. Row Expressway - Eastbound Lanes – Highway 3 (Huron Church Road) to Ojibway Parkway (surveyed September 1992)

- Pavement constructed under Contract 89-41 and consisted of 25 millimetres of OFC and 35 millimetres of HDDB over 225 millimetres of unreinforced concrete placed on 110 millimetres of OGD. This structure includes the partially paved shoulders.
- 0.7 kilometre long structure approach at Highway 3 constructed under Contract 87-23 and consisted of 65 millimetres of hot mix asphalt over 230 millimetres of plain concrete and asphalt stabilized OGD.
- 1992 PCR = 59

E.C. Row Expressway - Westbound Lanes – Highway 3 (Huron Church Road) to Ojibway Parkway (surveyed September 1992)

- Original pavement consisted of 40 millimetres of DFC over 200 millimetres of unreinforced concrete placed on 150 millimetres of cement treated Granular A.
- Structure approach at Highway 3 constructed under Contract 87-23 and consisted of 65 millimetres of hot mix asphalt over 230 millimetres of plain concrete and asphalt stabilized OGD.
- Rout and seal carried out between Matchette Road and Huron Church Line.
- Structure approaches patched full width at Malden Road and Matchette Road.
- Several slabs replaced under Contract 87-41.
- French drains installed in outer shoulder.
- 1992 PCR = 57

3.3 Review of Background Information From Golder Associates' Files

To supplement the background information for the pavements at the site, a review of the information in Golder Associates' files for the area of the site was carried out. The relevant information from that review is summarized in the following sections. The review included a summary of the recommended pavement design information for the various sections of roadway; however, these should not necessarily be construed to be the actual pavements constructed. Further, post report and construction modifications may have also been made.

No pavement information was provided by the City of Windsor.

Huron Church Road at Todd Lane and Todd Lane

Reference: Golder Associates Report No. 754139/13 entitled “Geotechnical Investigation, Contract No. 10, Proposed Provincial Sewage Works Program, Township of Sandwich West, County of Essex, Ontario” dated September 21, 1982.

The boreholes drilled for this investigation generally encountered silty clay to clayey silt till materials at subgrade level.

The recommendations provided in the report indicated that the pavements impacted by sewer construction could be restored using a pavement structure consisting of 40 millimetres of surface course, 50 millimetres of binder course and 400 millimetres of Granular A base.

Cousineau Road, East of Highway 3

Reference: Golder Associates Report No. 791-4096 entitled “Geotechnical Investigation, Proposed Heritage Estates Residential Development, Township of Sandwich West, County of Essex, Ontario” dated August 1979.

This report indicated that the Cousineau Road realignment could be constructed using a flexible pavement structure or a rigid pavement. The rigid pavement could consist of 200 millimetres of concrete and 230 millimetres of Granular A base. The flexible pavement could consist of 40 millimetres of surface course, 100 millimetres of binder course and either 600 millimetres of Granular A base or 150 millimetres of Granular A and 600 millimetres of Granular B subbase.

Labelle Street, East of Huron Church Road

Reference: Golder Associates Report No. 801-4009 entitled “Geotechnical Investigation, Proposed Phase II Bellewood Land Assembly, Windsor, Ontario” dated February 1980.

Two pavement design alternatives were provided for Labelle Street as summarized below:

<u>COMPONENT</u>	<u>THICKNESS (mm)</u>	
	<u>Alternative 1</u>	<u>Alternative 2</u>
Asphalt	100	100
Granular A Base	600	150
Granular B Subbase	-	660

It is not known which alternative was ultimately constructed.

Huron Church Road, Cabana Road to Grand Marais Drain and Pulford Street

Reference: Golder Associates Report No. 901-4256 entitled “Geotechnical Investigation, Proposed Phase 4 Reconstruction, Huron Church Road, Windsor, Ontario” dated January 1991.

Recommendations were provided in the above-noted report to reconstruct the subject section of Huron Church Road using a rigid pavement structure consisting of 275 millimetres of Portland cement concrete, 100 millimetres of drainage layer (19 millimetre clear stone or asphalt stabilized OGD) and 275 millimetres of Granular A base.

The report also noted that the existing Pulford Street intersection at Huron Church Road would be widened and realigned to the north. The pavement structure recommended for the new section of Pulford Street consisted of 230 millimetres of Portland cement concrete and 300 millimetres of Granular A base.

Howard Avenue, North Talbot Road to Highway 3

Reference: Golder Associates Report No. 921-4204 entitled “Geotechnical Investigation, Proposed Howard Avenue Sanitary Sewer, North Talbot to Highway No. 3, Windsor, Ontario” dated November 1992.

The above-noted report suggested that the new Howard Avenue pavement structure for the project consist of 150 millimetres of asphalt and 610 millimetres of Granular A base. In addition, it was suggested that continuous subdrains be provided at subgrade level to provide effective drainage of the pavement structure.

E.C. Row Expressway, Ojibway Parkway to Huron Church Road

Reference: John Emery Geotechnical Engineering Limited (JEGEL) Report No. 198258 entitled “Pavement Evaluation, E.C. Row Expressway, Ojibway Parkway to Huron Church Road and Huron Church Road to Midpoint of Dominion Boulevard and Dougall Avenue” dated April 5, 1999.

The background information provided in the above-noted report indicates that the original construction of this section of the E.C. Row Expressway was carried out between 1979 and 1981 and consisted of 38 millimetres of DFC, 200 millimetres of plain jointed concrete pavement and 150 millimetres of cement treated Granular A. The construction was carried out to accommodate two lanes of traffic.

In 1987, a grade separation was constructed at the Huron Church Road intersection from 900 metres west to 700 metres east of Huron Church Road. The pavements for the grade separation consisted of 25 millimetres of OFC, 30 millimetres of HL 4 binder course, 225 millimetres of plain jointed concrete and 110 millimetres of asphalt stabilized OGDL.

In 1989, two additional lanes, creating the existing eastbound lanes were constructed as well as interchanges at Matchette Road and Malden Road. The mainline pavements consisted of 25 millimetres of OFC, 30 millimetres of HL 4 binder course, 225 millimetres of plain jointed concrete and 110 millimetres of asphalt stabilized OGDL. The speed change lanes consisted of 40 millimetres of DFC, 225 millimetres of plain jointed concrete and 150 millimetres of OGDL. The ramps consisted of 35 millimetres of DFC, 35 millimetres of HL 4 binder course, 225 millimetres of plain jointed concrete and 110 millimetres of asphalt stabilized OGDL.

In 1997, a 50 millimetre HL 1 surface course overlay was provided between Ojibway Parkway and Matchette Road.

JEGEL provided several alternative pavement designs for the various sections of pavements to be reconstructed including two alternative flexible structures and a rigid structure as summarized in Table 6 of their Report No. 198258, as presented below:

TABLE 6
MINIMUM PAVEMENT STRUCTURE REQUIREMENTS
(All thickness in millimetres)

SECTION	PAVEMENT STRUCTURE ALTERNATIVES		
	RIGID	FLEXIBLE (THIN BASE)	FLEXIBLE (THICK BASE)
MAINLINES Ojibway Parkway to East Ramps of Huron Church Road, Section I	250 PCC* 100 OGDL 200 100% Crushed Granular A	40 SMA** 120 HDDB (2 lifts) 40 HL 8 100 OGDL 100 100% Crushed Granular A 300 100% Crushed Granular B	40 SMA 110 HDDB (2 lifts) 100 OGDL 100 100% Crushed Granular A 450 100% Crushed Granular B
East Ramps of Huron Church Road to East Ramps of Dominion Boulevard, Section II West	270 PCC 100 OGDL 200 100% Crushed Granular A	40 SMA 120 HDDB (2 lifts) 60 HL 8 100 OGDL 100 100% Crushed Granular A 300 100% Crushed Granular B	40 SMA 90 HDDB (2 lifts) 40 HL 8 100 OGDL 100 100% Crushed Granular A 450 100% Crushed Granular B

SECTION	PAVEMENT STRUCTURE ALTERNATIVES		
	RIGID	FLEXIBLE (THIN BASE)	FLEXIBLE (THICK BASE)
East Ramps of Dominion Boulevard to Midpoint of Dominion Boulevard and Dougall Road, Section II East	285 PCC 100 OGDL 200 100% Crushed Granular A	40 SMA 120 HDBC (2 lifts) 80 HL 8 100 OGDL 100 100% Crushed Granular A 300 100% Crushed Granular B	40 SMA 110 HDBC (2 lifts) 40 HL 8 100 OGDL 100 100% Crushed Granular A 450 100% Crushed Granular B
RAMPS Matchette Road Interchange	225 PCC 300 100% Crushed Granular A	40 SMA 90 HDBC 60 HL 8 100 100% Crushed Granular A 300 100% Crushed Granular B	40 SMA 90 HDBC 40 HL 8 100 100% Crushed Granular A 450 100% Crushed Granular B
Huron Church Road Interchange	270 PCC 300 100% Crushed Granular A	40 SMA 120 HDBC 80 HL 8 100 100% Crushed Granular A 300 100% Crushed Granular B	40 SMA 120 HDBC 40 HL 8 100 100% Crushed Granular A 450 100% Crushed Granular B
Dominion Boulevard Interchange	260 PCC 300 100% Crushed Granular A	40 SMA 120 HDBC 80 HL 8 100 100% Crushed Granular A 300 100% Crushed Granular B	40 SMA 120 HDBC 40 HL 8 100 100% Crushed Granular A 450 100% Crushed Granular B

* Portland Cement Concrete with a compressive strength of 35 MPa at 28 days.

** Stone Mastic Asphalt with Performance Graded Asphalt Cement.

Reproduced from JEGEL Report No. 198258

4.0 PAVEMENT CONDITION SURVEY

A pavement condition survey of the major pavements within the project was carried out by a senior pavement design engineer from our staff. At that time, the existing pavements were visually examined and digital photographs of characteristic and major distresses were obtained. Select site photographs are provided in Appendix D.

A summary of the items noted during the pavement condition survey are provided in the following table:

LOCATION	REMARKS
<p><i>Highway 401</i> - North Talbot Road to Huron Church Line</p>	<ul style="list-style-type: none"> - asphalt surfaced pavements - good condition - very slight to slight single and multiple transverse cracks throughout (see Photograph 1 in Appendix D) - multiple very slight centerline joint cracks throughout - short section of outer wheel path/pavement edge failure in curve beneath Talbot Road East in westbound lanes with severe rutting (see Photograph 2 in Appendix D)
<p><i>Huron Church Line (Highway 3)</i> - Highway 401 to Huron Church Road</p>	<ul style="list-style-type: none"> - asphalt surfaced pavements - good condition - intermittent slight transverse cracks in left turn lanes - intermittent slight longitudinal cracks in left turn lanes - slight to moderate wheel path rutting at intersections - the white topping placed at the Howard Avenue, Cousineau Road and Todd Lane intersections has been replaced with asphalt.
<p><i>Huron Church Road</i> - Huron Church Line to E.C. Row Expressway</p>	<ul style="list-style-type: none"> - asphalt surfaced from Highway 3 to just west of Todd Lane - good condition - no distresses noted in asphalt section - concrete pavements west of Todd Lane - good condition - few to intermittent, apparently full depth repairs in concrete - few moderate corner cracks, intermittent slight corner cracks
<p><i>Howard Avenue</i> - south of Huron Church Line</p>	<ul style="list-style-type: none"> - asphalt surfaced - recently resurfaced - excellent condition - see Photographs 3 and 4 in Appendix D
<p>- north of Huron Church Line</p>	<ul style="list-style-type: none"> - asphalt surfaced - severe midlane cracking in eastbound lanes throughout - moderate to severe transverse cracks throughout - moderate pavement edge/inner wheel path cracks in westbound lanes throughout - see Photographs 5 and 6 in Appendix D
<p><i>Cousineau Road</i></p>	<ul style="list-style-type: none"> - asphalt surfaced - good condition - slight transverse cracks - see Photograph 7 in Appendix D

LOCATION	REMARKS
<i>Sandwich Parkway</i>	<ul style="list-style-type: none"> - asphalt surfaced - fair to good condition - slight longitudinal cracks throughout - extensive slight transverse cracks - few moderate alligatored transverse cracks - see Photographs 8 and 9 in Appendix D
<i>Cabana Road</i>	<ul style="list-style-type: none"> - asphalt surfaced - excellent condition - recently resurfaced to about 25 metres from intersection - no distresses noted - see Photographs 10 and 11 in Appendix D
<i>Todd Lane</i>	<ul style="list-style-type: none"> - asphalt surfaced - fair condition - recently resurfaced at Huron Church Road to end of radius - slight alligatored pavement edge cracking throughout - few very slight transverse cracks - see Photographs 12 and 13 in Appendix D
<i>Pulford Street</i>	<ul style="list-style-type: none"> - concrete pavement - generally in good condition - see Photographs 14 and 15 in Appendix D - moderate to severe edge and corner cracks and joint distresses about 50 metres and 20 metres south of Northway Avenue (see Photographs 16 and 17 in Appendix D)
<i>Grand Marais Road West</i>	<ul style="list-style-type: none"> - concrete radius at Huron Church Road and asphalt surfaced beyond - good condition - intermittent slight transverse cracks - see Photographs 18 and 19 in Appendix D
<i>Lambton Street</i>	<ul style="list-style-type: none"> - concrete radius at Huron Church Road and asphalt surfaced beyond - fair condition - extensive moderate to severe alligatored transverse cracks - frequent moderate pavement edge cracks - few distresses patched with cold mix asphalt - map/random cracks at maintenance holes - see Photographs 20 and 21 in Appendix D
<i>Spring Garden Road/Bethlehem Avenue</i>	<ul style="list-style-type: none"> - concrete pavement to curve and asphalt surfaced beyond - concrete pavement in good condition - see Photographs 22 and 23 in Appendix D - few spalled concrete joints (see Photograph 24 in Appendix D)
<i>Labelle Street</i>	<ul style="list-style-type: none"> - concrete radius at Huron Church Road and asphalt surfaced beyond - pavement in excellent condition - see Photograph 25 in Appendix D

LOCATION	REMARKS
<p><i>Malden Road</i> - south of E.C. Row Expressway</p> <p>- north of E.C. Row Expressway</p>	<ul style="list-style-type: none"> - asphalt surfaced - good to excellent condition - frequent slight transverse cracks - see Photograph 26 in Appendix D - asphalt surfaced - pavements in poor condition - see Photographs 27 and 28 in Appendix D - severe to very severe single and alligatored transverse cracks throughout (see Photograph 29 in Appendix D) - very severe longitudinal/meander cracks throughout (some patched with cold mix –see Photograph 30 in Appendix D) - moderate pavement edge cracks (some patched with cold mix)
<p><i>Matchette Road</i> - north of E.C. Row Expressway</p> <p>- south of E.C. Row Expressway</p>	<ul style="list-style-type: none"> - asphalt surfaced - fair condition - see Photographs 31 and 32 in Appendix D - extensive slight transverse cracks - intermittent alligatored wheel path cracks and slight rutting in northbound lanes (see Photograph 33 in Appendix D) - asphalt surfaced - fair condition - see Photographs 34 and 35 in Appendix D - intermittent slight transverse cracks - intermittent slight wheel path ruts - intermittent slight wheel path cracks - frequent moderate longitudinal cracks (see Photograph 36 in Appendix D)
<p><i>E.C. Row Expressway</i> - Huron Church Road to Ojibway Parkway</p>	<ul style="list-style-type: none"> - asphalt surfaced pavements - excellent condition - intermittent slight transverse cracks
<p><i>Ojibway Parkway North</i> - E.C. Row Expressway to Prospect Avenue</p>	<ul style="list-style-type: none"> - asphalt surfaced to just north of rail crossing - asphalt in poor condition - moderate transverse cracks throughout - moderate longitudinal cracks throughout, some alligatored - frequent moderate map cracks - concrete pavements north of rail crossing - concrete pavements in poor condition - approximately 30 per cent of transverse joints failed (blow ups) with some concrete patches and poorly performing asphalt patches (see Photographs 37 and 38 in Appendix D) - few moderate longitudinal/crescent cracks
<p><i>Ojibway Parkway South</i> - E.C. Row Expressway to Weaver Road</p>	<ul style="list-style-type: none"> - asphalt surfaced pavements - poor condition in southbound lanes from E.C. Row Expressway to Broadway Street - severe depressed transverse cracks throughout - extensive moderate longitudinal cracks - northbound lanes and southbound lanes south of Broadway Street in fair condition - slight single and multiple transverse cracks throughout, blow ups - intermittent slight meander cracks - moderate centerline joint cracks throughout

5.0 TRAFFIC VOLUMES

The traffic data provided by URS Canada Inc. for the entire project are attached in Tables I-A to I-F following the text of this report. A summary of the projected 2015 traffic data for the proposed Highway 401 mainline extension/access route to the bridge for the various alternatives is provided below:

HIGHWAY 401 EXTENSION/ ACCESS ROUTE TO BRIDGE		ALT 1a		ALT 1b		ALT 2a		ALT 2b		ALT 3		PKWAY ALT	
FROM	TO	AA DT	% COMM.	AA DT	% COMM.								
WESTBOUND LANES													
North Talbot Road	Howard Avenue	19,972	27.6	19,954	27.2	19,958	27.4	19,958	27.4	19,936	27.0	19,954	27.2
Howard Avenue	St. Clair College	19,026	27.4	19,664	27.6					19,359	26.8	14,993	27.6
St. Clair College	Pulford Street			16,522	25.2							9,858	29.5
Pulford Street	E.C. Row Expressway			22,550	19.8								
Howard Avenue	Todd Lane					17,735	24.4	17,735	24.4				
Todd Lane	E.C. Row Expressway					22,373	18.0	22,373	18.0				
St. Clair College	Highway 3/Huron Church Road	16,155	24.8									20,784	25.2
St. Clair College	Highway 3/Huron Church Road									16,845	23.0		
Highway 3/Huron Church Road	Malden Road	7,502	55.7										
E.C. Row Expressway	Malden Road			7,414	53.3	7,274	53.8	7,274	53.8	7,336	55.3		
Malden Road	Ojibway Parkway	10,678	43.5	10,591	41.8	10,449	41.7	10,449	41.7	10,498	42.9		
Ojibway Parkway	EC Row Expressway	7,521	59.5	7,296	58.0	7,243	57.8	7,243	57.8	7,381	58.7	7,577	58.0
EC Row Expressway	Canadian Plaza	10,032	58.7	9,987	57.9	9,981	57.8	9,981	57.8	10,009	58.1	9,987	57.9
EASTBOUND LANES													
Canadian Plaza	Ojibway Parkway	18,007	52.4	17,980	52.0	18,028	52.8	18,028	52.8	18,010	52.4	17,980	52.0
Ojibway Parkway	EC Row Expressway	31,533	27.6	31,533	27.6	31,610	28.2	31,610	28.2	31,565	28.1	27,348	27.6
EC Row Expressway	Malden Road	18,914	51.3	18,914	51.3	18,476	52.2	18,476	52.2	18,546	53.3	14,333	51.3
Malden Road	Highway 3/Huron Church Road or E.C. Row Expressway	14,382	58.0	14,231	55.2	13,766	56.4	13,766	56.4	13,841	57.7	14,333	51.3
Highway 3/Huron Church Road	St Clair College	24,917	32.5							25,086	33.7	30,697	27.3
E.C. Row Expressway	Pulford Street			30,422	27.3								
Pulford Street	St Clair College			24,232	34.5							22,166	27.3
E.C. Row Expressway	Todd Lane					29,083	27.3	29,083	27.3				
Todd Lane	Howard Avenue					23,313	30.1	23,313	30.1				
Howard Avenue	Highway 3					27,051	25.3	27,051	25.3				
St Clair College	Howard Avenue	21,477	35.0	21,700	34.9					22,105	34.7	22,874	34.9
Howard Avenue	North Talbot Road	21,529	36.2	21,530	36.3	29,133	27.1	29,133	27.1	21,550	36.3	27,843	36.3

6.0 GRANULAR MATERIALS

The general area of the project lacks crushable gravel. Sandy material may be available from pits in the vicinity of Leamington. The high quality hot mix asphalt aggregates would have to be imported from great distances, either by truck or by water/truck transportation. The availability of aggregates from the following licensed sources needs to be investigated by bidders at the time of tendering. Aggregates transported by water from quarries in the USA, or from Canadian sources, need to be stockpiled and sampled at dock sites.

6.1 Granular Base and Subbase

Aggregate materials for Granular B Type I may be obtained from pits in the sandy delta deposit at Leamington, such as:

- Sterling Acres Farms Limited, Lot 24, Concession 5, Gosfield South Township, 4 kilometres northwest of Leamington.
- Erie Sand and Gravel Limited, Lots 23 and 24, Concessions 3 and 4, Gosfield South Township, 4 kilometres northwest of Leamington.
- Erie Sand and Gravel Limited, Lots 1, 2 and 3, Concession 2, Mersea Township, 2.4 kilometres west of Leamington.

This type of aggregate might also be obtained from pits under wayside permits from the same deposit provided the requirements of the Aggregate Resources of Ontario Provincial Standards under the Aggregate Resources Act are met by the Contractor. Careful selection would be required, as some of the sands are too fine for Granular B Type I.

Granular B Type II aggregates may be available from the following quarries:

- Amherst Quarries (1969) Anderdon quarry, Lots 9 and 10, Concession 7, Anderdon Township, 4 kilometres northwest of McGregor. It should be noted that this quarry has not reportedly been active recently for aggregate production.
- Amherst Quarries (1969) Limited quarry, Lots 21 and 22, Concession 2, Malden Township, 1.5 kilometres east of Amherstberg.
- The 671173 Ontario Limited quarry, Lot 27, the Ben Koop quarry, Lot 13 and the 670028 Ontario Limited quarry, Lots 1, 2, 12 and 13 in Registered Plan 35, Pelee Township, on Pelee Island, approximately 1 kilometre east of the Scudder dock. Transportation for these quarries is through the Kingsville dock. In the past, the main products from these quarries were armor stone, subbase and base aggregates for Pelee Island.
- Lafarge Canada Inc. Manitoulin Dolomite quarry, Lots 41 to 45, Concession 8, Dawson Township, 9.4 kilometres west of Meldrum Bay on Manitoulin Island, or quarries from the USA, all via the docks at Kingsville or the docks in Windsor.

Possible Granular A sources for the project are:

- Amherst Quarries (1969) Anderdon quarry; however excess material passing the 75 micrometre sieve may be problematic.
- Huron Gravel Limited pit in a large kame deposit, Lots 16, 17 and 18, Concession 13 LES, 11.5 kilometres east of Chatham. A dragline is currently in operation. The stone quality of pit run material is borderline for Granular A due to the presence of Kettle Point shale boulders. To improve the product, these boulders should be removed before crushing. The addition of screenings or suitable sand is required due to a lack of fines in order to meet Ministry specifications and to facilitate compaction.
- Lafarge Canada Inc. Manitoulin Dolomite quarry or quarries in the USA.
- Quarries on Pelee Island through the Kingsville dock; however, excess fines passing the 75 micrometre sieve may be problematic.

In addition to the use of virgin materials, since the majority of the pavements at the site are designated for removal and full reconstruction, recycling of the existing pavement materials into new granular base and subbase should be fully explored.

6.2 Asphaltic Concrete

SuperPave mixtures are to be used throughout and SuperPave aggregates would likely be producible from quarries or pits that can currently produce HDBC coarse and fine aggregates, subject to the materials meeting the additional testing requirements. For the top 100 millimetres of SuperPave asphalt, the fine aggregates could be obtained from HDBC fine aggregate sources, if properly processed.

Heavy duty binder course (HDBC) aggregates may be obtained from the following sources:

- Amherst Quarries (1969) Anderdon quarry; only the top bench consisting of Anderdon limestone is suitable.
- Lafarge Canada Inc. Manitoulin Dolomite quarry.
- Quarries in the USA.
- Beachvilime Limited, two quarries in Lots 13, 14 and 15, Broken Front, and Lots 14, 15, 17 and 18, Concessions 2 and 3, Oxford on Thames Geographic Township, 2.5 and 3.5 kilometres, respectively, south of Beachville. Aggregate may break down during handling.
- Global Stone Ingersoll Limited quarry, Lots 13, 14 and 15, Concessions 2, 3 and 4, North Oxford Geographic Township, 4.5 kilometres southwest of Beachville. Aggregate may break down during handling.

HDBC fine aggregates may be available from some of the quarries that can produce HDBC coarse aggregate, if properly processed. The Dufferin Aggregates Milton quarry and the Lafarge Canada Inc. Dundas quarry produce HDBC fine aggregates on a routine basis. The Beachvilime Limited and Global Stone Limited quarries have produced

HDBC fine aggregate, but specific approval for quality and gradation is required as the aggregate may break down during processing.

Asphalt pavement mixes may be produced by portable plants operated by contractors close to the project or by stationary plants in Chatham and/or Windsor. The location of portable asphalt plants in pits or other locations need to be cleared with local municipal authorities.

6.3 Concrete

Concrete aggregates may be available from the following sources:

- Lafarge Canada Inc. Manitoulin Dolomite Quarry;
- Lafarge Canada Inc., Lots 3 and 4, Concession 6, London Township;
- Huron Gravel Ltd., Harwich Township (fine aggregate);
- Osbourne Materials Company, Drummond Island quarry via Kingsville or Windsor;
- Presque Isle Corporation, Michigan, via Kingsville or Windsor;
- Michigan Limestone Operations, via Kingsville or Windsor;
- Smelter Bay Aggregates Inc., Sowerby pit, via Kingsville or Windsor;
- Blue Circle Aggregates, Lot 3, Concession 5, London Township;
- Erie Sand and Gravel Limited, Tyhurst Pit (fine aggregate);
- Lobo Sand and Gravel, Lots 11 and 12, Concession 9, Township of Lobo (fine aggregate); and
- Fowler Construction Company Ltd., 11 kilometres north of junction of Highway 12 and Simcoe County Road 44 (coarse aggregate).

7.0 PAVEMENT DESIGN

7.1 General

The proposed pavement sections have been analyzed using the American Association of State Highway and Transportation Officials (AASHTO) design methods, the Canadian Portland Cement Association (PCA) design method and the Asphalt Institute (1991) design method together with our knowledge of previous MTO experiences and standards and employing good engineering judgement. A discussion of the various pavement design methods used for this project is provided in Section 7.2.

It should be noted that only relatively limited cost information is available for SuperPave mixes at this time. Therefore, the life cycle costing analyses reported throughout this report are based on the costs utilized on recent adjacent projects.

The following are relevant SuperPave mixes together with the lift thicknesses currently specified by MTO:

<u>SUPERPAVE MIX</u>	<u>LIFT THICKNESS (mm)</u>
SuperPave 12.5 FC 2	38 to 50
SuperPave 12.5 FC 1	38 to 50
SuperPave 12.5	38 to 50
SuperPave 19.0	50 to 75
SuperPave 25.0	75 to 100
SuperPave 9.5	nil to 30

7.2 Discussion of Pavement Design Methods

7.2.1 AASHTO (1993) Design Method

The AASHTO design method is a statistically based method calibrated using the results from the AASHTO Road Test carried out in the late 1950's and early 1960's. Thus, there are some limitations to the application of this design method. The limitations are discussed in Section 1.4.2 of the Guide and are summarized below:

- a) limited pavement types (asphaltic concrete, granular base and subbase only for flexible pavements, rigid pavements with and without reinforcement but always with dowels);
- b) limited subgrade types;

- c) traffic loadings (road test terminated at 1,114,000 axle applications, thus use of design equivalent single axle loads (ESALs) in excess of eight million requires extrapolation beyond the equations developed);
- d) age (aging effects are ignored as the road test was terminated after two years); and
- e) environment (road test carried out in Ottawa, Illinois, U.S.A.).

The design method has been updated several times since inception, and recently the MTO undertook a study to adapt the AASHTO method to Ontario conditions and the results were provided in ERES Consultants Final Report entitled “Adaptation and Verification of AASHTO Pavement Design Guide for Ontario Conditions” dated February 22, 2001.

The benefits of employing the AASHTO method, particularly when properly calibrated to Ontario conditions, are that advanced conditions such as reliability, drainage, frost susceptible subgrades and swelling may be incorporated directly.

Since the AASHTO design method has not, until very recently, been scrutinized under Ontario conditions, the computed pavement structure must be verified using experience, judgement and comparison with other accepted pavement design methods.

Flexible Pavements

The results of the AASHTO design method for flexible pavements are sensitive to the input parameters, particularly subgrade resilient modulus and the initial and terminal serviceability factors. In addition, the scaling of layer coefficients is not consistent with the GBE concept. Designing for a specific GBE or structural number (SN) will cause discrepancies with other GBE based methods.

Rigid Pavements

Based on the comparison by Darter, Hall and Kuo (1995) as summarized in the Adaptation of AASHTO for Ontario guide, the largest factors to be questioned in the rigid pavement model are the composite modulus of subgrade reaction, and the J factor. The above referenced review notes that the nomograph for composite modulus of subgrade reaction produces unrealistically high values and overestimates the support actually experienced in the field. In addition, the J factor, which is a stress load factor across cracks and/or joints, is not properly applied in the AASHTO method and is intended to account for corner cracking. Joint faulting is not considered in the AASHTO analyses.

The above and other factors were addressed in the 1998 supplement to the guide, and the 1998 method has been examined and calibrated for Ontario conditions.

7.2.2 Asphalt Institute (AI) Design Method

The AI design method is based on a theoretical multilayered elastic system. However, the results of analyses using the AI method tend to provide asphaltic thicknesses well in excess of those typically employed in current practice. The main reason is the perceived notion that base and/or subbase courses greater than 300 millimetres in thickness do not provide additional structural capacity to the pavement structure as stated in the following excerpt from the AI design guide:

"Some agencies employ greater thicknesses of untreated aggregate base to try to minimize the potential for frost damage in the pavement. Although thicknesses greater than 300 millimetres are used for this purpose, pavement analysis studies have shown that this additional thickness adds little benefit if any to the structural behavior of the pavement system....Reducing the asphalt concrete thickness because of very large thicknesses of untreated aggregate is discouraged by the Asphalt Institute and most pavement designers because the potential for other pavement problems will increase."

The results of the AI design method will be scaled using typical GBE factors to develop a more typical pavement section based on past MTO experience and current design philosophies.

7.2.3 Canadian Portland Cement Association (PCA) Design Method

As indicated in the PCA "Thickness Design for Concrete Highway and Street Pavements" manual, the pavement design methods are based on pavement theory, performance, and research experience from:

- theoretical pavement slab studies by Westergaard and Pichett & Ray, and the results of finite element analyses,
- model and full scale testing,
- experimental pavements, and
- performance of existing pavements.

It is indicated that an emphasis has been placed on calibration of the design model to the performance of existing pavements.

The design method allows independent consideration of subgrade and base courses, subgrade resilient modulus, traffic and includes consideration of fatigue (to control fatigue cracking) and erosion (to control subgrade and shoulder erosion, pumping and faulting). The analysis can also consider plain jointed, doweled and continuously reinforced pavements.

The results of the PCA design method will be compared to the results of the AASHTO analyses and MTO experience to determine an appropriate design slab thickness.

7.2.4 Comparison of Pavement Design Methods

Comparisons of the results of the various pavement design methods were carried out as part of the pavement design process. The results of the AASHTO and Asphalt Institute flexible pavement design methods and the results of the AASHTO and Canadian Portland Cement Association rigid pavement design methods are compared on Figure 8 for the project specific conditions. Subgrade condition 1, as described in Sections 7.5.2 and 7.5.4 below, were used for the comparison.

Based on the results of the comparisons and our experience in the Windsor area, the AASHTO method yields reasonable results and has been used as the primary design tool for assessing the various pavement design alternatives.

7.3 Discussion of Life Cycle Cost Methods

The life cycle costing has been carried out in accordance with ERES Consultants Inc. Report entitled "Review of Life Cycle Costing Analysis Procedures" dated December 1998. Consistent with MTO direction, the discount rate utilized in the analyses is 5.0 per cent and, for flexible pavements, rehabilitation strategies have consisted of milling 50 millimetres and paving 50 millimetres of SuperPave 19.0 and 40 millimetres of surface course appropriate for the traffic conditions. For concrete pavements, a 50 millimetre asphalt overlay is provided in year 38.

The unit rates used in the life cycle costing are:

MATERIAL/ACTIVITY	UNIT RATE
SuperPave 12.5 FC2	\$140/tonne
SuperPave 12.5 FC1	\$120/tonne
SuperPave 12.5	\$85/tonne
SuperPave 19.0	\$90/tonne
SuperPave 25.0	\$90/tonne
OGDL	\$13/tonne
Granular A Base	\$20/tonne
Granular B Type III Subbase	\$18/tonne
Concrete – 175 to 200 mm	\$64/m ²
Concrete – 200 to 225 mm	\$66/m ²
Concrete – 225 to 260 mm	\$68/m ²
Concrete – 260 to 290 mm	\$70/m ²
Concrete – 290 to 330 mm	\$73/m ²
rout and seal	\$1.50/m

<u>MATERIAL/ACTIVITY</u>	<u>UNIT RATE</u>
milling (25-50mm depth)	\$1.75/m ²
milling (75-100mm depth)	\$2.25/m ²
asphalt patching	\$50/m ²
concrete joint reseal	\$5/m
surface texturing	\$5/m ²
subdrains	\$25/m

7.4 Concept Pavement Design

Based on the information provided in the Request for Proposal for this project, the MTO has advised that typical pavement designs for freeways in the area of this project consist of:

<u>RIGID PAVEMENT</u>		<u>FLEXIBLE PAVEMENT</u>	
<u>COMPONENT</u>	<u>THICKNESS</u>	<u>COMPONENT</u>	<u>THICKNESS</u>
	(mm)		(mm)
Plain Jointed Concrete	260	Stone Mastic Asphalt	40
Open Graded Drainage Layer	100	SuperPave 19.0	70
Granular A Base	300	SuperPave 25.0	190 (2@95)
		Open Graded Drainage Layer	100
		Granular A Base	500

The above noted pavement structures include continuous subdrains hydraulically connected to the open graded drainage layer (OGDL) that discharges to a positive gravity outlet.

It should be noted that the rigid pavement design noted above is considered to be applicable for the better drained and typically stiffer upper weathered crust in the area and may not necessarily be appropriate for the typical weaker and not as well drained soils in the depressed profile areas.

7.5 Pavement Design Model

7.5.1 Traffic Loading

The average annual daily traffic (AADT) loadings and per cent commercial vehicles for the various pavements under consideration in the Area of Continued Analysis are detailed in Tables I-A to I-F, attached. Calculations of the traffic loadings in terms of equivalent single axle loads (ESALs) were completed using the traffic data provided by URS and appropriate truck factors and lane distribution factors determined based on the anticipated

volume and nature of the loadings and geometry of the proposed pavements. The truck and lane distribution factors utilized are summarized below:

<u>ROAD CLASSIFICATION</u>	<u>NUMBER OF LANES</u> (each direction)	<u>APPROXIMATE ESALs (millions)</u>		<u>TRUCK FACTOR</u>	<u>LANE DISTRIBUTION FACTOR</u>
		<u>Flexible Pavt's</u>	<u>Rigid Pavt's</u>		
Local	1	less than 0.2	less than 10	1.5	1.0
Minor Collector	1	0.2 to 1	10 to 20	1.5	1.0
Major Collector	1 to 2	1 to 6	20 to 50	1.5	1.0
Minor Arterial	2	6 to 20	50 to 100	2.0	0.8 to 0.9
Major Arterial	2	20 to 50	100 to 200	2.0	0.8 to 0.9
Freeway	3	50 to 125	greater than 200	2.5	0.6 to 0.8

The truck factors in the table were based on the anticipated heavy traffic loading conditions for the various types of pavements. The lane distribution factors were determined based on the proposed pavement lane configurations, traffic volumes and Table 8-3 of the Ontario AASHTO design guidelines.

The cumulative ESAL loading were used to describe the roadway classification for the purposes of this report. While it may be more convenient for the reader to classify the pavements based on AADT or the like, varying percentage of commercial traffic, lane configuration and the like would not be taken into account, therefore, classification by ESALs was utilized.

The cumulative 19 and 21 year ESALs for the various flexible pavements are summarized in Tables II-A to II-F, attached. The freeway pavements have been based on an initial design life of 21 years and the remainder of the pavements based on an initial design life of 19 years, consistent with MTO standards.

The cumulative 25 year ESALs for the various rigid pavements are summarized in Tables III-A to III-F, attached.

7.5.2 AASHTO Analyses – Flexible Pavements

To carry out the AASHTO analyses, estimates of initial and terminal serviceability indices (ISI & TSI, respectively) and reliability (R) are required. The criteria for selecting the appropriate values of these parameters is dependent on the anticipated volume, the nature of the loadings and geometry of the proposed pavements. The initial and terminal serviceability indices and reliability used for the various pavements are summarized below:

<u>ROAD CLASSIFICATION</u>	<u>INITIAL SERVICEABILITY INDEX</u>	<u>TERMINAL SERVICEABILITY INDEX</u>	<u>RELIABILITY (%)</u>
Local	4.5	2.0	50
Minor Collector	4.5	2.0	75
Major Collector	4.5	2.0	75
Minor Arterial	4.5	2.2	85
Major Arterial	4.5	2.5	90
Freeway	4.5	2.5	95

The initial and terminal serviceability indices were selected in general accordance with the revised Table 8-4 of the Ontario AASHTO design guidelines. The design reliability was selected based on experience gained with other similar projects and the AASHTO design guidelines.

Subgrade Resilient Modulus, M_R

Based on the nature of the subgrade soils and our related experience in the Windsor area, a subgrade resilient modulus of 25 megapascals (MPa) is considered appropriate for the clayey crust soils that typically have an undrained shear strength in excess of about 100 kilopascals and is consistent with the recommendations for low to medium plasticity clays as indicated in Table 8.6 of the "Adaptation and Verification of AASHTO Pavement Design Guide for Ontario Conditions" document and is also consistent with the typical pavement thicknesses constructed by MTO in this area.

As indicated in Section 3.1.2 and on Figures 5, 6 and 7, the undrained shear strength beneath the upper weathered crust decreases significantly. While undrained shear strength cannot be directly correlated to resilient modulus, the shear strength data clearly indicates a reduction in support characteristics for the pavements. Therefore, for the various alternatives, the resilient moduli used in the analyses are:

<u>SUBGRADE CONDITION</u>	<u>SUBGRADE UNDRAINED SHEAR STRENGTH (kPa)</u>	<u>SUBGRADE RESILIENT MODULUS (MPa)</u>
1	greater than 100	25
2	75 to 100	20
3	less than 75	15

Based on the results of the investigation carried out for the foundations component of the project, the following table summarizes the subgrade conditions expected at various locations throughout the project for subgrade levels at grade, 3 metres below grade and 6 metres below grade:

LOCATION	SUBGRADE CONDITION		
	At Grade	3 m Below Grade	6 m Below Grade
<i>Proposed Highway 401</i>			
Highway 401/Highway 3 to Geraedts Drive	1	1	2
Geraedts Drive to 700m west of Huron Church Road	1	1	3
700m west of Huron Church Road to Cabana Road	1	1	2
Cabana Road to 100 m north of Pulford Street	1	1	3
100m north of Pulford Street to 200m west of Malden Road	1	1	2
200 to 600 m west of Malden Road	1	2	2
600 m west of Malden Road to Ojibway Parkway	1	2	3
Ojibway Parkway (E.C. Row Expressway to Sandwich Street)	1	2	3

Structural Number

The above-noted classifications and the required structural numbers suggested for each roadway class are summarized on Figures 9, 10 and 11, attached, for the three subgrade conditions considered.

Utilizing the above information, the following representative flexible pavement structural numbers were calculated for the major pavements to be constructed. The following structural numbers provide a general sense of the pavement structure required. Detailed information for the individual pavement sections analyzed is provided in Tables II-A to II-F:

LOCATION	STRUCTURAL NUMBER (mm)		
	Condition 1	Condition 2	Condition 3
Highway 401			
- westbound	208	222	240
- eastbound	222	236	255
Huron Church Road			
- northbound	144	154	167
- southbound	177	189	205
E.C. Row Expressway			
- westbound	148	158	172
- eastbound	174	185	201

LOCATION	STRUCTURAL NUMBER (mm)		
	Condition 1	Condition 2	Condition 3
Ojibway Parkway			
- northbound	112	120	130
- southbound	135	145	158

The structural analyses for the proposed new pavement sections were carried out using the design nineteen year traffic loadings and the following equivalency factors and AASHTO layer coefficients:

MATERIAL	EQUIVALENCY FACTOR	AASHTO LAYER COEFFICIENT	AASHTO DRAINAGE COEFFICIENT
Asphalt	2.0	0.42	-
Granular A Base	1.0	0.14	1.0
Granular B Type III Subbase	0.67	0.09	1.0
Granular B Type II Subbase	1.0	0.14	1.0

7.5.3 Preliminary Flexible Pavement Design

As noted above, while it may be more convenient for the reader to classify the pavements based on AADT or the like, varying percentage of commercial traffic, lane configuration and the like would not be taken into account, therefore, classification by ESALs was utilized. To aid in the assessment of appropriate pavement structures for the various roadways under consideration, Tables II-A to II-F summarize the cumulative ESALs and roadway classification to be used for design.

Based on the results of the analyses, appropriate pavement structures for the various pavements within the project consist of:

- Subgrade Condition 1

ROAD CLASSIFICATION	RANGE OF ESALs (millions)	STRUCTURAL NUMBER (mm)	PAVEMENT COMPONENT THICKNESS (mm)			
			Asphalt		OGDL	Granular A Base
			Surface	Binder		
Local	less than 0.2	<75	40	50	-	300
Minor Collector	0.2 to 1	75-95	40	90	-	300
Major Collector	1 to 6	95-120	40	110	-	400
Minor Arterial	6 to 20	120-150	40	120	-	550
Major Arterial	20 to 50	150-180	40	190	-	600
Freeway	50 to 125	>180	40	260	100	500

- Subgrade Condition 2

ROAD CLASSIFICATION	RANGE OF ESALs (millions)	STRUCTURAL NUMBER (mm)	PAVEMENT COMPONENT THICKNESS (mm)			
			Asphalt		OGDL	Granular A Base
			Surface	Binder		
Local	less than 0.2	<75	40	50	-	300
Minor Collector	0.2 to 1	75-95	40	90	-	350
Major Collector	1 to 6	95-130	40	120	-	450
Minor Arterial	6 to 20	130-160	40	150	-	600
Major Arterial	20 to 50	160-190	40	220	-	600
Freeway	50 to 125	>190	40	260	100	600

- Subgrade Condition 3

ROAD CLASSIFICATION	RANGE OF ESALs (millions)	STRUCTURAL NUMBER (mm)	PAVEMENT COMPONENT THICKNESS (mm)			
			Asphalt		OGDL	Granular A Base
			Surface	Binder		
Local	less than 0.2	<75	40	50	-	350
Minor Collector	0.2 to 1	75-100	40	90	-	350
Major Collector	1 to 6	100-135	40	130	-	500
Minor Arterial	6 to 20	135-180	40	190	-	600
Major Arterial	20 to 50	180-220	40	260	-	600
Freeway	50 to 125	>220	40	300	100	650

Alternative 3 involves the construction of cut and cover tunnels to convey the traffic and it is understood that the Highway 401 main line pavements will be constructed over the tunnel base slab. Therefore, the Alternative 3 main line pavements should consist of:

<u>COMPONENT</u>	<u>THICKNESS (mm)</u>
Surface Asphalt	40
Binder Asphalt	160
OGDL	100

Tables II-A to II-F provide the detailed results of the ESAL calculations and the resultant pavement classification based on the above for each of the pavement sections examined.

In addition, for comparison, alternative pavement designs were considered for Subgrade Condition 1 that incorporate a granular subbase component. These are summarized as follows:

ROAD CLASSIFICATION	RANGE OF ESALs (millions)	PAVEMENT COMPONENT THICKNESS (mm)			
		Asphalt		Granular A	Granular B Type III
		Surface	Binder	Base	Subbase
Local	less than 0.2	40	50	100	300
Minor Collector	0.2 to 1	40	90	100	300
Major Collector	1 to 6	40	110	150	400
Minor Arterial	6 to 20	40	120	150	650
Major Arterial	20 to 50	40	190	150	650
Freeway	50 to 125	40	260	100 OGDL 100 Gran A	650

7.5.4 AASHTO Analyses – Rigid Pavements

For the rigid pavement analyses, the initial and terminal serviceability indices and reliabilities used for the flexible pavement analyses were utilized.

Modulus of Subgrade Reaction

Based on the nature of the subgrade soils and our related experience, a modulus of subgrade reaction of 30 megapascals per metre (MPa/m) is considered appropriate for the clayey crust soils that typically have an undrained shear strength in excess of about 100 kilopascals and is consistent with the recommendations for low to medium plasticity clays as indicated in Table 8.9 of the “Adaptation and Verification of AASHTO Pavement Design Guide for Ontario Conditions” document.

As indicated in Section 3.1.2 and on Figures 5, 6 and 7, the undrained shear strength beneath the upper weathered crust decreases significantly. While undrained shear strength cannot be directly correlated to modulus of subgrade reaction, the shear strength data clearly indicates a reduction in support characteristics for the pavements. Therefore, for the various alternatives, the moduli of subgrade reaction used in the analyses are:

SUBGRADE CONDITION	SUBGRADE UNDRAINED SHEAR STRENGTH (kPa)	MODULUS OF SUBGRADE REACTION (MPa/m)
1	greater than 100	30
2	75 to 100	20
3	less than 75	10

The table previously provided in Section 7.5.2 summarizes the subgrade conditions expected at various locations throughout the project for subgrade levels of at grade, 3 metres below grade and 6 metres below grade.

The structural analyses for the proposed new pavement sections were carried out using the design twenty five year traffic loadings, in terms of ESALs, and the effective moduli of subgrade reaction for various Granular A and OGDL thicknesses beneath the slabs for the following effective moduli of subgrade reaction, k.

<u>COMBINED THICKNESS OF GRANULAR A AND OGDL (mm)</u>	<u>EFFECTIVE MODULUS OF SUBGRADE REACTION (MPa/m)</u>		
	<u>k=30MPa/m</u>	<u>k=20MPa/m</u>	<u>k=10MPa/m</u>
300	52	38	24
400	62	46	30

The values for effective modulus of subgrade reaction are based on Table 1 in the CPCA “Thickness Design for Concrete Highway and Street Pavements.”

In addition to the above, the following input parameters were used in the AASHTO rigid pavement analyses:

<u>PARAMETER</u>	<u>VALUE</u>
Modulus of Rupture, S_c'	5 MPa
Elastic Modulus, E_c	30,000 MPa
Load Transfer Coefficient, J	
- 0.5m monolithic shoulder	2.5
- no tied shoulder	3.2

The appropriate pavement classifications and the required slab thicknesses suggested for each roadway class and subgrade condition, based on the above input information, are summarized on Figures 9, 10 and 11.

7.5.5 Preliminary Rigid Pavement Design

As noted above, while it may be more convenient for the reader to classify the pavements based on AADT or the like, varying percentage of commercial traffic, lane configuration and the like would not be taken into account, therefore, classification by ESALs was utilized. To aid in the assessment of appropriate pavement structures for the various roadways under consideration, Tables III-A to III-F summarize the cumulative ESALs and roadway classification to be used for design.

Based on the results of the analyses, appropriate pavement structures for the various pavements within the project consist of:

- Subgrade Condition 1

<u>ROAD CLASSIFICATION</u>	<u>RANGE OF ESALs</u> (millions)	<u>PAVEMENT COMPONENT THICKNESS (mm)</u>		
		<u>Cement Concrete</u>	<u>OGDL</u>	<u>Granular A Base</u>
Local	less than 10	concrete pavement not warranted		
Minor Collector	10 to 20	175	-	300
Major Collector	20 to 50	210	-	300
Minor Arterial	50 to 100	260	-	300
Major Arterial	100 to 200	290	100	300
Freeway	greater than 200	330	100	300

- Subgrade Condition 2

<u>ROAD CLASSIFICATION</u>	<u>RANGE OF ESALs</u> (millions)	<u>PAVEMENT COMPONENT THICKNESS (mm)</u>		
		<u>Cement Concrete</u>	<u>OGDL</u>	<u>Granular A Base</u>
Local	less than 10	concrete pavement not warranted		
Minor Collector	10 to 20	175	-	300
Major Collector	20 to 50	220	-	300
Minor Arterial	50 to 100	260	-	300
Major Arterial	100 to 200	300	100	300
Freeway	greater than 200	330	100	300

- Subgrade Condition 3

<u>ROAD CLASSIFICATION</u>	<u>RANGE OF ESALs</u> (millions)	<u>PAVEMENT COMPONENT THICKNESS (mm)</u>		
		<u>Portland Cement Concrete</u>	<u>OGDL</u>	<u>Granular A Base</u>
Local	less than 10	concrete pavement not warranted		
Minor Collector	10 to 20	190	-	300
Major Collector	20 to 50	225	-	300
Minor Arterial	50 to 100	260	-	400
Major Arterial	100 to 200	300	100	400
Freeway	greater than 200	330	100	400

Alternative 3 involves the construction of cut and cover tunnels to convey the traffic and it is understood that the Highway 401 main line pavements will be constructed over the tunnel base slab. Therefore, the Alternative 3 main line pavements should consist of:

<u>COMPONENT</u>	<u>THICKNESS (mm)</u>
Portland Cement Concrete	260
OGDL	100

Tables III-A to III-F provide the detailed results of the ESAL calculations and the resultant pavement classification based on the above for each of the pavement sections examined.

7.6 Life Cycle Cost Analyses

Life cycle cost analyses were carried out for the alternative pavement designs above consistent with the procedures outlined in Section 7.3. In accordance with MTO procedures, the following maintenance and rehabilitation strategies were utilized in assessing the life cycle costs:

<u>YEAR</u>	<u>LIGHT AND MEDIUM DUTY PAVEMENTS</u>	<u>HEAVY DUTY PAVEMENTS (FREEWAY)</u>	<u>CONCRETE PAVEMENTS</u>
3	Rout & Seal (59m)	Rout & Seal (59m)	
9	Mill 40mm and Patch (293m ²) Rout & Seal (156m)	Mill 40mm and Patch (293m ²) Rout & Seal (156m)	
12			Joint Reseal (50% of transverse joints, 25% of longitudinal joints)
15	Mill 40mm and Patch (880 m ²) Rout & Seal (352m)	Mill 40mm and Patch (880m ²) Rout & Seal (352m)	
18			Diamond Grinding, Resealing, Patching
19	Mill 50mm and 90mm Overlay	Mill 40mm and Patch (440m ²) Rout & Seal (244m)	
21		Mill 50mm and 90mm Overlay	
22	Rout & Seal (59m)		
24		Rout & Seal (59m)	
27	Mill 40mm and Patch (440m ²) Rout & Seal (244m)		
28		Mill 40mm and Patch (440m ²) Rout & Seal (352m)	Extensive Patching, Diamond Grinding, Joint Resealing
31	Mill 50mm and 90mm Overlay	Rout & Seal (244m)	
34	Rout & Seal (59m)	Mill 50mm and 90mm Overlay	
37		Rout & Seal (59m)	
38	Mill 40mm and Patch (440m ²) Rout & Seal (244m)		50mm asphalt overlay
41			Rout & Seal (70% of transverse cracks)
42	Mill 50mm and 90mm Overlay	Mill 40mm and Patch (440m ²) Rout & Seal (352m)	
44		Rout & Seal (244m)	Rout & Seal (30% of transverse cracks, 50% of longitudinal cracks)
45	Rout & Seal (59m)		
46		Mill 50mm and 90mm Overlay	
48	Mill 40mm and Patch (440m ²) Rout & Seal (244m)		
49		Rout & Seal (59m)	

These strategies are illustrated on Figure 12.

Using the above-noted rehabilitation strategies, the following life cycle costs were determined:

- Subgrade Condition 1

ROAD CLASSIFICATION	LIFE CYCLE COST (\$ PER LANE KM)					
	Flexible Pavement				Rigid Pavement	
	Granular Base Alternative		Granular Subbase Alternative		Rigid Pavement	
	Capital Cost	Total Life Cycle Cost	Capital Cost	Total Life Cycle Cost	Capital Cost	Total Life Cycle Cost
Local	109,400	192,964	122,020	205,529		
Minor Collector	137,890	221,330	150,704	234,088	272,990	334,651
Major Collector	180,694	271,672	201,952	292,837	280,959	344,616
Minor Arterial	201,689	292,576	233,057	323,807	275,471	339,151
Major Arterial	264,991	360,016	288,502	383,424	284,752	349,552
Freeway	382,246	479,759	413,684	511,060	346,807	411,337
Tunnel Section	208,601	306,871	208,601	306,871	270,326	335,189

- **bold** represents preferred alternative

Based on the life cycle costing, flexible pavements are preferred for the local roadways, minor and major collector and minor arterial pavements. Rigid pavements are preferred for the major arterial and freeway pavements.

- Subgrade Condition 2

ROAD CLASSIFICATION	LIFE CYCLE COST (\$ PER LANE KM)			
	Flexible Pavement		Rigid Pavement	
	Capital Cost	Total Life Cycle Cost	Capital Cost	Total Life Cycle Cost
Local	109,400	192,964	-	-
Minor Collector	146,808	230,209	272,990	334,651
Major Collector	197,284	288,190	281,488	345,142
Minor Arterial	230,935	321,694*	275,471	339,151*
Major Arterial	286,125	381,058	294,303	359,061
Freeway	404,541	501,957	346,807	411,337

*these alternatives are considered equivalent since the life cycle costs are within 5 per cent.

Based on the life cycle costing, flexible pavements are preferred for the local roadways and minor and major collector pavements. Rigid pavements are preferred for the major arterial and freeway pavements and the flexible and rigid pavement alternatives are considered to be equivalent for the minor arterial pavements.

- Subgrade Condition 3

ROAD CLASSIFICATION	LIFE CYCLE COST (\$ PER LANE KM)			
	Flexible Pavement		Rigid Pavement	
	Capital Cost	Total Life Cycle Cost	Capital Cost	Total Life Cycle Cost
Local	118,180	201,706	-	-
Minor Collector	146,808	230,209	273,750	335,408
Major Collector	214,123	304,955	281,755	345,408
Minor Arterial	259,066	349,702*	291,406	355,017*
Major Arterial	314,353	409,163	310,376	375,064
Freeway	446,678	543,910	367,927	432,364

*these alternatives are considered equivalent since the life cycle costs are within 5 per cent.

Based on the life cycle costing, flexible pavements are preferred for the local roadways and minor and major collector pavements. Rigid pavements are preferred for the major arterial and freeway pavements and the flexible and rigid pavement alternatives are considered to be equivalent for the minor arterial pavements.

The above-noted total life cycle costs are referred to year 2011 dollars. The alternatives with the lowest total life cycle costs are indicated in **bold** for each road classification and each pavement type. However, based on both the MTO's and our experience in the Windsor area, rigid pavements are preferred at major intersections and any areas where frequent starting/stopping of heavy vehicles is expected.

8.0 PRELIMINARY RECOMMENDATIONS

8.1 Pavement Components

Based on the results of our analyses and the results of the life cycle costing, flexible pavements should be utilized for the local roadways, minor and major collectors and minor arterials, as follows:

<u>COMPONENT</u>	<u>THICKNESS (mm)</u>			
	<u>Local</u>	<u>Minor Collector</u>	<u>Major Collector</u>	<u>Minor Arterial</u>
Subgrade Condition 1				
Surface Asphalt	40	40	40	40
Binder Asphalt	50	90 (2 @ 45)	110 (2 @ 55)	120 (2 @ 60)
Granular A Base	300	300	400	550
Subgrade Condition 2				
Surface Asphalt	40	40	40	40
Binder Asphalt	50	90 (2 @ 45)	120 (2 @ 60)	150 (2 @ 75)
Granular A Base	300	350	450	600
Subgrade Condition 3				
Surface Asphalt	40	40	40	40
Binder Asphalt	50	90 (2 @ 45)	130 (2 @ 65)	190 (2 @ 60, 1 @ 70)
Granular A Base	350	350	500	600

However, based on both the MTO's and our experience in the Windsor area, rigid pavements are preferred at major intersections and any areas where frequent starting/stopping of heavy vehicles is expected.

The major arterial and freeway pavements should consist of rigid pavements, as follows:

<u>COMPONENT</u>	<u>THICKNESS (mm)</u>		
	<u>Major Arterial</u>	<u>Freeway</u>	<u>Tunnel</u>
Subgrade Condition 1			
Concrete	290	330	260
OGDL	100	100	100
Granular A	300	300	-

COMPONENT	THICKNESS (mm)		
	Major Arterial	Freeway	Tunnel
Subgrade Condition 2			
Concrete	300	330	260
OGDL	100	100	100
Granular A	300	300	-
Subgrade Condition 3			
Concrete	300	330	260
OGDL	100	100	100
Granular	400	400	-

All of the above-noted structures incorporate a 0.5 metre wide tied monolithic shoulder.

8.2 Mixture Types

Based on the anticipated traffic volumes and roadway usage, the following mixtures are recommended for the flexible pavements:

- Subgrade Condition 1

ROAD CLASSIFICATION	SURFACE COURSE			BINDER COURSES		
	Mixture	Thickness (mm)	Traffic Category	Mixture	Thickness (mm)	Traffic Category
Local	SuperPave 12.5	40	A	SuperPave 19.0	50	A
Minor Collector	SuperPave 12.5	40	B	SuperPave 19.0	90 (2@45)	B
Major Collector	SuperPave 12.5	40	C	SuperPave 19.0	110 (2@55)	C
	FC1					
Minor Arterial	SuperPave 12.5	40	D	SuperPave 19.0	120 (2@60)	D
	FC1					

- Subgrade Condition 2

ROAD CLASSIFICATION	SURFACE COURSE			BINDER COURSES		
	Mixture	Thickness (mm)	Traffic Category	Mixture	Thickness (mm)	Traffic Category
Local	SuperPave 12.5	40	A	SuperPave 19.0	50	A
Minor Collector	SuperPave 12.5	40	B	SuperPave 19.0	90 (2@45)	B
Major Collector	SuperPave 12.5 FC1	40	C	SuperPave 19.0	120 (2@60)	C
Minor Arterial	SuperPave 12.5 FC1	40	D	SuperPave 19.0	150 (2@75)	D

- Subgrade Condition 3

ROAD CLASSIFICATION	SURFACE COURSE			BINDER COURSES		
	Mixture	Thickness (mm)	Traffic Category	Mixture	Thickness (mm)	Traffic Category
Local	SuperPave 12.5	40	A	SuperPave 19.0	50	A
Minor Collector	SuperPave 12.5	40	B	SuperPave 19.0	90 (2@45)	B
Major Collector	SuperPave 12.5 FC1	40	C	SuperPave 19.0	130 (2@65)	C
Minor Arterial	SuperPave 12.5 FC1	40	D	SuperPave 19.0	190 (2@60, 1@70)	D

8.3 Construction Considerations

The granular materials should extend laterally full width and daylight to ditches having inverts at least 0.5 metres below subgrade level. In urban sections or in areas where ditches are not practical or feasible, perforated, continuous subdrains should be installed with outlets at appropriate intervals.

For the flexible pavements, if the top lift of binder asphalt is exposed through a winter, thorough cleaning and visual inspection will be required prior to placement of tack coat and surface course asphalt.

8.4 Paved Shoulders

Paved shoulders throughout the project should consist of two lifts of asphalt. Lift thicknesses should be equivalent to the adjacent surface course and upper binder course. The surface and binder courses for the non-driveable paved shoulders should be SuperPave 12.5. In any areas where tracking onto paved shoulders is considered likely, such as the inner loops of interchange ramps, the full design lane asphalt thickness and mix type should be provided.

8.5 Asphalt Cement Grades

Performance grade asphalt cement is to be used on this project. The asphalt cement grades to be used on this project are:

LOCATION	COMPONENT	PGAC
Major Collector and Minor Arterial	Surface Course	64-28
	Upper Binder Course	64-28
	Lower Binder Courses	58-28

<u>LOCATION</u>	<u>COMPONENT</u>	<u>PGAC</u>
Local Roads and Minor Collector	All components	58-28

8.6 Tack Coat

Tack coat should be applied between all asphaltic lifts and on any milled surfaces consistent with MTO Southwestern Region directives.

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9.0 CUT MATERIALS AND DESIGN

9.1 Transition Point Treatment

Transition treatment from earth cuts to earth fills and at the limits of subexcavation areas are to be provided in accordance with Ontario Provincial Standard Drawing (OPSD) 205.01. The transition treatment depth, t , should be taken as 1.0 metres less the thickness of asphalt or concrete. For preliminary purposes, the thickness of organic, leached and accumulation layers, D_a , should be taken as 0.0 metres.

For this project, the frost penetration depth should be taken as 1.0 metres.

Reference should be made to the approach foundation engineering report for additional information regarding the requirement for cut stability and construction issues.

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10.0 EMBANKMENT MATERIALS AND DESIGN

10.1 Embankment Construction

The embankments should be constructed using good quality, approved earth borrow. Based on the project location, it is anticipated that clayey borrow materials will be utilized. Following stripping of the surficial topsoil and any softened or unsuitable materials, the embankment fill material should be placed in maximum 300 millimetre thick loose lifts and compacted. Upon completion of filling to proposed subgrade level, the embankment side slopes should be trimmed to a final inclination of 2.5 horizontal to one vertical or flatter.

Reference should be made to the appropriate foundation engineering reports for additional information regarding requirement for embankment, settlements and construction issues.

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11.0 DRAINAGE

11.1 Ditches

The ditches throughout the project should be constructed in accordance with the OPSD 200 series for earth grading with inverts at least 0.5 metres below subgrade level. Subdrains should be provided where this minimum ditch depth is not practical.

Pipe subdrains should be perforated, 100 millimetres in diameter, and placed in a geotextile lined trench 300 millimetres wide in accordance with OPSD 207.041. The trench should be backfilled with 19 millimetre clear stone or OGDL aggregates. At least 300 millimetres of overlap should be provided between the joints in the geotextile.

Any ditch areas which may be wet from conditions such as poor grading or from adjacent surface flows or the like, should be provided with an approved geotextile and appropriately sized rip rap consisting of angular stone or recycled concrete conforming to OPSS 1004.

Geotextile used for pipe subdrains should be Class I, non-woven with a FOS of 75 to 150 microns. Geotextile used under rip rap should be Class II, non-woven with a FOS of 75 to 150 microns.

12.0 OTHER DESIGN FEATURES

12.1 Recycling of Existing Pavement Materials

Consideration may be given to recycling the existing asphalt, concrete and/or granular materials into the new pavements. A maximum of 20 per cent recycled asphalt pavement (RAP) may be utilized in the binder courses throughout below a depth of 150 millimetres. A maximum of 30 per cent RAP may be utilized in the granular base in any unpaved shoulders. The contractor must demonstrate that he can produce a suitable product that meets all of the appropriate material specifications on a consistent basis.

MEB/PRB/MLJM/cr
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SUMMARY OF TRAFFIC DATA - ALTERNATIVE 1A

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION		2015				2025				2035			
	From	To	AADT		Comm Vehicles		AADT		Comm Vehicles		AADT		Comm Vehicles	
			NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
Huron Church Road	Riverside Drive	University Avenue	6,903	5,381	2.6%	1.6%	6,921	5,488	2.7%	2.4%	6,884	5,682	2.9%	3.1%
	University Avenue	Wyandotte Street	3,208	3,874	4.3%	3.2%	3,185	3,974	4.6%	4.1%	3,071	4,106	5.0%	5.0%
	Wyandotte Street	AMB Off Ramp	2,263	3,076	1.0%	1.0%	2,244	3,139	1.0%	1.0%	2,110	3,240	1.0%	1.0%
	AMB Off Ramp	College	17,476	6,223	15.0%	1.5%	18,520	6,297	16.5%	1.6%	19,645	6,460	20.5%	1.7%
	College Street	Girardot Street	25,318	24,056	2.9%	12.5%	26,148	24,855	3.2%	13.4%	26,159	25,893	3.4%	16.5%
	Girardot Street	Tecumseh Road	24,203	23,788	3.3%	12.2%	25,103	24,972	3.7%	13.0%	25,638	26,470	3.9%	15.6%
	Tecumseh Road	Dorchester Street	27,458	27,231	3.5%	10.6%	28,263	28,077	3.8%	11.2%	28,751	29,264	4.0%	13.3%
	Dorchester Street	Prince Road/Totten Street	27,503	28,501	3.0%	9.2%	28,314	29,360	3.3%	9.8%	28,834	30,327	3.5%	11.7%
	Prince Road/Totten Street	Malden Road	30,089	31,859	3.1%	8.4%	30,960	33,126	3.4%	8.6%	31,699	34,496	3.6%	10.2%
	Malden Road	Industrial Road	24,695	26,711	2.4%	9.2%	24,658	28,107	2.5%	9.4%	25,290	29,911	2.6%	11.5%
	Industrial Rd	EC Row North Ramp Terminal	27,133	28,866	2.4%	8.9%	27,916	30,104	2.5%	9.0%	28,563	32,827	2.6%	10.6%
	EC Row North Ramp Terminal	EC Row South Ramp Terminal	20,198	34,938	2.2%	7.1%	20,480	37,897	2.3%	7.0%	21,332	41,573	2.3%	8.1%
	South of EC Row South Ramp Terminal		24,716	26,836	2.3%	7.5%	27,674	28,928	2.4%	7.1%	29,933	32,061	2.4%	8.0%
	South Service Road	North of Lambton Street		N/A	10,483	N/A	1.5%	N/A	12,380	N/A	1.4%	N/A	14,423	N/A
Lambton Street		Todd Lane/Cabana Road	N/A	9,429	N/A	1.3%	N/A	11,489	N/A	1.2%	N/A	13,362	N/A	1.2%
Todd Lane/Cabana Road		St Clair College	N/A	16,021	N/A	0.4%	N/A	17,084	N/A	0.5%	N/A	18,371	N/A	0.5%
St Clair College		Cousineau Drive	N/A	9,288	N/A	1.9%	N/A	9,834	N/A	2.1%	N/A	10,653	N/A	2.2%
Cousineau Drive		Howard Avenue	N/A	6,287	N/A	3.1%	N/A	6,313	N/A	3.1%	N/A	6,582	N/A	3.2%
North Service Road	East of Howard Avenue		N/A	12,060	N/A	2.0%	N/A	13,024	N/A	1.9%	N/A	14,106	N/A	2.0%
	North of Labelle Street		25,245	N/A	1.9%	N/A	28,297	N/A	1.9%	N/A	30,429	N/A	2.0%	
	Labelle Street	Grand Marais Road Ramp	24,277	N/A	1.3%	N/A	27,609	N/A	1.2%	N/A	29,689	N/A	1.4%	
	Grand Marais Road Ramp	Pulford Street	12,425	N/A	1.2%	N/A	13,788	N/A	1.2%	N/A	14,568	N/A	1.4%	
	Pulford Street	Todd Lane/Cabana Road	12,314	N/A	1.3%	N/A	14,331	N/A	1.3%	N/A	15,197	N/A	1.5%	
	Todd Lane/Cabana Road	St Clair College	6,976	N/A	1.0%	N/A	7,167	N/A	1.0%	N/A	7,428	N/A	1.0%	
	St Clair College	Cousineau Drive	14,452	N/A	0.5%	N/A	14,675	N/A	0.5%	N/A	15,278	N/A	0.6%	
Ojibway Parkway	Cousineau Drive	Howard Avenue	7,417	N/A	2.4%	N/A	7,599	N/A	2.6%	N/A	8,010	N/A	3.1%	
	East of Howard Avenue		13,630	N/A	2.1%	N/A	14,732	N/A	2.1%	N/A	15,472	N/A	2.2%	
	EC Row Expressway	GN Booth Drive	10,180	10,555	2.2%	5.3%	10,894	11,126	2.3%	6.0%	11,696	11,775	2.4%	6.6%
	GN Booth Drive	Sandwich Street	10,116	10,431	2.2%	5.4%	10,830	10,927	2.3%	6.1%	11,632	11,576	2.4%	6.7%
	Sandwich Street	Prospect Avenue	9,479	9,729	0.8%	0.8%	10,088	10,069	0.7%	0.7%	10,789	10,589	0.7%	0.7%
	North of Prospect Avenue		9,416	9,510	0.8%	0.8%	10,025	9,858	0.7%	0.7%	10,726	10,388	0.7%	0.7%
	CROSS ROADS													
Wyandotte Street	West of Huron Church Road		5,210	4,912	1.0%	1.0%	5,139	4,894	1.0%	1.0%	4,985	4,912	1.0%	1.0%
	East of Huron Church Road		3,635	5,183	1.8%	2.7%	3,633	5,254	1.9%	2.8%	3,622	5,422	2.1%	2.8%
University Avenue	West of Huron Church Road		1,266	1,188	1.0%	1.0%	1,376	1,275	1.0%	1.0%	1,547	1,310	1.0%	1.0%
	East of Huron Church Road		2,136	2,122	5.7%	6.5%	2,287	2,207	7.2%	6.6%	2,500	2,261	8.2%	6.8%
Riverside Drive	West of Huron Church Road		3,428	3,580	1.0%	1.0%	3,579	3,715	1.0%	1.0%	3,718	4,039	1.0%	1.0%
	E of Huron Church		6,712	5,703	1.0%	1.0%	6,925	5,802	1.0%	1.0%	7,178	5,977	1.0%	1.0%
AMB Off Ramp	E of Huron Church		N/A	10,153	N/A	24.1%	N/A	11,250	N/A	25.6%	N/A	12,464	N/A	30.7%
	AMB On Ramp		6,407	N/A	2.9%	N/A	6,739	N/A	3.4%	N/A	7,143	N/A	3.9%	N/A
Patricia Street	College Street	Wyandotte Street	4,105	5,097	4.7%	6.3%	4,135	4,980	5.5%	7.2%	4,288	4,829	5.7%	9.0%
	College Street		6,514	6,360	2.4%	4.2%	6,603	6,529	2.5%	5.2%	6,758	6,585	2.5%	6.5%
Girardot Street	West of Huron Church Road		1,861	809	1.0%	1.0%	2,066	963	1.0%	1.0%	2,275	1,078	1.0%	1.0%
	East of Huron Church Road		1,127	1,169	1.0%	1.0%	1,147	1,159	1.0%	1.0%	1,155	1,167	1.0%	1.0%
Tecumseh Road	West of Huron Church Road		2,346	2,275	1.6%	1.0%	2,297	2,203	1.6%	1.0%	2,291	2,171	1.6%	1.0%
	East of Huron Church Road		5,829	6,836	2.3%	4.4%	5,789	6,844	2.2%	5.0%	6,209	7,294	2.2%	6.7%
Dorchester Street	West of Huron Church Road		6,613	6,995	1.0%	1.0%	6,495	7,114	1.0%	1.0%	6,677	7,354	1.0%	1.0%
	East of Huron Church Road		1,684	1,556	1.0%	1.0%	1,717	1,582	1.0%	1.0%	1,740	1,600	1.0%	1.0%
Prince Road/Totten Street	West of Huron Church Road		1,419	807	1.6%	1.1%	1,419	808	1.6%	1.1%	1,419	808	1.6%	1.1%
	East of Huron Church Road		2,075	2,907	1.0%	1.0%	2,214	2,353	1.0%	1.0%	2,312	2,888	1.0%	1.0%
Malden Road	West of Huron Church Road		4,784	5,176	1.0%	1.0%	5,516	5,545	1.0%	1.0%	5,054	5,711	1.0%	1.0%
	East of Huron Church Road		1,376	1,126	1.0%	1.0%	1,632	1,359	1.0%	1.0%	1,859	1,512	1.0%	1.0%
Industrial Road	West of Huron Church Road		7,884	8,413	6.6%	10.8%	8,212	8,859	7.1%	12.4%	8,621	9,302	7.3%	13.8%
	East of Huron Church Road		3,616	3,425	1.7%	2.2%	3,925	3,673	1.5%	2.1%	4,361	3,862	1.2%	2.2%
E.C. Row Expressway North Ramp Terminal	West of Huron Church Road		4,072	3,169	3.9%	12.3%	4,262	3,467	4.0%	13.0%	4,490	3,603	4.1%	14.4%
	East of Huron Church Road (W-N/S Off Ramp & N-W On Ramp)		14,179	2,041	2.2%	0.0%	15,964	2,066	2.2%	0.0%	16,497	2,213	2.3%	0.1%
E.C. Row Expressway South Ramp Terminal	West of Huron Church Road (S-W On Ramp)		609	N/A	24.0%	N/A	584	N/A	27.8%	N/A	626	N/A	30.9%	0.0%
	East of Huron Church Road (N-E On Ramp)		N/A	7,407	N/A	1.5%	N/A	10,547	N/A	1.5%	N/A	12,051	N/A	1.9%
Labelle Street	West of Huron Church Road (S-E On Ramp & E-N/S Off Ramp)		8,624	2,901	6.2%	2.9%	9,448	3,084	7.1%	2.7%	10,022	3,317	8.9%	2.6%
	East of North Service Road		2,073	715	1.0%	1.0%	2,018	758	1.0%	1.0%	2,112	803	1.0%	1.0%
Grand Marais Road Ramp	East of North Service Road		4,896	1,877	1.0%	1.0%	5,402	2,065	1.0%	1.0%	5,912	2,254	1.0%	1.0%
	Fazio Drive		3,550	2,411	1.6%	1.2%	3,907	2,924	1.6%	1.2%	4,202	3,481	1.6%	1.1%
Pulford Street	West of South Service Road		493	1,011	1.0%	1.0%	476	1,099	1.0%	1.0%	476	1,205	1.0%	1.0%
	East of North Service Road		8,970	7,585	1.0%	1.0%	9,635	7,247	1.0%	1.0%	10,835	8,271	1.0%	1.0%
Todd Lane/Cabana Road	East of North Service Road		9,971	13,458	1.0%	0.8%	10,668	14,999	1.0%	0.8%	11,958	16,763	1.0%	0.9%
	between North and South Service Road		13,705	14,201	0.6%	0.7%	16,030	15,949	0.6%	0.7%	18,324	17,933	0.6%	0.8%
St. Clair College	between North and South Service Road		8,686	8,729	1.0%	1.0%	8,758	9,145	1.0%	1.0%	9,347	9,638	1.0%	1.0%
	East of North Service Rd		2,969	8,656	1.0%	1.0%	3,199	8,917	1.0%	1.0%	3,387	9,171	1.0%	1.0%
Cousineau Drive	between North and South Service Road		2,285	2,572	1.0%	1.0%	2,480	2,770	1.0%	1.0%	2,706	2,961	1.0%	1.0%
	West of South Service Road		5,880	4,408	1.0%	1.0%	5,242	4,265	1.0%	1.0%	5,507	4,380	1.0%	1.0%
Howard Avenue	East of North Service Road		7,569	6,705	0.1%	1.6%	7,879	7,085	0.1%	1.8%	9,161	7,923	0.1%	2.0%
	between North and South Service Road		9,746	6,412	0.2%	1.8%	10,617	7,091	0.2%	1.8%	12,108	8,103	0.2%	1.9%
E.C. Row Expressway	East of North Service Rd		7,718	8,482	1.7%	1.9%	8,580	9,789	1.6%	1.9%	9,246	10,454	1.6%	1.9%
	between North and South Service Road		11,604	7,215	1.7%	2.0%	12,668	7,994	1.7%	2.1%	13,631	8,725	1.7%	2.1%
GN Booth Drive	West of South Service Road		11,359	13,477	2.1%	2.1%	12,503	15,356	2.1%	2.1%	13,518	17,014	2.1%	2.1%
	West of Ojibway Parkway		13,304	8,173	2.8%	3.0%	17,700	9,006	3.1%	3.4%	21,805	9,794	2.9%	2.7%
Sandwich Street	East of Ojibway Parkway		20,534	11,155	1.6%	2.2%	25,738	12,305	1.5%	2.2%	30,777	13,314	1.5%	2.1%
	West of Matchette Road		34,989	43,027	3.0%	4.7%	43,140	50,618	3.2%	5.2%	48,161	57,032	3.3%	5.6%
Prospect Avenue	At Malden Rd		23,221	29,489	3.9%	4.6%	29,631	33,065	4.1%	5.1%	34,317	37,671	4.3%	5.1%
	West of Ojibway Parkway		15,619	8,173	4.8%	3.0%	20,348	9,006	5.1%	3.4%	24,784	9,794	5.4%	2.7%
EC Row Expressway	West of Ojibway Parkway		357	461	1.7%	1.4%	357	461	1.6%	1.4%	357	461	1.6%	1.4%
	West of Ojibway Parkway													

TABLE 1B
SUMMARY OF TRAFFIC DATA - ALTERNATIVE 1B

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION From To	2015				2025				2035				
		AADT		Comm Vehicles		AADT		Comm Vehicles		AADT		Comm Vehicles		
		NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	
Huron Church Road	Riverside Drive	6,911	5,457	2.5%	1.6%	6,986	5,610	2.6%	2.3%	6,924	5,840	2.9%	3.0%	
	University Avenue	3,258	3,990	3.4%	3.0%	3,233	4,092	3.5%	4.0%	3,108	4,254	5.0%	4.8%	
	Wyandotte Street	2,322	3,177	1.0%	1.0%	2,280	3,224	1.0%	1.0%	2,131	3,370	1.0%	1.0%	
	AMB Off Ramp	17,448	6,323	15.0%	1.5%	18,348	6,447	17.3%	1.6%	19,543	6,656	20.5%	1.6%	
	College Street	25,364	24,092	2.9%	12.4%	26,218	24,966	3.2%	13.9%	26,227	25,933	3.3%	16.5%	
	Girardot Street	24,197	23,801	3.4%	12.3%	25,129	25,158	3.7%	13.5%	25,638	26,525	3.9%	15.7%	
	Tecumseh Road	27,469	27,266	3.5%	10.6%	28,309	28,199	3.8%	11.6%	28,797	29,299	4.0%	13.3%	
	Dorchester Street	27,511	28,532	3.1%	9.3%	28,358	29,470	3.4%	10.3%	28,875	30,357	3.5%	11.7%	
	Prince Road/Totten Street	30,088	31,791	3.2%	8.5%	30,998	33,157	3.4%	8.9%	31,736	34,429	3.6%	10.1%	
	Malden Road	24,739	26,772	2.4%	9.0%	24,761	28,255	2.5%	9.7%	25,383	29,967	2.6%	11.3%	
	Industrial Road	27,169	28,916	2.4%	8.6%	28,022	30,240	2.5%	9.1%	28,657	32,868	2.6%	10.3%	
	EC Row North Ramp Terminal	20,228	35,043	2.1%	6.2%	20,486	38,090	2.1%	6.5%	21,298	41,670	2.2%	7.2%	
	EC Row South Ramp Terminal	24,803	26,946	2.1%	6.2%	27,808	29,115	2.2%	6.4%	30,005	32,155	2.3%	6.8%	
	South Service Road	north of Bethlehem Avenue	N/A	23,492	N/A	6.8%	N/A	25,122	N/A	7.0%	N/A	27,675	N/A	7.4%
		Bethlehem Avenue	N/A	5,220	N/A	2.4%	N/A	5,610	N/A	2.5%	N/A	6,174	N/A	2.6%
		Lambton Street	N/A	5,063	N/A	0.6%	N/A	5,642	N/A	0.3%	N/A	6,440	N/A	0.4%
		Pulford Street	N/A	11,853	N/A	0.8%	N/A	13,546	N/A	0.5%	N/A	15,723	N/A	0.5%
		Todd Lane/Cabana Road	N/A	12,504	N/A	0.9%	N/A	13,994	N/A	0.9%	N/A	15,799	N/A	0.9%
Huron Church Line		N/A	16,536	N/A	0.6%	N/A	17,693	N/A	0.6%	N/A	18,794	N/A	0.7%	
St. Clair College		N/A	9,334	N/A	2.8%	N/A	9,902	N/A	3.3%	N/A	10,735	N/A	3.7%	
Cousineau Drive		N/A	6,282	N/A	4.6%	N/A	6,321	N/A	5.2%	N/A	6,597	N/A	5.9%	
east of Howard Avenue		N/A	12,060	N/A	2.0%	N/A	13,024	N/A	1.9%	N/A	14,106	N/A	2.0%	
North Service Road		north of Labelle Street	25,501	N/A	1.7%	N/A	28,317	N/A	1.8%	N/A	30,540	N/A	1.9%	N/A
	Labelle Street	23,298	N/A	1.0%	N/A	26,127	N/A	1.1%	N/A	28,297	N/A	1.2%	N/A	
	Grand Marais Road Ramp	5,423	N/A	0.1%	N/A	5,754	N/A	0.1%	N/A	6,100	N/A	0.1%	N/A	
	Pulford Street	5,496	N/A	0.2%	N/A	6,105	N/A	0.2%	N/A	6,780	N/A	0.2%	N/A	
	Todd Lane/Cabana Road	11,313	N/A	1.1%	N/A	12,049	N/A	1.2%	N/A	12,703	N/A	1.2%	N/A	
	Huron Church Line	7,229	N/A	0.4%	N/A	7,778	N/A	0.7%	N/A	8,204	N/A	1.2%	N/A	
	St. Clair College	14,718	N/A	0.8%	N/A	15,051	N/A	0.9%	N/A	15,671	N/A	0.8%	N/A	
	Cousineau Drive	7,461	N/A	1.5%	N/A	7,603	N/A	1.5%	N/A	7,984	N/A	1.3%	N/A	
	east of Howard Avenue	13,630	N/A	2.1%	N/A	14,732	N/A	2.0%	N/A	15,472	N/A	2.0%	N/A	
	Ojibway Parkway	E.C. Row Expressway	10,180	10,556	2.2%	5.3%	10,894	11,127	2.3%	6.0%	11,697	11,777	2.5%	6.7%
GN Booth Drive		10,116	10,433	2.2%	5.5%	10,830	10,928	2.3%	6.1%	11,632	11,578	2.5%	6.8%	
Sandwich Street		9,478	9,729	0.8%	0.8%	10,088	10,069	0.7%	0.7%	10,788	10,588	0.7%	0.7%	
north of Prospect Avenue		9,415	9,510	0.8%	0.8%	10,025	9,858	0.7%	0.7%	10,725	10,387	0.7%	0.7%	
CROSS ROADS	Wyandotte Street	west of Huron Church Line	5,168	4,869	1.0%	1.0%	5,099	4,858	1.0%	1.0%	5,008	4,886	1.0%	1.0%
	east of Huron Church Line	3,574	5,121	1.1%	2.6%	3,562	5,201	1.1%	2.7%	3,648	5,398	2.0%	2.9%	
	University	west of Huron Church Line	1,254	1,192	1.0%	1.0%	1,365	1,272	1.0%	1.0%	1,511	1,306	1.0%	1.0%
		east of Huron Church Line	2,138	2,118	5.7%	5.2%	2,311	2,214	7.0%	5.1%	2,481	2,273	8.3%	6.8%
	Riverside Drive	west of Huron Church Line	3,390	3,487	1.0%	1.0%	3,552	3,655	1.0%	1.0%	3,642	3,993	1.0%	1.0%
		east of Huron Church Line	6,770	5,671	1.0%	1.0%	6,981	5,782	1.0%	1.0%	7,225	5,957	1.0%	1.0%
	AMB Off Ramp	east of Huron Church Line	N/A	12,464	N/A	30.7%	N/A	12,464	N/A	30.7%	N/A	12,464	N/A	30.7%
		AMB On Ramp	6,286	N/A	3.0%	N/A	6,558	N/A	3.5%	N/A	6,917	N/A	4.0%	N/A
	Patricia College Street	AMB	4,111	5,195	4.7%	6.2%	4,149	5,049	5.5%	7.1%	4,205	4,873	5.8%	9.0%
		east of Huron Church Road	6,514	6,361	2.6%	4.2%	6,603	6,526	2.5%	4.9%	6,758	6,581	2.5%	6.1%
	Girardot Street	west of Huron Church Road	1,867	806	1.0%	1.0%	2,068	956	1.0%	1.0%	2,272	1,076	1.0%	1.0%
		east of Huron Church Road	1,133	1,140	1.0%	1.0%	1,154	1,148	1.0%	1.0%	1,162	1,155	1.0%	1.0%
	Tecumseh Road	west of Huron Church Road	2,346	2,275	1.7%	1.1%	2,296	2,202	1.8%	1.1%	2,290	2,168	1.8%	1.2%
		east of Huron Church Road	5,829	6,836	2.4%	4.4%	5,786	6,844	2.4%	5.2%	6,210	7,294	2.2%	7.0%
	Dorchester Street	west of Huron Church Road	6,604	6,994	1.0%	1.0%	6,488	7,115	1.0%	1.0%	6,679	7,355	1.0%	1.0%
		east of Huron Church Road	1,693	1,533	1.0%	1.0%	1,726	1,557	1.0%	1.0%	1,748	1,574	1.0%	1.0%
	Prince Road/Totten Street	west of Huron Church Road	1,419	807	1.8%	1.2%	1,419	808	1.9%	1.3%	1,419	807	1.9%	1.3%
		east of Huron Church Road	2,075	2,907	1.0%	1.0%	2,213	2,353	1.0%	1.0%	2,311	2,888	1.0%	1.0%
	Malden Road	west of Huron Church Road	4,782	5,176	1.0%	1.0%	5,515	5,545	1.0%	1.0%	5,053	5,710	1.0%	1.0%
		east of Huron Church Road	1,377	1,126	1.0%	1.0%	1,631	1,358	1.0%	1.0%	1,858	1,508	1.0%	1.0%
	Industrial Road	west of Huron Church Road	7,891	8,417	6.8%	11.6%	8,223	8,875	7.3%	13.1%	8,633	9,314	7.6%	14.4%
		east of Huron Church Road	3,619	3,426	1.5%	2.1%	3,926	3,674	1.4%	2.1%	4,362	3,864	1.2%	2.2%
	E.C. Row Expressway North Ramp Terminal	west of Huron Church Road (E-N/S Off Ramp & S-W On Ramp)	4,072	3,166	3.9%	11.8%	4,262	3,458	4.0%	12.0%	4,490	3,954	4.0%	13.3%
		east of Huron Church Road (E-N/S Off Ramp & S-W On Ramp)	14,334	2,042	1.9%	10.0%	16,245	2,068	1.9%	10.0%	16,852	2,214	1.9%	0.3%
	E.C. Row Expressway South Ramp Terminal	west of Huron Church Road (N-W On Ramp)	607	N/A	22.4%	N/A	583	N/A	27.0%	N/A	624	N/A	30.0%	N/A
		east of Huron Church Road (S-E On Ramp)	N/A	7,407	N/A	0.9%	N/A	10,547	N/A	1.0%	N/A	12,051	N/A	1.0%
	Labelle Street/Bethlehem Avenue	west of Huron Church Road (N-E On Ramp & W-N/S Off Ramp)	8,637	2,904	6.3%	2.8%	9,466	3,083	7.2%	2.7%	10,047	3,314	9.3%	2.8%
		east of North Service Road	2,903	2,116	1.0%	1.0%	3,112	2,338	1.0%	1.0%	3,336	2,617	1.0%	1.0%
Grand Marais Road/Lambton Road	between North and South Service Road	1,403	3,302	1.0%	1.0%	1,232	3,565	1.0%	1.0%	1,573	3,934	1.0%	1.0%	
	west of South Service Road	1,804	3,255	1.0%	1.0%	1,678	4,360	1.0%	1.0%	2,055	3,283	1.0%	1.0%	
Pulford Street	east of Huron Church Road	4,183	3,270	1.0%	1.0%	4,593	3,595	1.0%	1.0%	5,010	3,929	1.0%	1.0%	
	between North and South Service Road	2,420	2,940	0.1%	0.8%	2,664	3,229	0.1%	0.9%	2,907	3,527	0.1%	1.0%	
Todd Lane/Cabana Road	west of South Service Road	1,714	1,960	1.7%	0.9%	1,876	2,193	1.8%	0.9%	2,056	2,428	1.8%	1.0%	
	east of North Service Road	1,465	1,949	1.0%	1.0%	1,600	2,135	1.0%	1.0%	1,748	2,330	1.0%	1.0%	
Huron Church Line	between North and South Service Road	1,393	1,234	1.0%	1.0%	1,528	1,356	1.0%	1.0%	1,672	1,483	1.0%	1.0%	
	west of South Service Road	1,177	876	2.0%	0.8%	1,295	956	2.0%	0.9%	1,413	1,051	2.0%	1.0%	
St. Clair College	east of North Service Road	8,721	7,177	1.0%	1.0%	9,390	7,481	1.0%	1.0%	10,586	8,495	1.0%	1.0%	
	between North and South Service Road	9,351	8,073	1.0%	1.0%	9,884	9,828	1.0%	1.0%	10,926	11,224	1.0%	1.0%	
Cousineau Drive	west of South Service Road	9,933	9,958	1.0%	1.0%	11,875	11,293	1.0%	1.0%	13,701	12,917	1.0%	1.0%	
	between North and South Service Road	1,219	5,242	3.4%	1.5%	1,392	5,744	2.8%	1.5%	1,480	6,252	3.6%	1.5%	
Howard Avenue	west of South Service Road	7,451	6,841	1.2%	1.4%	8,272	7,451	1.2%	1.5%	9,041	7,983	1.3%	1.5%	
	east of North Service Road	2,968	8,655	1.0%	1.0%	3,199	8,915	1.0%	1.0%	3,487	9,168	1.0%	1.0%	
E.C. Row Expressway	between North and South Service Road	2,255	2,587	1.0%	1.0%	2,480	2,790	1.0%	1.0%	2,706	2,988	1.0%	1.0%	
	east of North Service Road	5,396	4,415	1.0%	1.0%	5,254	4,268	1.0%	1.0%	5,106	4,382	1.0%	1.0%	
GN Booth Drive	between North and South Service Road	7,608	6,705	1.0%	1.0%	7,924	7,085	1.0%	1.0%	9,207	7,923	1.0%	1.0%	
	west of South Service Road	9,797	6,318	1.0%	1.0%	10,685	7,021	1.0%	0.2%	12,218	8,024	1.0%	1.0%	
Sandwich Street	east of North Service Road	7,718	8,482	1.7%	1.8%	8,580	9,789	1.7%	1.9%	9,246	10,454	1.7%	1.9%	
	between North and South Service Road	11,637	7,215	1.8%	2.2%	12,711	7,994	1.7%	2.2%	13,678	8,725	1.7%	2.2%	
Prospect Avenue	west of South Service Road	13,382	13,477	2.2%	2.3%	12,530	15,356	2.1%	2.2%	13,546	17,014	2.1%	2.2%	
	east of Ojibway Parkway	11,304	8,173	2.8%	4.7%	17,698	9,003	3.2%	5.2%	21,804</				

SUMMARY OF TRAFFIC DATA - ALTERNATIVE 2A

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION		2015				2025				2035				
	From	To	AADT		Comm Vehicles		AADT		Comm Vehicles		AADT		Comm Vehicles		
			NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	
Huron Church Road	Riverside Drive	University Avenue	6,939	5,479	2.5%	1.6%	7,062	5,644	2.6%	2.4%	7,038	5,893	2.8%	3.0%	
	University Avenue	Wyandotte Street	3,286	3,971	3.3%	3.1%	3,349	4,081	4.3%	4.0%	3,312	4,280	4.5%	4.8%	
	Wyandotte Street	AMB Off Ramp	2,256	3,176	1.0%	1.0%	2,234	3,201	1.0%	1.0%	2,292	3,415	1.0%	1.0%	
	AMB Off Ramp	College Street	17,371	6,347	13.8%	1.5%	18,219	6,483	16.6%	1.6%	19,697	6,722	19.2%	1.6%	
	College Street	Girardot Street	24,380	23,704	2.9%	11.4%	25,180	25,325	3.2%	13.6%	25,791	26,069	3.3%	15.9%	
	Girardot Street	Tecumseh Road	23,677	23,943	3.4%	11.2%	24,578	25,437	3.6%	13.1%	25,158	27,097	3.8%	15.2%	
	Tecumseh Road	Dorchester Street	27,103	27,831	3.5%	9.7%	27,806	28,711	3.8%	11.0%	28,406	31,078	4.0%	12.5%	
	Dorchester Street	Prince Road/Totten Street	27,021	29,147	3.1%	8.4%	27,999	30,476	3.3%	9.6%	28,518	32,810	3.5%	11.1%	
	Prince Road/Totten Street	Malden Road	29,320	32,345	3.2%	7.5%	30,999	34,133	3.4%	8.3%	31,078	36,661	3.6%	9.5%	
	Malden Road	Industrial Road	24,228	27,223	2.4%	8.0%	25,181	28,820	2.5%	9.0%	25,673	31,289	2.6%	10.4%	
	Industrial Road	EC Row Expressway North Ramp Terminal	25,922	29,090	2.4%	7.6%	27,797	30,992	2.6%	8.6%	27,661	33,495	2.6%	9.7%	
	EC Row Expressway North Ramp Terminal	EC Row Expressway South Ramp Terminal	19,860	35,172	2.1%	5.5%	21,217	39,953	2.3%	6.1%	21,241	42,144	2.3%	6.8%	
	EC Row Expressway South Ramp Terminal	Highway 401 Off Ramp	25,710	26,218	1.7%	5.4%	26,699	30,391	1.8%	5.8%	30,263	32,833	1.9%	6.4%	
	Highway 401 Off Ramp	Spring Garden Road/Labelle Street	11,401	7,335	0.7%	1.3%	12,069	8,877	0.7%	1.5%	12,489	9,489	0.8%	1.6%	
	Spring Garden Road/Labelle Street	Lambton Street/Grand Marais Road Ramp	9,600	7,377	1.2%	1.8%	10,251	8,762	1.3%	2.2%	10,516	9,720	1.3%	2.2%	
	Lambton Street/Grand Marais Road Ramp	Pulford Street	8,208	6,730	1.7%	0.6%	8,577	8,072	1.8%	0.6%	8,947	8,380	1.5%	0.7%	
	Pulford Street	Todd Lane/Cabana Road	8,186	7,395	1.9%	0.7%	8,811	8,686	1.9%	0.7%	9,368	9,494	1.9%	0.7%	
	Todd Lane/Cabana Road	Huron Church Line	11,076	13,226	1.1%	1.6%	12,791	14,745	1.2%	1.5%	14,484	17,025	1.3%	1.6%	
	Huron Church Line	St Clair College	6,414	7,682	0.1%	1.0%	6,864	7,897	0.2%	1.0%	7,245	8,548	0.2%	1.0%	
	St Clair College	Cousineau Drive	9,895	6,404	0.1%	1.0%	10,440	7,016	0.1%	1.0%	10,857	6,843	0.1%	1.0%	
Cousineau Drive	Howard Avenue	9,831	5,472	0.2%	1.0%	10,484	6,166	0.4%	0.1%	10,911	6,141	0.6%	0.1%		
Howard Avenue	EC Row Expressway	15,176	13,247	1.9%	2.1%	16,424	14,899	2.0%	2.1%	17,869	16,234	2.0%	2.1%		
EC Row Expressway	GN Booth Drive	10,181	11,207	2.2%	5.1%	10,894	11,526	2.3%	5.8%	11,697	12,459	2.5%	6.3%		
GN Booth Drive	Sandwich Street	10,116	10,994	2.2%	5.2%	10,830	11,322	2.3%	5.9%	11,633	12,247	2.5%	6.4%		
Sandwich Street	Prospect Avenue	9,487	9,723	0.8%	0.8%	10,088	10,109	0.7%	0.7%	10,780	10,639	0.7%	0.7%		
Prospect Avenue	North of Prospect Avenue	9,424	9,512	0.8%	0.8%	10,025	9,989	0.7%	0.7%	10,717	10,429	0.7%	0.7%		
North of Prospect Avenue															
CROSSING ROADS															
Wyandotte Street	West of Huron Church Road		5,192	4,872	1.0%	1.0%	5,112	4,861	1.0%	1.0%	4,937	4,882	1.0%	1.0%	
	East of Huron Church Road		3,616	5,077	1.1%	2.7%	3,628	5,148	1.9%	2.7%	3,627	5,297	2.0%	2.9%	
University Avenue	West of Huron Church Road		1,267	1,128	1.0%	1.0%	1,358	1,254	1.0%	1.0%	1,504	1,357	1.0%	1.0%	
	East of Huron Church Road		2,139	2,145	5.7%	5.1%	2,312	2,356	7.1%	6.1%	2,457	2,367	8.4%	6.3%	
Riverside Drive	West of Huron Church Road		3,368	3,642	1.0%	1.0%	3,548	3,770	1.0%	1.0%	3,634	3,914	1.0%	1.0%	
	East of Huron Church Road		6,739	5,763	1.0%	1.0%	6,951	5,853	1.0%	1.0%	7,254	6,036	1.0%	1.0%	
AMB Off Ramp	East of Huron Church Road		N/A	10,035	N/A	22.1%	N/A	10,798	N/A	26.4%	N/A	12,337	N/A	29.1%	
AMB On Ramp	East of Huron Church Road		6,302	N/A	3.0%	N/A	6,604	N/A	3.5%	N/A	6,927	N/A	4.0%	N/A	
Patricia Street	AMB		4,102	5,173	4.7%	5.6%	4,153	5,101	5.0%	7.0%	4,194	4,966	6.5%	8.8%	
College Street	East of Huron Church Road		6,642	6,443	2.6%	4.4%	6,747	6,609	2.6%	4.9%	6,798	6,780	2.7%	5.8%	
	West of Huron Church Road		1,777	805	1.0%	1.0%	2,013	899	1.0%	1.0%	2,239	990	1.0%	1.0%	
Girardot Street	East of Huron Church Road		1,127	1,161	1.0%	1.0%	1,132	1,167	1.0%	1.0%	1,153	1,174	1.0%	1.0%	
	West of Huron Church Road		2,338	2,273	1.9%	1.4%	2,282	2,206	1.9%	1.4%	2,292	2,172	2.1%	1.4%	
Tecumseh Road	East of Huron Church Road		5,983	6,760	2.2%	4.3%	5,758	6,765	2.2%	5.8%	6,350	7,261	2.2%	7.5%	
	West of Huron Church Road		6,444	6,926	1.0%	1.0%	6,335	6,833	1.0%	1.0%	6,629	7,220	1.0%	1.0%	
Dorchester Street	East of Huron Church Road		1,706	1,536	1.0%	1.0%	1,738	1,562	1.0%	1.0%	1,746	1,586	1.0%	1.0%	
	West of Huron Church Road		1,417	807	2.2%	1.4%	1,418	807	2.3%	1.5%	1,422	806	2.4%	1.5%	
Prince Road/Totten Street	East of Huron Church Road		2,112	2,713	1.0%	1.0%	2,259	2,683	1.0%	1.0%	2,359	2,668	1.0%	1.0%	
	West of Huron Church Road		4,880	5,238	1.0%	1.0%	5,023	5,427	1.0%	1.0%	5,173	5,546	1.0%	1.0%	
Malden Road	East of Huron Church Road		1,376	1,114	1.0%	1.0%	1,681	1,348	1.0%	1.0%	1,859	1,541	1.0%	1.0%	
	West of Huron Church Road		7,502	7,026	7.1%	10.9%	7,798	7,050	7.4%	12.4%	8,088	7,317	7.7%	14.0%	
Industrial Road	East of Huron Church Road		3,634	3,450	1.4%	2.0%	3,903	3,861	1.4%	2.0%	4,318	4,030	1.4%	2.1%	
	West of Huron Church Road		3,911	3,157	3.8%	11.7%	4,306	3,451	4.0%	13.0%	4,481	3,597	4.0%	13.9%	
EC Row Expressway North Ramp Terminal	E-N/S Ramp		13,740	N/A	1.9%	N/A	16,099	N/A	1.9%	N/A	16,787	N/A	2.0%	N/A	
	N-W Ramp		N/A	768	N/A	1.0%	N/A	889	N/A	1.0%	N/A	988	N/A	0.8%	N/A
	S-W Ramp		1,562	N/A	35.6%	N/A	1,642	N/A	40.7%	N/A	1,691	N/A	44.1%	N/A	
EC Row Expressway South Ramp Terminal	W-N/E Ramp		N/A	2,804	N/A	1.7%	N/A	2,910	N/A	2.2%	N/A	2,860	N/A	2.5%	N/A
	S-N-E Ramp		N/A	16,908	N/A	3.1%	N/A	19,396	N/A	3.6%	N/A	21,212	N/A	4.2%	N/A
Spring Garden Road	West of Huron Church Road		2,322	3,118	1.0%	1.0%	2,322	3,118	1.0%	1.0%	2,368	3,118	1.0%	1.0%	
Labelle Street	East of Huron Church Road		3,606	1,866	1.0%	1.0%	3,883	2,060	1.0%	1.0%	4,091	2,140	1.0%	1.0%	
Lambton Street/Grand Marais Road Ramp	East of Huron Church Road		5,266	4,439	1.0%	1.0%	5,269	4,900	1.0%	1.0%	5,271	5,542	1.0%	1.0%	
Pulford Street	East of Huron Church Road		3,301	1,925	1.0%	1.0%	2,975	1,517	1.0%	1.0%	3,004	1,495	1.0%	1.0%	
Cabana Road	East of Huron Church Road		8,027	6,614	1.0%	1.0%	8,534	7,653	1.0%	1.0%	9,275	8,802	1.0%	1.0%	
	between Huron Church Road and Highway 401 northbound Ramps		19,842	19,082	0.2%	1.0%	21,977	20,665	0.3%	1.1%	23,942	23,009	0.3%	1.2%	
Todd Lane	between Highway 401 northbound and southbound Ramps		12,043	16,536	0.2%	1.0%	12,917	18,098	0.3%	1.0%	13,743	19,749	0.3%	1.1%	
	West of Highway 401 southbound Ramps		11,370	9,895	1.0%	1.0%	12,182	10,099	1.0%	1.0%	12,291	10,338	1.0%	1.0%	
Huron Church Line	West of Huron Church Road		7,444	6,031	1.6%	1.3%	8,588	7,611	1.5%	1.3%	10,341	9,022	1.6%	1.4%	
St Clair College	East of Talbot Road		3,144	9,599	1.0%	1.0%	3,254	9,546	1.0%	1.0%	3,214	9,802	1.0%	1.0%	
Cousineau Drive	East of Talbot Road		5,464	5,233	1.0%	1.0%	5,707	5,513	1.0%	1.0%	6,502	5,727	1.0%	1.0%	
	West of Talbot Road		7,233	6,365	1.0%	1.0%	8,167	7,060	0.0%	0.4%	8,832	7,650	0.0%	0.6%	
Howard Avenue	East of Talbot Road		8,133	10,857	1.8%	1.8%	8,765	11,517	1.7%	1.9%	9,113	12,884	1.8%	1.9%	
	between Talbot Road and Highway 401 southbound On Ramp		14,444	7,333	1.4%	2.0%	15,646	8,026	1.5%	2.1%	17,352	8,434	1.6%	2.1%	
	West of Highway 401 southbound On Ramp		12,559	14,692	2.0%	2.0%	13,654	16,628	1.9%	2.0%	15,378	18,277	1.9%	2.0%	
E.C. Row Expressway	East of Huron Church Road		34,790	44,698	3.1%	4.6%	43,065	50,997	3.2%	5.1%	48,073	56,669	3.4%	5.4%	
	At Malden Road		23,297	29,858	4.3%	5.4%	29,982	32,888	4.6%	5.8%	33,768	37,407	4.7%	5.9%	
	West of Matchette Drive		16,051	8,173	2.7%	4.9%	20,854	9,029	2.7%	4.5%	25,601	9,811	2.8%	3.8%	
* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West															
HIGHWAY 401 Ramps															
Highway 3 merge/split															
Highway 401 northbound Off Ramp			11,467	N/A	6.1%	N/A	12,564	N/A	7.2%	N/A	14,074	N/A	8.6%	N/A	
Highway 401 northbound On Ramp			9,736	N/A	2.0%	N/A	9,748	N/A	2.0%	N/A	10,103	N/A	2.0%	N/A	
Highway 401 southbound Off Ramp			N/A	9,952	N/A	1.8%	N/A	N/A	10,144	N/A	1.9%	N/A	10,701	N/A	1.9%
Highway 401 southbound On Ramp			N/A	10,350	N/A	6.1%	N/A	N/A	11,816	N/A	7.7%	N/A	13,164	N/A	7.7%
Howard Avenue															
401 NB Off Ramp			N/A	3,146	N/A	1.1%	N/A	N/A	3,457	N/A	1.4%	N/A	3,75		

SUMMARY OF TRAFFIC DATA - ALTERNATIVE 2B

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION		2015				2025				2035				
	From	To	AADT		Comm Vehicles		AADT		Comm Vehicles		AADT		Comm Vehicles		
			NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	
Huron Church Road	Riverside Drive	University Avenue	6,939	5,479	2.5%	1.6%	7,062	5,644	2.6%	2.4%	7,038	5,893	2.8%	3.0%	
	University Avenue	Wyandotte Street	3,286	3,971	3.3%	3.1%	3,349	4,081	4.3%	4.0%	3,312	4,280	4.5%	4.8%	
	Wyandotte Street	AMB Off Ramp	2,256	3,176	1.0%	1.0%	2,234	3,201	1.0%	1.0%	2,292	3,415	1.0%	1.0%	
	AMB Off Ramp	College Street	17,371	6,347	13.8%	1.5%	18,219	6,483	16.6%	1.6%	19,697	6,722	19.2%	1.6%	
	College Street	Girardot Street	24,380	23,704	2.9%	11.4%	25,180	25,325	3.2%	13.6%	25,791	26,069	3.3%	15.9%	
	Girardot Street	Tecumseh Road	23,677	23,943	3.4%	11.2%	24,378	25,437	3.6%	13.1%	25,158	27,097	3.8%	15.2%	
	Tecumseh Road	Dorchester Street	27,103	27,831	3.5%	9.7%	27,806	28,711	3.8%	11.0%	28,406	31,078	4.0%	12.5%	
	Dorchester Street	Prince Road/Totten Street	27,021	29,147	3.1%	8.4%	27,999	30,476	3.3%	9.6%	28,518	32,810	3.5%	11.1%	
	Prince Road/Totten Street	Malden Road	29,320	32,345	3.2%	7.5%	30,399	34,133	3.4%	8.3%	31,078	36,661	3.6%	9.5%	
	Malden Road	Industrial Road	24,228	27,223	2.4%	8.0%	25,181	28,820	2.5%	9.0%	25,673	31,289	2.6%	10.4%	
	Industrial Road	EC Row Expressway North Ramp Terminal	25,922	29,090	2.4%	7.6%	27,797	30,892	2.6%	8.6%	27,661	33,495	2.6%	9.7%	
	EC Row Expressway North Ramp Terminal	EC Row Expressway South Ramp Terminal	19,860	35,172	2.1%	5.5%	21,217	39,953	2.3%	6.1%	21,241	42,144	2.3%	6.8%	
	EC Row Expressway South Ramp Terminal	Highway 401 Off Ramp	25,710	26,218	1.7%	5.4%	28,699	30,391	1.8%	5.8%	30,263	32,461	1.9%	6.4%	
	Highway 401 Off Ramp	Spring Garden Road/Labelle Street	11,401	7,335	0.7%	1.3%	12,069	8,877	0.7%	1.5%	12,489	9,489	0.8%	1.6%	
	Spring Garden Road/Labelle Street	Lambton Street/Grand Marais Road Ramp	9,600	7,377	1.2%	1.8%	10,251	8,762	1.3%	2.2%	10,516	9,720	1.3%	2.2%	
	Lambton Street/Grand Marais Road Ramp	Pulford Street	8,208	6,730	1.7%	0.6%	8,577	8,072	1.8%	0.6%	8,947	8,380	1.5%	0.7%	
	Pulford Street	Todd Lane/Cabana Road	8,186	7,395	1.9%	0.7%	8,811	8,686	1.9%	0.7%	9,368	9,494	1.9%	0.7%	
	Todd Lane/Cabana Road	Huron Church Line	11,076	13,226	1.1%	1.6%	12,791	14,745	1.2%	1.5%	14,484	17,025	1.3%	1.6%	
	Huron Church Line	St Clair College	6,414	7,682	0.1%	1.0%	6,864	7,897	0.2%	1.0%	7,245	8,548	0.2%	1.0%	
	St Clair College	Cousineau Drive	9,895	6,404	0.1%	1.0%	10,440	7,016	0.1%	1.0%	10,857	6,843	0.1%	1.0%	
Cousineau Drive	Howard Avenue	9,831	5,472	0.2%	1.0%	10,484	6,166	0.4%	0.1%	10,911	6,441	0.6%	0.1%		
Howard Avenue	Highway 3 split	15,176	13,247	1.9%	2.1%	16,424	14,899	2.0%	2.1%	17,869	16,234	2.0%	2.1%		
Highway 3 split	EC Row Expressway	10,181	11,207	2.2%	5.1%	10,894	11,526	2.3%	5.8%	11,697	12,459	2.5%	6.3%		
EC Row Expressway	GN Booth Drive	10,116	10,994	2.2%	5.2%	10,830	11,322	2.3%	5.9%	11,633	12,247	2.5%	6.4%		
GN Booth Drive	Sandwich Street	9,487	9,723	0.8%	0.8%	10,088	10,109	0.7%	0.7%	10,780	10,639	0.7%	0.7%		
Sandwich Street	Prospect Avenue	9,424	9,512	0.8%	0.8%	10,025	9,899	0.7%	0.7%	10,717	10,429	0.7%	0.7%		
Prospect Avenue															
CROSSING ROADS															
Wyandotte Street	West of Huron Church Road		5,192	4,872	1.0%	1.0%	5,112	4,861	1.0%	1.0%	4,937	4,882	1.0%	1.0%	
	East of Huron Church Road		3,616	5,077	1.1%	2.7%	3,628	5,148	1.9%	2.7%	3,627	5,297	2.0%	2.9%	
University Avenue	West of Huron Church Road		1,267	1,128	1.0%	1.0%	1,358	1,254	1.0%	1.0%	1,504	1,357	1.0%	1.0%	
	East of Huron Church Road		2,139	2,145	5.7%	5.1%	2,312	2,356	7.1%	6.1%	2,457	2,367	8.4%	6.3%	
Riverside Drive	West of Huron Church Road		3,368	3,642	1.0%	1.0%	3,548	3,770	1.0%	1.0%	3,634	3,914	1.0%	1.0%	
	East of Huron Church Road		6,739	5,763	1.0%	1.0%	6,951	5,853	1.0%	1.0%	7,254	6,036	1.0%	1.0%	
AMB Off Ramp	Wyandotte Street		N/A	10,035	N/A	22.1%	N/A	10,798	N/A	26.4%	N/A	12,337	N/A	29.1%	
AMB On Ramp	Wyandotte Street		6,302	N/A	3.0%	N/A	6,604	N/A	3.5%	N/A	6,927	N/A	4.0%	N/A	
Patricia Street	Wyandotte Street		4,102	5,173	4.7%	5.6%	4,153	5,101	5.0%	7.0%	4,194	4,966	6.5%	8.8%	
College Street	East of Huron Church Road		6,642	6,443	2.6%	4.4%	6,747	6,609	2.6%	4.9%	6,798	6,780	2.7%	5.8%	
	West of Huron Church Road		1,777	805	1.0%	1.0%	2,013	899	1.0%	1.0%	2,239	990	1.0%	1.0%	
Girardot Street	East of Huron Church Road		1,127	1,161	1.0%	1.0%	1,132	1,167	1.0%	1.0%	1,153	1,174	1.0%	1.0%	
	West of Huron Church Road		2,338	2,273	1.9%	1.4%	2,282	2,206	1.9%	1.4%	2,292	2,172	2.1%	1.4%	
Tecumseh Road	East of Huron Church Road		5,983	6,760	2.2%	4.3%	5,758	6,765	2.2%	5.8%	6,350	7,261	2.2%	7.5%	
	West of Huron Church Road		6,444	6,926	1.0%	1.0%	6,335	6,833	1.0%	1.0%	6,629	7,220	1.0%	1.0%	
Dorchester Street	East of Huron Church Road		1,706	1,536	1.0%	1.0%	1,738	1,562	1.0%	1.0%	1,746	1,586	1.0%	1.0%	
	West of Huron Church Road		1,417	807	2.2%	1.4%	1,418	807	2.3%	1.5%	1,422	806	2.4%	1.5%	
Prince Road/Totten Street	East of Huron Church Road		2,112	2,713	1.0%	1.0%	2,259	2,683	1.0%	1.0%	2,359	2,668	1.0%	1.0%	
	West of Huron Church Road		4,860	5,238	1.0%	1.0%	5,023	5,427	1.0%	1.0%	5,173	5,546	1.0%	1.0%	
Malden Road	East of Huron Church Road		1,376	1,114	1.0%	1.0%	1,681	1,348	1.0%	1.0%	1,859	1,541	1.0%	1.0%	
	West of Huron Church Road		7,502	7,026	7.1%	10.9%	7,798	7,050	7.4%	12.4%	8,088	7,317	7.7%	14.0%	
Industrial Road	East of Huron Church Road		3,634	3,450	1.4%	2.0%	3,903	3,861	1.4%	2.0%	4,318	4,030	1.4%	2.1%	
	West of Huron Church Road		3,911	3,157	3.8%	11.7%	4,306	3,451	4.0%	13.0%	4,481	3,597	4.0%	13.9%	
EC Row Expressway North Ramp Termi	E-N/S Ramp		13,740	N/A	1.9%	N/A	16,099	N/A	1.9%	N/A	16,787	N/A	2.0%	N/A	
	N-W Ramp		N/A	768	N/A	1.0%	N/A	889	N/A	1.0%	N/A	988	N/A	0.8%	N/A
	S-W Ramp		1,562	N/A	35.6%	N/A	1,642	N/A	40.7%	N/A	1,691	N/A	44.1%	N/A	
EC Row Expressway South Ramp Termi	W-N/S Ramp		N/A	2,804	N/A	1.7%	N/A	2,910	N/A	2.2%	N/A	2,860	N/A	2.5%	N/A
	S/N-E Ramp		N/A	16,908	N/A	3.1%	N/A	19,396	N/A	3.6%	N/A	21,212	N/A	4.2%	N/A
Spring Garden Road	West of Huron Church Road		2,322	3,118	1.0%	1.0%	2,322	3,118	1.0%	1.0%	2,368	3,118	1.0%	1.0%	
Labelle Street	East of Huron Church Road		3,606	1,866	1.0%	1.0%	3,883	2,060	1.0%	1.0%	4,091	2,140	1.0%	1.0%	
Lambton Street/Grand Marais Road	East of Huron Church Road		4,296	3,589	1.0%	1.0%	4,299	3,821	1.0%	1.0%	4,299	4,417	1.0%	1.0%	
	West of Huron Church Road		2,354	2,360	1.5%	0.9%	2,581	2,363	1.7%	0.9%	2,627	2,362	1.8%	1.0%	
Pulford Street	East of Huron Church Road		3,301	1,925	1.0%	1.0%	2,975	1,517	1.0%	1.0%	3,004	1,495	1.0%	1.0%	
Cabana Road	East of Huron Church Road		8,027	6,614	1.0%	1.0%	8,534	7,653	1.0%	1.0%	9,275	8,802	1.0%	1.0%	
	between Huron Church Road and Highway 401 northbound Ramps		19,842	19,082	0.2%	1.0%	21,977	20,565	0.3%	1.1%	23,942	23,009	0.3%	1.2%	
	between Highway 401 northbound and southbound Ramps		12,043	16,556	0.2%	1.0%	12,917	18,098	0.3%	1.0%	13,743	19,749	0.3%	1.1%	
Todd Lane	West of Highway 401 southbound Ramps		11,370	9,895	1.0%	1.0%	12,182	10,099	1.0%	1.0%	12,291	10,338	1.0%	1.0%	
	West of Huron Church Road		7,444	6,031	1.6%	1.3%	8,588	7,611	1.5%	1.3%	10,341	9,022	1.6%	1.4%	
Huron Church Line	East of Talbot Road		3,144	9,599	1.0%	1.0%	3,254	9,546	1.0%	1.0%	3,214	9,802	1.0%	1.0%	
St Clair College	East of Talbot Road		5,464	5,233	1.0%	1.0%	5,707	5,513	1.0%	1.0%	6,502	5,727	1.0%	1.0%	
Cousineau Drive	West of Talbot Road		7,232	6,665	1.0%	1.0%	8,167	7,000	0.0%	0.4%	8,832	7,650	0.0%	0.6%	
	East of Talbot Road		8,134	10,557	1.6%	1.8%	8,765	11,517	1.7%	1.9%	9,113	12,384	1.8%	1.9%	
Howard Avenue	between Talbot Road and Highway 401 southbound On Ramp		14,444	7,334	1.4%	2.0%	15,646	8,026	1.5%	2.1%	17,352	8,434	1.6%	2.1%	
	West of Highway 401 southbound On-Ramp		12,559	14,692	2.0%	2.0%	13,654	16,628	1.9%	2.0%	15,378	18,277	1.9%	2.0%	
E.C. Row Expressway	East of Huron Church Road		34,790	44,897	3.1%	4.6%	43,065	50,397	3.2%	5.1%	49,464	57,015	3.4%	5.4%	
	At Malden Road		23,297	30,060	4.3%	5.4%	29,382	32,888	4.6%	5.8%	35,165	37,750	4.8%	5.8%	
	West of Matchette Street		16,051	8,173	2.7%	4.9%	20,854	9,029	2.7%	4.5%	25,601	9,811	2.8%	3.8%	

* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West

HIGHWAY 401 Ramps

Highway 3 merge/split

Highway 401 northbound Off Ramp			11,467	N/A	6.1%	N/A	12,564	N/A	7.2%	N/A	14,074	N/A	8.6%	N/A
Highway 401 northbound On Ramp			9,736	N/A	2.0%	N/A	9,748	N/A	2.0%	N/A	10,103	N/A	2.0%	N/A
Highway 401 southbound Off Ramp			N/A	9,952	N/A	1.8%	N/A	10,144	N/A	1.9%	N/A	10,701	N/A	1.9%
Highway 401 southbound On Ramp			N/A	10,350	N/A	6.1%	N/A	11,816	N/A					

TABLE I-E
SUMMARY OF TRAFFIC DATA - ALTERNATIVE 3

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION		2015				2025				2035			
	FROM	TO	AADT		Comm Vehicles		AADT		Comm Vehicles		AADT		Comm Vehicles	
			NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
Huron Church Road	FROM	TO												
	Riverside Drive	University Avenue	6,918	5,396	2.6%	1.6%	6,961	5,530	2.6%	2.4%	6,880	5,780	2.9%	3.0%
	University Avenue	Wyandotte Street	3,192	3,920	3.5%	3.1%	3,214	4,019	4.5%	4.0%	3,053	4,205	5.0%	4.9%
	Wyandotte Street	AMB Off Ramp	2,259	3,128	1.0%	1.0%	2,224	3,176	1.0%	1.0%	2,107	3,328	1.0%	1.0%
	AMB Off Ramp	College Street	17,523	6,248	15.0%	1.5%	18,564	6,353	16.4%	1.6%	19,717	6,581	20.7%	1.6%
	College Street	Girardot Street	24,195	23,449	2.9%	12.4%	24,955	24,843	3.2%	13.4%	25,463	26,103	3.3%	16.8%
	Girardot Street	Tecumseh Road	23,064	23,964	3.4%	12.3%	24,408	25,958	3.7%	13.1%	25,119	27,680	3.9%	16.0%
	Tecumseh Road	Dorchester Street	26,282	27,186	3.5%	10.6%	27,651	29,331	3.8%	11.3%	28,380	30,495	4.0%	13.6%
	Dorchester Street	Prince Road/Totten Street	26,623	28,555	3.1%	9.3%	28,081	30,873	3.3%	9.9%	28,794	31,651	3.5%	12.0%
	Prince Road/Totten Street	Malden Road	28,955	32,055	3.2%	8.5%	30,049	33,749	3.4%	8.6%	31,206	34,207	3.7%	10.5%
	Malden Road	Industrial Road	23,645	26,388	2.4%	9.0%	24,646	27,981	2.5%	9.4%	25,464	28,851	2.6%	11.7%
	Industrial Road	EC Row Expressway North Ramp Terminal	25,478	28,982	2.4%	8.7%	26,596	30,037	2.6%	8.8%	27,054	31,283	2.6%	10.7%
	EC Row Expressway North Ramp Terminal	EC Row Expressway South Ramp Terminal	19,503	36,395	2.2%	6.3%	20,149	38,952	2.3%	6.4%	20,884	41,304	2.3%	7.7%
	EC Row Expressway South Ramp Terminal	Spring Gdn Rd/Labelle St	24,639	28,455	1.7%	6.3%	28,259	30,210	1.8%	6.2%	29,662	32,024	1.8%	7.3%
	Spring Gdn Rd/Labelle St	Lambton Street/Grand Marais Road	22,690	11,287	1.3%	1.5%	26,134	13,261	1.4%	1.5%	27,720	13,928	1.4%	1.5%
	Lambton Street/Grand Marais Road	Pulford Street	10,760	11,989	1.4%	1.3%	12,557	14,320	1.5%	1.2%	13,439	15,346	1.5%	1.2%
	Pulford Street	Todd Lane/Cabana Road	10,912	12,726	1.5%	1.4%	12,763	15,081	1.6%	1.2%	13,680	16,161	1.6%	1.2%
	Todd Lane/Cabana Road	Huron Church Line	10,614	11,744	1.0%	0.8%	12,281	14,453	1.0%	0.7%	12,890	15,643	1.0%	0.7%
	Huron Church Line	St Clair College	6,839	13,604	0.8%	0.6%	6,530	14,107	1.2%	0.6%	7,121	14,895	1.3%	0.7%
	St Clair College	Cousineau Drive	14,243	7,669	0.9%	3.0%	14,778	7,704	0.9%	3.5%	15,512	8,120	0.8%	3.9%
Cousineau Drive	Howard Avenue	6,432	5,582	1.5%	4.8%	7,085	5,242	1.4%	5.3%	7,625	5,360	1.3%	5.7%	
Howard Avenue	South of Howard Avenue	13,491	12,505	2.1%	2.0%	14,875	13,903	2.0%	2.0%	15,866	14,939	2.0%	2.0%	
South of Howard Avenue	EC Row Expressway	9,914	10,556	1.4%	5.3%	10,857	11,127	1.3%	6.0%	11,827	11,522	1.3%	6.8%	
EC Row Expressway	GN Booth Drive	9,850	10,366	1.4%	5.4%	10,758	10,889	1.3%	6.1%	11,744	11,274	1.3%	6.9%	
GN Booth Drive	Sandwich Street	9,183	9,681	0.8%	0.8%	10,039	10,079	0.7%	0.7%	10,920	10,280	0.7%	0.7%	
Sandwich Street	North of Prospect Avenue	9,120	9,480	0.8%	0.8%	9,975	9,897	0.7%	0.7%	10,857	10,051	0.7%	0.7%	
North of Prospect Avenue														
CROSSING ROADS														
Wyandotte Street	West of Huron Church Road		5,176	4,869	1.0%	1.0%	5,113	4,883	1.0%	1.0%	4,977	4,900	1.0%	1.0%
University Avenue	East of Huron Church Road		3,579	5,179	1.1%	2.7%	3,606	5,258	1.9%	2.7%	3,621	5,433	2.1%	2.8%
Riverside Drive	West of Huron Church Road		1,264	1,185	1.0%	1.0%	1,375	1,229	1.0%	1.0%	1,513	1,313	1.0%	1.0%
AMB Off Ramp	East of Huron Church Road		2,129	2,108	5.7%	5.3%	2,295	2,207	7.1%	6.6%	2,476	2,249	8.3%	6.9%
AMB On Ramp	West of Huron Church Road		3,427	3,539	1.0%	1.0%	3,595	3,728	1.0%	1.0%	3,708	4,018	1.0%	1.0%
Patricia Street	East of Huron Church Road		6,762	5,658	1.0%	1.0%	6,979	5,800	1.0%	1.0%	7,256	5,956	1.0%	1.0%
College Street	East of Huron Church Road		N/A	10,176	N/A	24.1%	N/A	11,242	N/A	25.5%	N/A	12,540	N/A	31.1%
Girardot Street	East of Huron Church Road		6,319	N/A	2.9%	N/A	6,616	N/A	3.5%	N/A	7,019	N/A	4.0%	N/A
Tecumseh Road	West of Huron Church Road		4,109	5,115	4.7%	6.3%	4,135	5,001	5.5%	7.1%	4,206	4,833	5.8%	9.0%
Dorchester Street	East of Huron Church Road		6,585	6,227	2.4%	4.3%	6,690	6,390	2.5%	5.1%	6,834	6,532	2.5%	6.4%
Prince Road/Totten Street	West of Huron Church Road		1,839	751	1.0%	1.0%	2,051	935	1.0%	1.0%	2,260	1,021	1.0%	1.0%
Malden Road	East of Huron Church Road		1,120	1,156	1.0%	1.0%	1,150	1,153	1.0%	1.0%	1,159	1,160	1.0%	1.0%
Industrial Road	West of Huron Church Road		2,346	2,282	1.7%	1.1%	2,288	2,217	1.8%	1.2%	2,290	2,184	1.8%	1.2%
EC Row Expressway North Ramp Terminal	East of Huron Church Road		5,692	6,768	2.4%	4.4%	5,683	6,763	2.4%	5.2%	6,150	7,222	2.3%	6.8%
EC Row Expressway South Ramp Terminal	West of Huron Church Road		6,453	6,857	1.0%	1.0%	6,537	6,961	1.0%	1.0%	6,800	7,321	1.0%	1.0%
Spring Garden Road/Labelle Street	East of Huron Church Road		1,297	844	1.0%	1.0%	1,296	843	1.0%	1.0%	1,296	842	1.0%	1.0%
Lambton Street/Grand Marais Road	West of Huron Church Road		1,796	1,457	1.8%	1.2%	1,830	1,473	1.8%	1.3%	1,849	1,490	1.8%	1.3%
Pulford Street	East of Huron Church Road		2,067	2,624	1.0%	1.0%	2,206	2,597	1.0%	1.0%	2,304	2,597	1.0%	1.0%
Todd Lane/Cabana Road	West of Huron Church Road		4,684	4,687	1.0%	1.0%	4,726	4,924	1.0%	1.0%	4,856	4,953	1.0%	1.0%
Huron Church Line	East of Huron Church Road		1,377	1,093	1.0%	1.0%	1,632	1,318	1.0%	1.0%	1,868	1,462	1.0%	1.0%
St Clair College	West of Huron Church Road		7,305	6,667	7.0%	11.3%	7,621	6,939	7.4%	12.7%	8,033	7,260	7.6%	14.1%
Cousineau Drive	East of Huron Church Road		3,700	3,485	1.6%	2.2%	4,029	3,803	1.4%	2.2%	4,394	3,993	1.2%	2.2%
Howard Avenue	West of Huron Church Road		3,702	3,167	3.6%	12.1%	4,158	3,449	3.9%	12.0%	4,432	3,594	3.9%	13.3%
EC Row Expressway North Ramp Terminal	East of Huron Church Road (E-N/S Off Ramp & S-W On Ramp)		14,514	1,487	1.9%	1.0%	16,498	1,503	1.9%	0.1%	17,403	1,647	2.0%	0.2%
EC Row Expressway South Ramp Terminal	West of Huron Church Road (N-W On Ramp)		846	N/A	31.2%	N/A	948	N/A	32.8%	N/A	1,072	N/A	39.0%	N/A
Spring Garden Road/Labelle Street	East of Huron Church Road (N-E On Ramp & W-N/S Off Ramp)		N/A	7,757	N/A	0.8%	N/A	10,999	N/A	0.9%	N/A	11,842	N/A	1.0%
Lambton Street/Grand Marais Road	West of Huron Church Road		8,597	2,928	6.2%	2.5%	9,010	3,132	6.8%	2.5%	9,507	3,316	8.7%	2.3%
Pulford Street	East of Huron Church Road		3,643	2,941	1.0%	1.0%	3,734	3,026	1.0%	1.0%	3,434	3,160	1.0%	1.0%
Todd Lane/Cabana Road	West of Huron Church Road		3,659	4,143	1.0%	1.0%	3,994	4,329	1.0%	1.0%	4,255	4,448	1.0%	1.0%
Huron Church Line	East of Huron Church Road		4,381	3,824	1.0%	1.0%	4,948	3,919	1.0%	1.0%	5,418	4,073	1.0%	1.0%
St Clair College	West of Huron Church Road		2,028	4,081	1.8%	1.3%	2,077	3,924	1.8%	1.3%	2,126	3,871	1.8%	1.4%
Cousineau Drive	East of Huron Church Road		2,192	1,948	1.0%	1.0%	2,210	1,992	1.0%	1.0%	2,227	2,037	1.0%	1.0%
Howard Avenue	West of Huron Church Road		10,171	8,767	1.0%	1.0%	10,073	8,513	1.0%	1.0%	10,941	9,229	1.0%	1.0%
EC Row Expressway North Ramp Terminal	East of Talbot Road		13,136	10,317	1.0%	1.0%	12,847	10,327	1.0%	1.0%	13,261	10,845	1.0%	1.0%
EC Row Expressway South Ramp Terminal	West of Talbot Road		8,084	6,446	1.2%	1.3%	9,768	8,150	1.2%	1.3%	11,081	9,590	1.2%	1.3%
Spring Garden Road/Labelle Street	East of Talbot Road		3,078	9,540	1.0%	1.0%	3,201	9,406	1.0%	1.0%	3,255	9,306	1.0%	1.0%
Lambton Street/Grand Marais Road	West of Talbot Road		7,837	5,831	1.0%	1.0%	8,160	5,416	1.0%	1.0%	8,875	5,604	1.0%	1.0%
Pulford Street	East of Talbot Road		10,718	8,538	1.0%	0.5%	11,856	8,767	1.0%	1.3%	13,082	9,483	1.0%	1.3%
Todd Lane/Cabana Road	West of Talbot Road		7,849	9,487	1.7%	1.8%	8,186	10,256	1.6%	1.9%	8,905	11,116	1.7%	1.9%
Huron Church Line	between Talbot Road and Highway 401 southbound On Ramp		10,770	6,885	1.8%	2.2%	11,524	7,289	1.7%	2.2%	12,423	7,884	1.7%	2.3%
St Clair College	West of Highway 401 southbound On Ramp		9,648	12,566	2.1%	2.3%	10,488	14,834	2.0%	2.2%	11,262	16,265	2.1%	2.2%
Cousineau Drive	East of Huron Church Road		35,580	35,532	3.0%	4.6%	43,452	42,975	3.2%	5.1%	50,269	48,093	3.4%	5.5%
Howard Avenue	At Malden Road		23,319	29,881	4.2%	5.2%	29,307	34,264	4.5%	5.8%	35,432	38,618	4.8%	5.8%
EC Row Expressway	West of Matchette Street		16,032	8,173	2.3%	4.7%	20,751	9,029	2.3%	4.6%	25,742	9,811	2.3%	4.2%
* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West														
HIGHWAY 401 Ramps														
Highway 3 merge/split														
Highway 401 northbound Off Ramp			9,808	N/A	6.0%	N/A	11,216	N/A	7.1%	N/A	12,186	N/A	8.4%	N/A
Highway 401 northbound On Ramp			9,225	N/A	1.9%	N/A	9,408	N/A	1.9%	N/A	9,811	N/A	1.9%	N/A
Highway 401 southbound Off Ramp			N/A	9,835	N/A	2.0%	N/A	9,929	N/A	1.8%	N/A	10,598	N/A	1.9%
Highway 401 southbound On Ramp			N/A	9,516	N/A	6.1%	N/A	10,588	N/A	7.1%	N/A	11,840	N/A	7.9%
At St. Clair College														
Highway 401 northbound Off Ramp			6,260	N/A	0.7%	N/A	6,414	N/A	0.9%	N/A	6,745	N/A	1.0%	N/A
Highway 401 northbound On Ramp			4,021	N/A	0.8%	N/A	4,728	N/A	0.8%	N/A	5,077	N/A	0.8%	N/A
Highway 401 southbound Off Ramp			N/A	6,455	N/A	3.0%								

TABLE I-F
SUMMARY OF TRAFFIC DATA - PARKWAY ALTERNATIVE

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION From	TO	2015				2025				2035				
			AADT		Comm Vehicles		AADT		Comm Vehicles		AADT		Comm Vehicles		
			NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	
Huron Church Road	Riverside Drive	University Avenue	6,911	5,457	2.5%	1.6%	6,986	5,610	2.6%	2.3%	6,924	5,840	2.9%	3.0%	
	University Avenue	Wyandotte Street	3,258	3,990	3.4%	3.0%	3,233	4,092	3.5%	4.0%	3,108	4,254	5.0%	4.8%	
	Wyandotte Street	AMB Off Ramp	2,322	3,177	1.0%	1.0%	2,280	3,224	1.0%	1.0%	2,131	3,370	1.0%	1.0%	
	AMB Off Ramp	College Street	17,448	6,323	15.0%	1.5%	18,348	6,447	17.3%	1.6%	19,543	6,656	20.5%	1.6%	
	College Street	Girardot Street	25,364	24,092	2.9%	12.4%	26,218	24,966	3.2%	13.9%	26,227	25,933	3.3%	16.5%	
	Girardot Street	Tecumseh Road	24,197	25,801	3.4%	12.3%	25,129	25,158	3.7%	13.5%	25,638	26,525	3.9%	15.7%	
	Tecumseh Road	Dorchester Street	27,469	27,256	3.5%	10.6%	28,309	28,199	3.8%	11.6%	28,797	29,299	4.0%	13.3%	
	Dorchester Street	Prince Road/Totten Street	27,511	28,532	3.1%	9.3%	28,358	29,470	3.4%	10.3%	28,875	30,357	3.5%	11.7%	
	Prince Road/Totten Street	Malden Road	30,088	31,791	3.2%	8.5%	30,998	33,157	3.4%	8.9%	31,736	34,429	3.6%	10.1%	
	Malden Road	Industrial Road	24,739	26,772	2.4%	9.0%	24,761	28,255	2.5%	9.7%	25,383	29,967	2.6%	11.3%	
	Industrial Road	E.C. Row Expressway North Ramp Terminal	27,169	28,916	2.4%	8.6%	28,022	30,240	2.5%	9.1%	28,657	32,868	2.6%	10.3%	
	E.C. Row Expressway North Ramp Terminal	E.C. Row Expressway South Ramp Terminal	20,228	35,043	2.1%	6.2%	20,486	38,090	2.1%	6.5%	21,298	41,670	2.2%	7.2%	
	E.C. Row Expressway South Ramp Terminal		24,741	26,578	2.1%	6.2%	27,739	28,701	2.2%	6.4%	30,005	32,155	2.3%	6.8%	
	South Service Road	North of Bethlehem Avenue		N/A	23,492	N/A	6.8%	N/A	25,122	N/A	7.0%	N/A	27,675	N/A	7.4%
		Bethlehem Avenue	Grand Marais Road	N/A	5,220	N/A	2.4%	N/A	5,610	N/A	2.5%	N/A	6,174	N/A	2.6%
North Service Road	North of Labelle Street		25,501	N/A	1.7%	N/A	28,317	N/A	1.8%	N/A	30,540	N/A	1.9%		
	Labelle Street	Grand Marais Road Ramp	23,298	N/A	1.0%	N/A	26,127	N/A	1.1%	N/A	28,297	N/A	1.2%		
Huron Church Road	Grand Marais Road	Pulford Street	6,176	4,265	0.1%	0.6%	6,629	4,743	0.1%	0.3%	7,103	5,374	0.1%	0.4%	
	Pulford Street	Todd Lane/Cabana Road	5,813	4,243	0.2%	0.8%	6,418	4,880	0.2%	0.5%	7,074	5,644	0.2%	0.5%	
Talbot Road	Huron Church Line	Huron Church Line	15,881	9,555	1.1%	0.9%	16,915	10,707	1.2%	0.9%	17,838	12,117	1.2%	0.9%	
	St Clair College	St Clair College	11,107	9,691	0.4%	0.6%	11,982	10,375	0.7%	0.6%	12,692	11,023	1.2%	0.7%	
	Cousineau Drive	Cousineau Drive	9,229	8,012	0.8%	2.8%	9,448	8,541	0.9%	3.3%	9,792	9,249	0.8%	3.7%	
	Howard Avenue	Laurier Extension	8,722	2,696	1.5%	4.0%	8,810	2,709	1.5%	5.2%	9,366	2,847	1.3%	5.9%	
Ojibway Parkway	South of Laurier Extension		11,607	11,385	2.1%	2.0%	12,429	12,257	2.0%	1.9%	13,137	13,283	2.0%	2.0%	
	E.C. Row Expressway		12,021	11,914	2.1%	2.0%	12,974	12,826	2.0%	1.9%	13,639	13,900	2.0%	2.0%	
	GN Booth Drive	GN Booth Drive	10,180	10,556	2.2%	5.3%	10,894	11,127	2.3%	6.0%	11,697	11,777	2.5%	6.7%	
	Sandwich Street	Sandwich Street	10,116	10,433	2.2%	5.5%	10,830	10,928	2.3%	6.1%	11,632	11,578	2.5%	6.8%	
	Prospect Avenue	Prospect Avenue	9,478	9,729	0.8%	0.8%	10,088	10,069	0.7%	0.7%	10,788	10,588	0.7%	0.7%	
	North of Prospect Avenue		9,415	9,510	0.8%	0.8%	10,025	9,858	0.7%	0.7%	10,725	10,387	0.7%	0.7%	
Wyandotte Street	West of Huron Church Road		5,168	4,869	1.0%	1.0%	5,099	4,858	1.0%	1.0%	5,008	4,886	1.0%	1.0%	
	East of Huron Church Road		3,574	5,121	1.1%	2.6%	3,562	5,201	1.1%	2.7%	3,648	5,398	2.0%	2.9%	
	West of Huron Church Road		1,254	1,192	1.0%	1.0%	1,365	1,272	1.0%	1.0%	1,511	1,306	1.0%	1.0%	
	East of Huron Church Road		2,138	2,118	5.7%	5.2%	2,311	2,214	7.0%	5.1%	2,481	2,273	8.3%	6.8%	
	West of Huron Church Road		3,390	3,487	1.0%	1.0%	3,552	3,655	1.0%	1.0%	3,642	3,993	1.0%	1.0%	
	East of Huron Church Road		6,770	5,671	1.0%	1.0%	6,981	5,782	1.0%	1.0%	7,225	5,957	1.0%	1.0%	
	AMB Off Ramp		N/A	12,464	N/A	30.7%	N/A	12,464	N/A	30.7%	N/A	12,464	N/A	30.7%	
	AMB On Ramp		6,286	N/A	3.0%	N/A	6,558	N/A	3.5%	N/A	6,917	N/A	4.0%	0.0%	
	Patricia Street	Wyandotte Street	4,111	5,195	4.7%	6.2%	4,149	5,049	5.5%	7.1%	4,205	4,873	5.8%	9.0%	
	College Street		6,514	6,361	2.6%	4.2%	6,603	6,526	2.5%	4.9%	6,758	6,581	2.5%	6.1%	
	Girardot Street	West of Huron Church Road		1,867	806	1.0%	1.0%	2,068	956	1.0%	1.0%	2,272	1,076	1.0%	1.0%
		East of Huron Church Road		1,133	1,160	1.0%	1.0%	1,154	1,148	1.0%	1.0%	1,162	1,155	1.0%	1.0%
	Tecumseh Road	West of Huron Church Road		2,546	2,275	1.7%	1.1%	2,296	2,202	1.8%	1.1%	2,299	2,168	1.8%	1.2%
		East of Huron Church Road		5,829	6,836	2.4%	4.4%	5,786	6,844	2.4%	5.2%	6,210	7,294	2.3%	7.0%
	Dorchester Street	West of Huron Church Road		6,604	6,994	1.0%	1.0%	6,488	7,115	1.0%	1.0%	6,679	7,355	1.0%	1.0%
East of Huron Church Road			1,693	1,533	1.0%	1.0%	1,726	1,557	1.0%	1.0%	1,748	1,574	1.0%	1.0%	
Prince Road/Totten Street	West of Huron Church Road		1,419	807	1.8%	1.2%	1,419	808	1.9%	1.3%	1,419	807	1.9%	1.3%	
	East of Huron Church Road		2,075	2,907	1.0%	1.0%	2,213	2,353	1.0%	1.0%	2,311	2,888	1.0%	1.0%	
Malden Road	West of Huron Church Road		4,782	5,176	1.0%	1.0%	5,515	5,545	1.0%	1.0%	5,053	5,710	1.0%	1.0%	
	East of Huron Church Road		1,377	1,126	1.0%	1.0%	1,631	1,358	1.0%	1.0%	1,858	1,508	1.0%	1.0%	
Industrial Road	West of Huron Church Road		7,891	8,417	6.8%	11.6%	8,223	8,875	7.3%	13.1%	8,633	9,314	7.6%	14.4%	
	East of Huron Church Road		3,619	3,426	1.5%	2.1%	3,926	3,674	1.4%	2.1%	4,362	3,864	1.2%	2.2%	
E.C. Row Expressway North Ramp Terminal	West of Huron Church Road		4,072	3,166	3.9%	11.8%	4,262	3,458	4.0%	12.0%	4,490	3,594	4.0%	13.3%	
	East of Huron Church Road		14,334	10,42	1.9%	1.0%	16,245	2,068	1.9%	1.0%	16,852	2,214	1.9%	0.3%	
E.C. Row Expressway South Ramp Terminal	West of Huron Church Road		607	N/A	22.4%	N/A	583	N/A	27.0%	N/A	624	N/A	30.0%	N/A	
	East of Huron Church Road		N/A	7,407	N/A	0.9%	N/A	10,547	N/A	1.0%	N/A	12,051	N/A	1.0%	
Labelle Street/Bethlehem Avenue	West of Huron Church Road		8,637	2,904	6.3%	2.8%	9,466	3,083	7.2%	2.7%	10,047	3,314	9.3%	2.8%	
	East of North Service Road		2,903	2,203	1.0%	1.0%	3,112	2,438	1.0%	1.0%	3,336	2,617	1.0%	1.0%	
Grand Marais Road/Lambton Street	Between North and South Service Road		1,403	3,202	1.0%	1.0%	1,232	3,565	1.0%	1.0%	1,573	3,934	1.0%	1.0%	
	West of South Service Road		1,804	3,255	1.0%	1.0%	1,678	4,360	1.0%	1.0%	2,055	3,283	1.0%	1.0%	
Pulford Street	East of Huron Church Road		3,962	3,270	1.0%	1.0%	4,372	3,595	1.0%	1.0%	5,010	3,929	1.0%	1.0%	
	East of Huron Church Road		1,714	1,960	1.4%	0.8%	1,876	2,103	1.6%	0.9%	2,066	2,428	1.6%	0.8%	
Todd Lane/Cabana Road	East of Huron Church Road		2,407	1,762	1.0%	1.0%	2,635	1,928	1.0%	1.0%	2,876	2,107	1.0%	1.0%	
	East of Huron Church Road		8,767	7,224	1.0%	1.0%	9,440	7,526	1.0%	1.0%	10,586	8,495	1.0%	1.0%	
Huron Church Line	Between Huron Church Road and Highway 401 Off Ramp		9,350	12,349	1.0%	1.0%	9,855	15,424	1.0%	1.0%	10,886	17,405	1.0%	1.0%	
	West of Highway 401 Off Ramp		9,953	10,417	1.0%	1.0%	11,908	11,817	1.0%	1.0%	13,727	13,505	1.0%	1.0%	
St Clair College	West of Talbot Road		7,456	6,841	1.2%	1.4%	8,273	7,451	1.2%	1.5%	9,041	7,983	1.3%	1.5%	
	East of Talbot Road		3,009	9,320	1.0%	1.0%	3,240	9,608	1.0%	1.0%	3,428	9,882	1.0%	1.0%	
Cousineau Drive	West of Talbot Road		6,321	5,777	1.0%	1.0%	6,134	5,580	1.0%	1.0%	6,470	5,725	1.0%	1.0%	
	West of Talbot Road		7,099	5,807	1.0%	1.0%	7,697	6,496	1.0%	0.2%	8,816	7,424	1.0%	0.1%	
Howard Avenue	East of Talbot Road		7,048	8,092	1.7%	1.8%	8,580	9,316	1.7%	1.9%	9,246	9,953	1.7%	1.9%	
	West of Talbot Road		6,911	8,038	2.2%	2.3%	7,584	9,172	2.1%	2.2%	8,379	10,157	2.1%	2.2%	
Laurier Extension	West of Talbot Road/Highway 3		6,658	6,543	2.2%	2.3%	7,307	7,473	2.1%	2.2%	7,881	8,274	2.1%	2.2%	
	West of Ojibway Parkway		17,859	15,300	2.8%	4.7%	23,590	16,818	3.2%	5.2%	30,784	17,189	1.6%	2.2%	
E.C. Row Expressway	West of Broadway Street		19,828	27,454	1.5%	2.2%	24,768	30,219	1.5%	2.2%	29,551	32,605	1.6%	2.2%	
	East of Huron Church Road		38,042	43,067	3.1%	4.5%	43,102	51,004	3.2%	5.0%	49,462	56,583	3.4%	5.4%	
GN Booth Drive	At Malden Road		23,838	29,462	4.3%	5.4%	29,896	33,650	4.6%	6.0%	35,168	37,219	4.8%	6.0%	
	West of Matchette Road		16,363	8,173	2.7%	4.7%	21,440	9,003	3.1%	5.2%	25,630	9,791	2.9%	4.4%	
Sandwich Street	West of Ojibway Parkway		357	461	1.9%	1.7%	357	461	1.9%	1.7%	357	461	1.9%	1.7%	
	West of Ojibway Parkway		1,533	1,388	9.6%	6.6%	1,629	1,518	9.3%	6.4%	1,775	1,630	8.8%	6.3%	
Prospect Avenue	West of Ojibway Parkway		342	437	2.0%	1.0%	342	437	1.9						

SUMMARY OF ESAL CALCULATIONS - FLEXIBLE PAVEMENTS - ALTERNATIVE 1A

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION		Northbound/Westbound					Southbound/Eastbound				
	From	To	LDF	TF	Design Period (years)	ESALs	Class	LDF	TF	Design Period (years)	ESALs	Class
Huron Church Road	Riverside Drive	University Avenue	0.9	2	19	2,355,841	Major Collector	0.9	2	19	1,632,290	Major Collector
	University Avenue	Wyandotte Street	0.9	2	19	1,822,880	Major Collector	0.9	2	19	2,033,116	Major Collector
	Wyandotte Street	AMB Off Ramp	0.9	2	19	277,133	Minor Collector	0.9	2	19	392,502	Minor Collector
	AMB Off Ramp	College	0.8	2	19	35,164,062	Major Arterial	0.9	2	19	1,267,536	Major Collector
	College Street	Girardot Street	0.8	2	19	9,169,220	Minor Arterial	0.8	2	19	38,378,611	Major Arterial
	Girardot Street	Tecumseh Road	0.8	2	19	10,093,451	Minor Arterial	0.8	2	19	37,366,261	Major Arterial
	Tecumseh Road	Dorchester Street	0.8	2	19	11,751,221	Minor Arterial	0.8	2	19	36,073,735	Major Arterial
	Dorchester Street	Prince Road/Totten Street	0.8	2	19	10,283,260	Minor Arterial	0.8	2	19	32,960,098	Major Arterial
	Prince Road/Totten Street	Malden Road	0.8	2	19	11,554,694	Minor Arterial	0.8	2	19	32,824,966	Major Arterial
	Malden Road	Industrial Road	0.8	2	19	6,862,058	Minor Arterial	0.8	2	19	30,927,075	Major Arterial
	Industrial Rd	EC Row North Ramp Terminal	0.8	2	19	7,800,046	Minor Arterial	0.8	2	19	31,594,901	Major Arterial
	EC Row North Ramp Terminal	EC Row South Ramp Terminal	0.8	2	19	5,146,190	Major Collector	0.8	2	19	30,683,990	Major Arterial
	EC Row South Ramp Terminal	North of Lambton Street	0.8	2	19	7,123,330	Minor Arterial	0.8	2	19	23,990,334	Major Arterial
	North of Lambton Street	Todd Lane/Cabana Road				no data		1	2	19	2,445,688	Major Collector
	Todd Lane/Cabana Road	St Clair College				no data		1	2	19	1,869,677	Major Collector
	St Clair College	Cousineau Drive				no data		1	2	19	1,172,194	Major Collector
	Cousineau Drive	Howard Avenue				no data		1	2	19	2,834,974	Major Collector
Howard Avenue	East of Howard Avenue				no data		1	2	19	2,776,739	Major Collector	
East of Howard Avenue	North of Labelle Street				no data		1	2	19	3,518,137	Major Collector	
North of Labelle Street	Labelle Street				7,514,528	Minor Arterial				no data		
Labelle Street	Grand Marais Road Ramp				4,847,309	Major Collector				no data		
Grand Marais Road Ramp	Pulford Street				2,367,614	Major Collector				no data		
Pulford Street	Todd Lane/Cabana Road				2,605,552	Major Collector				no data		
Todd Lane/Cabana Road	St Clair College				994,834	Minor Collector				no data		
St Clair College	Cousineau Drive				1,102,788	Major Collector				no data		
Cousineau Drive	Howard Avenue				2,834,656	Major Collector				no data		
Howard Avenue	East of Howard Avenue				4,353,230	Major Collector				no data		
East of Howard Avenue	GN Booth Drive				2,784,093	Major Collector	0.8	2	19	7,338,520	Minor Arterial	
GN Booth Drive	Sandwich Street				2,789,884	Major Collector	0.8	2	19	7,376,860	Minor Arterial	
Sandwich Street	Prospect Avenue				814,358	Minor Collector	0.8	2	19	821,465	Minor Collector	
Prospect Avenue	North of Prospect Avenue				809,496	Minor Collector	0.8	2	19	804,291	Minor Collector	
North of Prospect Avenue												
CROSS ROADS												
Wyandotte Street	West of Huron Church Road		1	1.5	19	533,102	Minor Collector	1	1.5	19	509,976	Minor Collector
East of Huron Church Road	West of Huron Church Road		1	1.5	19	724,004	Minor Collector	1	1.5	19	1,531,451	Major Collector
University Avenue	West of Huron Church Road		1	1.5	19	143,940	Local	1	1.5	19	131,043	Local
East of Huron Church Road	West of Huron Church Road		1	1.5	19	1,691,694	Major Collector	1	1.5	19	1,516,825	Major Collector
Riverside Drive	E of Huron Church		1	1.5	19	371,254	Minor Collector	1	1.5	19	389,942	Minor Collector
E of Huron Church	E of Huron Church		1	1.5	19	720,155	Minor Collector	1	1.5	19	604,732	Minor Collector
AMB Off Ramp	E of Huron Church		1	1.5	19	no data		1	1.5	19	31,000,318	Major Arterial
AMB On Ramp	AMB		1	1.5	19	2,387,572	Major Collector				no data	
Patricia Street	Wyandotte Street		1	1.5	19	2,316,801	Major Collector	1	1.5	19	3,813,587	Major Collector
College Street	East of Huron Church Road		1	1.5	19	1,708,003	Major Collector	1	1.5	19	3,553,628	Major Collector
East of Huron Church Road	West of Huron Church Road		1	1.5	19	213,918	Minor Collector	1	1.5	19	98,502	Local
Girardot Street	East of Huron Church Road		1	1.5	19	118,935	Local	1	1.5	19	121,049	Local
West of Huron Church Road	East of Huron Church Road		1	1.5	19	381,998	Minor Collector	1	1.5	19	223,541	Minor Collector
Tecumseh Road	East of Huron Church Road		1	1.5	19	1,348,886	Major Collector	1	1.5	19	3,776,582	Major Collector
West of Huron Church Road	East of Huron Church Road		1	1.5	19	682,926	Major Collector	1	1.5	19	742,094	Minor Collector
Dorchester Street	East of Huron Church Road		1	1.5	19	178,211	Local	1	1.5	19	164,294	Local
West of Huron Church Road	East of Huron Church Road		1	1.5	19	235,973	Minor Collector	1	1.5	19	89,597	Local
Prince Road/Totten Street	East of Huron Church Road		1	1.5	19	228,660	Minor Collector	1	1.5	19	271,824	Minor Collector
West of Huron Church Road	East of Huron Church Road		1	1.5	19	543,540	Minor Collector	1	1.5	19	570,391	Minor Collector
Malden Road	East of Huron Church Road		1	1.5	19	167,789	Local	1	1.5	19	138,372	Local
West of Huron Church Road	East of Huron Church Road		1	1.5	19	5,996,945	Major Collector	1	1.5	19	11,347,383	Minor Arterial
Industrial Road	East of Huron Church Road		1	1.5	19	610,571	Minor Collector	1	1.5	19	817,538	Minor Collector
West of Huron Church Road	East of Huron Church Road		1	1.5	19	1,781,647	Major Collector	1	1.5	19	4,677,110	Major Collector
E.C. Row Expressway North Ramp Terminal	East of Huron Church Road (W-N/S Off Ramp & N-W On Ramp)		1	1.5	19	3,646,597	Major Collector	1	1.5	19	4,699	Local
West of Huron Church Road (S-W On Ramp)	East of Huron Church Road (N-E On Ramp)		1	1.5	19	1,717,399	Major Collector				no data	
E.C. Row Expressway South Ramp Terminal	West of Huron Church Road (S-E On Ramp & E-N/S Off Ramp)		1	1.5	19	7,160,163	Minor Arterial	1	1.5	19	1,700,453	Major Collector
East of North Service Road	West of North Service Road		1	1.5	19	213,501	Minor Collector	1	1.5	19	879,060	Minor Collector
Grand Marais Road Ramp	East of North Service Road		1	1.5	19	559,400	Minor Collector	1	1.5	19	78,655	Local
Fazio Drive	West of South Service Road		1	1.5	19	658,859	Minor Collector	1	1.5	19	213,865	Minor Collector
Pulford Street	East of North Service Road		1	1.5	19	50,023	Local	1	1.5	19	352,201	Minor Collector
Todd Lane/Cabana Road	East of North Service Road		1	1.5	19	1,010,692	Major Collector	1	1.5	19	114,248	Local
between North and South Service Road	between North and South Service Road		1	1.5	19	1,119,285	Major Collector	1	1.5	19	785,844	Minor Collector
between South Service Road and Huron Church Line	between South Service Road and Huron Church Line		1	1.5	19	956,746	Minor Collector	1	1.5	19	1,265,943	Major Collector
West of Huron Church Line	East of North Service Rd		1	1.5	19	922,144	Minor Collector	1	1.5	19	1,206,016	Major Collector
St. Clair College	East of North Service Rd		1	1.5	19	330,663	Minor Collector	1	1.5	19	950,828	Minor Collector
between North and South Service Road	East of North Service Rd		1	1.5	19	256,814	Minor Collector	1	1.5	19	926,084	Local
Cousineau Drive	East of North Service Road		1	1.5	19	554,966	Minor Collector	1	1.5	19	298,988	Minor Collector
between North and South Service Road	West of South Service Road		1	1.5	19	49,734	Local	1	1.5	19	450,109	Minor Collector
West of South Service Road	East of North Service Rd		1	1.5	19	203,916	Minor Collector	1	1.5	19	1,339,311	Major Collector
Howard Avenue	East of North Service Rd		1	1.5	19	1,444,079	Major Collector	1	1.5	19	1,333,221	Major Collector
between North and South Service Road	West of South Service Road		1	1.5	19	2,205,001	Major Collector	1	1.5	19	1,921,514	Major Collector
West of South Service Road	East of North Service Rd		1	1.5	19	2,702,072	Major Collector	1	1.5	19	1,705,104	Major Collector
E.C. Row Expressway	East of Ojibway Parkway		0.8	2	19	5,757,431	Major Collector	1	1.5	19	3,278,335	Major Collector
West of Ojibway Parkway	East of Huron Church Road		0.8	2	19	4,230,045	Major Collector	1	2	19	3,909,440	Major Collector
East of Huron Church Road	At Malden Rd		0.8	2	19	14,798,368	Minor Arterial	1	2	19	3,678,095	Major Collector
At Malden Rd	West of Matchette Road		0.8	2	19	13,222,919	Minor Arterial	1	2	19	36,065,807	Major Arterial
West of Matchette Road	West of Ojibway Parkway		0.8	2	19	11,413,597	Minor Arterial	1	2	19	23,049,269	Major Arterial
GN Booth Drive	West of Ojibway Parkway		1	1.5	19	59,678	Local	1	1.5	19	3,909,440	Major Collector
Sandwich Street	West of Ojibway Parkway		1	1.5	19	1,575,586	Major Collector	1	1.5	19	66,610	Local
Prospect Avenue	West of Ojibway Parkway		1	1.5	19	57,268	Local	1	1.5	19	1,001,131	Major Collector
West of Ojibway Parkway			1	1.5	19			1	1.5	19	40,772	Local
* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West												
HIGHWAY 401 Ramps												
Highway 3 merge/split												
Highway 401 northbound Off Ramp			1	2	19	10,917,727	Minor Arterial				no data	
Highway 401 northbound On Ramp			1	2	19	2,428,699	Major Collector				no data	
Highway 401 southbound Off Ramp						no data		1	2	19	2,769,473	Major Collector
Highway 401 southbound On Ramp						no data		1	2	19	10,549,830	Minor Arterial
At St. Clair College												
Highway 401 northbound Off Ramp			1	1.5	19	755,609	Minor Collector				no data	
Highway 401 northbound On Ramp			1	1.5	19	229,431	Minor Collector				no data	
Highway 401 southbound Off Ramp						no data		1	1.5	19	2,176,331	Major Collector
Highway 401 southbound On Ramp						no data		1	1.5	19	234,069	Minor Collector
At Huron Church Road												
Highway 401 northbound Off Ramp			1	2	19	3,997,976	Major Collector				no data	
Highway 401 southbound On Ramp								1	2	19	19,271,082	Minor Arterial
At Malden Road												
Highway 401 northbound On Ramp			1	1.5	19	5,640,656	Major Collector				no data	
Highway 401 southbound Off Ramp						no data		1	1.5	19	5,686,088	Major Collector
Highway 401 to E.C. Row Expressway												
401 SB Off Ramp						no data		1	2	19	17,729,368	Minor Arterial
Ojibway Parkway Interchange												
Highway 401 northbound Off Ramp			1	2	19	6,425,673	Minor Arterial				no data	
Highway 401 northbound On Ramp			1	2	19	4,883,853	Major Collector					

SUMMARY OF ESAL CALCULATIONS - FLEXIBLE PAVEMENTS - ALTERNATIVE 1B

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION		Northbound/Westbound					Southbound/Eastbound				
	From	To	LDF	TF	Design Period (years)	ESALs	Class	LDF	TF	Design Period (years)	ESALs	Class
Huron Church Road	Riverside Drive	University Avenue	0.9	2	19	2,318,723	Major Collector	0.9	2	19	1,613,018	Major Collector
	University Avenue	Wyandotte Street	0.9	2	19	1,534,091	Major Collector	0.9	2	19	2,014,241	Major Collector
	Wyandotte Street	AMB Off Ramp	0.9	2	19	282,018	Minor Collector	0.9	2	19	404,775	Minor Collector
	AMB Off Ramp	College	0.8	2	19	35,745,592	Major Arterial	0.9	2	19	1,246,000	Major Collector
	College Street	Girardot Street	0.8	2	19	9,121,152	Minor Arterial	0.8	2	19	39,268,951	Major Arterial
	Girardot Street	Tecumseh Road	0.8	2	19	10,108,420	Minor Arterial	0.8	2	19	38,247,717	Major Arterial
	Tecumseh Road	Dorchester Street	0.8	2	19	11,804,328	Minor Arterial	0.8	2	19	36,838,770	Major Arterial
	Dorchester Street	Prince Road/Totten Street	0.8	2	19	10,422,643	Minor Arterial	0.8	2	19	33,845,734	Major Arterial
	Prince Road/Totten Street	Malden Road	0.8	2	19	11,709,441	Minor Arterial	0.8	2	19	33,464,371	Major Arterial
	Malden Road	Industrial Road	0.8	2	19	6,843,950	Minor Arterial	0.8	2	19	31,147,517	Major Arterial
	Industrial Road	EC Row North Ramp Terminal	0.8	2	19	7,762,430	Minor Arterial	0.8	2	19	31,385,533	Major Arterial
	EC Row North Ramp Terminal	EC Row South Ramp Terminal	0.8	2	19	4,848,338	Major Collector	0.8	2	19	27,775,883	Major Arterial
	South Service Road	South of EC Row South Ramp Terminal	0.8	2	19	6,739,829	Minor Arterial	0.8	2	19	20,972,160	Major Arterial
	north of Bethlehem Avenue					no data		1	2	19	24,643,746	Major Arterial
	Bethlehem Avenue	Lambton Street				no data		1	2	19	1,931,404	Major Collector
	Lambton Street	Pulford Street				no data		1	2	19	306,828	Minor Collector
	Pulford Street	Todd Lane/Cabana Road				no data		1	2	19	1,031,576	Major Collector
Todd Lane/Cabana Road	Huron Church Line				no data		1	2	19	1,685,810	Major Collector	
Huron Church Line	St. Clair College				no data		1	2	19	1,564,142	Major Collector	
St. Clair College	Cousineau Drive				no data		1	2	19	4,524,555	Major Collector	
Cousineau Drive	Howard Avenue				no data		1	2	19	4,620,893	Major Collector	
east of Howard Avenue					no data		1	2	19	3,527,171	Major Collector	
North Service Road	north of Labelle Street		1	2	19	7,040,640	Minor Arterial				no data	
	Labelle Street	Grand Marais Road Ramp	1	2	19	3,876,909	Major Collector				no data	
	Grand Marais Road Ramp	Pulford Street	1	2	19	108,248	Local				no data	
	Pulford Street	Todd Lane/Cabana Road	1	2	19	170,430	Local				no data	
	Todd Lane/Cabana Road	Huron Church Line	1	2	19	1,907,803	Major Collector				no data	
	Huron Church Line	St. Clair College	1	2	19	829,845	Minor Collector				no data	
	St. Clair College	Cousineau Drive	1	2	19	1,822,141	Major Collector				no data	
	Cousineau Drive	Howard Avenue	1	2	19	1,516,256	Major Collector				no data	
	east of Howard Avenue		1	2	19	4,148,596	Major Collector				no data	
	E.C. Row Expressway	GN Booth Drive	0.8	2	19	2,822,038	Major Collector	0.8	2	19	7,408,690	Minor Arterial
Ojibway Parkway	GN Booth Drive	Sandwich Street	0.8	2	19	2,827,820	Major Collector	0.8	2	19	7,446,829	Minor Arterial
	Sandwich Street	Prospect Avenue	0.8	2	19	827,232	Minor Collector	0.8	2	19	831,603	Minor Collector
	north of Prospect Avenue		0.8	2	19	822,281	Minor Collector	0.8	2	19	814,230	Minor Collector
CROSS ROADS	Wyandotte Street	west of Huron Church Line	1	1.5	19	530,306	Minor Collector	1	1.5	19	506,299	Minor Collector
	University	west of Huron Church Line	1	1.5	19	498,288	Minor Collector	1	1.5	19	1,497,725	Major Collector
Riverside Drive	west of Huron Church Line		1	1.5	19	142,238	Local	1	1.5	19	130,873	Local
	east of Huron Church Line		1	1.5	19	1,677,084	Major Collector	1	1.5	19	1,276,242	Major Collector
AMB Off Ramp	west of Huron Church Line		1	1.5	19	367,095	Minor Collector	1	1.5	19	383,074	Minor Collector
	east of Huron Church Line		1	1.5	19	725,809	Minor Collector	1	1.5	19	602,328	Minor Collector
AMB On Ramp	east of Huron Church Line		1	1.5	19	no data		1	1.5	19	39,778,029	Major Arterial
	Wyandotte Street		1	1.5	19	2,384,754	Major Collector				no data	
Patricia	AMB		1	1.5	19	2,320,936	Major Collector	1	1.5	19	3,829,080	Major Collector
	College Street	east of Huron Church Road	1	1.5	19	1,731,091	Major Collector	1	1.5	19	3,381,361	Major Collector
Girardot Street	west of Huron Church Road		1	1.5	19	214,141	Minor Collector	1	1.5	19	97,988	Local
	east of Huron Church Road		1	1.5	19	119,621	Local	1	1.5	19	119,915	Local
Tecumseh Road	west of Huron Church Road		1	1.5	19	430,888	Minor Collector	1	1.5	19	264,100	Minor Collector
	east of Huron Church Road		1	1.5	19	1,431,479	Major Collector	1	1.5	19	3,940,554	Major Collector
Dorchester Street	west of Huron Church Road		1	1.5	19	682,338	Minor Collector	1	1.5	19	742,123	Minor Collector
	east of Huron Church Road		1	1.5	19	179,099	Local	1	1.5	19	161,663	Local
Prince Road/Totten Street	west of Huron Church Road		1	1.5	19	273,395	Minor Collector	1	1.5	19	106,303	Local
	east of Huron Church Road		1	1.5	19	228,617	Minor Collector	1	1.5	19	271,778	Minor Collector
Malden Road	west of Huron Church Road		1	1.5	19	543,413	Minor Collector	1	1.5	19	570,409	Minor Collector
	east of Huron Church Road		1	1.5	19	167,733	Local	1	1.5	19	138,262	Local
Industrial Road	west of Huron Church Road		1	1.5	19	6,228,212	Minor Arterial	1	1.5	19	11,980,340	Minor Arterial
	east of Huron Church Road		1	1.5	19	369,110	Minor Collector	1	1.5	19	808,713	Minor Collector
E.C. Row Expressway North Ramp Terminal	west of Huron Church Road		1	1.5	19	1,747,369	Major Collector	1	1.5	19	4,358,199	Major Collector
	east of Huron Church Road (E-N/S Off Ramp & S-W On Ramp)		1	1.5	19	3,157,192	Major Collector	1	2	19	2,197,579	Major Collector
E.C. Row Expressway South Ramp Terminal	west of Huron Church Road (N-W On Ramp)		1	1.5	19	1,650,554	Major Collector				no data	
	east of Huron Church Road (S-E On Ramp)		1	2	19	no data		1	2	19	1,359,110	Major Collector
Labelle Street/Bethlehem Avenue	west of Huron Church Road (N-E On Ramp & W-N/S Off Ramp)		1	1.5	19	7,304,349	Minor Arterial	1	2	19	1,180,968	Major Collector
	east of North Service Road		1	1.5	19	323,003	Minor Collector	1	1.5	19	243,335	Minor Collector
Grand Marais Road/Lambton Road	between North and South Service Road		1	1.5	19	140,366	Local	1	1.5	19	369,113	Minor Collector
	west of South Service Road		1	1.5	19	186,351	Local	1	1.5	19	399,459	Minor Collector
Pulford Street	east of North Service Road		1	1.5	19	475,792	Minor Collector	1	1.5	19	372,455	Minor Collector
	between North and South Service Road		1	1.5	19	24,743	Local	1	1.5	19	297,734	Minor Collector
Todd Lane/Cabana Road	west of South Service Road		1	1.5	19	344,115	Minor Collector	1	1.5	19	210,036	Minor Collector
	east of North Service Road		1	1.5	19	166,004	Local	1	1.5	19	221,312	Minor Collector
Huron Church Line	between North and South Service Road		1	1.5	19	158,444	Local	1	1.5	19	140,517	Local
	west of South Service Road		1	1.5	19	265,107	Minor Collector	1	1.5	19	87,247	Local
St. Clair College	east of North Service Road		1	1.5	19	985,003	Minor Collector	1	1.5	19	792,372	Minor Collector
	between North and South Service Road		1	1.5	19	1,036,720	Major Collector	1	1.5	19	1,005,264	Major Collector
Cousineau Drive	west of South Service Road		1	1.5	19	1,222,612	Major Collector	1	1.5	19	1,174,203	Major Collector
	east of North Service Road		1	1.5	19	448,122	Minor Collector	1	1.5	19	905,846	Minor Collector
Howard Avenue	west of South Service Road		1	1.5	19	1,080,769	Major Collector	1	1.5	19	1,161,572	Major Collector
	east of North Service Road		1	1.5	19	330,617	Minor Collector	1	1.5	19	925,874	Minor Collector
E.C. Row Expressway	between North and South Service Road		1	1.5	19	256,814	Minor Collector	1	1.5	19	289,076	Minor Collector
	east of North Service Road		1	1.5	19	556,250	Minor Collector	1	1.5	19	450,545	Minor Collector
GN Booth Drive	between North and South Service Road		1	1.5	19	844,095	Minor Collector	1	1.5	19	745,196	Minor Collector
	west of South Service Road		1	1.5	19	1,121,187	Major Collector	1	1.5	19	427,178	Minor Collector
Sandwich Street	east of North Service Road		1	1.5	19	1,492,660	Major Collector	1	1.5	19	1,873,822	Major Collector
	between North and South Service Road		1	1.5	19	2,306,946	Major Collector	1	1.5	19	1,828,872	Major Collector
Prospect Avenue	west of South Service Road		1	1.5	19	2,741,117	Major Collector	1	1.5	19	3,536,412	Major Collector
	east of Ojibway Parkway		0.8	2	19	5,866,348	Major Collector	0.8	2	19	4,840,302	Major Collector
HIGHWAY 401 Ramps	west of Ojibway Parkway		0.8	2	19	4,342,634	Major Collector	0.8	2	19	2,977,058	Major Collector
	east of Ojibway Parkway		0.8	2	19	15,171,182	Minor Arterial	0.8	2	19	27,901,258	Major Arterial
At St. Clair College	at Malden Road		0.8	2	19	14,685,915	Minor Arterial	0.8	2	19	21,605,735	Major Arterial
	west of Matchette		0.8	2	19	6,740,518	Minor Arterial	0.8	2	19	4,840,302	Major Collector
At Pulford Street	west of Ojibway Parkway		1	1.5	19	71,351	Local	1	1.5	19	79,754	Local
	west of Ojibway Parkway		1	1.5	19	1,570,291	Major Collector	1	1.5	19	1,002,890	Major Collector
At Malden Road	west of Ojibway Parkway		1	1.5	19	69,348	Local	1	1.5	19	48,013	Local
	west of Ojibway Parkway		1	1.5	19			1	1.5	19		
At E.C. Row Expressway	west of Ojibway Parkway		1	2	19	10,954,220	Minor Arterial	1	2	19	no data	
	east of Ojibway Parkway		1	2	19	2,459,797	Major Collector	1	2	19	no data	
At Pulford Street	west of Ojibway Parkway		1	2	19	no data		1	2	19	2,628,824	Major Collector
	east of Ojibway Parkway		1	2	19	no data		1	2	19	10,636,980	Minor Arterial
At Malden Road	west of Ojibway Parkway		1	1.5	19	470,168	Minor Collector				no data	
	east of Ojibway Parkway		1	1.5	19	334,642	Minor Collector				no data	
At E.C. Row Expressway	west of Ojibway Parkway		1	1.5	19	no data		1	1.5	19	3,101,103	Major Collector
	east of Ojibway Parkway		1	1.5	19	no data		1	1.5	19	336,576	Minor Collector
At Pulford Street	west of Ojibway Parkway		1	1.5	19	952,472	Minor Collector	1	1.5	19	no data	

SUMMARY OF ESAL CALCULATIONS - FLEXIBLE PAVEMENTS - ALTERNATIVE 2A

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION		Northbound/Westbound					Southbound/Eastbound					
	From	To	LDF	TF	Design Period (years)	ESALs	Class	LDF	TF	Design Period (years)	ESALs	Class	
Huron Church Road	Riverside Drive	University Avenue	0.9	2	19	2,267,830	Major Collector	0.9	2	19	1,639,892	Major Collector	
	University Avenue	Wyandotte Street	0.9	2	19	1,700,172	Major Collector	0.9	2	19	2,040,505	Major Collector	
	Wyandotte Street	AMB Off Ramp	0.9	2	19	281,104	Minor Collector	0.9	2	19	404,480	Minor Collector	
	AMB Off Ramp	College Street	0.8	2	19	33,653,502	Major Arterial	0.9	2	19	1,278,419	Major Collector	
	College Street	Girardot Street	0.8	2	19	8,754,323	Minor Arterial	0.8	2	19	37,817,378	Major Arterial	
	Girardot Street	Tecumseh Road	0.8	2	19	9,776,177	Minor Arterial	0.8	2	19	37,174,638	Major Arterial	
	Tecumseh Road	Dorchester Street	0.8	2	19	11,532,926	Minor Arterial	0.8	2	19	35,655,663	Major Arterial	
	Dorchester Street	Prince Road/Totten Street	0.8	2	19	10,255,125	Minor Arterial	0.8	2	19	32,954,683	Major Arterial	
	Prince Road/Totten Street	Malden Road	0.8	2	19	11,510,526	Minor Arterial	0.8	2	19	31,784,965	Major Arterial	
	Malden Road	Industrial Road	0.8	2	19	6,981,447	Minor Arterial	0.8	2	19	29,233,379	Major Arterial	
	Industrial Road	EC Row Expressway North Ramp Terminal	0.8	2	19	7,681,945	Minor Arterial	0.8	2	19	29,711,655	Major Arterial	
	EC Row Expressway North Ramp Terminal	EC Row Expressway South Ramp Terminal	0.8	2	19	5,165,251	Major Collector	0.8	2	19	26,667,735	Major Arterial	
	EC Row Expressway South Ramp Terminal	Highway 401 Off Ramp	0.8	2	19	5,714,013	Major Collector	0.8	2	19	19,444,054	Minor Arterial	
	Highway 401 Off Ramp	Spring Garden Road/Labelle Street	0.8	2	19	972,220	Minor Collector	0.8	2	19	1,431,625	Major Collector	
	Spring Garden Road/Labelle Street	Lambton Street/Grand Marais Road Ramp	0.8	2	19	1,437,746	Major Collector	0.8	2	19	1,988,355	Major Collector	
	Lambton Street/Grand Marais Road Ramp	Pulford Street	0.8	2	19	1,589,255	Major Collector	0.8	2	19	529,408	Minor Collector	
	Pulford Street	Todd Lane/Cabana Road	0.8	2	19	1,825,214	Major Collector	0.8	2	19	670,657	Minor Collector	
	Todd Lane/Cabana Road	Huron Church Line	0.8	2	19	1,706,435	Major Collector	0.8	2	19	2,568,379	Major Collector	
	Talbot Road	Huron Church Line	St Clair College	0.9	2	19	147,840	Local	0.8	2	19	885,500	Minor Collector
		St Clair College	Cousineau Drive	0.8	2	19	129,349	Local	0.9	2	19	851,084	Minor Collector
Cousineau Drive		Howard Avenue	0.8	2	19	496,098	Minor Collector	0.9	2	19	212,355	Minor Collector	
Howard Avenue		EC Row Expressway	0.8	2	19	3,559,509	Major Collector	0.8	2	19	3,466,485	Major Collector	
Ojibway Parkway	EC Row Expressway	GN Booth Drive	0.8	2	19	2,819,502	Major Collector	0.8	2	19	7,399,089	Minor Arterial	
	GN Booth Drive	Sandwich Street	0.8	2	19	2,825,328	Major Collector	0.8	2	19	7,397,115	Minor Arterial	
	Sandwich Street	Prospect Avenue	0.8	2	19	825,929	Minor Collector	0.8	2	19	825,509	Minor Collector	
	North of Prospect Avenue		0.8	2	19	820,995	Minor Collector	0.8	2	19	808,350	Minor Collector	
CROSSING ROADS													
Wyandotte Street	West of Huron Church Road		1	1.5	19	530,103	Minor Collector	1	1.5	19	506,426	Minor Collector	
	East of Huron Church Road		1	1.5	19	652,585	Minor Collector	1	1.5	19	1,482,823	Major Collector	
University Avenue	West of Huron Church Road		1	1.5	19	141,998	Local	1	1.5	19	129,314	Local	
	East of Huron Church Road		1	1.5	19	1,699,799	Major Collector	1	1.5	19	1,416,255	Major Collector	
Riverside Drive	West of Huron Church Road		1	1.5	19	366,045	Minor Collector	1	1.5	19	391,846	Minor Collector	
	East of Huron Church Road		1	1.5	19	723,983	Minor Collector	1	1.5	19	610,459	Minor Collector	
AMB Off Ramp	East of Huron Church Road				no data		1	1.5	19	29,663,810	Major Arterial		
AMB On Ramp	East of Huron Church Road				no data					no data			
Patricia Street	Wyandotte Street		1	1.5	19	2,388,073	Major Collector	1	1.5	19	3,722,913	Major Collector	
College Street	East of Huron Church Road		1	1.5	19	1,848,818	Major Collector	1	1.5	19	3,432,860	Major Collector	
Girardot Street	West of Huron Church Road		1	1.5	19	207,927	Minor Collector	1	1.5	19	92,990	Local	
	East of Huron Church Road		1	1.5	19	118,076	Local	1	1.5	19	121,403	Local	
Tecumseh Road	West of Huron Church Road		1	1.5	19	469,270	Minor Collector	1	1.5	19	325,412	Minor Collector	
	East of Huron Church Road		1	1.5	19	1,368,509	Major Collector	1	1.5	19	4,158,194	Major Collector	
Dorchester Street	West of Huron Church Road		1	1.5	19	668,482	Minor Collector	1	1.5	19	721,961	Minor Collector	
	East of Huron Church Road		1	1.5	19	180,124	Local	1	1.5	19	162,330	Local	
Prince Road/Totten Street	West of Huron Church Road		1	1.5	19	339,175	Minor Collector	1	1.5	19	122,081	Local	
	East of Huron Church Road		1	1.5	19	233,196	Minor Collector	1	1.5	19	279,563	Minor Collector	
Malden Road	West of Huron Church Road		1	1.5	19	521,405	Minor Collector	1	1.5	19	562,003	Minor Collector	
	East of Huron Church Road		1	1.5	19	170,478	Local	1	1.5	19	138,108	Local	
Industrial Road	West of Huron Church Road		1	1.5	19	5,984,098	Major Collector	1	1.5	19	9,177,512	Minor Arterial	
	East of Huron Church Road		1	1.5	19	573,716	Minor Collector	1	1.5	19	802,133	Minor Collector	
EC Row Expressway North Ramp Terminal	West of Huron Church Road		1	1.5	19	1,733,054	Major Collector	1	1.5	19	4,573,116	Major Collector	
	E-N/S Ramp					no data				no data			
	N-W Ramp					no data				no data			
	S-W Ramp		1	2	19	9,113,907	Minor Arterial	1	2	19	116,689	Local	
EC Row Expressway South Ramp Terminal	W-N/S Ramp					no data		1	2	19	846,675	Minor Collector	
	S/N-E Ramp					no data		1	2	19	9,683,406	Minor Arterial	
Spring Garden Road	West of Huron Church Road		1	1.5	19	242,551	Minor Collector	1	1.5	19	324,349	Minor Collector	
	East of Huron Church Road		1	1.5	19	400,962	Minor Collector	1	1.5	19	210,733	Minor Collector	
Labelle Street	East of Huron Church Road		1	1.5	19	548,092	Minor Collector	1	1.5	19	511,362	Minor Collector	
	West of Huron Church Road		1	1.5	19	319,028	Minor Collector	1	1.5	19	168,468	Local	
Lambton Street/Grand Marais Road Ramp	East of Huron Church Road		1	1.5	19	890,289	Minor Collector	1	1.5	19	793,161	Minor Collector	
Pulford Street	between Huron Church Road and Highway 401 northbound Ramps		1	1.5	19	567,842	Minor Collector	1	1.5	19	2,319,084	Major Collector	
Cabana Road	between Highway 401 northbound and southbound Ramps		1	1.5	19	334,535	Minor Collector	1	1.5	19	1,954,325	Major Collector	
Todd Lane	West of Highway 401 southbound Ramps		1	1.5	19	1,247,442	Major Collector	1	1.5	19	1,050,231	Major Collector	
Huron Church Line	West of Huron Church Road		1	1.5	19	1,405,818	Major Collector	1	1.5	19	1,047,256	Major Collector	
	East of Talbot Road		1	1.5	19	334,584	Minor Collector	1	1.5	19	1,000,169	Major Collector	
St Clair College	East of Talbot Road		1	1.5	19	604,649	Minor Collector	1	1.5	19	570,581	Minor Collector	
Cousineau Drive	West of Talbot Road		1	1.5	19	226,713	Minor Collector	1	1.5	19	451,135	Minor Collector	
Howard Avenue	East of Talbot Road		1	1.5	19	1,514,091	Major Collector	1	1.5	19	2,241,544	Major Collector	
	between Talbot Road and Highway 401 southbound On Ramp		1	1.5	19	2,474,266	Major Collector	1	1.5	19	1,721,976	Major Collector	
E.C. Row Expressway	West of Highway 401 southbound On Ramp		1	1.5	19	2,764,107	Major Collector	1	1.5	19	3,407,026	Major Collector	
	East of Huron Church Road		0.8	2	19	15,078,657	Minor Arterial	0.8	2	19	28,108,637	Major Arterial	
	At Malden Road		0.8	2	19	14,619,885	Minor Arterial	0.8	2	19	20,918,124	Major Arterial	
	West of Matchette Drive		0.8	2	19	6,283,330	Minor Arterial	0.8	2	19	4,392,185	Major Collector	
* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West													
HIGHWAY 401 Ramps													
Highway 3 merge/split													
Highway 401 northbound Off Ramp			1	2	19	12,770,680	Minor Arterial				no data		
Highway 401 northbound On Ramp			1	2	19	2,727,622	Major Collector				no data		
Highway 401 southbound Off Ramp						no data		1	2	19	2,670,979	Major Collector	
Highway 401 southbound On Ramp						no data		1	2	19	11,911,133	Minor Arterial	
Howard Avenue						no data					no data		
401 NB Off Ramp						no data		1	2	19	610,847	Minor Collector	
At Todd Lane/Cabana Road													
Highway 401 northbound Off Ramp			1	1.5	19	931,020	Minor Collector				no data		
Highway 401 northbound On Ramp			1	1.5	19	1,395,145	Major Collector				no data		
Highway 401 southbound Off Ramp						no data		1	1.5	19	2,577,794	Major Collector	
Highway 401 southbound On Ramp						no data		1	1.5	19	348,733	Minor Collector	
At Huron Church Road													
Highway 401 northbound Off Ramp			1	2	19	5,139,048	Major Collector				no data		
Highway 401 southbound On Ramp						no data		1	2	19	22,490,491	Major Arterial	
At Malden Road													
Highway 401 northbound On Ramp			1	1.5	19	5,101,197	Major Collector				no data		
Highway 401 southbound Off Ramp						no data		1	1.5	19	4,905,375	Major Collector	
EC Row Expressway to Highway 401						no data					no data		
Highway 401 southbound On Ramp						no data		1	2	19	19,232,457	Minor Arterial	
Ojibway Parkway Interchange						no data					no data		
Highway 401 northbound Off Ramp			1	2	19	6,400,766	Minor Arterial				no data		
Highway 401 northbound On Ramp			1	2	19	4,666,462	Major Collector				no data		
Highway 401 southbound Off Ramp						no data		1	2	19	389,928	Minor Collector	
Highway 401 southbound On Ramp						no data		1	2	19	6,144,891	Minor Arterial	
EC Row Expressway Interchange						no data					no data		
Highway 401 northbound On Ramp			1	2	19	14,184,840	Minor Arterial				no data		
Highway 401 Mainline													
South of Highway 3 merge/split						no data					no data		
Highway 3/Highway 401 northbound Off Ramp			0.6	2.5	21	80,126,151	Freeway				no data		
Highway 3/Highway 401 northbound On Ramp			0.8	2.5	21	70,304,443	Freeway				no data		
Todd Lane/Highway 401 northbound Off Ramp			0.6	2.5	21	68,820,150	Freeway				no data		
Todd Lane/Highway 401 northbound On Ramp			0.7	2.5	21	55,643,124	Freeway				no data		
Todd Lane/Highway 401 northbound On Ramp			0.6	2.5	21	62,806,125	Freeway				no data		
Huron Church Road/													

SUMMARY OF ESAL CALCULATIONS - FLEXIBLE PAVEMENTS - ALTERNATIVE 2B

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION		Northbound/Westbound					Southbound/Eastbound					
	From	To	LDF	TF	Design Period (years)	ESALs	Class	LDF	TF	Design Period (years)	ESALs	Class	
Huron Church Road	Riverside Drive	University Avenue	0.9	2	19	2,267,830	Major Collector	0.9	2	19	1,639,892	Major Collector	
	University Avenue	Wyandotte Street	0.9	2	19	1,700,172	Major Collector	0.9	2	19	2,040,505	Major Collector	
	Wyandotte Street	AMB Off Ramp	0.9	2	19	281,104	Minor Collector	0.9	2	19	404,480	Minor Collector	
	AMB Off Ramp	College Street	0.8	2	19	33,653,502	Major Arterial	0.9	2	19	1,278,419	Major Collector	
	College Street	Girardot Street	0.8	2	19	8,754,323	Minor Arterial	0.8	2	19	37,817,378	Major Arterial	
	Girardot Street	Tecumseh Road	0.8	2	19	9,776,177	Minor Arterial	0.8	2	19	37,174,638	Major Arterial	
	Tecumseh Road	Dorchester Street	0.8	2	19	11,532,926	Minor Arterial	0.8	2	19	35,655,663	Major Arterial	
	Dorchester Street	Prince Road/Totten Street	0.8	2	19	10,255,125	Minor Arterial	0.8	2	19	32,954,683	Major Arterial	
	Prince Road/Totten Street	Malden Road	0.8	2	19	11,510,526	Minor Arterial	0.8	2	19	31,784,965	Major Arterial	
	Malden Road	Industrial Road	0.8	2	19	6,981,447	Minor Arterial	0.8	2	19	29,233,379	Major Arterial	
	Industrial Road	EC Row Expressway North Ramp Terminal	0.8	2	19	7,681,945	Minor Arterial	0.8	2	19	29,711,655	Major Arterial	
	EC Row Expressway North Ramp Terminal	EC Row Expressway South Ramp Terminal	0.8	2	19	5,165,251	Major Collector	0.8	2	19	26,667,735	Major Arterial	
	EC Row Expressway South Ramp Terminal	Highway 401 Off Ramp	0.8	2	19	5,714,013	Major Collector	0.8	2	19	19,368,387	Minor Arterial	
	Highway 401 Off Ramp	Spring Garden Road/Labelle Street	0.8	2	19	972,220	Minor Collector	0.8	2	19	1,431,625	Major Collector	
	Spring Garden Road/Labelle Street	Lambton Street/Grand Marais Road Ramp	0.8	2	19	1,437,746	Major Collector	0.8	2	19	1,988,355	Major Collector	
	Lambton Street/Grand Marais Road Ramp	Pulford Street	0.8	2	19	1,589,255	Major Collector	0.8	2	19	529,408	Minor Collector	
	Pulford Street	Todd Lane/Cabana Road	0.8	2	19	1,825,214	Major Collector	0.8	2	19	670,657	Minor Collector	
	Todd Lane/Cabana Road	Huron Church Line	0.8	2	19	1,706,435	Major Collector	0.8	2	19	2,568,379	Major Collector	
	Talbot Road	Huron Church Line	St Clair College	0.9	2	19	147,840	Local	0.8	2	19	885,350	Minor Collector
		St Clair College	Cousineau Drive	0.8	2	19	129,349	Local	0.9	2	19	851,084	Minor Collector
		Cousineau Drive	Howard Avenue	0.8	2	19	496,098	Minor Collector	0.9	2	19	212,355	Minor Collector
		Howard Avenue	Highway 3 split	0.8	2	19	3,559,509	Major Collector	0.8	2	19	3,466,485	Major Collector
	Ojibway Parkway	EC Row Expressway	GN Booth Drive	0.8	2	19	2,819,502	Major Collector	0.8	2	19	7,399,089	Minor Arterial
		GN Booth Drive	Sandwich Street	0.8	2	19	2,825,328	Major Collector	0.8	2	19	7,397,115	Minor Arterial
		Sandwich Street	Prospect Avenue	0.8	2	19	825,929	Minor Collector	0.8	2	19	825,509	Minor Collector
	North of Prospect Avenue		0.8	2	19	820,995	Minor Collector	0.8	2	19	808,350	Minor Collector	
CROSSING ROADS													
Wyandotte Street	West of Huron Church Road		1	1.5	19	530,103	Minor Collector	1	2	19	675,234	Minor Collector	
	East of Huron Church Road		1	1.5	19	652,585	Minor Collector	1	2	19	1,977,097	Major Collector	
University Avenue	West of Huron Church Road		1	1.5	19	141,998	Local	1	2	19	172,419	Local	
	East of Huron Church Road		1	1.5	19	1,699,799	Major Collector	1	2	19	1,888,340	Major Collector	
Riverside Drive	West of Huron Church Road		1	1.5	19	366,045	Minor Collector	1	2	19	522,462	Minor Collector	
	East of Huron Church Road		1	1.5	19	723,983	Minor Collector	1	2	19	813,946	Minor Collector	
AMB Off Ramp	East of Huron Church Road					no data		1	2	19	39,551,747	Major Arterial	
AMB On Ramp	AMB	Wyandotte Street	1	2	19	3,184,098	Major Collector				no data		
Patricia Street			1	1.5	19	2,278,257	Major Collector	1	2	19	4,963,884	Major Collector	
College Street	East of Huron Church Road		1	1.5	19	1,848,818	Major Collector	1	2	19	4,577,147	Major Collector	
	West of Huron Church Road		1	1.5	19	207,927	Minor Collector	1	2	19	123,987	Local	
Girardot Street	East of Huron Church Road		1	1.5	19	118,076	Local	1	2	19	161,870	Local	
	West of Huron Church Road		1	1.5	19	469,270	Minor Collector	1	2	19	433,883	Minor Collector	
Tecumseh Road	East of Huron Church Road		1	1.5	19	1,368,509	Major Collector	1	2	19	5,544,259	Major Collector	
	West of Huron Church Road		1	1.5	19	668,482	Minor Collector	1	2	19	962,615	Minor Collector	
Dorchester Street	East of Huron Church Road		1	1.5	19	180,124	Local	1	2	19	216,440	Minor Collector	
	West of Huron Church Road		1	1.5	19	339,175	Minor Collector	1	2	19	162,774	Local	
Prince Road/Totten Street	East of Huron Church Road		1	1.5	19	233,196	Minor Collector	1	2	19	372,751	Minor Collector	
	West of Huron Church Road		1	1.5	19	521,405	Minor Collector	1	2	19	749,337	Minor Collector	
Malden Road	East of Huron Church Road		1	1.5	19	170,478	Local	1	2	19	184,144	Local	
	West of Huron Church Road		1	1.5	19	5,984,098	Major Collector	1	2	19	12,236,683	Minor Arterial	
Industrial Road	East of Huron Church Road		1	1.5	19	573,716	Minor Collector	1	2	19	1,069,511	Major Collector	
	West of Huron Church Road		1	1.5	19	1,733,054	Major Collector	1	2	19	6,097,488	Minor Arterial	
EC Row Expressway North Ramp Terminal	E-N/S Ramp		1	2	19	4,248,046	Major Collector				no data		
	N-W Ramp					no data		1	2	19	116,689	Local	
	S-W Ramp		1	2	19	9,113,907	Minor Arterial				no data		
EC Row Expressway South Ramp Terminal	W-N/S Ramp					no data		1	2	19	846,675	Minor Collector	
	S-N/E Ramp					no data		1	2	19	9,683,406	Minor Arterial	
Spring Garden Road	West of Huron Church Road		1	1.5	19	242,551	Minor Collector	1	2	19	432,466	Minor Collector	
Labelle Street	East of Huron Church Road		1	1.5	19	400,962	Minor Collector	1	2	19	280,977	Minor Collector	
Lambton Street/Grand Marais Road	East of Huron Church Road		1	1.5	19	447,113	Minor Collector	1	2	19	539,088	Minor Collector	
	West of Huron Church Road		1	1.5	19	441,195	Minor Collector	1	2	19	300,685	Minor Collector	
Pulford Street	East of Huron Church Road		1	1.5	19	319,028	Minor Collector	1	2	19	224,624	Minor Collector	
Cabana Road	East of Huron Church Road		1	1.5	19	890,289	Minor Collector	1	2	19	1,057,548	Major Collector	
	between Huron Church Road and Highway 401 northbound Ramps		1	1.5	19	567,842	Minor Collector	1	2	19	3,092,112	Major Collector	
Todd Lane	between Highway 401 northbound and southbound Ramps		1	1.5	19	334,535	Minor Collector	1	2	19	2,605,766	Major Collector	
	West of Highway 401 southbound Ramps		1	1.5	19	1,247,442	Major Collector	1	2	19	1,400,308	Major Collector	
Huron Church Line	West of Huron Church Road		1	1.5	19	1,405,818	Major Collector	1	2	19	1,396,342	Major Collector	
St Clair College	East of Talbot Road		1	1.5	19	334,584	Minor Collector	1	2	19	1,333,559	Major Collector	
Cousineau Drive	East of Talbot Road		1	1.5	19	604,649	Minor Collector	1	2	19	760,775	Minor Collector	
	West of Talbot Road		1	1.5	19	226,713	Minor Collector	1	2	19	601,513	Minor Collector	
Howard Avenue	East of Talbot Road		1	1.5	19	1,514,091	Major Collector	1	2	19	2,988,725	Major Collector	
	West of Talbot Road and Highway 401 southbound On Ramp		1	1.5	19	2,474,266	Major Collector	1	2	19	2,965,969	Major Collector	
	West of Highway 401 southbound On Ramp		1	1.5	19	2,764,107	Major Collector	1	2	19	4,542,701	Major Collector	
E.C. Row Expressway	East of Huron Church Road		0.8	2	19	15,221,498	Minor Arterial	0.8	2	19	28,171,735	Major Arterial	
	At Malden Road		0.8	2	19	14,829,069	Minor Arterial	0.8	2	19	20,989,330	Major Arterial	
	West of Matchette Street		0.8	2	19	6,283,330	Minor Arterial	0.8	2	19	4,392,185	Major Collector	
* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West													
HIGHWAY 401 Ramps													
<i>Highway 3 merge/split</i>													
Highway 401 northbound Off Ramp			1	2	19	12,770,680	Minor Arterial				no data		
Highway 401 northbound On Ramp			1	2	19	2,727,622	Major Collector				no data		
Highway 401 southbound Off Ramp						no data		1	2	19	2,670,979	Major Collector	
Highway 401 southbound On Ramp						no data		1	2	19	11,911,133	Minor Arterial	
<i>Howard Avenue</i>													
Highway 401 southbound Off Ramp			1	2	10	no data		1	2	19	610,847	Minor Collector	
<i>At Todd Lane/Cabana Road</i>													
Highway 401 northbound Off Ramp			1	1.5	19	931,020	Minor Collector				no data		
Highway 401 northbound On Ramp			1	1.5	19	1,395,145	Major Collector				no data		
Highway 401 southbound Off Ramp						no data		1	2	19	3,437,058	Major Collector	
Highway 401 southbound On Ramp						no data		1	2	19	464,977	Minor Collector	
<i>At Huron Church Road</i>													
Highway 401 northbound Off Ramp			1	2	19	5,139,048	Major Collector				no data		
Highway 401 southbound On Ramp						no data		1	2	19	22,372,608	Major Arterial	
<i>At Malden Road</i>													
Highway 401 northbound On Ramp			1	1.5	19	5,101,197	Major Collector				no data		
Highway 401 southbound Off Ramp						no data		1	2	19	6,540,500	Minor Arterial	
<i>EC Row Expressway to Highway 401</i>													
Highway 401 southbound Off Ramp						no data		1	2	19	19,232,457	Minor Arterial	
<i>Ojibway Parkway Interchange</i>													
Highway 401 northbound Off Ramp			1	2	19	6,400,766	Minor Arterial				no data		
Highway 401 northbound On Ramp			1	2	19	4,666,462	Major Collector				no data		
Highway 401 southbound Off Ramp						no data		1	2	19	389,928	Minor Collector	
Highway 401 southbound On Ramp						no data		1	2	19	6,144,891	Minor Arterial	
<i>EC Row Expressway Interchange</i>													
Highway 401 northbound On Ramp			1	2	19	14,184,840	Minor Arterial				no data		
Highway 401 Mainline													
	South of Highway 3 merge/split	Highway 3/Highway 401 northbound Off Ramp	0.6	2.5	21	80,126,151	Freeway				no data		
	Highway 3/Highway 401 northbound Off Ramp	Highway 3/Highway 401 northbound On Ramp	0.8	2.5	21	70,304,443	Freeway				no data		
	Highway 3/Highway 401 northbound On Ramp	Todd Lane/Highway 401 northbound Off Ramp	0.6	2.5	21	68,820,150	Freeway				no data		
	Todd Lane/Highway 401 northbound Off Ramp	Todd Lane/Highway 401 northbound On Ramp	0.7	2.5	21	55,643,124	Freeway				no data		
	Todd Lane/Highway 401 northbound On Ramp	Huron Church Road/Highway 401 northbound On Ramp	0.6	2.5	21	62,806,125	Freeway				no data		
	Huron Church Road/Highway 401 northbound On Ramp	Malden Road/Highway 401 northbound On Ramp	0.8	2.5	21	85,002,759	Freeway	</					

SUMMARY OF ESAL CALCULATIONS - FLEXIBLE PAVEMENTS - ALTERNATIVE 3

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION		Northbound/Westbound					Southbound/Eastbound				
	From	To	LDF	IF	Design Period (years)	ESALs	Class	LDF	IF	Design Period (years)	ESALs	Class
Huron Church Road	Riverside Drive	University Avenue	0.9	2	19	2,328,597	Major Collector	0.9	2	19	1,618,731	Major Collector
	University Avenue	Wyandotte Street	0.9	2	19	1,729,616	Major Collector	0.9	2	19	2,017,711	Major Collector
	Wyandotte Street	AMB Off Ramp	0.9	2	19	275,654	Minor Collector	0.9	2	19	398,955	Minor Collector
	AMB Off Ramp	College Street	0.8	2	19	35,279,857	Major Arterial	0.9	2	19	1,251,798	Major Collector
	College Street	Girardot Street	0.8	2	19	8,704,745	Minor Arterial	0.8	2	19	38,391,872	Major Arterial
	Girardot Street	Tecumseh Road	0.8	2	19	9,764,254	Minor Arterial	0.8	2	19	39,018,493	Major Arterial
	Tecumseh Road	Dorchester Street	0.8	2	19	11,448,950	Minor Arterial	0.8	2	19	37,665,820	Major Arterial
	Dorchester Street	Prince Road/Totten Street	0.8	2	19	10,305,392	Minor Arterial	0.8	2	19	34,775,501	Major Arterial
	Prince Road/Totten Street	Malden Road	0.8	2	19	11,452,792	Minor Arterial	0.8	2	19	33,566,216	Major Arterial
	Malden Road	Industrial Road	0.8	2	19	6,886,568	Minor Arterial	0.8	2	19	30,400,608	Major Arterial
	Industrial Road	EC Row Expressway North Ramp Terminal	0.8	2	19	7,443,207	Minor Arterial	0.8	2	19	30,790,999	Major Arterial
	EC Row Expressway North Ramp Terminal	EC Row Expressway South Ramp Terminal	0.8	2	19	5,105,886	Major Collector	0.8	2	19	28,727,049	Major Arterial
	EC Row Expressway South Ramp Terminal	Spring Gdn Rd/Labelle St	0.8	2	19	5,486,062	Major Collector	0.8	2	19	21,792,751	Major Arterial
	Spring Gdn Rd/Labelle St	Lambton Street/Grand Marais Road	0.8	2	19	3,903,420	Major Collector	0.8	2	19	2,127,447	Major Collector
	Lambton Street/Grand Marais Road	Pulford Street	0.8	2	19	1,986,740	Major Collector	0.8	2	19	1,838,451	Major Collector
	Pulford Street	Todd Lane/Cabana Road	0.8	2	19	2,211,713	Major Collector	0.8	2	19	2,041,324	Major Collector
	Todd Lane/Cabana Road	Huron Church Line	0.8	2	19	1,333,686	Major Collector	0.8	2	19	1,145,767	Major Collector
	Huron Church Line	St Clair College	0.9	2	19	914,123	Minor Collector	0.8	2	19	1,004,054	Major Collector
	St Clair College	Cousineau Drive	0.8	2	19	1,401,753	Major Collector	0.8	2	19	2,987,434	Major Collector
	Cousineau Drive	Howard Avenue	0.9	2	19	1,234,811	Major Collector	0.9	2	19	3,516,522	Major Collector
Howard Avenue	South of Howard Avenue	0.8	2	19	3,294,380	Major Collector	0.8	2	19	3,057,641	Major Collector	
South of Howard Avenue	EC Row Expressway	0.8	2	19	1,556,798	Major Collector	0.8	2	19	7,368,173	Minor Arterial	
EC Row Expressway	GN Booth Drive	0.8	2	19	1,547,381	Major Collector	0.8	2	19	7,334,745	Minor Arterial	
GN Booth Drive	Sandwich Street	0.8	2	19	812,617	Minor Collector	0.8	2	19	819,486	Minor Collector	
Sandwich Street	Prospect Avenue	0.8	2	19	807,717	Minor Collector	0.8	2	19	803,394	Minor Collector	
Prospect Avenue												
CROSSING ROADS												
Wyandotte Street	West of Huron Church Road		1	1.5	19	530,606	Minor Collector	1	1.5	19	507,929	Minor Collector
	East of Huron Church Road		1	1.5	19	654,254	Minor Collector	1	1.5	19	1,510,134	Major Collector
University Avenue	West of Huron Church Road		1	1.5	19	143,041	Local	1	1.5	19	128,492	Local
	East of Huron Church Road		1	1.5	19	1,680,030	Major Collector	1	1.5	19	1,438,770	Major Collector
Riverside Drive	West of Huron Church Road		1	1.5	19	371,873	Minor Collector	1	1.5	19	389,075	Minor Collector
	East of Huron Church Road		1	1.5	19	726,183	Minor Collector	1	1.5	19	602,898	Minor Collector
AMB Off Ramp	East of Huron Church Road					no data						
AMB On Ramp	East of Huron Church Road		1	1.5	19	2,383,756	Major Collector	1	1.5	19	41,509,362	Major Arterial
Patricia Street	AMB	Wyandotte Street	1	1.5	19	2,314,747	Major Collector	1	1.5	19	3,813,143	Major Collector
College Street	East of Huron Church Road		1	1.5	19	1,730,252	Major Collector	1	1.5	19	3,444,909	Major Collector
	West of Huron Church Road		1	1.5	19	212,177	Minor Collector	1	1.5	19	94,131	Local
Girardot Street	East of Huron Church Road		1	1.5	19	119,024	Local	1	1.5	19	120,186	Local
	West of Huron Church Road		1	1.5	19	430,638	Minor Collector	1	1.5	19	268,101	Minor Collector
Tecumseh Road	East of Huron Church Road		1	1.5	19	1,434,953	Major Collector	1	1.5	19	3,836,233	Major Collector
	West of Huron Church Road		1	1.5	19	683,536	Minor Collector	1	1.5	19	729,238	Minor Collector
Dorchester Street	East of Huron Church Road		1	1.5	19	134,876	Local	1	1.5	19	87,706	Local
	West of Huron Church Road		1	1.5	19	345,078	Minor Collector	1	1.5	19	194,350	Local
Prince Road/Totten Street	East of Huron Church Road		1	1.5	19	227,839	Minor Collector	1	1.5	19	270,881	Minor Collector
	West of Huron Church Road		1	1.5	19	493,332	Minor Collector	1	1.5	19	506,370	Minor Collector
Malden Road	East of Huron Church Road		1	1.5	19	167,983	Local	1	1.5	19	154,147	Local
	West of Huron Church Road		1	1.5	19	5,826,152	Major Collector	1	2	19	12,200,427	Minor Arterial
Industrial Road	East of Huron Church Road		1	1.5	19	591,230	Minor Collector	1	1.5	19	848,410	Minor Collector
	West of Huron Church Road		1	1.5	19	1,637,563	Major Collector	1	2	19	5,816,136	Major Collector
EC Row Expressway North Ramp Terminal	East of Huron Church Road (E-N/S Off Ramp & S-W On Ramp)		1	1.5	19	3,228,505	Major Collector	1	1.5	19	52,467	Local
	West of Huron Church Road (N-W On Ramp)		1	1.5	19	3,357,780	Major Collector				no data	
EC Row Expressway South Ramp Terminal	East of Huron Church Road (S-E On Ramp)					no data		1	1.5	19	1,006,600	Major Collector
	West of Huron Church Road (N-E On Ramp & W-N/S Off Ramp)		1	1.5	19	6,688,163	Minor Arterial	1	1.5	19	790,823	Minor Collector
Spring Garden Road/Labelle Street	East of Huron Church Road		1	1.5	19	379,314	Minor Collector	1	1.5	19	315,403	Minor Collector
	West of Huron Church Road		1	1.5	19	412,103	Minor Collector	1	1.5	19	443,445	Minor Collector
Lambton Street/Grand Marais Road	East of Huron Church Road		1	1.5	19	509,620	Minor Collector	1	1.5	19	408,482	Minor Collector
	West of Huron Church Road		1	1.5	19	393,240	Minor Collector	1	1.5	19	544,797	Minor Collector
Pulford Street	East of Huron Church Road		1	1.5	19	229,782	Minor Collector	1	1.5	19	207,050	Minor Collector
Todd Lane/Cabana Road	East of Huron Church Road		1	1.5	19	1,069,749	Major Collector	1	1.5	19	908,393	Minor Collector
	West of Huron Church Road		1	1.5	19	1,353,508	Major Collector	1	1.5	19	1,085,497	Major Collector
Huron Church Line	West of Huron Church Road		1	1.5	19	1,183,798	Major Collector	1	1.5	19	1,067,231	Major Collector
St Clair College	East of Talbot Road		1	1.5	19	330,807	Minor Collector	1	1.5	19	979,085	Minor Collector
Cousineau Drive	East of Talbot Road		1	1.5	19	855,836	Minor Collector	1	1.5	19	578,911	Minor Collector
	West of Talbot Road		1	1.5	19	1,229,340	Major Collector	1	1.5	19	985,934	Minor Collector
Howard Avenue	East of Talbot Road		1	1.5	19	1,413,123	Major Collector	1	1.5	19	2,022,545	Major Collector
	between Talbot Road and Highway 401 southbound On Ramp		1	1.5	19	2,075,442	Major Collector	1	1.5	19	1,696,281	Major Collector
E.C. Row Expressway	West of Highway 401 southbound On Ramp		1	1.5	19	2,247,653	Major Collector	1	1.5	19	3,372,469	Major Collector
	East of Huron Church Road		0.8	1.5	19	11,464,746	Minor Arterial	0.8	2	19	23,959,134	Major Arterial
	At Malden Road		0.8	1.5	19	10,907,982	Minor Arterial	0.8	2	19	21,440,297	Major Arterial
	West of Matchette Street		0.8	1.5	19	3,923,355	Major Collector	0.8	2	19	4,495,833	Major Collector
* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West												
HIGHWAY 401 Ramps												
Highway 3 merge/split												
Highway 401 northbound Off Ramp			1	2	19	11,009,422	Minor Arterial				no data	
Highway 401 northbound On Ramp			1	2	19	2,489,010	Major Collector				no data	
Highway 401 southbound Off Ramp						no data		1	2	19	2,626,208	Major Collector
Highway 401 southbound On Ramp						no data		1	2	19	10,435,344	Minor Arterial
At St. Clair College												
Highway 401 northbound Off Ramp			1	1.5	19	583,831	Minor Collector				no data	
Highway 401 northbound On Ramp			1	1.5	19	383,897	Minor Collector				no data	
Highway 401 southbound Off Ramp						no data		1	1.5	19	2,375,643	Major Collector
Highway 401 southbound On Ramp						no data		1	1.5	19	264,876	Minor Collector
At Huron Church Road												
Highway 401 northbound Off Ramp			1	2	19	4,181,452	Major Collector				no data	
Highway 401 southbound On Ramp						no data		1	2	19	19,946,487	Minor Arterial
Malden Road Interchange												
Highway 401 On Ramp			1	1.5	19	5,897,729	Major Collector				no data	
Highway 401 Off Ramp						no data		1	1.5	19	5,462,529	Major Collector
EC Row Expressway Interchange								1	1.5	19	14,486,209	Minor Arterial
Highway 401 southbound Off Ramp						no data						
Ojibway Parkway Interchange												
Highway 401 northbound Off Ramp			1	2	19	6,742,411	Minor Arterial				no data	
Highway 401 northbound On Ramp			1	2	19	4,812,914	Major Collector				no data	
Highway 401 southbound Off Ramp						no data		1	2	19	1,216,567	Major Collector
Highway 401 southbound On Ramp						no data		1	2	19	7,514,146	Minor Arterial
EC Row Expressway Interchange												
Highway 401 northbound On Ramp			1	2	19	13,299,703	Minor Arterial				no data	
Highway 401 Mainline												
South of Highway 3 merge/split		Highway 3/Highway 401 northbound Off Ramp	0.6	2.5	21	78,361,050	Freeway				no data	
Highway 3/Highway 401 northbound Off Ramp		Highway 3/Highway 401 northbound On Ramp	0.7	2.5	21	77,699,758	Freeway				no data	
Highway 3/Highway 401 northbound On Ramp		St. Clair College/Highway 401 northbound Off Ramp	0.6	2.5	21	77,786,735	Freeway				no data	
St. Clair College/Highway 401 northbound Off Ramp		St. Clair College/Highway 401 northbound On Ramp	0.7	2.5	21	68,751,045	Freeway				no data	
St. Clair College/Highway 401 northbound On Ramp		Huron Church Road/Highway 401 northbound Off Ramp	0.6	2.5	21	62,901,295	Freeway				no data	
Huron Church Road/Highway 401 northbound Off Ramp		Malden Road/Highway 401 northbound On Ramp	0.8	2.5	21	87,954,907	Freeway				no data	
Malden Road/Highway 401 northbound On Ramp		Ojibway Parkway/Highway 401 northbound Off Ramp	0.7	2.5	21							

SUMMARY OF ESAL CALCULATIONS - RIGID PAVEMENTS - ALTERNATIVE 1B

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION		Northbound/Westbound					Southbound/Eastbound					
	From	To	LDF	TF	Design Period (years)	ESALs	Class	LDF	TF	Design Period (years)	ESALs	Class	
Huron Church Road	Riverside Drive	University Avenue	0.9	2	25	3,077,400	Local	0.9	2	25	2,230,914	Local	
	University Avenue	Wyandotte Street	0.9	2	25	2,048,765	Local	0.9	2	25	2,757,478	Local	
	Wyandotte Street	AMB Off Ramp	0.9	2	25	364,841	Local	0.9	2	25	538,754	Local	
	AMB Off Ramp	College	0.8	2	25	48,879,305	Major Collector	0.9	2	25	1,660,578	Local	
	College Street	Girardot Street	0.8	2	25	12,121,728	Minor Collector	0.8	2	25	53,231,477	Minor Arterial	
	Girardot Street	Tecumseh Road	0.8	2	25	13,512,891	Minor Collector	0.8	2	25	51,973,153	Minor Arterial	
	Tecumseh Road	Dorchester Street	0.8	2	25	15,758,333	Minor Collector	0.8	2	25	49,725,238	Major Collector	
	Dorchester Street	Prince Road/Totten Street	0.8	2	25	13,910,123	Minor Collector	0.8	2	25	45,600,590	Major Collector	
	Prince Road/Totten Street	Malden Road	0.8	2	25	15,647,014	Minor Collector	0.8	2	25	45,073,767	Major Collector	
	Malden Road	Industrial Road	0.8	2	25	9,110,936	Local	0.8	2	25	42,326,986	Major Collector	
	Industrial Road	EC Row North Ramp Terminal	0.8	2	25	10,321,304	Minor Collector	0.8	2	25	42,761,724	Major Collector	
	EC Row North Ramp Terminal	EC Row South Ramp Terminal	0.8	2	25	6,463,195	Local	0.8	2	25	37,941,684	Major Collector	
	South of EC Row South Ramp Terminal	north of Bethlehem Avenue	0.8	2	25	9,136,857	Local	0.8	2	25	28,585,674	Major Collector	
	South Service Road	Bethlehem Avenue				no data		1	2	25	33,535,751	Major Collector	
		Lambton Street	Lambton Street				no data		1	2	25	2,628,900	Local
		Lambton Street	Pulford Street				no data		1	2	25	404,576	Local
		Pulford Street	Todd Lane/Cabana Road				no data		1	2	25	1,368,682	Local
	Todd Lane/Cabana Road	Huron Church Line				no data		1	2	25	2,292,795	Local	
	Huron Church Line	St. Clair College				no data		1	2	25	2,116,089	Local	
	St. Clair College	Cousineau Drive				no data		1	2	25	6,211,048	Local	
	Cousineau Drive	Howard Avenue				no data		1	2	25	6,244,242	Local	
	east of Howard Avenue	north of Labelle Street				no data		1	2	25	4,758,694	Local	
North Service Road	north of Labelle Street	Labelle Street	1	2	25	9,538,715	Local				no data		
	Labelle Street	Grand Marais Road Ramp	1	2	25	5,283,431	Local				no data		
	Grand Marais Road Ramp	Pulford Street	1	2	25	144,326	Local				no data		
	Pulford Street	Todd Lane/Cabana Road	1	2	25	229,861	Local				no data		
	Todd Lane/Cabana Road	Huron Church Line	1	2	25	2,566,311	Local				no data		
	Huron Church Line	St. Clair College	1	2	25	1,182,947	Local				no data		
	St. Clair College	Cousineau Drive	1	2	25	2,423,331	Local				no data		
	Cousineau Drive	Howard Avenue	1	2	25	2,001,317	Local				no data		
	east of Howard Avenue	E.C. Row Expressway	1	2	25	5,543,938	Local				no data		
	Ojibway Parkway	GN Booth Drive	0.8	2	25	3,818,692	Local	0.8	2	25	10,057,279	Minor Collector	
	GN Booth Drive	Sandwich Street	0.8	2	25	3,827,016	Local	0.8	2	25	10,102,168	Minor Collector	
	Sandwich Street	Prospect Avenue	0.8	2	25	1,101,865	Local	0.8	2	25	1,098,205	Local	
	north of Prospect Avenue		0.8	2	25	1,095,414	Local	0.8	2	25	1,075,855	Local	
CROSS ROADS													
Wyandotte Street	west of Huron Church Line		1	1.5	25	694,232	Local	1	1.5	25	666,967	Local	
	east of Huron Church Line		1	1.5	25	689,819	Local	1	1.5	25	2,002,780	Local	
University	west of Huron Church Line		1	1.5	25	192,850	Local	1	1.5	25	174,005	Local	
	east of Huron Church Line		1	1.5	25	2,309,980	Local	1	1.5	25	1,725,370	Local	
Riverside Drive	west of Huron Church Line		1	1.5	25	487,330	Local	1	1.5	25	516,473	Local	
	east of Huron Church Line		1	1.5	25	964,742	Local	1	1.5	25	799,175	Local	
AMB Off Ramp	east of Huron Church Line				no data					52,339,512	Minor Arterial		
AMB On Ramp	east of Huron Church Line		1	1.5	25	3,250,192	Local				no data		
Patricia	Wyandotte Street		1	1.5	25	3,107,462	Local	1	1.5	25	5,102,108	Local	
College Street	east of Huron Church Road		1	1.5	25	2,289,981	Local	1	1.5	25	4,573,190	Local	
	west of Huron Church Road		1	1.5	25	290,101	Local	1	1.5	25	134,115	Local	
Girardot Street	east of Huron Church Road		1	1.5	25	157,849	Local	1	1.5	25	157,910	Local	
	west of Huron Church Road		1	1.5	25	567,343	Local	1	1.5	25	347,457	Local	
Tecumseh Road	east of Huron Church Road		1	1.5	25	1,907,420	Local	1	1.5	25	5,430,573	Local	
	west of Huron Church Road		1	1.5	25	902,982	Local	1	1.5	25	985,320	Local	
Dorchester Street	east of Huron Church Road		1	1.5	25	236,654	Local	1	1.5	25	213,476	Local	
	west of Huron Church Road		1	1.5	25	360,048	Local	1	1.5	25	140,416	Local	
Prince Road/Totten Street	east of Huron Church Road		1	1.5	25	305,193	Local	1	1.5	25	370,182	Local	
	west of Huron Church Road		1	1.5	25	706,374	Local	1	1.5	25	759,081	Local	
Malden Road	east of Huron Church Road		1	1.5	25	230,260	Local	1	1.5	25	188,801	Local	
	west of Huron Church Road		1	1.5	25	8,368,583	Local	1	1.5	25	16,223,749	Minor Collector	
Industrial Road	east of Huron Church Road		1	1.5	25	759,283	Local	1	1.5	25	1,082,288	Local	
	west of Huron Church Road		1	1.5	25	2,339,227	Local	1	1.5	25	5,865,251	Local	
E.C. Row Expressway North Ramp Terminal	east of Huron Church Road (E-N/S Off Ramp & S-W On Ramp)		1	1.5	25	4,231,065	Local	1	1.5	25	2,686,293	Local	
	west of Huron Church Road (N-W On Ramp)		1	1.5	25	2,243,827	Local				no data		
E.C. Row Expressway South Ramp Terminal	east of Huron Church Road (S-E On Ramp)					no data		1	2	25	1,902,158	Local	
	west of Huron Church Road (N-E On Ramp & W-N/S Off Ramp)		1	1.5	25	10,061,304	Minor Collector	1	2	25	1,585,368	Local	
Labelle Street/Bethlehem Avenue	east of North Service Road		1	1.5	25	434,060	Local	1	1.5	25	331,135	Local	
	between North and South Service Road		1	1.5	25	194,281	Local	1	1.5	25	500,781	Local	
Grand Marais Road/Lambton Road	west of South Service Road		1	1.5	25	256,338	Local	1	1.5	25	500,236	Local	
	east of North Service Road		1	1.5	25	503,114	Local	1	1.5	25	503,736	Local	
	between North and South Service Road		1	1.5	25	32,625	Local	1	1.5	25	407,601	Local	
	west of South Service Road		1	1.5	25	467,037	Local	1	1.5	25	288,094	Local	
Pulford Street	east of North Service Road		1	1.5	25	224,412	Local	1	1.5	25	299,120	Local	
	between North and South Service Road		1	1.5	25	214,309	Local	1	1.5	25	190,063	Local	
	west of South Service Road		1	1.5	25	357,634	Local	1	1.5	25	119,543	Local	
Todd Lane/Cabana Road	east of North Service Road		1	1.5	25	1,340,613	Local	1	1.5	25	1,078,092	Local	
	between North and South Service Road		1	1.5	25	1,402,500	Local	1	1.5	25	1,383,140	Local	
	west of South Service Road		1	1.5	25	1,684,692	Local	1	1.5	25	1,609,216	Local	
Huron Church Line	between North and South Service Road		1	1.5	25	606,870	Local	1	1.5	25	1,227,699	Local	
	west of South Service Road		1	1.5	25	1,468,443	Local	1	1.5	25	1,568,008	Local	
St. Clair College	east of North Service Road		1	1.5	25	443,110	Local	1	1.5	25	1,228,701	Local	
	between North and South Service Road		1	1.5	25	347,171	Local	1	1.5	25	388,546	Local	
Cousineau Drive	east of North Service Road		1	1.5	25	739,163	Local	1	1.5	25	595,221	Local	
	between North and South Service Road		1	1.5	25	1,154,957	Local	1	1.5	25	1,010,971	Local	
	west of South Service Road		1	1.5	25	1,532,626	Local	1	1.5	25	591,297	Local	
Howard Avenue	east of North Service Road		1	1.5	25	2,011,428	Local	1	1.5	25	2,531,151	Local	
	between North and South Service Road		1	1.5	25	3,098,594	Local	1	1.5	25	2,472,906	Local	
	west of South Service Road		1	1.5	25	3,687,059	Local	1	1.5	25	4,799,149	Local	
E.C. Row Expressway	east of Ojibway Parkway		0.8	2	25	8,300,384	Local	0.8	2	25	6,506,690	Local	
	west of Ojibway Parkway		0.8	2	25	6,069,160	Local	0.8	2	25	4,011,686	Local	
	east of Huron Church Road		0.8	2	25	21,109,529	Major Collector	0.8	2	25	38,468,583	Major Collector	
	at Malden Road		0.8	2	25	20,667,760	Major Collector	0.8	2	25	29,568,892	Major Collector	
	west of Matchette		0.8	2	25	9,528,949	Local	0.8	2	25	6,506,690	Local	
GN Booth Drive	west of Ojibway Parkway		1	1.5	25	93,809	Local	1	1.5	25	104,949	Local	
Sandwich Street	west of Ojibway Parkway		1	1.5	25	2,104,888	Local	1	1.5	25	1,345,831	Local	
Prospect Avenue	west of Ojibway Parkway		1	1.5	25	91,116	Local	1	1.5	25	63,622	Local	
HIGHWAY 401 Ramps													
<i>Highway 3 merge/split</i>													
Highway 401 Northbound Off Ramp			1	2	25	14,990,226	Minor Collector	1	2	25	no data		
Highway 401 Northbound On Ramp			1	2	25	3,268,470	Local	1	2	25	no data		
Highway 401 Southbound Off Ramp						no data		1	2	25	3,494,101	Local	
Highway 401 Southbound On Ramp						no data		1	2	25	14,635,604	Minor Collector	
<i>At St. Clair College</i>													
Highway 401 Northbound Off Ramp			1	1.5	25	665,998	Local				no data		
Highway 401 Northbound On Ramp			1	1.5	25	444,106	Local				no data		
Highway 401 Southbound Off Ramp						no data		1	1.5	25	4,174,822	Local	
Highway 401 Southbound On Ramp						no data		1	1.5	25	456,116	Local	
<i>At Pulford Street</i>													
Highway 401 Northbound On Ramp			1	1.5	25	1,290,271	Local				no data		
Highway 401 Southbound Off Ramp						no data		1	1.5	25	1,099,706	Local</	

SUMMARY OF ESAL CALCULATIONS - RIGID PAVEMENTS - ALTERNATIVE 2A

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION		Northbound/Westbound					Southbound/Eastbound					
	From	To	LDF	IF	Design Period (years)	ESALs	Class	LDF	IF	Design Period (years)	ESALs	Class	
Huron Church Road	Riverside Drive	University Avenue	0.9	2	25	3,003,414	Local	0.9	2	25	2,267,626	Local	
	University Avenue	Wyandotte Street	0.9	2	25	2,273,977	Local	0.9	2	25	2,797,191	Local	
	Wyandotte Street	AMB Off Ramp	0.9	2	25	371,922	Local	0.9	2	25	540,775	Local	
	AMB Off Ramp	College Street	0.8	2	25	46,237,229	Major Collector	0.9	2	25	1,705,458	Local	
	College Street	Girardot Street	0.8	2	25	11,706,946	Minor Collector	0.8	2	25	51,381,316	Minor Arterial	
	Girardot Street	Tecumseh Road	0.8	2	25	13,088,483	Minor Collector	0.8	2	25	50,850,389	Minor Arterial	
	Tecumseh Road	Dorchester Street	0.8	2	25	15,395,542	Minor Collector	0.8	2	25	48,718,427	Major Collector	
	Dorchester Street	Prince Road/Totten Street	0.8	2	25	13,082,470	Minor Collector	0.8	2	25	45,070,741	Major Collector	
	Prince Road/Totten Street	Malden Road	0.8	2	25	15,375,948	Minor Collector	0.8	2	25	43,366,525	Major Collector	
	Malden Road	Industrial Road	0.8	2	25	9,300,337	Local	0.8	2	25	40,087,258	Major Collector	
	Industrial Road	EC Row Expressway North Ramp Terminal	0.8	2	25	10,173,324	Minor Collector	0.8	2	25	40,658,732	Major Collector	
	EC Row Expressway North Ramp Terminal	EC Row Expressway South Ramp Terminal	0.8	2	25	6,849,753	Local	0.8	2	25	36,316,054	Major Collector	
	EC Row Expressway South Ramp Terminal	Highway 401 Off Ramp	0.8	2	25	7,699,909	Local	0.8	2	25	26,592,454	Major Collector	
	Highway 401 Off Ramp	Spring Garden Road/Labelle Street	0.8	2	25	1,303,925	Local	0.8	2	25	1,954,826	Local	
	Spring Garden Road/Labelle Street	Lambton Street/Grand Marais Road Ramp	0.8	2	25	1,928,836	Local	0.8	2	25	2,738,677	Local	
	Lambton Street/Grand Marais Road Ramp	Pulford Street	0.8	2	25	2,103,320	Local	0.8	2	25	717,384	Local	
	Pulford Street	Todd Lane/Cabana Road	0.8	2	25	2,451,298	Local	0.8	2	25	914,155	Local	
	Todd Lane/Cabana Road	Huron Church Line	0.8	2	25	2,350,950	Local	0.8	2	25	3,538,796	Local	
	Talbot Road	Huron Church Line	St Clair College	0.9	2	25	202,126	Local	0.8	2	25	1,189,454	Local
		St Clair College	Cousineau Drive	0.8	2	25	174,323	Local	0.9	2	25	1,119,464	Local
Cousineau Drive		Howard Avenue	0.8	2	25	702,188	Local	0.9	2	25	226,825	Local	
Howard Avenue		EC Row Expressway	0.8	2	25	4,817,363	Local	0.8	2	25	4,698,514	Local	
Ojibway Parkway	EC Row Expressway	GN Booth Drive	0.8	2	25	3,816,612	Local	0.8	2	25	10,078,277	Minor Collector	
	GN Booth Drive	Sandwich Street	0.8	2	25	3,825,020	Local	0.8	2	25	10,077,909	Minor Collector	
	Sandwich Street	Prospect Avenue	0.8	2	25	1,099,952	Local	0.8	2	25	1,090,292	Local	
	North of Prospect Avenue		0.8	2	25	1,093,523	Local	0.8	2	25	1,067,942	Local	
CROSSING ROADS													
Wyandotte Street	West of Huron Church Road		1	1.5	25	691,154	Local	1	1.5	25	666,955	Local	
	East of Huron Church Road		1	1.5	25	889,042	Local	1	1.5	25	1,974,611	Local	
University Avenue	West of Huron Church Road		1	1.5	25	192,347	Local	1	1.5	25	174,581	Local	
	East of Huron Church Road		1	1.5	25	2,336,177	Local	1	1.5	25	1,899,605	Local	
Riverside Drive	West of Huron Church Road		1	1.5	25	486,003	Local	1	1.5	25	521,381	Local	
	East of Huron Church Road		1	1.5	25	964,270	Local	1	1.5	25	809,963	Local	
AMB Off Ramp	East of Huron Church Road		1	1.5	25	no data		1	1.5	25	41,238,608	Major Collector	
AMB On Ramp	East of Huron Church Road		1	1.5	25	3,250,546	Local				no data		
Patricia Street	Wyandotte Street		1	1.5	25	3,073,521	Local	1	1.5	25	5,000,645	Local	
College Street	East of Huron Church Road		1	1.5	25	2,441,619	Local	1	1.5	25	4,634,076	Local	
Girardot Street	West of Huron Church Road		1	1.5	25	282,978	Local	1	1.5	25	126,110	Local	
	East of Huron Church Road		1	1.5	25	156,077	Local	1	1.5	25	160,033	Local	
Tecumseh Road	West of Huron Church Road		1	1.5	25	619,854	Local	1	1.5	25	425,668	Local	
	East of Huron Church Road		1	1.5	25	1,835,031	Local	1	1.5	25	5,771,568	Local	
Dorchester Street	West of Huron Church Road		1	1.5	25	888,172	Local	1	1.5	25	961,699	Local	
	East of Huron Church Road		1	1.5	25	237,510	Local	1	1.5	25	214,598	Local	
Prince Road/Totten Street	West of Huron Church Road		1	1.5	25	448,850	Local	1	1.5	25	160,658	Local	
	East of Huron Church Road		1	1.5	25	311,330	Local	1	1.5	25	367,127	Local	
Malden Road	West of Huron Church Road		1	1.5	25	692,330	Local	1	1.5	25	744,979	Local	
	East of Huron Church Road		1	1.5	25	232,719	Local	1	1.5	25	190,007	Local	
Industrial Road	West of Huron Church Road		1	1.5	25	8,002,565	Local	1	1.5	25	12,382,485	Minor Collector	
	East of Huron Church Road		1	1.5	25	776,309	Local	1	1.5	25	1,077,069	Local	
EC Row Expressway North Ramp Terminal	West of Huron Church Road		1	1.5	25	2,324,857	Local	1	1.5	25	6,177,174	Local	
	E-N/S Ramp		1	2	25	5,716,274	Local				no data		
EC Row Expressway South Ramp Terminal	N-W Ramp					no data		1	2	25	157,118	Local	
	S-W Ramp		1	2	25	12,276,704	Minor Collector				no data		
Spring Garden Road	W-N/S Ramp					no data		1	2	25	1,139,060	Local	
	S/N-E Ramp					no data		1	2	25	13,390,680	Minor Collector	
Labelle Street	West of Huron Church Road		1	1.5	25	320,631	Local	1	1.5	25	426,779	Local	
	East of Huron Church Road		1	1.5	25	536,707	Local	1	1.5	25	281,556	Local	
Lambton Street/Grand Marais Road Ramp	East of Huron Church Road		1	1.5	25	721,249	Local	1	1.5	25	697,644	Local	
	East of Huron Church Road		1	1.5	25	417,886	Local	1	1.5	25	217,417	Local	
Pulford Street	East of Huron Church Road		1	1.5	25	1,199,881	Local	1	1.5	25	1,089,842	Local	
	East of Huron Church Road		1	1.5	25	786,233	Local	1	1.5	25	3,181,065	Local	
Cabana Road	between Huron Church Road and Highway 401 northbound Ramps		1	1.5	25	459,538	Local	1	1.5	25	2,667,887	Local	
	between Highway 401 northbound and southbound Ramps		1	1.5	25	1,631,936	Local	1	1.5	25	1,391,395	Local	
Todd Lane	West of Highway 401 southbound Ramps		1	1.5	25	1,956,835	Local	1	1.5	25	1,459,340	Local	
	West of Huron Church Road		1	1.5	25	439,914	Local	1	1.5	25	1,325,857	Local	
Huron Church Line	East of Talbot Road		1	1.5	25	823,446	Local	1	1.5	25	760,123	Local	
	West of Talbot Road		1	1.5	25	239,550	Local	1	1.5	25	587,207	Local	
Cousineau Drive	East of Talbot Road		1	1.5	25	2,034,139	Local	1	1.5	25	3,023,866	Local	
	West of Talbot Road		1	1.5	25	3,273,932	Local	1	1.5	25	2,310,325	Local	
Howard Avenue	between Talbot Road and Highway 401 southbound On Ramp		1	1.5	25	3,761,508	Local	1	1.5	25	4,624,392	Local	
	West of Highway 401 southbound On Ramp		0.8	2	25	20,797,916	Major Collector	0.8	2	25	38,740,646	Major Collector	
E.C. Row Expressway	At Malden Road		0.8	2	25	20,314,284	Major Collector	0.8	2	25	28,736,837	Major Collector	
	West of Matchette Drive		0.8	2	25	8,877,795	Local	0.8	2	25	5,838,068	Local	
* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West													
HIGHWAY 401 Ramps													
Highway 3 merge/split													
Highway 401 northbound Off Ramp			1	2	25	17,763,332	Minor Collector				no data		
Highway 401 northbound On Ramp			1	2	25	3,627,312	Local				no data		
Highway 401 southbound Off Ramp						no data		1	2	25	3,573,480	Local	
Highway 401 southbound On Ramp						no data		1	2	25	16,446,401	Minor Collector	
Howard Avenue						no data		1	2	25	834,906	Local	
401 NB Off Ramp						no data							
At Todd Lane/Cabana Road													
Highway 401 northbound Off Ramp			1	1.5	25	1,248,804	Local				no data		
Highway 401 northbound On Ramp			1	1.5	25	1,885,405	Local				no data		
Highway 401 southbound Off Ramp						no data		1	1.5	25	3,507,977	Local	
Highway 401 southbound On Ramp						no data		1	1.5	25	477,804	Local	
At Huron Church Road													
Highway 401 northbound Off Ramp			1	2	25	6,930,905	Local				no data		
Highway 401 southbound On Ramp						no data		1	2	25	30,663,730	Major Collector	
At Malden Road													
Highway 401 northbound On Ramp			1	1.5	25	6,884,017	Local				no data		
Highway 401 southbound Off Ramp						no data		1	1.5	25	6,476,966	Local	
EC Row Expressway to Highway 401													
Highway 401 southbound On Ramp						no data		1	2	25	26,795,424	Major Collector	
Ojibway Parkway Interchange													
Highway 401 northbound Off Ramp			1	2	25	8,532,329	Local				no data		
Highway 401 northbound On Ramp			1	2	25	6,358,614	Local				no data		
Highway 401 southbound Off Ramp						no data		1	2	25	512,325	Local	
Highway 401 southbound On Ramp						no data		1	2	25	8,775,237	Local	
EC Row Expressway Interchange													
Highway 401 northbound On Ramp			1	2	25	19,854,252	Minor Collector				no data		
Highway 401 Mainline													
South of Highway 3 merge/split			0.6	2.5	25	98,354,919	Minor Arterial				no data		
Highway 3/Highway 401 northbound Off Ramp			0.8	2.5	25	87,330,456	Minor Arterial				no data		
Highway 3/Highway 401 northbound On Ramp			0.6	2.5	25	84,475,424	Minor Arterial				no data		
Todd Lane/Highway 401 northbound Off Ramp			0.7	2.5	25	69,263,131	Minor Arterial				no data		
Todd Lane/Highway 401 northbound On Ramp			0.6	2.5	25	77,127,923	Minor Arterial				no data		
Huron Church Road/Highway 401 northbound On Ramp			0.8	2.5	25	105,736,754	Major Arterial				no data		
Malden Road/Highway 401 northbound On Ramp			0.7	2.5	25	100,314,701	Major Arterial				no data		
Ojibway Parkway/Highway 401 northbound Off Ramp			0.8	2.5	25	106,732,924	Major Arterial				no data		
Ojibway Parkway/Highway 401 northbound On Ramp													

SUMMARY OF ESAL CALCULATIONS - RIGID PAVEMENTS - ALTERNATIVE 2B

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION		Northbound/Westbound						Southbound/Eastbound					
	From	To	LDF	TF	Design Period (years)	ESALs	Class	LDF	TF	Design Period (years)	ESALs	Class		
Huron Church Road	Riverside Drive	University Avenue	0.9	2	25	3,003,414	Local	0.9	2	25	2,267,626	Local		
	University Avenue	Wyandotte Street	0.9	2	25	2,273,977	Local	0.9	2	25	2,797,191	Local		
	Wyandotte Street	AMB Off Ramp	0.9	2	25	371,922	Local	0.9	2	25	540,775	Local		
	AMB Off Ramp	College Street	0.8	2	25	46,237,229	Major Collector	0.9	2	25	1,705,458	Local		
	College Street	Girardot Street	0.8	2	25	11,706,946	Minor Collector	0.8	2	25	51,381,316	Minor Arterial		
	Girardot Street	Tecumseh Road	0.8	2	25	13,088,483	Minor Collector	0.8	2	25	50,850,389	Minor Arterial		
	Tecumseh Road	Dorchester Street	0.8	2	25	15,393,542	Minor Collector	0.8	2	25	48,718,427	Major Collector		
	Dorchester Street	Prince Road/Totten Street	0.8	2	25	13,682,470	Minor Collector	0.8	2	25	45,070,741	Major Collector		
	Prince Road/Totten Street	Malden Road	0.8	2	25	15,375,948	Minor Collector	0.8	2	25	43,366,525	Major Collector		
	Malden Road	Industrial Road	0.8	2	25	9,300,337	Local	0.8	2	25	40,087,258	Major Collector		
	Industrial Road	EC Row Expressway North Ramp Terminal	0.8	2	25	10,173,324	Minor Collector	0.8	2	25	40,658,732	Major Collector		
	EC Row Expressway North Ramp Terminal	EC Row Expressway South Ramp Terminal	0.8	2	25	6,849,753	Local	0.8	2	25	36,316,054	Major Collector		
	EC Row Expressway South Ramp Terminal	Highway 401 Off Ramp	0.8	2	25	7,699,909	Local	0.8	2	25	26,405,895	Major Collector		
	Highway 401 Off Ramp	Spring Garden Road/Labelle Street	0.8	2	25	1,303,925	Local	0.8	2	25	1,954,826	Local		
	Spring Garden Road/Labelle Street	Lambton Street/Grand Marais Road Ramp	0.8	2	25	1,928,836	Local	0.8	2	25	2,738,677	Local		
	Lambton Street/Grand Marais Road Ramp	Pulford Street	0.8	2	25	2,103,320	Local	0.8	2	25	717,384	Local		
	Pulford Street	Todd Lane/Cabana Road	0.8	2	25	2,451,298	Local	0.8	2	25	914,155	Local		
	Todd Lane/Cabana Road	Huron Church Line	0.8	2	25	2,350,950	Local	0.8	2	25	3,538,796	Local		
	Talbot Road	Huron Church Line	St Clair College	0.9	2	25	202,126	Local	0.8	2	25	1,189,454	Local	
		St Clair College	Cousineau Drive	0.8	2	25	174,323	Local	0.9	2	25	1,119,464	Local	
Cousineau Drive		Howard Avenue	0.8	2	25	702,188	Local	0.9	2	25	226,825	Local		
Howard Avenue		Highway 3 split	0.8	2	25	4,817,363	Local	0.8	2	25	4,698,514	Local		
Ojibway Parkway	EC Row Expressway	GN Booth Drive	0.8	2	25	3,816,612	Local	0.8	2	25	10,078,277	Minor Collector		
	GN Booth Drive	Sandwich Street	0.8	2	25	3,825,020	Local	0.8	2	25	10,077,909	Minor Collector		
	Sandwich Street	Prospect Avenue	0.8	2	25	1,099,952	Local	0.8	2	25	1,090,292	Local		
	North of Prospect Avenue		0.8	2	25	1,093,523	Local	0.8	2	25	1,067,942	Local		
CROSSING ROADS														
Wyandotte Street	West of Huron Church Road		1	1.5	25	691,154	Local	1	2	25	889,273	Local		
	East of Huron Church Road		1	1.5	25	889,042	Local	1	2	25	2,632,815	Local		
University Avenue	West of Huron Church Road		1	1.5	25	192,347	Local	1	2	25	232,775	Local		
	East of Huron Church Road		1	1.5	25	2,336,177	Local	1	2	25	2,532,807	Local		
Riverside Drive	West of Huron Church Road		1	1.5	25	486,003	Local	1	2	25	695,175	Local		
	East of Huron Church Road		1	1.5	25	964,270	Local	1	2	25	1,079,951	Local		
AMB Off Ramp	East of Huron Church Road		1	2	25	no data		1	2	25	54,984,811	Minor Arterial		
AMB On Ramp	East of Huron Church Road		1	2	25	4,334,061	Local				no data			
Patricia Street	AMB	Wyandotte Street	1	1.5	25	3,073,521	Local	1	2	25	6,667,526	Local		
College Street	East of Huron Church Road		1	1.5	25	2,441,619	Local	1	2	25	6,178,769	Local		
Girardot Street	West of Huron Church Road		1	1.5	25	282,978	Local	1	2	25	168,147	Local		
	East of Huron Church Road		1	1.5	25	156,077	Local	1	2	25	213,377	Local		
Tecumseh Road	West of Huron Church Road		1	1.5	25	619,854	Local	1	2	25	567,558	Local		
	East of Huron Church Road		1	1.5	25	1,835,031	Local	1	2	25	7,695,424	Local		
Dorchester Street	West of Huron Church Road		1	1.5	25	888,172	Local	1	2	25	1,282,265	Local		
	East of Huron Church Road		1	1.5	25	237,510	Local	1	2	25	286,131	Local		
Prince Road/Totten Street	West of Huron Church Road		1	1.5	25	448,850	Local	1	2	25	214,211	Local		
	East of Huron Church Road		1	1.5	25	311,330	Local	1	2	25	489,502	Local		
Malden Road	West of Huron Church Road		1	1.5	25	692,330	Local	1	2	25	993,305	Local		
	East of Huron Church Road		1	1.5	25	232,719	Local	1	2	25	253,343	Local		
Industrial Road	West of Huron Church Road		1	1.5	25	8,002,565	Local	1	2	25	16,509,980	Minor Collector		
	East of Huron Church Road		1	1.5	25	776,309	Local	1	2	25	1,436,092	Local		
EC Row Expressway North Ramp Terminal	E-N/S Ramp		1	1.5	25	2,324,857	Local	1	2	25	8,236,231	Local		
	N-W Ramp		1	2	25	5,716,274	Local				no data			
EC Row Expressway South Ramp Terminal	W-N/S Ramp		1	2	25	12,276,704	Minor Collector	1	2	25	157,118	Local		
	S-N/E Ramp		1	2	25	no data		1	2	25	no data			
Spring Garden Road	West of Huron Church Road		1	1.5	25	no data		1	2	25	13,390,680	Minor Collector		
	East of Huron Church Road		1	1.5	25	320,631	Local	1	2	25	569,038	Local		
Labelle Street	East of Huron Church Road		1	1.5	25	536,707	Local	1	2	25	375,408	Local		
Lambton Street/Grand Marais Road	East of Huron Church Road		1	1.5	25	588,358	Local	1	2	25	737,751	Local		
	West of Huron Church Road		1	1.5	25	592,967	Local	1	2	25	398,163	Local		
Pulford Street	East of Huron Church Road		1	1.5	25	417,886	Local	1	2	25	289,889	Local		
Cabana Road	East of Huron Church Road		1	1.5	25	1,199,851	Local	1	2	25	1,453,123	Local		
	between Huron Church Road and Highway 401 northbound Ramps		1	1.5	25	786,233	Local	1	2	25	4,241,419	Local		
Todd Lane	between Highway 401 northbound and southbound Ramps		1	1.5	25	459,538	Local	1	2	25	3,557,183	Local		
Huron Church Line	West of Highway 401 southbound Ramps		1	1.5	25	1,651,936	Local	1	2	25	1,855,193	Local		
	East of Talbot Road		1	1.5	25	1,956,835	Local	1	2	25	1,945,787	Local		
St Clair College	East of Talbot Road		1	1.5	25	439,914	Local	1	2	25	1,765,143	Local		
Cousineau Drive	East of Talbot Road		1	1.5	25	823,446	Local	1	2	25	1,013,498	Local		
	West of Talbot Road		1	1.5	25	239,550	Local	1	2	25	782,943	Local		
Howard Avenue	East of Talbot Road		1	1.5	25	2,034,139	Local	1	2	25	4,029,154	Local		
	between Talbot Road and Highway 401 southbound On Ramp		1	1.5	25	3,733,932	Local	1	2	25	3,080,434	Local		
E.C. Row Expressway	West of Highway 401 southbound On-Ramp		1	1.5	25	3,761,568	Local	1	2	25	6,165,856	Local		
	East of Huron Church Road		0.8	2	25	21,129,303	Major Collector	0.8	2	25	38,872,371	Major Collector		
At Malden Road	At Malden Road		0.8	2	25	20,840,008	Major Collector	0.8	2	25	28,885,180	Major Collector		
	West of Matchette Street		0.8	2	25	8,877,795	Local	0.8	2	25	5,838,068	Local		
* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West														
HIGHWAY 401 Ramps														
<i>Highway 3 merge/split</i>														
Highway 401 northbound Off Ramp			1	2	25	17,763,332	Minor Collector				no data			
Highway 401 northbound On Ramp			1	2	25	3,627,312	Local				no data			
Highway 401 southbound Off Ramp						no data		1	2	25	3,573,480	Local		
Highway 401 southbound On Ramp						no data		1	2	25	16,446,401	Minor Collector		
Howard Avenue						no data					no data			
Highway 401 southbound Off Ramp			1	2	25	no data		1	2	25	834,906	Local		
At Todd Lane/Cabana Road						no data					no data			
Highway 401 northbound Off Ramp			1	1.5	25	1,248,804	Local				no data			
Highway 401 northbound On Ramp			1	1.5	25	1,885,405	Local				no data			
Highway 401 southbound Off Ramp						no data		1	2	25	4,677,303	Local		
Highway 401 southbound On Ramp						no data		1	2	25	637,072	Local		
At Huron Church Road						no data					no data			
Highway 401 northbound Off Ramp			1	2	25	6,930,905	Local				no data			
Highway 401 southbound On Ramp						no data		1	2	25	30,360,347	Major Collector		
At Malden Road						no data					no data			
Highway 401 northbound On Ramp			1	1.5	25	6,884,017	Local				no data			
Highway 401 southbound Off Ramp						no data		1	2	25	8,635,955	Local		
EC Row Expressway to Highway 401						no data					no data			
Highway 401 southbound Off Ramp						no data		1	2	25	26,795,424	Major Collector		
Ojibway Parkway Interchange						no data					no data			
Highway 401 northbound Off Ramp			1	2	25	8,532,329	Local				no data			
Highway 401 northbound On Ramp			1	2	25	6,358,614	Local				no data			
Highway 401 southbound Off Ramp						no data		1	2	25	512,325	Local		
Highway 401 southbound On Ramp						no data		1	2	25	8,775,237	Local		
EC Row Expressway Interchange						no data					no data			
Highway 401 northbound On Ramp			1	2	25	19,854,252	Minor Collector				no data			
Highway 401 Mainline														
Highway 401 Mainline	South of Highway 3 merge/split	Highway 3/Highway 401 northbound Off Ramp	0.6	2.5	25	98,354,919	Minor Arterial				no data			
	Highway 3/Highway 401 northbound Off Ramp	Highway 3/Highway 401 northbound On Ramp	0.8	2.5	25	87,330,456	Minor Arterial				no data			
	Highway 3/Highway 401 northbound On Ramp	Todd Lane/Highway 401 northbound Off Ramp	0.6	2.5	25	84,475,424	Minor Arterial				no data			
	Todd Lane/Highway 401 northbound Off Ramp	Todd Lane/Highway 401 northbound On Ramp	0.7	2.5	25	69,263,131	Minor Arterial				no data			
	Todd Lane/Highway 401 northbound On Ramp	Huron Church Road/Highway 401 northbound On Ramp	0.6	2.5										

SUMMARY OF ESAL CALCULATIONS - RIGID PAVEMENTS - ALTERNATIVE 3

Detroit River International Crossing
Windsor, Ontario

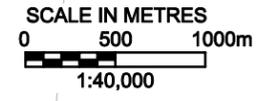
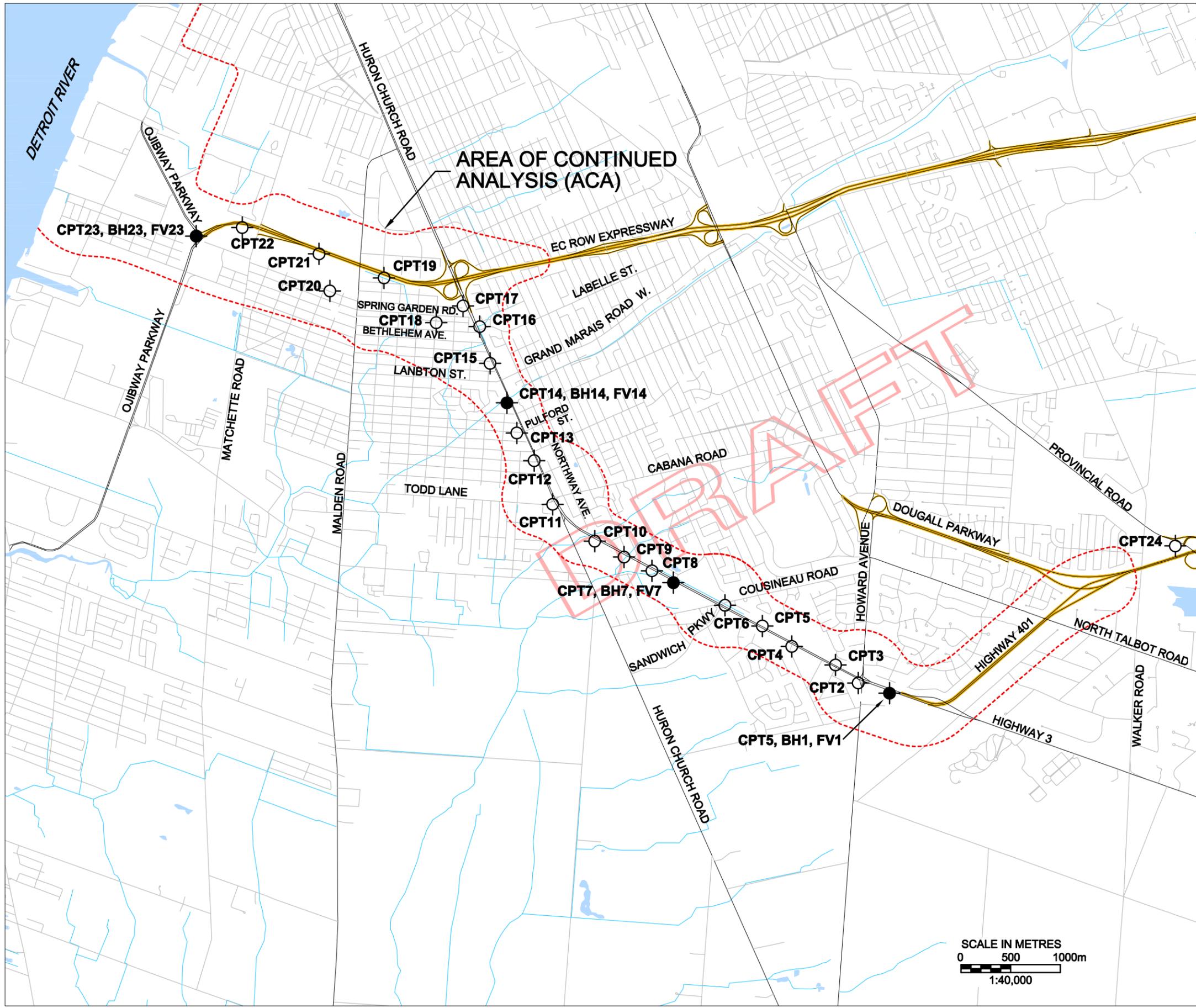
Pavement Section	LOCATION		Northbound/Westbound					Southbound/Eastbound				
	From	To	LDF	IF	Design Period (years)	ESALs	Class	LDF	IF	Design Period (years)	ESALs	Class
Huron Church Road	Riverside Drive	University Avenue	0.9	2	25	3,077,854	Local	0.9	2	25	2,240,674	Local
	University Avenue	Wyandotte Street	0.9	2	25	2,298,797	Local	0.9	2	25	2,765,978	Local
	Wyandotte Street	AMB Off Ramp	0.9	2	25	357,802	Local	0.9	2	25	531,350	Local
	AMB Off Ramp	College Street	0.8	2	25	48,314,738	Major Collector	0.9	2	25	1,669,621	Local
	College Street	Girardot Street	0.8	2	25	11,624,061	Minor Collector	0.8	2	25	52,357,898	Minor Arterial
	Girardot Street	Tecumseh Road	0.8	2	25	13,086,035	Minor Collector	0.8	2	25	53,338,799	Minor Arterial
	Tecumseh Road	Dorchester Street	0.8	2	25	15,321,817	Minor Collector	0.8	2	25	51,089,731	Minor Arterial
	Dorchester Street	Prince Road/Totten Street	0.8	2	25	13,794,907	Minor Collector	0.8	2	25	47,029,220	Major Collector
	Prince Road/Totten Street	Malden Road	0.8	2	25	15,366,113	Minor Collector	0.8	2	25	45,086,556	Major Collector
	Malden Road	Industrial Road	0.8	2	25	9,211,776	Local	0.8	2	25	41,165,442	Major Collector
	Industrial Road	EC Row Expressway North Ramp Terminal	0.8	2	25	9,897,068	Local	0.8	2	25	41,597,660	Major Collector
	EC Row Expressway North Ramp Terminal	EC Row Expressway South Ramp Terminal	0.8	2	25	6,816,457	Local	0.8	2	25	39,048,204	Major Collector
	EC Row Expressway South Ramp Terminal	Spring Gdn Rd/Labelle St	0.8	2	25	7,397,321	Local	0.8	2	25	29,483,508	Major Collector
	Spring Gdn Rd/Labelle St	Lambton Street/Grand Marais Road	0.8	2	25	5,279,275	Local	0.8	2	25	2,852,004	Local
	Lambton Street/Grand Marais Road	Pulford Street	0.8	2	25	2,696,780	Local	0.8	2	25	2,470,273	Local
	Pulford Street	Todd Lane/Cabana Road	0.8	2	25	2,999,285	Local	0.8	2	25	2,735,616	Local
	Todd Lane/Cabana Road	Huron Church Line	0.8	2	25	1,800,509	Local	0.8	2	25	1,543,435	Local
	Huron Church Line	St Clair College	0.9	2	25	1,260,298	Local	0.8	2	25	1,365,942	Local
	St Clair College	Cousineau Drive	0.8	2	25	1,861,070	Local	0.8	2	25	4,046,296	Local
	Cousineau Drive	Howard Avenue	0.9	2	25	1,651,370	Local	0.9	2	25	4,685,701	Local
Howard Avenue	South of Howard Avenue	0.8	2	25	4,426,756	Local	0.8	2	25	4,124,981	Local	
South of Howard Avenue	EC Row Expressway	0.8	2	25	2,093,984	Local	0.8	2	25	9,960,405	Local	
EC Row Expressway	GN Booth Drive	0.8	2	25	2,081,887	Local	0.8	2	25	9,909,079	Local	
GN Booth Drive	Sandwich Street	0.8	2	25	1,088,643	Local	0.8	2	25	1,074,749	Local	
Sandwich Street	Prospect Avenue	0.8	2	25	1,082,258	Local	0.8	2	25	1,052,767	Local	
Prospect Avenue												
CROSSING ROADS												
Wyandotte Street	West of Huron Church Road		1	1.5	25	693,224	Local	1	1.5	25	669,025	Local
	East of Huron Church Road		1	1.5	25	892,583	Local	1	1.5	25	2,008,801	Local
University Avenue	West of Huron Church Road		1	1.5	25	193,642	Local	1	1.5	25	172,170	Local
	East of Huron Church Road		1	1.5	25	2,316,614	Local	1	1.5	25	1,937,132	Local
Riverside Drive	West of Huron Church Road		1	1.5	25	494,443	Local	1	1.5	25	522,956	Local
	East of Huron Church Road		1	1.5	25	966,358	Local	1	1.5	25	799,583	Local
AMB Off Ramp	East of Huron Church Road		1	1.5	25	no data		1	2	25	57,455,194	Minor Arterial
AMB On Ramp	East of Huron Church Road		1	1.5	25	3,252,300	Local				no data	
Patricia Street	AMB	Wyandotte Street	1	1.5	25	3,100,023	Local	1	1.5	25	5,083,323	Local
College Street	East of Huron Church Road		1	1.5	25	2,296,152	Local	1	1.5	25	4,684,466	Local
	West of Huron Church Road		1	1.5	25	287,771	Local	1	1.5	25	128,247	Local
Girardot Street	East of Huron Church Road		1	1.5	25	157,153	Local	1	1.5	25	158,354	Local
	West of Huron Church Road		1	1.5	25	567,325	Local	1	1.5	25	352,916	Local
Tecumseh Road	East of Huron Church Road		1	1.5	25	1,915,853	Local	1	1.5	25	5,278,764	Local
	West of Huron Church Road		1	1.5	25	908,650	Local	1	1.5	25	972,099	Local
Dorchester Street	East of Huron Church Road		1	1.5	25	177,465	Local	1	1.5	25	115,374	Local
	West of Huron Church Road		1	1.5	25	456,470	Local	1	1.5	25	257,750	Local
Prince Road/Totten Street	East of Huron Church Road		1	1.5	25	304,157	Local	1	1.5	25	356,179	Local
	West of Huron Church Road		1	1.5	25	653,717	Local	1	1.5	25	669,254	Local
Malden Road	East of Huron Church Road		1	1.5	25	230,890	Local	1	1.5	25	183,101	Local
	West of Huron Church Road		1	1.5	25	7,828,593	Local	1	2	25	16,500,848	Minor Collector
Industrial Road	East of Huron Church Road		1	1.5	25	783,674	Local	1	1.5	25	1,136,520	Local
	West of Huron Church Road		1	1.5	25	2,217,029	Local	1	2	25	7,819,422	Local
EC Row Expressway North Ramp Terminal	East of Huron Church Road (E-N/S Off Ramp & S-W On Ramp)		1	1.5	25	4,346,581	Local	1	1.5	25	58,859	Local
	West of Huron Church Road (N-W On Ramp)		1	1.5	25	4,657,548	Local				no data	
EC Row Expressway South Ramp Terminal	East of Huron Church Road (S-E On Ramp)					no data		1	1.5	25	1,389,261	Local
	West of Huron Church Road (N-E On Ramp & W-N/S Off Ramp)		1	1.5	25	9,150,700	Local	1	1.5	25	1,053,091	Local
Spring Garden Road/Labelle Street	East of Huron Church Road		1	1.5	25	490,166	Local	1	1.5	25	420,880	Local
	West of Huron Church Road		1	1.5	25	553,594	Local	1	1.5	25	582,444	Local
Lambton Street/Grand Marais Road	East of Huron Church Road		1	1.5	25	600,709	Local	1	1.5	25	543,272	Local
	West of Huron Church Road		1	1.5	25	522,382	Local	1	1.5	25	715,926	Local
Pulford Street	East of Huron Church Road		1	1.5	25	303,060	Local	1	1.5	25	274,270	Local
Todd Lane/Cabana Road	East of Huron Church Road		1	1.5	25	1,434,862	Local	1	1.5	25	1,216,248	Local
	West of Huron Church Road		1	1.5	25	1,791,868	Local	1	1.5	25	1,445,151	Local
Huron Church Line	West of Huron Church Road		1	1.5	25	1,624,212	Local	1	1.5	25	1,485,323	Local
St Clair College	East of Talbot Road		1	1.5	25	438,079	Local	1	1.5	25	1,284,110	Local
Cousineau Drive	East of Talbot Road		1	1.5	25	1,152,081	Local	1	1.5	25	764,228	Local
	West of Talbot Road		1	1.5	25	1,667,119	Local	1	1.5	25	1,388,966	Local
Howard Avenue	East of Talbot Road		1	1.5	25	1,906,879	Local	1	1.5	25	2,735,766	Local
	between Talbot Road and Highway 401 southbound On Ramp		1	1.5	25	2,790,801	Local	1	1.5	25	2,283,670	Local
E.C. Row Expressway	West of Highway 401 southbound On Ramp		1	1.5	25	3,020,136	Local	1	1.5	25	4,581,230	Local
	East of Huron Church Road		0.8	1.5	25	15,937,192	Minor Collector	0.8	2	25	33,144,634	Major Collector
	At Malden Road		0.8	1.5	25	15,376,513	Minor Collector	0.8	2	25	29,477,730	Major Collector
	West of Matchette Street		0.8	1.5	25	5,539,329	Local	0.8	2	25	6,025,739	Local
* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West												
HIGHWAY 401 Ramps												
Highway 3 merge/split												
Highway 401 northbound Off Ramp			1	2	25	15,223,164	Minor Collector				no data	
Highway 401 northbound On Ramp			1	2	25	3,316,671	Local				no data	
Highway 401 southbound Off Ramp						no data		1	2	25	3,507,406	Local
Highway 401 southbound On Ramp						no data		1	2	25	14,444,993	Minor Collector
At St. Clair College												
Highway 401 northbound Off Ramp			1	1.5	25	801,352	Local				no data	
Highway 401 northbound On Ramp			1	1.5	25	517,399	Local				no data	
Highway 401 southbound Off Ramp						no data		1	1.5	25	3,213,902	Local
Highway 401 southbound On Ramp						no data		1	1.5	25	366,203	Local
At Huron Church Road												
Highway 401 northbound Off Ramp			1	2	25	5,765,139	Local				no data	
Highway 401 southbound On Ramp						no data		1	2	25	26,643,826	Major Collector
Malden Road Interchange												
Highway 401 On Ramp			1	1.5	25	8,081,700	Local				no data	
Highway 401 Off Ramp						no data		1	1.5	25	7,267,134	Local
EC Row Expressway Interchange												
Highway 401 southbound Off Ramp						no data		1	1.5	25	20,210,842	Major Collector
Ojibway Parkway Interchange												
Highway 401 northbound Off Ramp			1	2	25	9,035,576	Local				no data	
Highway 401 northbound On Ramp			1	2	25	6,557,314	Local				no data	
Highway 401 southbound Off Ramp						no data		1	2	25	1,680,972	Local
Highway 401 southbound On Ramp						no data		1	2	25	10,548,859	Minor Collector
EC Row Expressway Interchange												
Highway 401 northbound On Ramp			1	2	25	18,573,804	Minor Collector				no data	
Highway 401 Mainline												
South of Highway 3 merge/split		Highway 3/Highway 401 northbound Off Ramp	0.6	2.5	25	96,136,699	Minor Arterial				no data	
Highway 3/Highway 401 northbound Off Ramp		Highway 3/Highway 401 northbound On Ramp	0.7	2.5	25	97,214,232	Minor Arterial				no data	
Highway 3/Highway 401 northbound On Ramp		St. Clair College/Highway 401 northbound Off Ramp	0.6	2.5	25	96,098,132	Minor Arterial				no data	
St. Clair College/Highway 401 northbound Off Ramp		St. Clair College/Highway 401 northbound On Ramp	0.7	2.5	25	85,760,495	Minor Arterial				no data	
St. Clair College/Highway 401 northbound On Ramp		Huron Church Road/Highway 401 northbound Off Ramp	0.6	2.5	25	78,044,023	Minor Arterial				no data	
Huron Church Road/Highway 401 northbound Off Ramp		Malden Road/Highway 401 northbound On Ramp	0.8	2.5	25	109,412,212	Major Arterial				no data	
Malden Road/Highway 401 northbound On Ramp		Ojibway Parkway/Highway 401 northbound Off Ramp	0.7	2.5	25	104,907,134	Major Arterial				no data	
Ojibway Parkway/Highway 401 northbound Off Ramp		Ojibway Parkway/Highway 401 northbound On Ramp										

SUMMARY OF ESAL CALCULATIONS - RIGID PAVEMENTS - PARKWAY ALTERNATIVE

Detroit River International Crossing
Windsor, Ontario

Pavement Section	LOCATION		Northbound/Westbound					Southbound/Eastbound				
	From	To	LDF	TF	Design Period (years)	ESALs	Class	LDF	TF	Design Period (years)	ESALs	Class
Huron Church Road	Riverside Drive	University Avenue	0.9	2	25	3,077,400	Local	0.9	2	25	2,230,914	Local
	University Avenue	Wyandotte Street	0.9	2	25	2,048,765	Local	0.9	2	25	2,757,478	Local
	Wyandotte Street	AMB Off Ramp	0.9	2	25	364,841	Local	0.9	2	25	538,754	Local
	AMB Off Ramp	College Street	0.8	2	25	48,879,305	Major Collector	0.9	2	25	1,660,578	Local
	College Street	Girardot Street	0.8	2	25	12,121,728	Minor Collector	0.8	2	25	53,231,477	Minor Arterial
	Girardot Street	Tecumseh Road	0.8	2	25	13,512,891	Minor Collector	0.8	2	25	51,973,153	Minor Arterial
	Tecumseh Road	Dorchester Street	0.8	2	25	15,758,333	Minor Collector	0.8	2	25	49,725,238	Major Collector
	Dorchester Street	Prince Road/Totten Street	0.8	2	25	13,910,123	Minor Collector	0.8	2	25	45,600,590	Major Collector
	Prince Road/Totten Street	Malden Road	0.8	2	25	15,647,014	Minor Collector	0.8	2	25	45,073,767	Major Collector
	Malden Road	Industrial Road	0.8	2	25	9,110,936	Local	0.8	2	25	42,326,986	Major Collector
	Industrial Road	E.C. Row Expressway North Ramp Terminal	0.8	2	25	10,321,304	Minor Collector	0.8	2	25	42,761,724	Major Collector
	E.C. Row Expressway North Ramp Terminal	E.C. Row Expressway South Ramp Terminal	0.8	2	25	6,463,195	Local	0.8	2	25	37,941,684	Major Collector
	South of E.C. Row Expressway South Ramp Terminal		0.8	2	25	9,125,202	Local	0.8	2	25	28,384,887	Major Collector
	North of Bethlehem Avenue		0.8	2	25			0.8	2	25	26,828,601	Major Collector
South Service Road	Bethlehem Avenue	Grand Marais Road	0.8	2	25	7,630,972	Local	0.9	2	25	2,366,010	Local
North Service Road	North of Labelle Street		0.8	2	25	4,226,745	Local					
Labelle Street	Grand Marais Road Ramp		0.8	2	25	150,056	Local	0.9	2	25	305,232	Local
Grand Marais Road	Pulford Street		0.9	2	25	216,967	Local	0.9	2	25	442,345	Local
Huron Church Road	Todd Lane/Cabana Road		0.9	2	25	2,882,568	Local	0.8	2	25	1,404,675	Local
Pulford Street	Huron Church Line		0.8	2	25	1,461,523	Local	0.8	2	25	992,698	Local
Talbot Road	St Clair College		0.8	2	25	1,214,215	Local	0.8	2	25	4,280,010	Local
Huron Church Line	Cousineau Drive		0.8	2	25	1,868,413	Local	0.9	2	25	2,417,566	Local
St Clair College	Howard Avenue		0.8	2	25	3,759,688	Local	0.8	2	25	3,585,852	Local
Cousineau Drive	Laurier Extension		0.8	2	25	3,908,804	Local	0.8	2	25	3,752,400	Local
Howard Avenue	South of Laurier Extension		0.8	2	25	3,818,692	Local	0.8	2	25	10,057,279	Minor Collector
Laurier Extension	E.C. Row Expressway		0.8	2	25	3,827,016	Local	0.8	2	25	10,102,168	Minor Collector
South of Laurier Extension	GN Booth Drive		0.8	2	25	1,101,865	Local	0.8	2	25	1,098,205	Local
E.C. Row Expressway	Sandwich Street		0.8	2	25	1,095,414	Local	0.8	2	25	1,075,855	Local
South of E.C. Row Expressway	Prospect Avenue		0.8	2	25			0.8	2	25		
North of Prospect Avenue			0.8	2	25			0.8	2	25		
Wyandotte Street	West of Huron Church Road		0.9	1.5	25	624,808	Local	0.9	1.5	25	600,270	Local
University Avenue	East of Huron Church Road		0.9	1.5	25	620,837	Local	0.9	1.5	25	1,802,502	Local
Riverside Drive	West of Huron Church Road		0.9	1.5	25	173,565	Local	0.9	1.5	25	156,605	Local
AMB Off Ramp	East of Huron Church Road		0.9	1.5	25	2,078,982	Local	0.9	1.5	25	1,552,833	Local
AMB On Ramp	West of Huron Church Road		0.9	1.5	25	438,597	Local	0.9	1.5	25	464,825	Local
Patricia Street	East of Huron Church Road		0.9	1.5	25	868,268	Local	0.9	1.5	25	719,257	Local
College Street	East of Huron Church Road		0.8	1.5	25			0.8	1.5	25	41,871,610	Major Collector
Girardot Street	AMB	Wyandotte Street	0.9	1.5	25	2,925,173	Local	0.9	1.5	25	4,591,897	Local
Tecumseh Road	East of Huron Church Road		0.9	1.5	25	2,796,716	Local	0.9	1.5	25	4,115,871	Local
Dorchester Street	West of Huron Church Road		0.9	1.5	25	2,060,983	Local	0.9	1.5	25	120,704	Local
Prince Road/Totten Street	East of Huron Church Road		0.9	1.5	25	261,091	Local	0.9	1.5	25	142,119	Local
Malden Road	West of Huron Church Road		0.9	1.5	25	142,064	Local	0.9	1.5	25	312,712	Local
Industrial Road	East of Huron Church Road		0.9	1.5	25	510,609	Local	0.9	1.5	25	4,887,516	Local
E.C. Row Expressway North Ramp Terminal	West of Huron Church Road		0.9	1.5	25	1,716,678	Local	0.9	1.5	25	886,788	Local
E.C. Row Expressway South Ramp Terminal	East of Huron Church Road		0.9	1.5	25	812,683	Local	0.9	1.5	25	192,128	Local
Labelle Street/Bethlehem Avenue	West of Huron Church Road		0.9	1.5	25	212,989	Local	0.9	1.5	25	126,375	Local
Grand Marais Road/Lambton Street	East of Huron Church Road		0.9	1.5	25	324,043	Local	0.9	1.5	25	333,164	Local
Pulford Street	West of Huron Church Road		0.9	1.5	25	274,674	Local	0.9	1.5	25	683,173	Local
Todd Lane/Cabana Road	East of Huron Church Road		0.9	1.5	25	635,737	Local	0.9	1.5	25	169,921	Local
Huron Church Line	West of Huron Church Road		0.9	1.5	25	207,234	Local	0.9	1.5	25	12,978,999	Minor Collector
St Clair College	East of Huron Church Road		0.8	1.5	25	683,355	Local	0.8	1.5	25	974,059	Local
Cousineau Drive	West of Huron Church Road		0.9	1.5	25	2,105,904	Local	0.9	1.5	25	5,276,726	Local
Howard Avenue	East of Huron Church Road		0.8	1.5	25	3,384,852	Local	0.9	1.5	25	202,285	Local
Laurier Extension	West of Huron Church Road		0.9	1.5	25	2,019,444	Local	0.8	1.5	25	1,141,295	Local
E.C. Row Expressway	East of Huron Church Road		0.8	1.5	25	8,049,043	Local	0.9	1.5	25	1,070,123	Local
South of E.C. Row Expressway	West of Huron Church Road		0.9	1.5	25	390,654	Local	0.9	1.5	25	304,484	Local
North of Bethlehem Avenue	Between North and South Service Road		0.9	1.5	25	174,833	Local	0.9	1.5	25	450,703	Local
Grand Marais Road/Lambton Street	West of South Service Road		0.9	1.5	25	230,704	Local	0.9	1.5	25	450,212	Local
Pulford Street	East of Huron Church Road		0.9	1.5	25	564,330	Local	0.9	1.5	25	453,362	Local
Todd Lane/Cabana Road	West of Huron Church Road		0.9	1.5	25	420,333	Local	0.9	1.5	25	259,284	Local
Huron Church Line	East of Huron Church Road		0.9	1.5	25	332,327	Local	0.9	1.5	25	243,325	Local
St Clair College	East of Huron Church Road		0.8	1.5	25	1,075,417	Local	0.8	1.5	25	865,161	Local
Cousineau Drive	Between Huron Church Road and Highway 401 Off Ramp		0.8	1.5	25	1,118,866	Local	0.8	1.5	25	1,723,579	Local
Howard Avenue	West of Highway 401 Off Ramp		0.8	1.5	25	1,350,769	Local	0.8	1.5	25	1,346,465	Local
Laurier Extension	West of Huron Church Road		0.8	1.5	25	1,174,921	Local	0.9	1.5	25	1,411,207	Local
E.C. Row Expressway	East of Talbot Road		0.9	1.5	25	403,887	Local	0.8	1.5	25	1,059,258	Local
South of E.C. Row Expressway	East of Talbot Road		0.9	1.5	25	778,882	Local	0.9	1.5	25	700,261	Local
North of Bethlehem Avenue	West of Talbot Road		0.8	1.5	25	884,855	Local	0.9	1.5	25	237,841	Local
Grand Marais Road/Lambton Street	East of Talbot Road		0.8	1.5	25	1,609,143	Local	0.8	1.5	25	1,928,198	Local
Pulford Street	West of Talbot Road		0.8	1.5	25	1,784,364	Local	0.8	1.5	25	2,292,015	Local
Todd Lane/Cabana Road	West of Talbot Road/Highway 3		0.9	1.5	25	1,934,059	Local	0.9	1.5	25	2,100,322	Local
Huron Church Line	West of Ojibway Parkway		0.8	1.5	25	7,032,005	Local	0.8	1.5	25	7,622,219	Local
St Clair College	West of Broadway Street		0.8	1.5	25	4,376,646	Local	0.8	1.5	25	7,382,092	Local
Cousineau Drive	East of Huron Church Road		0.8	1.5	25	15,831,997	Minor Collector	0.8	1.5	25	28,851,437	Major Collector
Howard Avenue	At Malden Road		0.8	1.5	25	15,648,904	Minor Collector	0.8	1.5	25	22,176,669	Major Collector
Laurier Extension	West of Matchette Road		0.8	1.5	25	7,246,916	Local	0.8	1.5	25	4,880,017	Local
E.C. Row Expressway	West of Ojibway Parkway		0.9	1.5	25	84,428	Local	0.9	1.5	25	94,454	Local
South of E.C. Row Expressway	West of Ojibway Parkway		0.9	1.5	25	1,894,399	Local	0.9	1.5	25	1,211,248	Local
North of Bethlehem Avenue	West of Ojibway Parkway		0.9	1.5	25	82,004	Local	0.9	1.5	25	57,260	Local
Grand Marais Road/Lambton Street			0.9	1.5	25			0.9	1.5	25		
Pulford Street			0.9	1.5	25			0.9	1.5	25		
Todd Lane/Cabana Road			0.9	1.5	25			0.9	1.5	25		
Huron Church Line			0.8	2	25	16,809,375	Minor Collector					
St Clair College			0.8	2	25	2,499,973	Local	0.8	2	25	2,525,443	Local
Cousineau Drive			0.9	2	25			0.9	2	25	7,698,500	Local
Howard Avenue			0.9	2	25	240,624	Local	0.9	2	25	6,023,709	Local
Laurier Extension			0.9	2	25	544,551	Local	0.9	2	25	1,147,771	Local
E.C. Row Expressway			0.9	2	25			0.9	2	25	212,116	Local
South of E.C. Row Expressway			0.8	2	25	2,144,618	Local	0.8	2	25	1,421,787	Local
North of Bethlehem Avenue			0.9	2	25			0.9	2	25	641,106	Local
Grand Marais Road/Lambton Street			0.8	2	25	4,795,039	Local	0.8	2	25	25,506,592	Major Collector
Pulford Street			0.8	2	25			0.8	2	25	20,776,275	Major Collector
Todd Lane/Cabana Road			0.9	2	25	5,195,387	Local	0.9	2	25	3,779,532	Local
Huron Church Line			0.9	2	25	11,560,147	Minor Collector	0.8	2	25	7,579,779	Local
St Clair College			0.9	2	25			0.8	2	25		
Cousineau Drive			0.8	2.5	25	132,440,945	Major Arterial	0.8	2.5	25	225,276,134	Freeway
Howard Avenue			0.8	2.5	25	80,696,299	Minor Arterial	0.8	2.5	25	198,199,485	Major Arterial
E.C. Row Expressway			0.8	2.5	25							

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KEY PLAN

LEGEND

- PIEZO CONE PENETRATION TEST
- BOREHOLE, CONE PENETRATION TEST, FIELD VANE

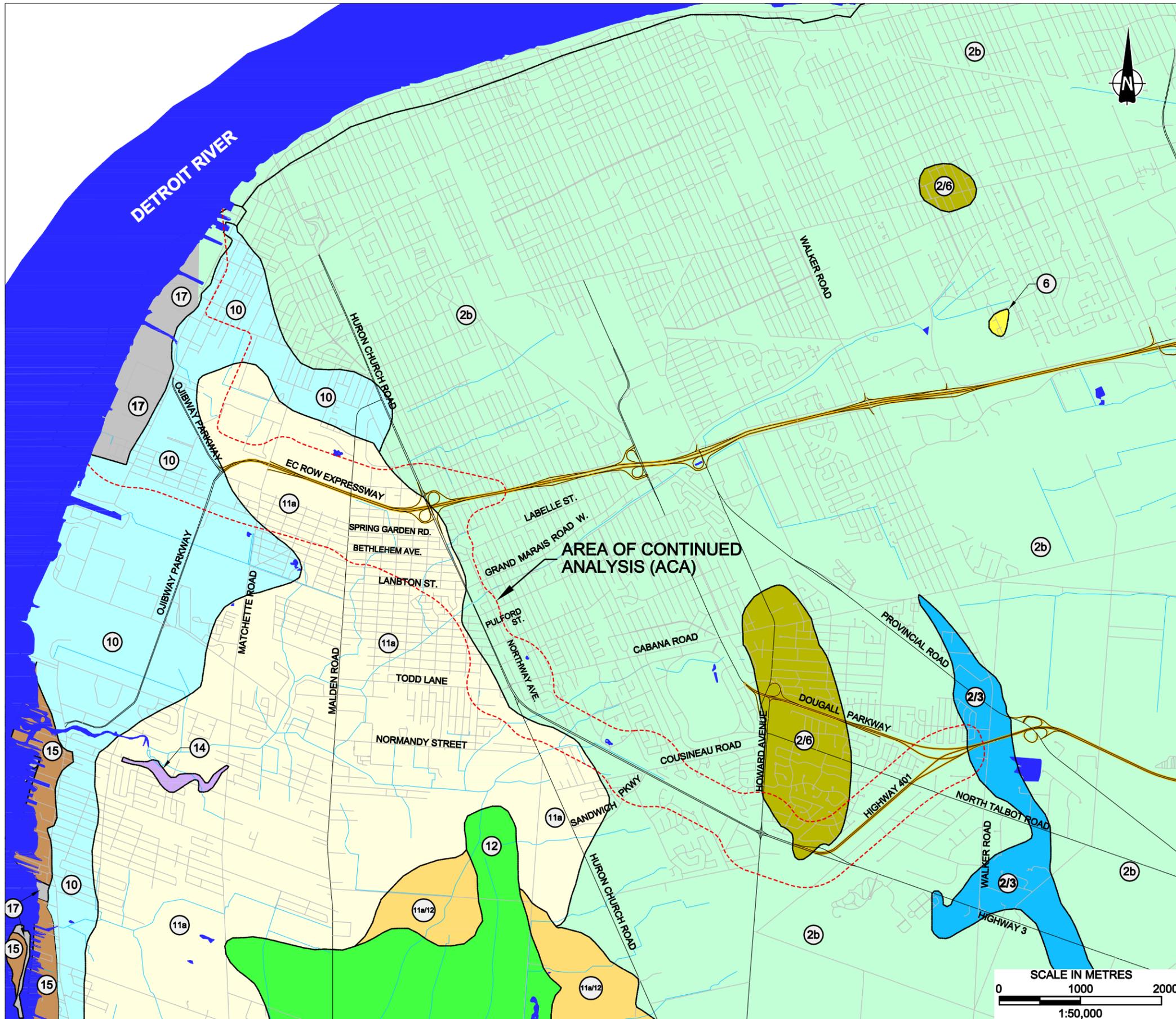
REFERENCE

DRAWING BASED ON CANMAP STREET FILES V2005.4

NOTES

THIS DRAWING IS SCHEMATIC ONLY AND IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.
ALL LOCATIONS ARE APPROXIMATE.

PROJECT			
DETROIT RIVER INTERNATIONAL CROSSING WINDSOR, ONTARIO			
TITLE			
LOCATION PLAN			
		PROJECT No. 05-1140-003	FILE No. 051140003-R01001
CADD	LMK	Nov. 15/07	SCALE AS SHOWN
CHECK			REV.
			FIGURE 1



LEGEND

QUATERNARY GEOLOGY:

- 2b Clayey silt till.
- 2/3 Area of till (2) and glaciofluvial gravel or gravelly sand (3).
- 6 Glaciolacustrine: medium sand.
- 2/6 Area of till (2) with a thin and discontinuous cover of glaciolacustrine medium sand (6).
- 10 Lacustrine (Lake Rouge): gravel, gravelly sand.
- 11a Lacustrine sand.
 - a) Lake Rouge: medium sand.
- 11a/12 Lacustrine (Lake Rouge): area of medium sand on the knolls and silt in the depressions.
- 12 Lacustrine (Lake Rouge): silt, clay. May include some glaciolacustrine silt-clay (8).
- 14 Unsubdivided modern alluvium: silty loam, some organic matter.
- 15 Bogs, marshes and swamps: peat, muck, marl, loam.
- 17 Fill, concrete, other cultural features.

REFERENCE

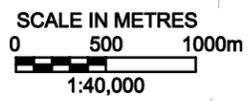
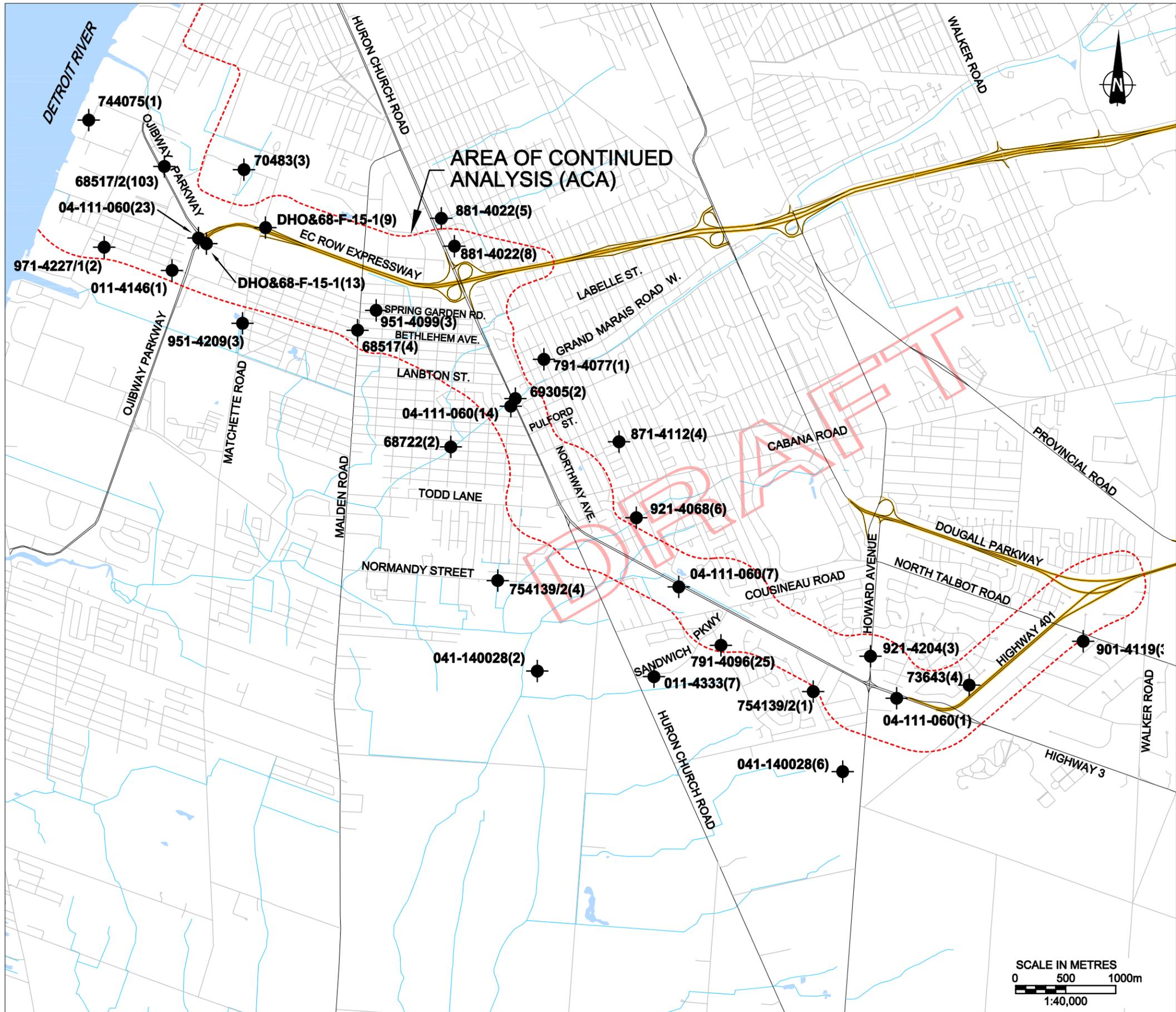
DRAWING BASED ON CANMAP STREET FILES V2005.4
 QUATERNARY GEOLOGY: Ontario Division of Mines (1972)
 "Quaternary Geology of the Windsor-Essex Area, Western Part",
 Map 749, Geol. Ser., Scale 1:50,000.

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PROJECT			
DETROIT RIVER INTERNATIONAL CROSSING WINDSOR, ONTARIO			
TITLE			
QUATERNARY GEOLOGY			
PROJECT No.	05-1140-003	FILE No.	051140003-R01002
CADD	LMK	SCALE	AS SHOWN
CHECK			REV.
		FIGURE 2	





LEGEND

● BOREHOLE

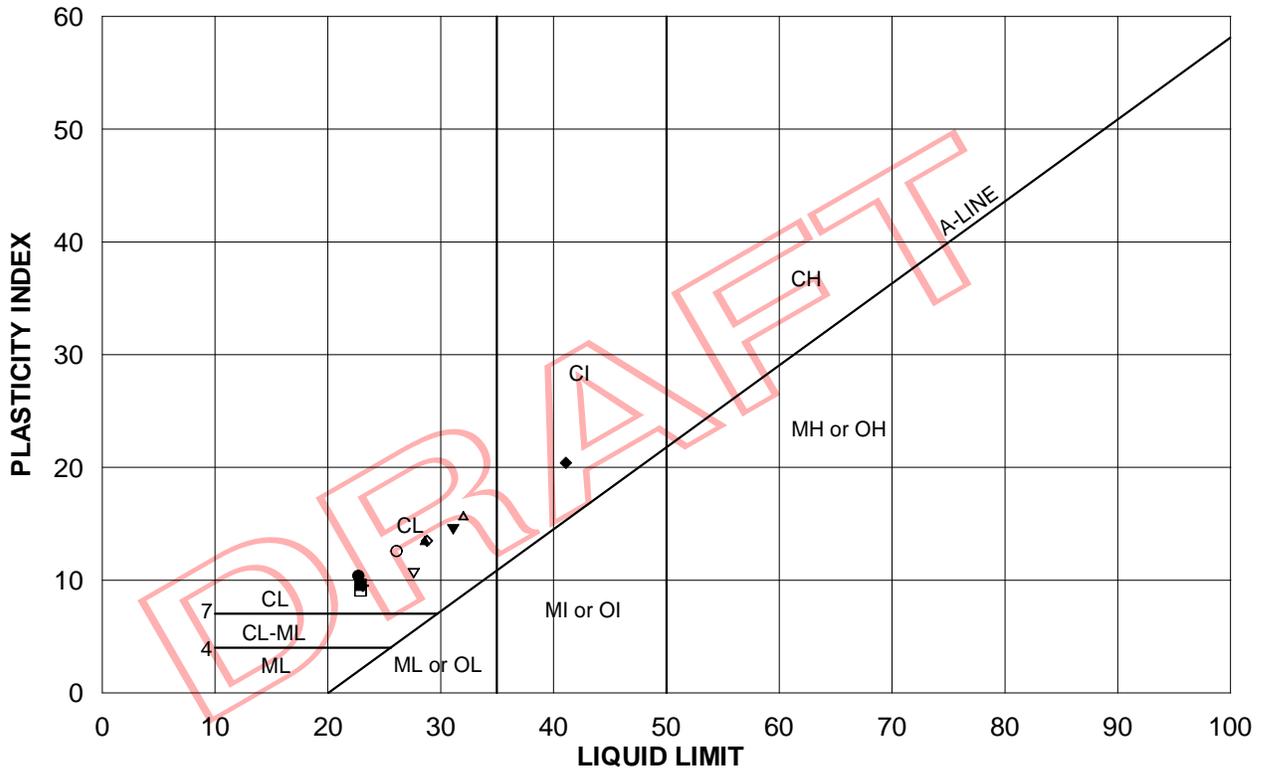
REFERENCE

DRAWING BASED ON CANMAP STREET FILES V2005.4

NOTES

THIS DRAWING IS SCHEMATIC ONLY AND IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.
ALL LOCATIONS ARE APPROXIMATE.

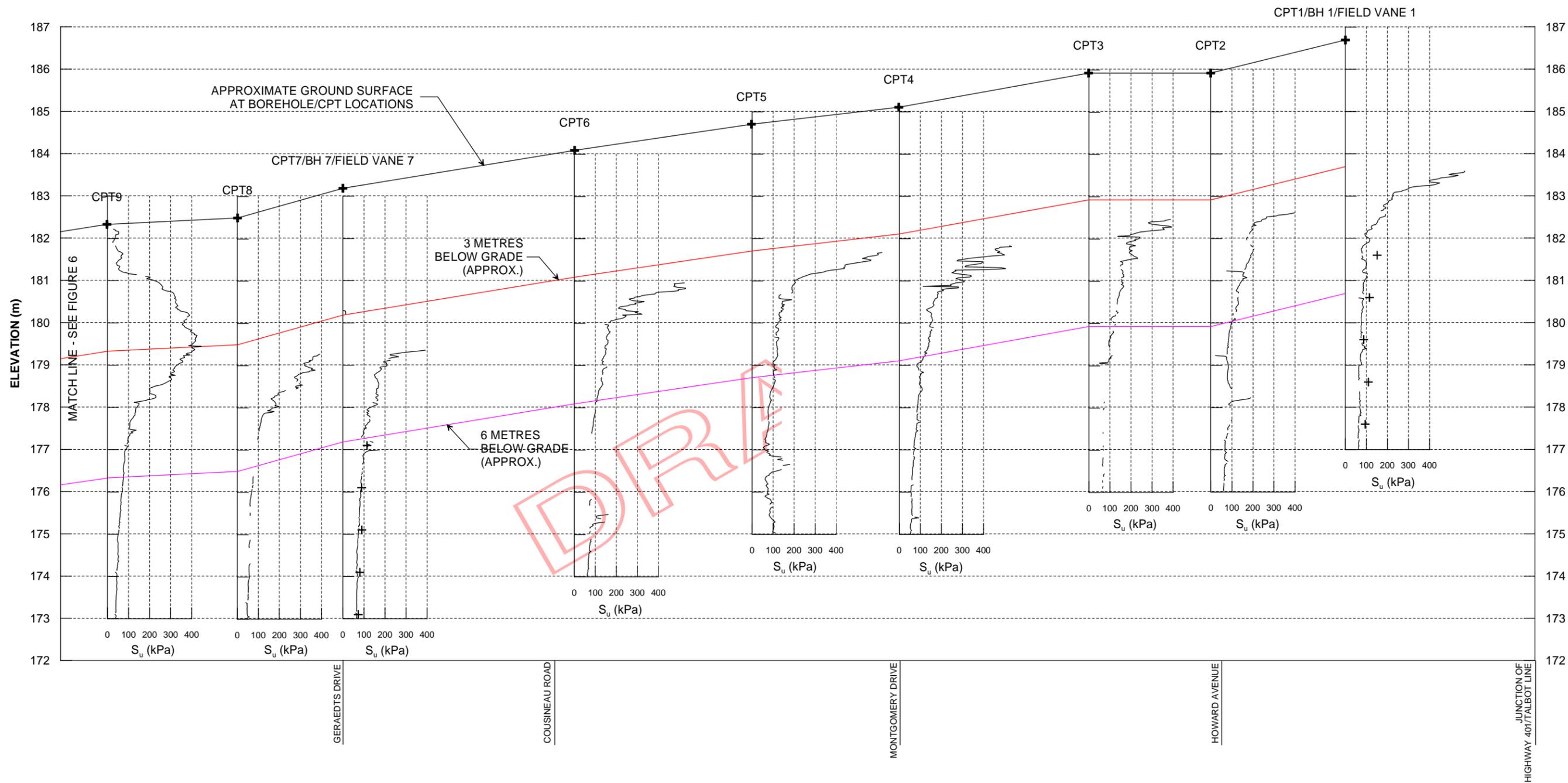
PROJECT		DETROIT RIVER INTERNATIONAL CROSSING WINDSOR, ONTARIO	
TITLE		SUBSURFACE DATABASE	
PROJECT No.	05-1140-003	FILE No.	051140003-R01003
CADD	LMK	Nov. 15/07	SCALE AS SHOWN
CHECK			REV.
 Golder Associates LONDON, ONTARIO			FIGURE 3



LEGEND (04-1111-060)

- Borehole 1, Sample 5
- Borehole 1, Sample 7
- Borehole 7, Sample 5
- Borehole 7, Sample 7
- ◇ Borehole 7, Sample 9
- ◆ Borehole 14, Sample 4
- △ Borehole 14, Sample 6
- ▲ Borehole 14, Sample 9
- ▽ Borehole 23, Sample 4
- ▼ Borehole 23, Sample 7
- + Borehole 23, Sample 9

PROJECT DETROIT RIVER INTERNATIONAL CROSSING WINDSOR, ONTARIO			
TITLE PLASTICITY CHART			
PROJECT No. 05-1140-003-1		FILE No. 051140003-1-R01004	
		SCALE AS SHOWN REV. 0	
CADD	MEB	Nov. 15/07	
CHECK			
 Golder Associates			FIGURE 4



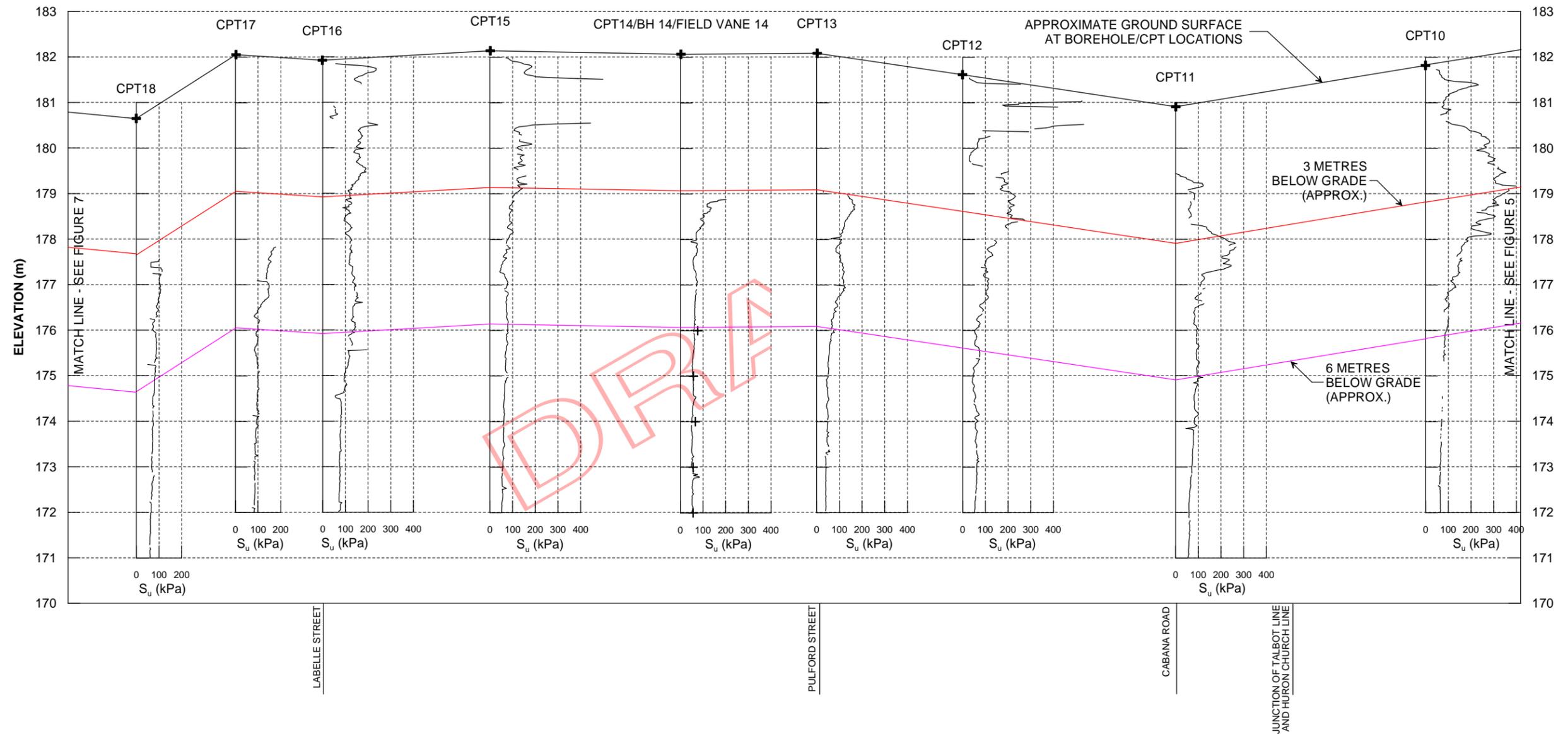
LEGEND (04-1111-060)

- CPT DATA
- + FIELD VANE DATA

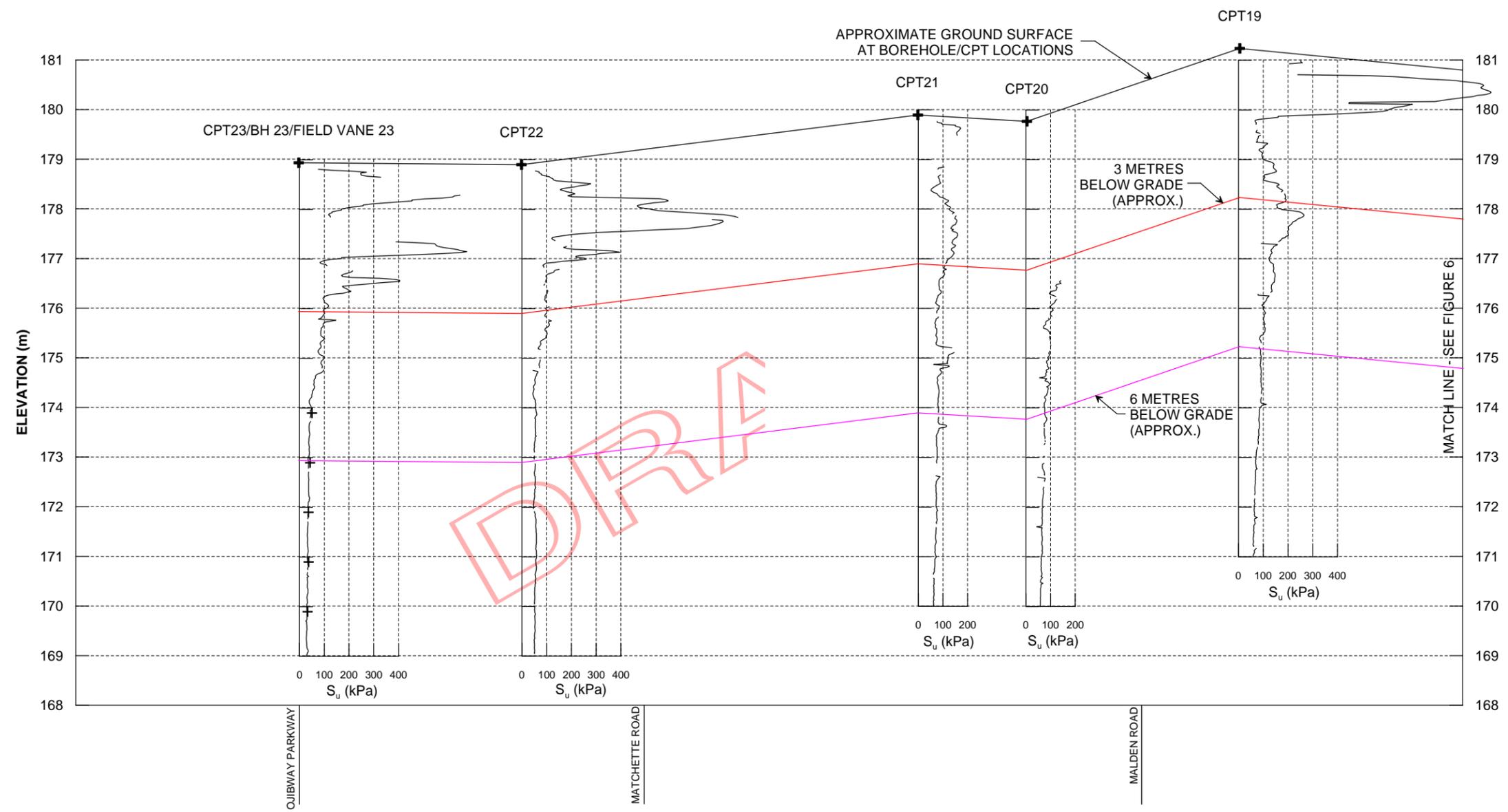
SCALE

VERTICAL SCALE - 1:100
 HORIZONTAL SCALE - 1:10,000

PROJECT				
DETROIT RIVER INTERNATIONAL CROSSING WINDSOR, ONTARIO				
TITLE				
UNDRAINED SHEAR STRENGTH PROFILE				
	PROJECT No.	05-1140-003-1	FILE No.	051140003-1-R01005
	CADD	MEB	Nov. 15/07	SCALE AS SHOWN REV. 0
	CHECK			
FIGURE 5				



PROJECT			
DETROIT RIVER INTERNATIONAL CROSSING WINDSOR, ONTARIO			
TITLE			
UNDRAINED SHEAR STRENGTH PROFILE			
PROJECT No.	05-1140-003-1	FILE No.	051140003-1-R01006
CADD	MEB	Nov. 15/07	SCALE AS SHOWN REV. 0
CHECK			
			FIGURE 6



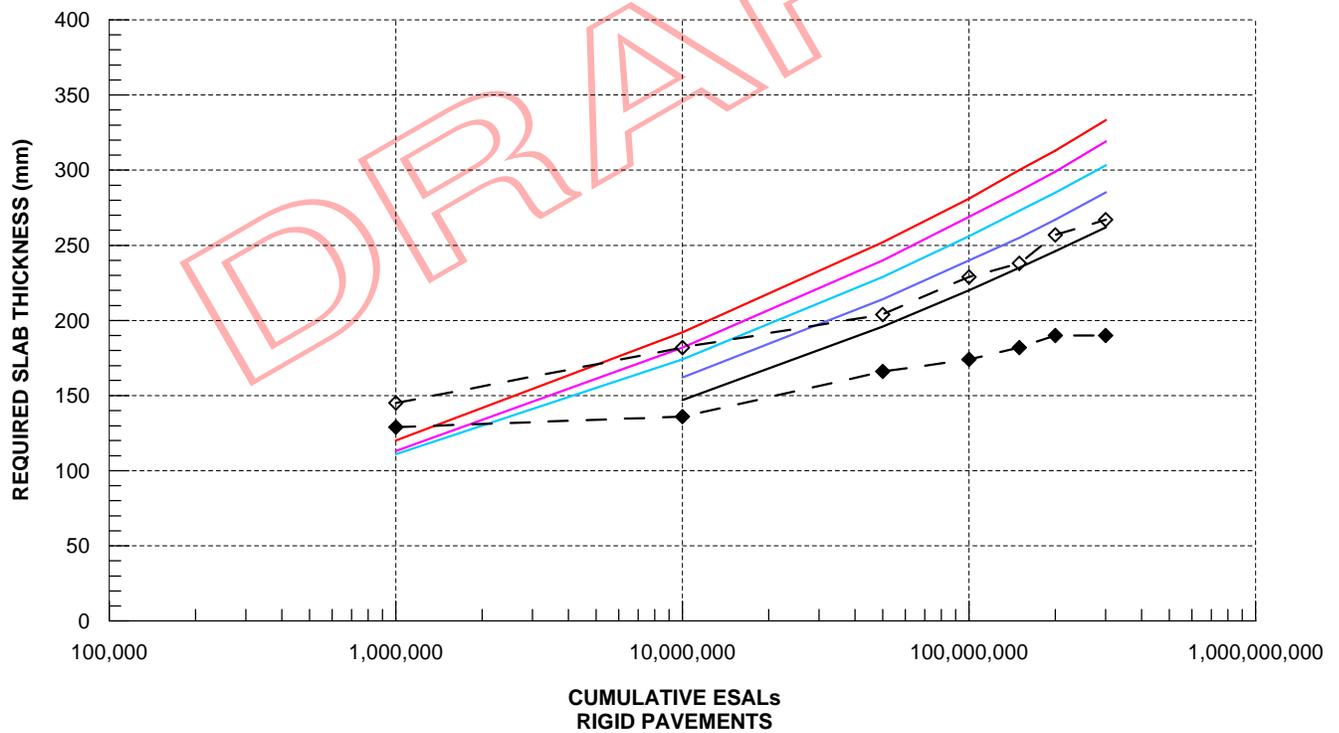
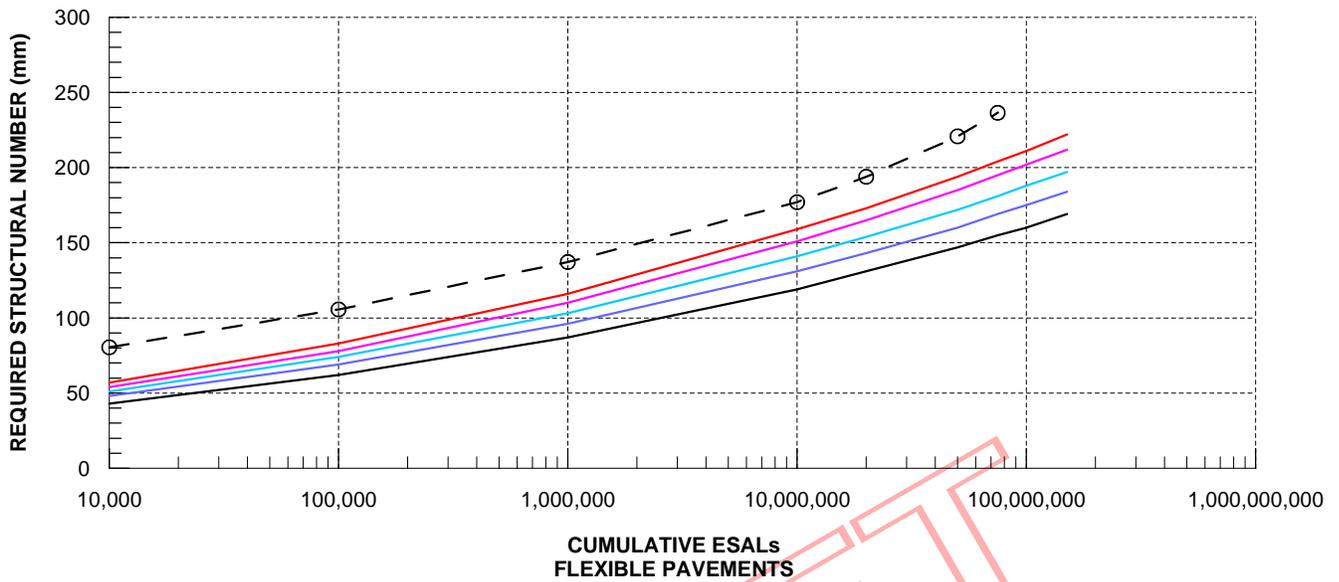
LEGEND (04-1111-060)

- CPT DATA
- + FIELD VANE DATA

SCALE

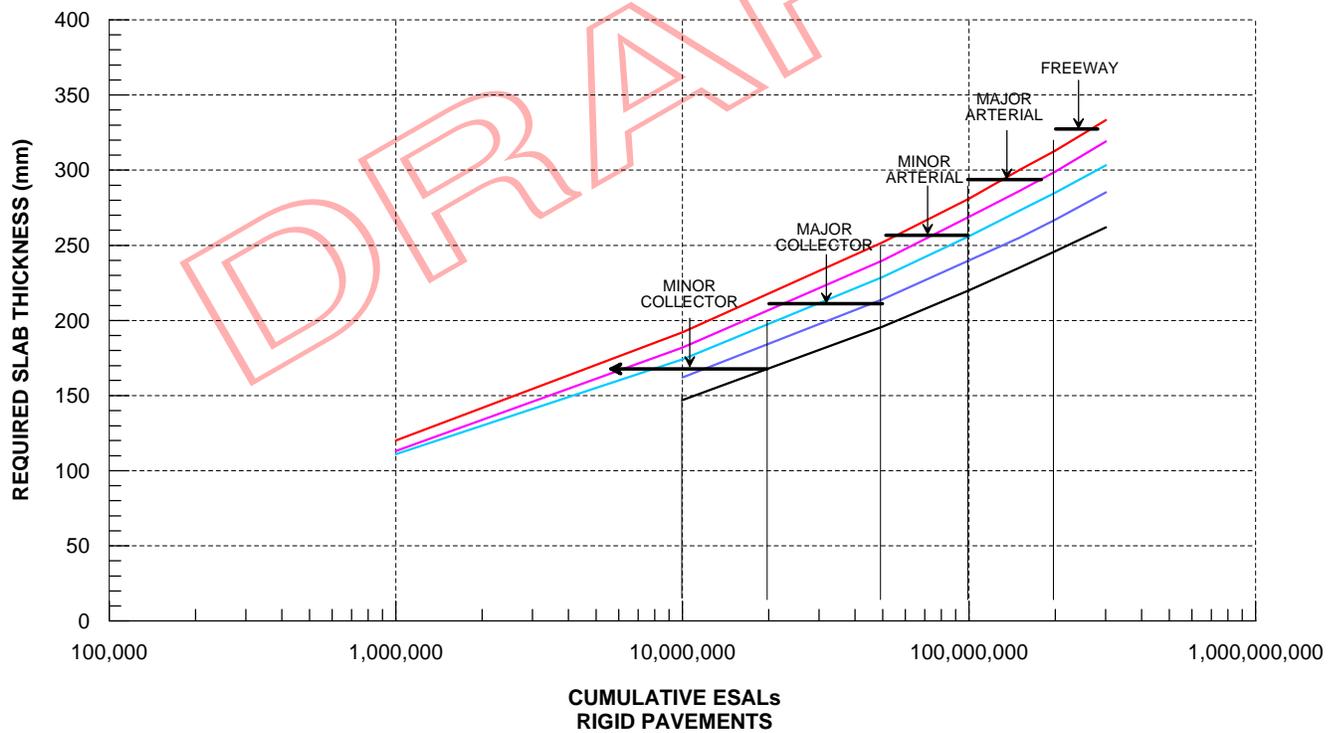
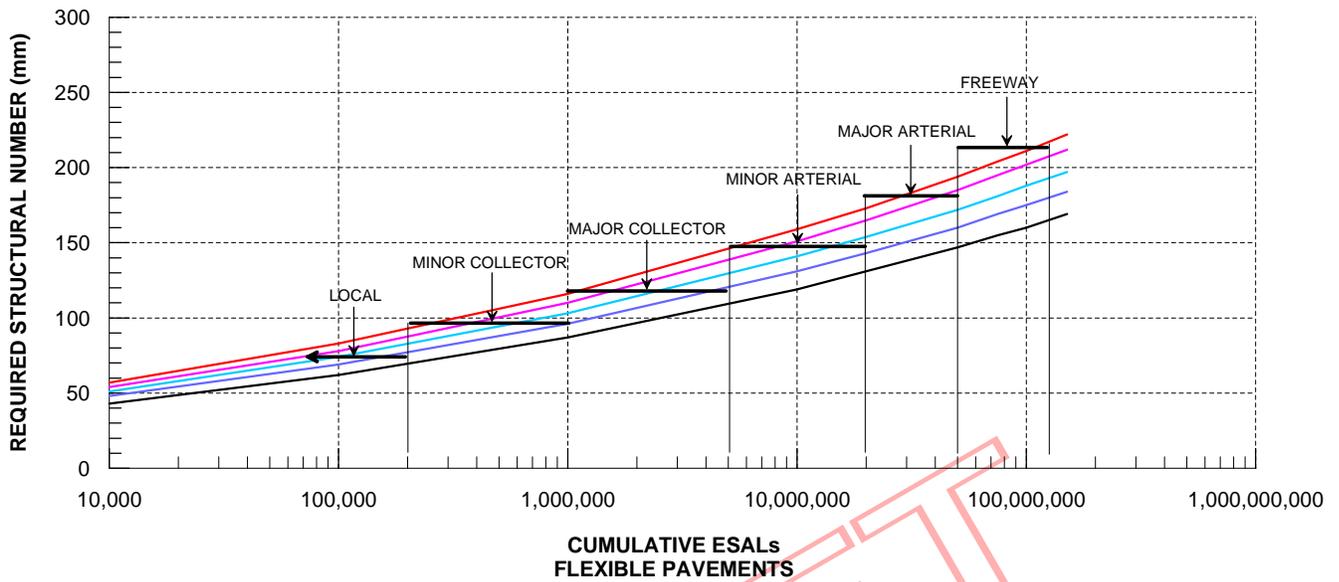
VERTICAL SCALE - 1:100
 HORIZONTAL SCALE - 1:10,000

PROJECT			
DETROIT RIVER INTERNATIONAL CROSSING WINDSOR, ONTARIO			
TITLE			
UNDRAINED SHEAR STRENGTH PROFILE			
PROJECT No. 05-1140-003-1		FILE No. 051140003-1-R01007	
SCALE AS SHOWN		REV. 0	
CADD	MEB	Nov. 15/07	
CHECK			
Golder Associates		FIGURE 7	



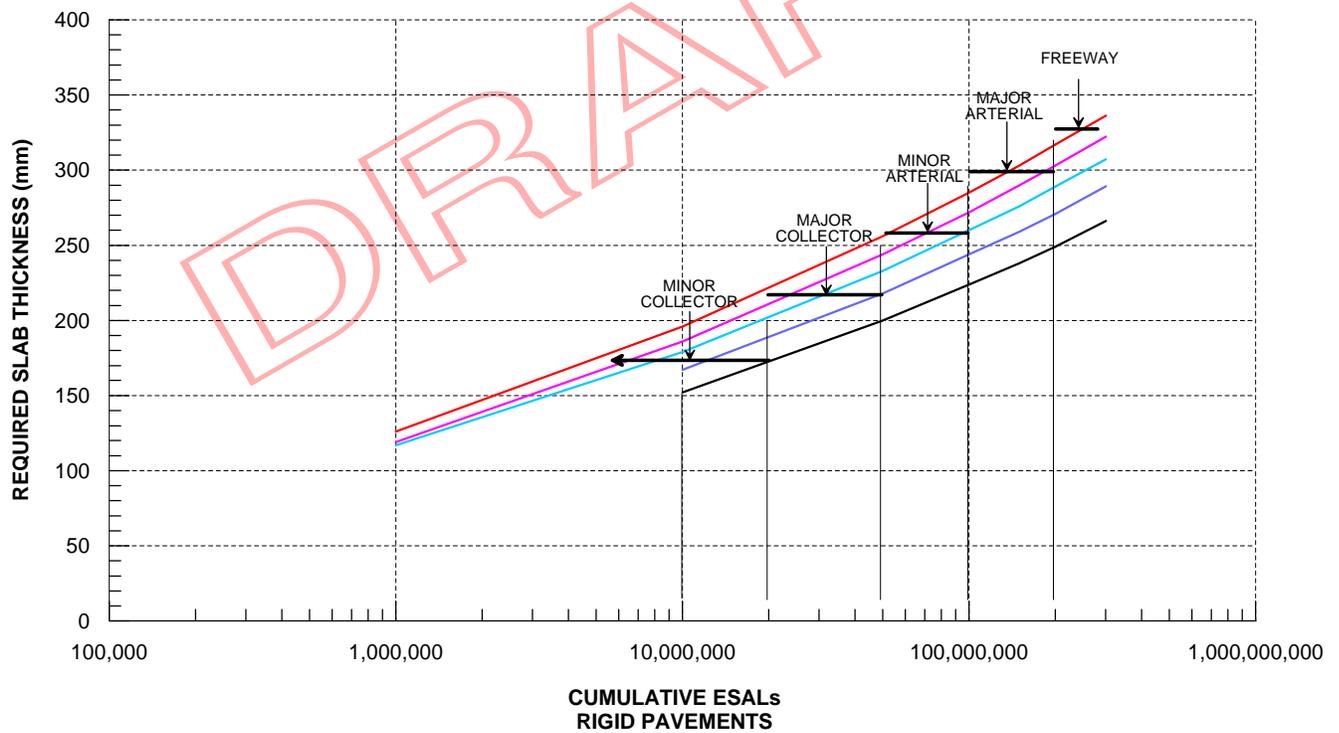
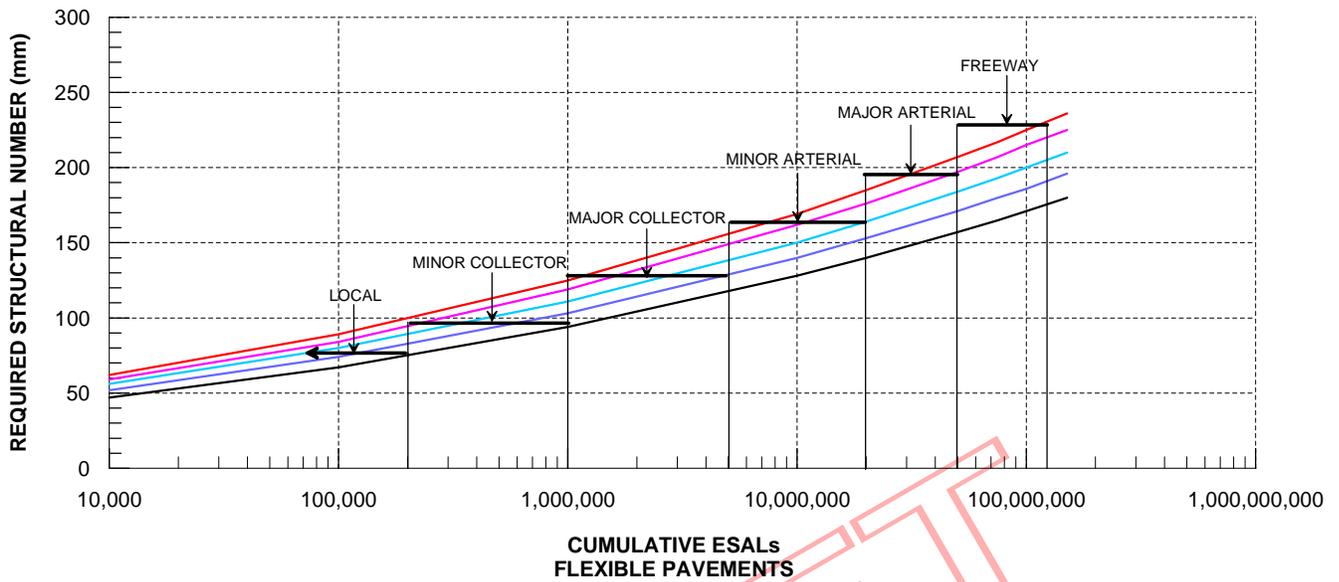
- AASHTO METHOD**
- R=50%, TSI=2.0 (Local & Minor Collector)
 - R=75%, TSI=2.0 (Major Collector)
 - R=85%, TSI=2.2 (Minor Arterial)
 - R=90%, TSI=2.5 (Major Arterial)
 - R=95%, TSI=2.5 (Freeway)
- ○ — ASPHALT INSTITUTE METHOD
- ◇ — PCA METHOD - NO TIED SHOULDER
- ◆ — PCA METHOD - WITH TIED SHOULDER

PROJECT			
DETROIT RIVER INTERNATIONAL CROSSING WINDSOR, ONTARIO			
TITLE			
COMPARISON OF PAVEMENT DESIGN METHODS (using Subgrade Condition 1)			
PROJECT No. 05-1140-003-1		FILE No. 051140003-1-R01008	
CADD	MEB	Nov. 15/07	SCALE JUN 29-07/REV. 0
CHECK			
			FIGURE 8



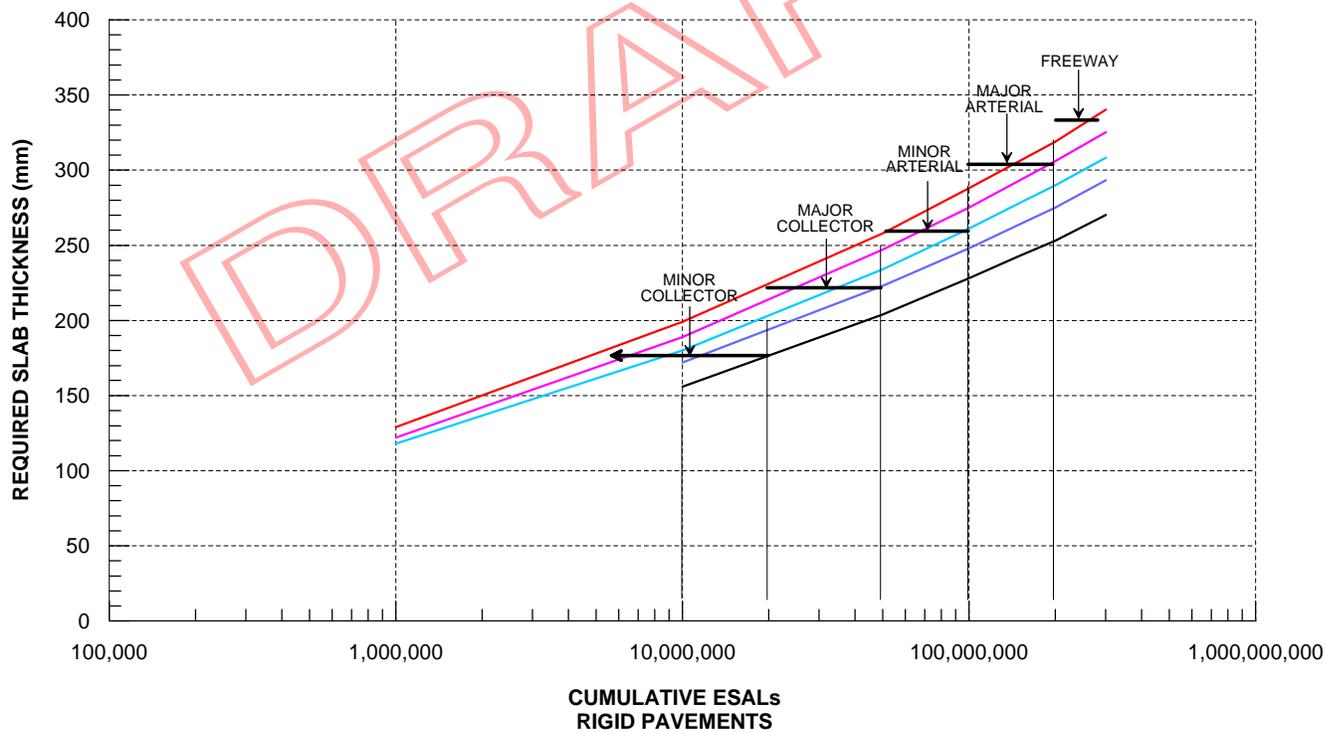
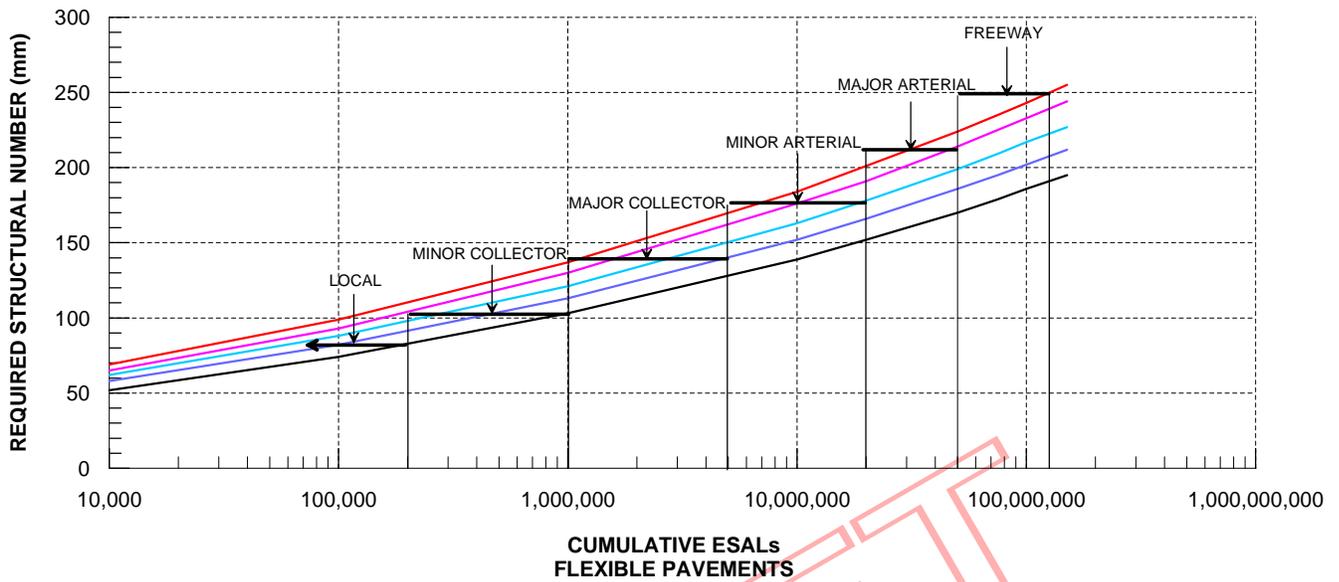
- R=50%, TSI=2.0 (Local & Minor Collector)
- R=75%, TSI=2.0 (Major Collector)
- R=85%, TSI=2.2 (Minor Arterial)
- R=90%, TSI=2.5 (Major Arterial)
- R=95%, TSI=2.5 (Freeway)

PROJECT			
DETROIT RIVER INTERNATIONAL CROSSING WINDSOR, ONTARIO			
TITLE			
PAVEMENT STRUCTURAL REQUIREMENTS VERSUS CUMULATIVE ESALs SUBGRADE CONDITION 1			
PROJECT No. 05-1140-003-1		FILE No. 051140003-1-R01009	
		SCALE JUN 29-07/REV. 0	
CADD	MEB	Nov. 15/07	
CHECK			
			FIGURE 9



- R=50%, TSI=2.0 (Local & Minor Collector)
- R=75%, TSI=2.0 (Major Collector)
- R=85%, TSI=2.2 (Minor Arterial)
- R=90%, TSI=2.5 (Major Arterial)
- R=95%, TSI=2.5 (Freeway)

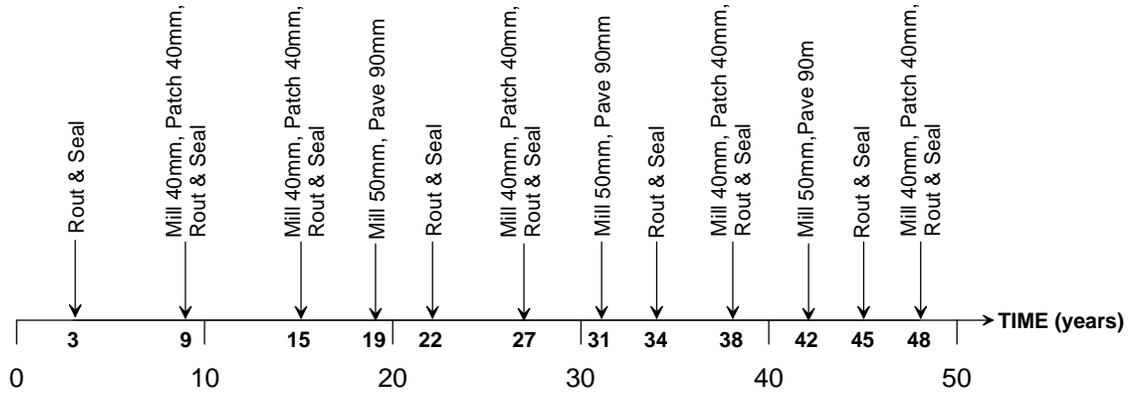
PROJECT			
DETROIT RIVER INTERNATIONAL CROSSING WINDSOR, ONTARIO			
TITLE			
PAVEMENT STRUCTURAL REQUIREMENTS VERSUS CUMULATIVE ESALs SUBGRADE CONDITION 2			
PROJECT No. 05-1140-003-1		FILE No. 051140003-1-R01010	
		SCALE JUN 29-07/REV. 0	
CADD	MEB	Nov. 15/07	
CHECK			
			FIGURE 10



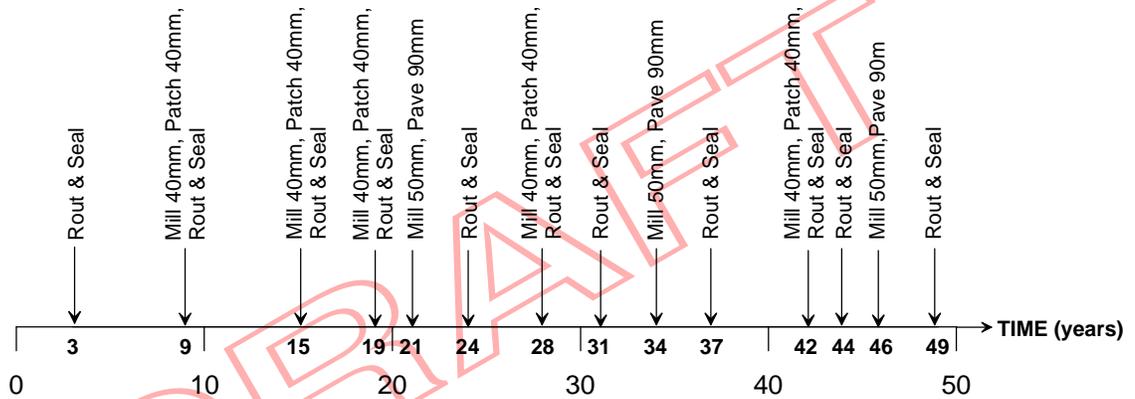
- R=50%, TSI=2.0 (Local & Minor Collector)
- R=75%, TSI=2.0 (Major Collector)
- R=85%, TSI=2.2 (Minor Arterial)
- R=90%, TSI=2.5 (Major Arterial)
- R=95%, TSI=2.5 (Freeway)

PROJECT			
DETROIT RIVER INTERNATIONAL CROSSING WINDSOR, ONTARIO			
TITLE			
PAVEMENT STRUCTURAL REQUIREMENTS VERSUS CUMULATIVE ESALs SUBGRADE CONDITION 3			
PROJECT No. 05-1140-003-1		FILE No. 051140003-1-R01011	
		SCALE JUN 29-07/REV. 0	
CADD	MEB	Nov. 15/07	
CHECK			
 Golder Associates		FIGURE 11	

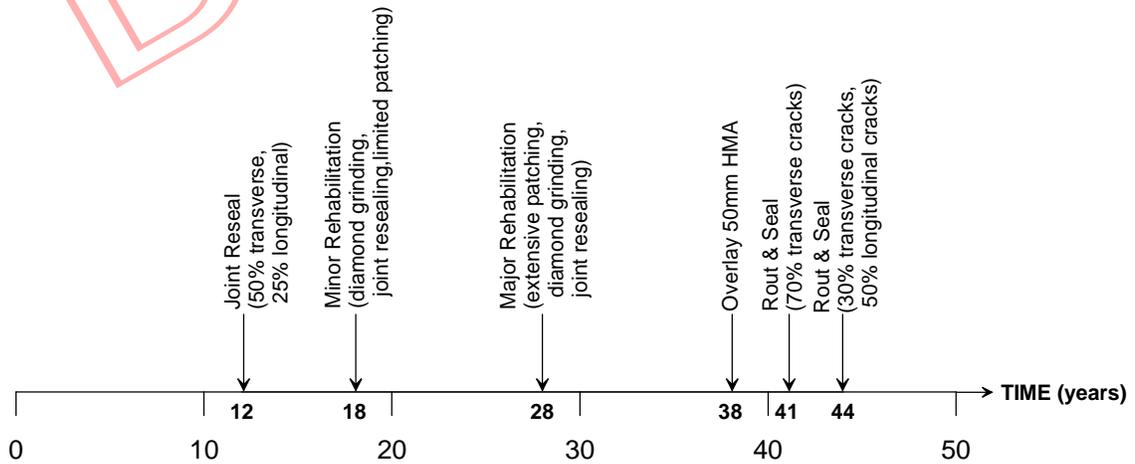
**LIGHT AND MEDIUM DUTY
FLEXIBLE PAVEMENTS**



**HEAVY DUTY
FLEXIBLE PAVEMENTS
(FREEWAY)**



RIGID PAVEMENTS



PROJECT				DETROIT RIVER INTERNATIONAL CROSSING WINDSOR, ONTARIO			
TITLE				SUMMARY OF LIFE CYCLE COST STRATEGIES			
PROJECT No.		05-1140-003-1		FILE No.		051140003-1-R01012	
CADD		MEB		Nov. 15/07		SCALE AS SHOWN REV. 0	
CHECK						FIGURE 12	

