REVIEW of PROPOSED TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS in the CITY OF WINDSOR

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1.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

1.1 Introduction

This review of the short/medium term transportation infrastructure improvements in the City of Windsor was commissioned by Transport Canada to address three specific elements:

1. Traffic Flow Management
2. Huron Church Road Truck By-Pass and Brighton Beach Transportation Centre as proposed by Schwartz[1]
3. E.C. Row Expressway

1.1.1 Short and medium term solutions are to address traffic needs prior to the provision of an additional border crossing with an earliest completion date anticipated in 2013. However, the issue raised by Schwartz that the completion date may be delayed is valid and the study horizon has looked up to the 2015 – 2018 period for medium term solutions.

1.1.2 A program of short and medium term actions to improve traffic flows is already underway through the "Let's Get Windsor/Essex Moving" strategy with a number of projects currently approved or identified to improve Windsor/Essex traffic flow operations, particularly the traffic flows leading to the existing crossings.

1.1.3 The Schwartz Report provides useful input and ideas on the broad issue of multimodal border crossings alternatives and it is understood that the Schwartz-recommended Industrial Crossing route, which encompasses the truck by-pass, will be considered in the DRIC (Detroit River International Crossing Project). This review focuses solely on the "early-action" component suggested by Schwartz.

1.2 Short and Mid-Term Traffic Conditions

1.2.1 The Ambassador Bridge currently carries the highest volume of Canada-USA crossing traffic in Ontario and satisfactory operating conditions on the road system leading to and from the bridge are vital to the efficient movement of people and goods.

1.2.2 The majority of long distance border crossing traffic follows a route from Highway 401, Talbot Road and Huron Church Road, passing through 17 traffic signals to access the Ambassador Bridge. Peak directional flows range from 1,500 – 2,000 PCE (passenger car equivalents) for USA bound travel and from 2,000 – 2,500 PCE for Canada bound travel. Most sections of this route operate with acceptable levels of service in the AM peak hour but during the PM peak hour some road links and intersections are nearing capacity. Some of these road links are candidates for an early action program.

1.2.3 E.C. Row Expressway also serves a role in bringing traffic to the Ambassador Bridge. It carries the highest traffic volumes in the City, with a total volume of 4,000 – 4,250 PCE per hour in the peak direction and has reached capacity particularly in the vicinity of Howard and Dougall Avenues with other sections nearing capacity.

[1] Windsor Gateway Report, dated January 2005, Prepared by Sam Schwartz Engineering PLLC

1.2.4 As mentioned previously, many projects are approved or pending approval to improve traffic conditions. Identification of key expressway and arterial roads with capacity constraints that are not addressed include:

- E.C. Row between Huron Church Road and Lauzon Parkway;
- Ouellette Avenue/Dougall Avenue north of E.C. Row;
- Howard Avenue north and south of E.C. Row; and
- certain sections of Huron Church Road particularly near Tecumseh Road and E.C. Row north ramp.

1.2.5 There is currently adequate capacity at the Ambassador Bridge with 2 lanes in operation in each direction and, as identified in the Schwartz Report, extensive queues and delays (particularly on the Canadian side) have been largely eliminated due to operational improvements and changes in travel demands, as outlined below:

- increase in primary inspection stations (6 to 13);
- advance completion of border crossing paperwork;
- decline in passenger car traffic since September 2001; and
- FAST and NEXUS programs.

We concur with Schwartz's comment that if a lane on the Bridge is closed then unstable conditions and traffic queues may occur.

1.2.6 Our assessment of future conditions is generally consistent with Schwartz in that capacity conditions will deteriorate with continued traffic growth. Sections of Huron Church Road north of E.C. Row could reach capacity by about 2013 and Huron Church Road south of E.C. Row could reach capacity about 2018. As well, congestion of E.C. Row will become more prominent with key sections operating at or near capacity.

1.3 Traffic Flow Management

1.3.1 There are a substantial number of infrastructure improvement projects committed to or planned over the next few years both through the "Let's Get Windsor/Essex Moving" strategy and local City projects. Provision of adequate traffic management during construction (detours, time of day lane closure restrictions, etc.) both on a system-wide basis as well as a project specific basis, should be addressed to ensure that adequate roadway system capacity is maintained at all times.

1.3.2 In the short term there are no practical alternative routes from Highway 401 to the Ambassador Bridge other than the Talbot Road/Huron Church Road route. Therefore, until other routes become available, this route needs to operate at existing capacity or better during any reconstruction. This requirement has particular impact on proposed improvements to the Talbot Road section.

1.4 Huron Church Road Truck By-Pass

1.4.1 The Schwartz Report has suggested that segments of the proposed access to the "Industrial Crossing" be built as "stand-alone" infrastructure to serve existing needs until a new crossing is chosen (referred to as a truck by-pass). A preferred route with a Transportation Centre and queue control signals for traffic is illustrated in **Figure 2**. This alternative is assessed in light of three objectives: 1) removing trucks from City streets;

2) provide a new traffic management centre; and 3) queue control on Huron Church Road.

1.4.2 The proposed truck by-pass could remove some trucks from a short section of Huron Church Road from Todd Lane to just north of E.C. Row Expressway, a section of road that is not anticipated to reach capacity until about 2018 (or after the anticipated opening date for a new international crossing). The proposed truck by-pass is about 8 km in length and by-passes only 2 km of Huron Church Road; travel times may actual increase using this new route. As well, the additional length of the by-pass and the existing residential uses in the Todd Lane area suggests that vehicle noise and emission impacts need to be addressed to determine if any benefits accrue.

1.4.3 Many truckers complete preprocessing before leaving their trip origin or at other preprocessing centres (London, Windsor) so preprocessing facilities at Brighton Beach will not voluntarily attract many vehicles; in fact, unless legislation requiring all trucks crossing the border use this route it would not, in our opinion, meet the needs and justification requirements to obtain environmental assessment approval.

1.4.4 As noted earlier, the queuing/delay issues on Huron Church Road have been substantially eliminated due to improved management techniques at the border crossing and a queue control system is not currently warranted. In the event that a queue control system was required in the future, a location outside Windsor adjacent to Highway 401 could be operated more efficiently and cost effectively.

1.4.5 The construction of the Schwartz-preferred Huron Church Truck By-Pass would require major construction including a 1,300 m long tunnel under the Ojibway Prairie Grass Provincial Nature Reserve, a tunnel under Huron Church Road in conjunction with the depressed reconstruction of Talbot Road, as well as aqua-duct and roadway structures. Other issues related to subsurface conditions (salt extraction) and drainage need further study and could have significant cost implications. Overall, depending on which segments of the access to the Schwartz Industrial Crossing are constructed, and the number of tunnel tubes (1, 2 or 3), the cost of the by-pass could range from $200-300 million.

1.4.6 The Huron Church By-Pass is included in the ongoing DRIC study anticipated to be completed by the end of 2007. A new environmental assessment to study the Huron Church Truck By-Pass could not reasonably be anticipated to be completed much prior to this date.

1.4.7 In the event the “Industrial Crossing” or “Twinning of the Ambassador Bridge” location is not selected by the DRIC study, the Huron Church Truck By-Pass could have little or no long term local benefit.

1.4.8 In summary, the proposed Huron Church By-Pass may not attract sufficient truck traffic to meet “needs and justification” requirements under the Province’s Environmental Act, may not effectively address current traffic issues, can most speedily be reviewed in the current DRIC study, has major capital cost implications, and may have little residual value if the “Industrial Crossing” is not selected. The Huron Church Road Truck By-Pass does not appear to have the attributes to be selected for an “early action” program.

1.5 E.C. Row Expressway

1.5.1 The E.C. Row Expressway carries the largest traffic volumes in the City of Windsor and currently experiences near capacity conditions and is subject to recurring congestion. As such, improvements to this facility may have great potential to improve traffic operations in the City.

1.5.2 The E.C. Row was planned and designed to allow for expansion to 6 lanes with a short section of a collector distributor system.

1.5.3 Options exist to improve the E.C. Row/Huron Church Interchange to meet short/medium term traffic needs without adversely impacting traffic operations on either facility.

1.5.4 Widening of E.C. Row could be coordinated with the expressway rehabilitation needs.

1.5.5 Plans for improvements to Talbot Road could provide additional corridor capacity to allow E.C. Row widening within several years at a minimum level of disruption. However, improvements to Talbot Road do not eliminate the need to widen E.C. Row.

1.5.6 Widening of E.C. Row to a 6 lane section is justified to relieve local traffic congestion, and could reasonably be assessed in an environmental assessment process prior to completion of the DRIC study.

1.5.7 E.C. Row widening could be justified due to its benefits to the City of Windsor residents, regardless of the selected international border crossing.

1.5.8 Widening of E.C. Row would result in increased traffic volumes resulting in increased noise levels on adjacent areas unless appropriate mitigation measures can be implemented. Impacts on vehicle emissions would require further investigation.

1.5.9 Widening of E.C. Row would provide for redundancy in the access system to the border crossing.

1.5.10 In summary, the E.C. Row Expressway is a candidate for inclusion in the “early action” program to relieve traffic congestion in Windsor.

1.6 Other Potential Mid-Term Improvements

1.6.1 As indicated earlier, Huron Church Road between the Ambassador Bridge and E.C. Row Expressway will reach capacity by about 2013, and should a new international crossing be delayed, mid-term improvements should be identified and protected to ensure continuation of adequate traffic operations.

1.6.2 A number of mid-term improvements could be considered including signal optimization, increasing border crossing capacity and efficiencies (bridge and tunnel), rationalization or reduction in the number of intersections/accesses, metering of border bound truck traffic at the proposed marshalling yard on Highway 401, and increasing ferry crossing capacity.

1.6.3 If the improvements suggested above are not adequate to address the mid-term needs, provision of a new auxiliary road to relieve Huron Church Road north of E.C. Row may be warranted. The only identified road improvement proposals that by-pass this section

of Huron Church Road are the development of a new road corridor along the right-of-way of Essex Terminal Railway from the E.C. Row/Ojibway Parkway intersection to the Huron Church Road/College Avenue intersection or in the DRTP corridor to College Avenue.

Unless other alternatives are identified, it is suggested that studies/property acquisition proceed on a schedule such that its implementation could be undertaken in 2013, if required.

1.7 Recommendations

1. **A coordinated traffic management strategy plan involving all transportation agencies is essential to ensure that planned improvements to the transportation infrastructure are implemented while minimizing any impacts on City of Windsor residents.**
2. **The Huron Church Road Truck By-pass is not recommended as a candidate for an "early action" program since it may not provide significant relief to short/medium term traffic congestion in Windsor. Its review should only proceed as part of the DRIC study.**
3. **E.C. Row Expressway widening to improve intra-city traffic conditions and local road improvements to Huron Church Road north of E.C. Row are recommended as potential candidates for an "early action" program.**
4. **Protection for a new auxiliary road to relieve Huron Church Road may be necessary if a new international crossing is delayed beyond 2013.**

2.0 INTRODUCTION AND BACKGROUND

2.1 Introduction

The Government of Canada has received proposals from the City of Windsor, as a component of its Windsor Gateway Study, for an early action program of road improvements to serve existing needs until a new international crossing and associated access improvements are implemented. The Government of Canada and the Province of Ontario have previously entered into a Memorandum of Understanding with the City entitled "Let's Get Windsor/Essex Moving" strategy to provide short/medium term improvements and have already identified a number of needed projects.

To assess the new proposals for early construction of segments of a by-pass for travel from 401 to a Brighton Beach Transportation Centre and a new trucking and queue control system, as outlined in the Schwartz Report, Transport Canada determined that a consultant review of these proposals to assist in their evaluation and validation was appropriate.

A consultant team led by Cansult Limited, in association with LEA Consulting Ltd. was retained by Transport Canada on July 6, 2005 to undertake this review. The scope of work for this review is to focus solely on three elements of the short and mid-term recommendations in the Windsor Gateway Study as follows:

1) the Huron Church Road truck By-pass and Brighton Beach PPC;
2) Traffic Flow Management; and
3) E.C. Row.

A copy of the study approach is appended in **Appendix 1**.

During the course of the study a teleconference was held with Mr. Schwartz to obtain clarification regarding the assumptions and findings of his report.

2.2 Background

2.2.1 Study of Detroit River International Crossing

A Bi-National Partnership including the Governments of Canada and the United States of America, Province of Ontario and State of Michigan, was established in 2001 to undertake long term planning for additional border crossing capacity in the Windsor-Detroit area. The challenges facing this border crossing include travel demand on the Ambassador Bridge which are expected to reach capacity within the next ten years and needs for redundancy and national security in the event of temporary closures.

The Bi-National Partnership has developed a process for considering border crossing capacity through a single coordinated planning and environmental study that meets the legislative requirements for all members. This study addresses border crossing opportunities as well as transportation access corridors in Ontario and Michigan. Terms of Reference for this study were developed in 2004 and currently a wide range of background working papers have been completed and a long list of crossing/access route options has been identified. The study schedule anticipates selection of a preferred corridor by spring 2007 and submissions of a final report by the end of 2007. Construction could begin in 2010 with opening of a new international crossing by 2013.

2.2.2 Short and Medium Term Solutions

In recognition of the long lead time to provide additional border crossing capacity with an earliest opening date for a new crossing anticipated in 2013, and current issues related to traffic flows/operations in Windsor the three levels of government in Canada; federal, provincial and municipal have embarked on a program to improve traffic flows leading to the existing crossings through a memorandum of understanding entitled "Let's Get Windsor/Essex Moving" strategy. Projects currently approved or identified for this project are shown on **Figure 1** and described in **Table 1**.

2.2.3 The Schwartz Report

Sam Schwartz Engineering PLLC (SCC) was retained by the City of Windsor to provide the City with a recommended approach on how to address both commercial and passenger related traffic issues as they relate to the Detroit-Windsor border crossings.[2] This report provides a well presented overview of a wide range of issues including a discussion and comparison of alternative international crossing locations and access routes from a City of Windsor perspective, a more detailed review of access options for "The Industrial Crossing", improvements to rail infrastructure, ferry services, ITS measures and improvements to operations at existing crossings and finally an early action program. This report provides useful input and ideas for the Bi-National Partnership Planning and Environmental study, and provides objectives and study criteria which should be considered during development of the evaluation process. As well, it is understood that the proposed Industrial Crossing Access Options developed by Schwartz are to be included as options for evaluation by that study.

Of particular relevance to this review is the proposed "early-action program which is needed before the outcome of the Bi-National process", which in part proposed that "segments of the options discussed for access to the "Industrial Crossing" be built as "stand-alone" infrastructure to serve existing needs until a new crossing is chosen". The proposed by-pass route with traffic and queue control centres proposed by Schwartz is shown on **Figure 2**.

Table 1: Infrastructure and Transportation Improvements Projects for the City of Windsor

Project #	Description	Status	Proponent
Let's Get Windsor/Essex Moving Strategy			
1	E.A. and detailed design for improvements to Highway 3/Talbot Road from Highway 401 to Todd Lane	Phase 2	MTO
2	E.A. and detailed design to upgrade and extend Lauzon Parkway from Highway 401 to E.C. Row	Phase 2	City of Windsor
3	E.A. and detailed design to upgrade Manning Road from Highway 401 to County Road 22, including the interchange at Highway 401, in the County of Essex	Phase 2	MTO & Essex County
4	Truck ferry road infrastructure and signing improvements, and in partnership with the ferry operator, a needs and feasibility study for additional truck ferry services	Phase 2	MTO & Ferry Operator
5	Needs and feasibility study for the establishment of a truck marshalling facility on Highway 401 in the Windsor-Essex Region	Phase 2	MTO
6	Community-based strategic rail study to examine the opportunities for rail rationalization and the development of an intermodal facility in the vicinity of Windsor Airport (not shown on map)	Phase 2	City of Windsor
7	Detailed design and construction of Highway 401 widening from Highway 3 to Manning Road	Phase 2	MTO
8	Highway 3 intersection improvements at: a) Outer Drive	Phase 2	MTO

[2] Windsor Gateway Draft Report, Sam Schwartz Engineering PLLC (SSC), presented January 21, 2005

Project #	Description	Status	Proponent
	b) Walker Road		
9	Howard Avenue/CP Rail grade separation: a) Detailed design and construction b) E.A. study	9a in Phase 2 and 9b in Phase 1	City of Windsor
10	Complete construction of a pedestrian bridge over Huron Church Road at Girardot Street near Assumption College School	Operational approx. Fall 2005	City of Windsor
11	Complete construction of intersection improvement at Huron Church Road and Industrial Drive	Operational approx. Summer 2005	City of Windsor
12	Complete master plan and E.A. for Windsor-Detroit Tunnel Canadian Plaza	Operational approx. mid-2009	City of Windsor
13	Complete Grand Marais Road detour and start construction of Walker Road-CP Rail grade separation	Operational approx. late 2007	City of Windsor
14	Intelligent Transportation System (ITS) Projects: a-d) CCTV monitoring cameras – construct and/or design e) Changeable message sign at Hwy 401/402 f) Action Plan for Intelligent Border Crossings study g) Additional projects selected by 14f study	14a-d) Operational approx. Summer 2005 to late 2006 14e) late 2006 14f) end 2008 14g) end 2006 to late 2008	MTO / City of Windsor
Projects by City of Windsor and other Municipalities			
15	Widen Lauzon Road to 4 through lanes from Edgar to Wyandotte	Approved (0-5 years)	City of Windsor
16	Widen Tecumseh Road to 6 through lanes from Jefferson Blvd. to Banwell Road/CR 43	Approved (0-5 years)	City of Windsor
17	Extend Wyandotte Street east of Little River into Riveside East community	Approved (0-5 years)	City of Windsor
18	Widen Walker Road to 4 lanes plus turn lanes from Tecumseh Road to south City limit	Approved (0-5 years)	City of Windsor
19	Widen Howard Avenue to 4 lanes from Highway 3 to Dougall Parkway, 3 lanes Cabana Road and then 4 lanes to Provincial Road	Approved (0-5 years)	City of Windsor
20	Widen Provincial/Division Road to 4 through lanes from Howard Avenue to south City limit	Planned (0-5 years)	City of Windsor
21	Widen Cabana/Division Road to 4 through lanes from Huron Church Road to east City limit	Planned (5-10 years)	City of Windsor
22	Widen Banwell Road from Tecumseh Road to City limit including at-grade intersection improvements	Planned (0-5 years)	City of Windsor
23	Widen CR 43 to 4 lanes from City boundary to CR 42	Planned (0-5 years)	County of Essex
24	Widen CR 19 (Manning Rd) to 4 through lanes from CPR tracks to Jamesyl Drive and improve from CNR tracks to Sylvestre Drive	Planned (0-5 years)	County of Essex
25	Widen CR 3/Malden Road to 4 through lanes from Todd Lane to south limit of sanitary sewer area	Planned (0-5 years)	County of Essex
26	Widen CR 7/Huron Church Line to 4 through lanes from Highway 3 to Sandwich West Parkway	Planned (5-10 years)	County of Essex
27	Extend 4 lane Laurier Drive from CR 3/Malden Road to CR 9/Howard Avenue	Planned (0-10 years)	Town of LaSalle

The Windsor Gateway improvements follow the “Let’s Get Windsor/Essex Moving” strategy and focus on regional routes serving cross-border vehicle and rail traffic. Although there may be some minor project overlaps between the City’s and other local municipalities’ strategies, most of the local projects were identified independent of the Windsor Gateway improvements.

FIGURE NO. 1

REVIEW OF PROPOSED TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS, CITY OF WINDSOR

INFRASTRUCTURE AND TRANSPORTATION IMPROVEMENT PROJECTS LOCATIONS

Note: Concept Only

FIGURE NO. 2

REVIEW OF PROPOSED TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS, CITY OF WINDSOR

CONCEPT BY-PASS ROUTE PROPOSED BY SCHWARTZ

3.0 CURRENT AND MID-TERM TRAFFIC CONDITIONS

3.1 Overview of Current Traffic Conditions

The short-term and medium-term road improvements planned or approved in the City of Windsor are to address the current local deficiencies and border-crossing needs. Since the Ambassador Bridge carries the highest volume of Ontario-USA border crossing traffic, the road network and its good operating conditions leading to the crossing are vital to the efficient movement of people and goods. Highway 401 with 4 lanes east of Talbot Road/Highway 3 is the primary road connecting international passenger and commercial vehicle traffic to the Ambassador Bridge crossing. As shown on **Figure 3**, its current peak hour volume is in the order of 1,200 passenger car equivalents[3] (PCE) in the peak direction. This volume is considered within the capacity of the roadway.

From Highway 401 to the Ambassador Bridge, the majority of the border crossing traffic uses the route via Talbot Road and Huron Church Road, passing through an existing 17 traffic signals as shown on **Figure 3**. During the A.M. (morning) peak hour, the peak direction is in northbound (Canada to USA), with about 1,500 – 2,000 PCE, while in the afternoon, the peak direction is southbound (USA to Canada) with about 2,000 – 2,500 PCE. Given the existing conditions, preliminary analyses from current studies suggest that most of the links along this route are operating with acceptable Level of Service during the A.M. peak. On the other hand, during the P.M. peak hour, there are road links and intersections where operations are reaching Level of Service (LOS) E and include the Huron Church Road/Tecumseh Road and the Talbot Road/Howard Avenue intersections.

The E.C. Row Expressway is also a key link in the City of Windsor bringing some of the more local traffic to the Ambassador Bridge. It is a 4 lane grade separated road with volumes reaching as high as 4,000 - 4,250 PCE per hour in the peak direction. This traffic level represents at-capacity conditions and sections of the E.C. Row Expressway experiencing these congested conditions are in the vicinity of the Dougall Avenue and Howard Avenue interchanges. The Schwartz Report has also recognized the congested nature of E.C. Row and suggests an 8-10 lane cross section if the E.C. Row Expressway/Lauzon Parkway Alternative is adopted as a cross border access route for a new crossing in the long term. However, physical upgrading of E.C. Row is not reflected in any of the approved or planned roadway improvements in the City of Windsor's capital works program or the Windsor Gateway projects.

As highlighted in Figure 3, there are key expressway and arterial road sections with capacity constraints not addressed by the approved or planned transportation improvements. The most notable are on:

- E.C. Row between Dominion Avenue and Walker Road (already operating at capacity);
- Ouellette Avenue/Dougall Avenue north of E.C. Row; and
- Howard Avenue north and south of E.C. Row.

In addition, small sections of Huron Church Road near Tecumseh Road and the E.C. Row north ramp are experiencing some capacity constraints.

[3] Assuming 1 Truck = 2.5 passenger car equivalents (PCEs)

FIGURE NO. 3

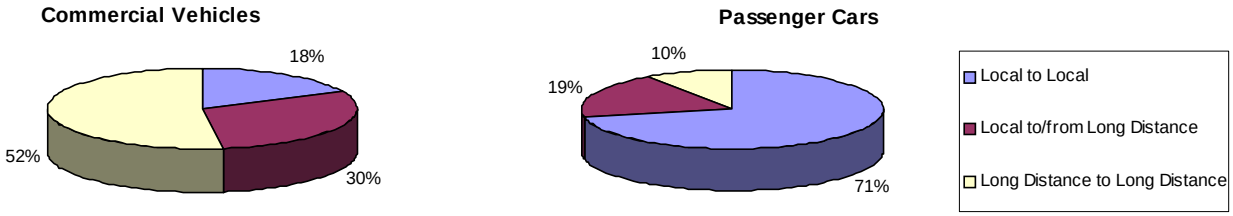
REVIEW OF PROPOSED TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS, CITY OF WINDSOR

EXISTING TRAFFIC VOLUMES AND CONDITIONS

3.2 Current Operations on Huron Church Road and Ambassador Bridge Crossing

On a typical weekday in 2004, the Ambassador Bridge carried a total in the order of 12,000 to 13,000 commercial vehicles per day (vpd) and 19,000 other vehicles (passenger cars, buses, motorcycles, etc.) This represents about 95% of the commercial vehicles and about 53% of the passenger cars crossing between Detroit and Windsor[4]. The rest use the Detroit-Windsor Tunnel. For the Ambassador Bridge traffic, **Figure 4** provides a summary of the origin-destination patterns for the commercial vehicle and passenger car traffic.

Figure 4: Ambassador Bridge Vehicle Trip Origins/Destinations



Only less than 20% of the commercial vehicles on the Ambassador Bridge are local to local, involving short distance trips with origins and destinations in Windsor and Detroit, while 30% involve long distance to local trip, where one trip end is either in the Windsor or Detroit area and the other is a long distance away[5]. The more significant number is the long-distance to long distance commercial vehicle trips which account for about 52% of the travel through Windsor, and these usually approach/depart via Highway 401 and Huron Church Road. This compares to the small proportion of long distance to long distance passenger car trips (10%) using the Ambassador Bridge. Most of the passenger car trips have an origin or destination in the greater Windsor-Detroit area.

During the A.M. peak hour, the US-bound traffic crossing the Ambassador Bridge peaks between 7:00-8:00 a.m. with about 1,100-1,200 passenger cars and 300 commercial vehicles. During the P.M. period, the overall peak hour for the Canada-bound traffic occurs between 4:00 – 5:00 p.m. consisting of about 1,200 passenger cars and 400 commercial vehicles. With 2 lanes in each direction on the Bridge and an assumed peak hour roadbed capacity of 1,750 PCE/h/lane, the volume to capacity (v/c) ratio assuming 3 PCE for each commercial vehicle (due to higher grades on the bridge) is 0.57 to 0.69. This v/c ratio illustrates that there is currently sufficient road capacity to accommodate the cross-border passenger car and commercial vehicle volumes assuming that 2 lanes in each direction are opened. However, if one of the lanes is closed during any of the peak hours then, as illustrated in Schwartz's presentation, traffic can become unstable with queues and delays resulting from the above capacity condition. In general, there is currently adequate capacity at the Ambassador Bridge and the border crossing process has greatly improved in recent years to minimize and manage the delays.

[4] 1999/2000 NRS/MTO Commercial Vehicle Survey and Ontario-Michigan Border Crossing Traffic Study.
[5] Beyond Windsor-Essex or Southeastern Michigan

As mentioned in the Schwartz Report, a number of changes have occurred to increase capacity and improve operations at the Ambassador Bridge in order to reduce queuing. Some of the recent changes and operational measures that have been taken to reduce the delays include:

- More than doubling the number of primary inspection stations (from 6 to 13);
- Enforcement of completion of border crossing paperwork one hour in advance of arrival at the border;
- Decline of passenger car traffic since September 2001; and
- FAST and NEXUS programs for pre-approved low-risk travellers with special booths and permission to use left lane on bridge.

There is room to add more custom booths on the Canadian side if needed. These recent capacity improvements and increased staffing levels have eliminated major queuing delays during normal conditions. As such, the US-bound commercial vehicle traffic no longer form extensive queues along Huron Church Road under typical conditions. The majority of the delays result from the intersection traffic control signals along Huron Church Road leading to the Bridge.

3.3 Mid-Term Traffic Conditions (to 2013)

Based on various background studies and data, the compound annual traffic growth rate for passenger car demands crossing the Ambassador Bridge in the mid-term (to 2013) is estimated to be 2.6%, while in the long-term (to 2035), the rate reduces to 1.4%. For commercial vehicles, the annual growth rate is estimated to be 3.6% in the mid-term and 2.7% in the long-term. With these rates, the Ambassador Bridge traffic is forecast to have peak hour PCE demands and v/c ratios in 2013 as follows:

- A.M. peak hour = approx. 2,700 PCE (with v/c = 0.77)
- P.M. peak hour = approx. 3,150 PCE (with v/c = 0.90)

The 2013 peak hour US-bound commercial vehicle traffic is projected to be in the order of 410, while the Canada-bound commercial vehicle traffic is projected to be about 550. The forecast volumes indicate that there could still be adequate capacity on the Bridge in the year 2013; however, conditions will become unstable by this time, particularly during the P.M. peak hour. The forecasts are consistent with those documented in Schwartz's Report.

By 2013, the traffic volumes are projected to be above the road capacity on several sections of Huron Church Road and Talbot Road assuming the existing road and intersection geometry. The intersections that are anticipated to be critical include Huron Church Road/Tecumseh Road, Huron Church Road/Industrial Drive, Huron Church Road/Cabana Road, and Talbot Road/Howard Avenue. These intersections would be operating with some turning movements being critical, particularly during the P.M. peak hours. The section of Huron Church Road north of E.C. Row will become unstable between 2008-2013 and it could reach capacity around 2013 or shortly thereafter if no road improvements are implemented. The section of Huron Church Road south of E.C. Row is forecast to become unstable between 2013-2018, and reaching capacity about 2018, again assuming no road network improvements.

Other key roads in Windsor such as E.C. Row will also be experiencing some additional delays as the travel demands increase. The congestion will become more prominent on E.C. Row between Dougall Avenue and Walker Road with v/c ratios expected to be at or near capacity (1.0) in the mid-term. Whereas on Highway 401 east of Talbot Road, the volumes are projected to be about 2,000 PCE in the peak direction and is still within the acceptable capacity of the roadway.

4.0 TRAFFIC FLOW MANAGEMENT

4.1 Impact of Construction of Federal/Provincial Funded Projects

Construction to widen Highway 401 and Talbot Road could have some potential impact on the cross border traffic and surrounding road network. Given the origins and destinations of the long distance trips likely via Highway 401, it is estimated that up to 20% of the passenger trips and 67% (two-thirds) of the commercial vehicles crossing the Ambassador Bridge could be affected[6] if there are significant delays resulting from construction. In the short-term, this would represent up to about 240 passenger cars and 200-270 commercial vehicles (or 740 to 915 PCE[7]) in the peak direction that could be sensitive to construction effects on Highway 401 and Talbot Road. The rest of the border crossing vehicles are assumed to continue using the local and regional roads.

Proper traffic management measures should be taken to maintain or even slightly increase capacity and thus offset the effects of potential construction delays in the Talbot Road corridor. It can be reconstructed without the need for prior widening along alternative routes such as E.C. Row or Cabana Road. In fact, widening of Talbot Road first could provide additional roadway capacity to support other future projects.

Given the capacity of Highway 401 (1,800-2,000 PCE/h/lane at mid-block) and the existing peak demand volume of only about 1,200 PCE, it is anticipated that a single lane in each direction would be sufficient to accommodate the traffic levels during reconstruction of Hwy 401.

The significance of the construction impacts due to the Talbot Road improvement would depend on the ultimate design of the road. If the ultimate widened 6 lanes of Talbot Road are to be at-grade then proper construction techniques can be applied to phase the project so that two lanes in each direction can be maintained during construction. Techniques may include the use of shoulders or other areas within the road right-of-way to balance the traffic flow during peak periods. Without keeping 2 lanes in each direction, there is inadequate existing infrastructure in the vicinity which can handle the diverted traffic and significant impacts may result. If the ultimate design of Talbot is not at-grade (e.g., open cut or partially depressed), then there will be more significant construction impacts and traffic diversion. With the amount of material hauling, trenching, and construction activity, maintaining 2 lanes in each direction for traffic flow is very difficult and may not be possible at times. Again, there is insufficient capacity on the existing road network to absorb the diverted traffic from Talbot Road.

The other construction project that may have significant traffic impact is the Walker Road/CP Rail grade separation crossing at Grand Marais Road. During construction, alternative routes such as Howard Avenue and Central Avenue should be kept opened with appropriate detour signage.

The works along Huron Church Road including the intersection improvements and the pedestrian crossing should be monitored and measures taken to minimize disruption to through traffic, particularly during peak hours.

Impacts of the other Federal/Provincial funded projects during construction are considered minor.

[6] Taking long distance to long distance trips plus half of the local to/from long distance trips.
[7] Using a factor of 1 commercial vehicle =2.5 PCE on all roads except at Ambassador Bridge where 1 commercial vehicle = 3.0 PCE due to grades.

4.2 Mitigation of Deficiencies

As mentioned above, mitigation measures can be considered during the construction of Highway 401 and Talbot Road including:

- During construction, maintain at least one through lane in each direction along Highway 401 during construction and two through lanes in each direction along Talbot Road. Given the shoulders and rural cross sections, use of the shoulder lane as a travel lane during construction may be possible. With the peak directional flows, it may be advisable to accommodate 2 US-bound lanes in the A.M. peak hour and 2 Canada-bound lanes in the P.M. peak direction;
- Improvement of the Huron Church Road/E.C. Row interchange to accommodate additional demands on both Huron Church Road and E.C. Row;
- Provision of adequate through and turning lanes at the Talbot Road/Howard Avenue intersection approaches; and
- Works can be scheduled to occur during the off-peaks (e.g. night time) of the traffic flow.

4.3 Future Study Requirements

Given the number if individual projects planned by the various transportation agencies, it is recommended that a coordinated traffic management strategy plan involving all the transportation agencies be studied comprehensively. This would provide overall staging coordination for the projects so that implementation of the planned improvements to the transportation infrastructure can be achieved with minimal adverse impact on City of Windsor residents.

5.0 HURON CHURCH ROAD TRUCK BYPASS

5.1 Introduction / Background

In the Schwartz Report, a preferred location for a new river crossing was identified as being centrally located in the industrial areas of both Windsor and Detroit; this area is located near the west end of the E.C. Row Expressway. As part of a possible mid-term solution to address traffic congestion problems anticipated prior to the opening of a new border crossing, the Report suggests that a "bypass" be constructed for trucks comprised of segments of the Schwartz proposed Industrial Crossing route, taking the trucks inbound from Highway 401 to a proposed traffic management center at Brighton Beach before directing the trucks along a dedicated truckway and metering them onto Huron Church Road via a special queue control signal tied into an Intelligent Transportation System. It is suggested that the metering of truck traffic may help to prevent queuing on City streets.

The purpose of this section of the review document is to evaluate the feasibility, practicality and suitability of the truck bypass suggested in the Schwartz Report for addressing the mid-term traffic issues that will be faced until a new international border crossing is constructed. This section will address the feasibility of the proposed route from an engineering, highway geometric and traffic management perspective. It also reviews the effectiveness of this truck bypass in addressing the mid-term traffic issues, and the expected duration of the planning, approvals, design and construction process before the truck bypass could be fully opened to traffic.

Truck Bypass Engineering, Alignment and Geometry

Detailed plans illustrating the proposed horizontal and vertical alignment for the truck bypass route were not available for our review; information on the alignment of the Schwartz-proposed truck bypass was taken from the information posted on the City of Windsor website and a subsequent teleconference call with Mr. Schwartz. Furthermore, exactly what segments of the proposed Industrial Crossing route were proposed to be constructed for the truck bypass was not specified; as part of this review, an assessment of the minimum required construction was developed.

The proposed truck bypass diverges from Talbot Road (which was proposed to be depressed in the Schwartz Report) at Todd Lane and passes under the Huron Church Road / Todd Lane intersection via a short section of tunnel. The truck bypass then parallels Todd Lane as it moves westerly, with the grade rising to pass over Turkey Creek and Malden Road before falling to cross beneath the Ojibway Prairie Grass Provincial Nature Reserve. It then rises to an at-grade condition and then turns to the north and travels along or adjacent to the Ojibway Parkway to a traffic management center located at Brighton Beach. From there, it is proposed to travel eastward along the north side of E.C. Row Expressway to Huron Church Road. From this point on, the truck traffic would re-join the Huron Church Road traffic and travel to the existing border crossing at the Ambassador Bridge.

Based on this schematic representation of the alignment, a conceptual-level horizontal and vertical alignment for the proposed route was developed and refined at a scale of 1:2000 over recent aerial photography of the City of Windsor and this conceptual alignment was evaluated from an engineering, alignment and geometry perspective. The location and extent of the Ojibway Prairie Grass Reserve was taken from the City of Windsor Official Plan and, for that area within the Town of Lasalle, the existing wooded area contiguous with the remainder of the Reserve was used as the limits. These limits may be in excess of what was apparently

estimated by Schwartz, but is considered appropriate to minimize the potential disruption to the local environmental conditions.

Given that this bypass is targeted specifically at truck traffic, it is considered desirable to maintain a maximum vertical grade of 3% for the design of the truck bypass; on this basis, the vertical alignment was developed on a conceptual-level of detail and is illustrated in **Figure 5**.

As noted previously, details of the configuration of the truck bypass were not provided. In reviewing the traffic needs for a possible future border crossing, it is anticipated that at least three lanes of traffic may ultimately be required in each direction. On the assumption that the tunnel would be constructed by Tunnel Boring Machine (TBM), a maximum number of 2 lanes per tunnel were assumed. Accordingly, to minimize the size of the boring machine, provide for the necessary ultimate traffic volumes and to provide for staging of maintenance or emergency situations, it was assumed that the tunnel for the future Industrial Crossing would feature three 2-lane tunnels, with the center tunnel used for contra-flow operation, maintenance and emergency purposes. In discussion with Mr. Schwartz he indicated that two 2-lane tunnels may be adequate. For the interim truck bypass, a single tunnel may be adequate and this is what our review focussed on. It should be noted that the overall construction cost and engineering complexities for the Schwartz-proposed border crossing will be substantially higher if only a portion of the ultimate tunnel system is built in the initial construction; however, to minimize the exposure to risk of constructing all three tunnels before confirming ultimate need, a single interim tunnel was used for analysis.

In the development of the vertical alignment, the length of the required tunnelling as originally anticipated in the Schwartz Report was refined; it is estimated that approximately 1,300 m of tunnelling will be required to cross beneath the Ojibway Prairie Grass Reserve; it is anticipated that the crossing of the Huron Church Road / Todd Lane intersection could be undertaken using a cut-and-cover construction technique similar to what would be undertaken for the construction of the depressed Talbot Road section.

In reviewing and evaluating the proposed route, some significant engineering issues were identified, including:

- Subsurface Conditions – The subsurface conditions along this route are not known, but this area is known to have been subject to extensive “room-and-pillar” and “solution” mining for salt, suggesting that subsurface conditions may be extremely variable and difficult to engineer. Furthermore, the depth of a tunnelled roadway is difficult to assess at this level of review – it would need to be deep enough to avoid any negative impacts or water table drawdown within the Ojibway Prairie Grass Reserve – but it is expected that the obvert of any tunnel would be at least 6 m below grade;

- Constructability – tunnelling under the Huron Church Road / Todd Lane intersection could potentially be undertaken using a cut-and-cover approach with appropriate detouring of local traffic, but the tunnelling under the Ojibway Prairie Grass Reserve would either be undertaken using Tunnel Boring Machines or a suitable “mining” technique. The use of a TBM may be exorbitantly expensive and, as mentioned previously, may effectively limit the dimensions (and hence ultimate capacity) of the tunnel (requiring multiple tunnels), while a more traditional mining approach may be very slow to construct and may have increased environmental impacts on the Nature Reserve;

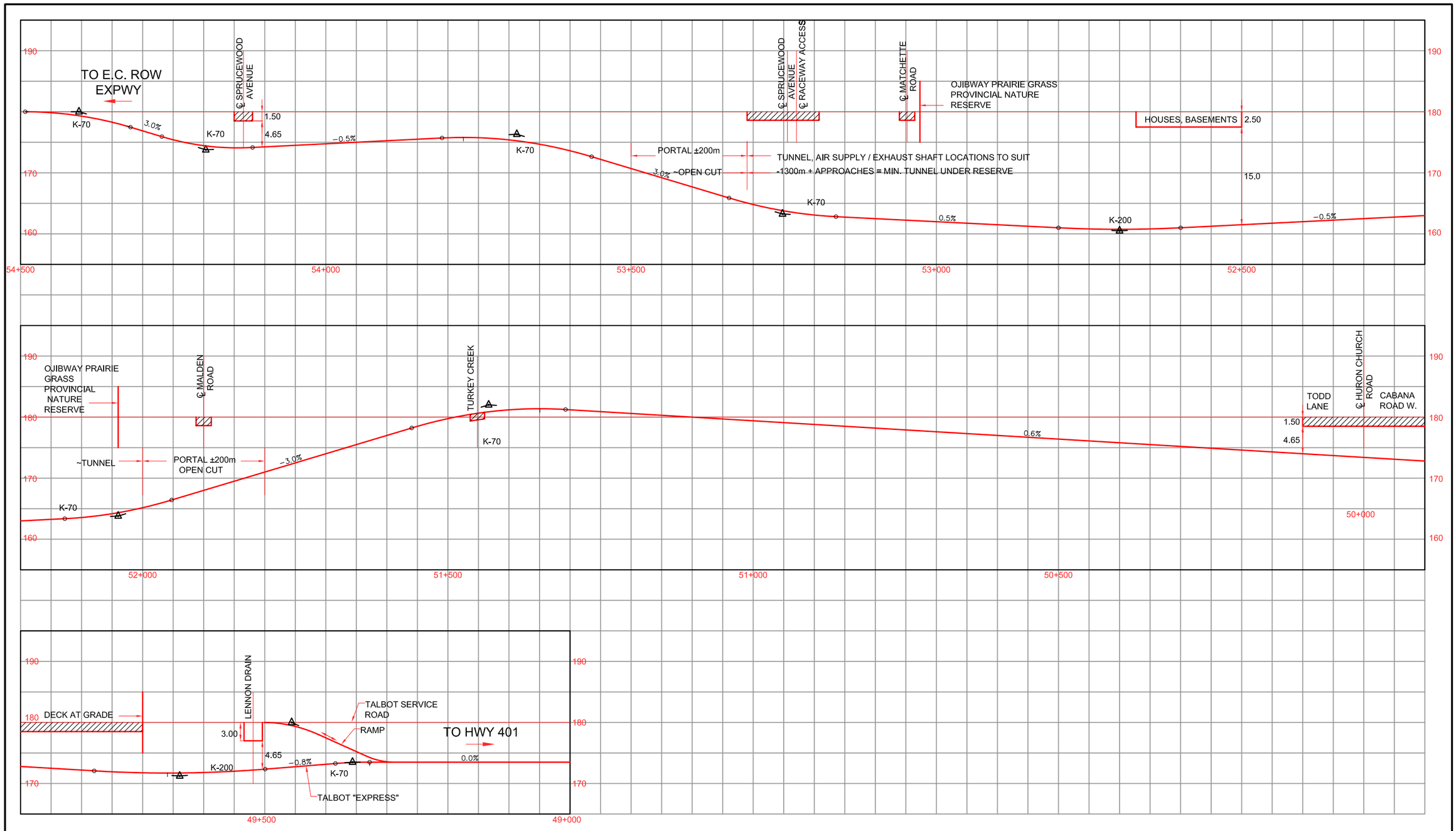


FIGURE NO. 5

REVIEW OF PROPOSED TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS, CITY OF WINDSOR

HURON CHURCH ROAD TRUCK BY-PASS ROUTE (SCHWARTZ REPORT)
SOUTHERLY SECTION FROM TALBOT ROAD TO OJIBWAY PKWY.

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- Traffic Management during Construction – constructing Talbot Road at a depressed elevation will have significant impacts on the traffic using Talbot Road. Traffic, particularly traffic to and from the border, may need to be detoured around the construction site (presumably via E.C. Row Expressway as Schwartz did not identify an detour alternative) for an extended period of time and will have negative impacts on existing City of Windsor traffic, as well as traffic detoured from other construction projects on-going that are associated with the Phase 1 and Phase 2 of the "Let's Get Windsor-Essex Moving" program; and

- Management of Surface and Subsurface Drainage – the terrain in Windsor is relatively flat (low relief) and has a relatively high water table level. Any depressed roadway or tunnel will be subject to continuing water infiltration concerns (which may result in local water table draw-down) and will require any streams (Lennon and Cahill Drains, for example) or major overland flow routes for storm drainage to be relocated around or cross over the truck bypass.

It is anticipated that all of the engineering issues can be resolved through appropriate and sufficient engineering design, although the already-significant cost of construction anticipated for this truck bypass could increase appreciably to address these issues. Therefore, in spite of the engineering issues identified above, the operation of the truck bypass was also reviewed.

5.2 Mid-Term Needs

As mentioned in Section 3.3, the intersection operations on Huron Church Road north of E.C. Row will approach capacity near 2013, while the section between E.C. Row and Talbot Road will approach capacity around 2018. Accordingly, mid-term improvements may be warranted to provide suitable capacity before the new border crossing is opened.

In the Schwartz Report, several measures were proposed, including the truck bypass that is intended to divert trucks from Huron Church Road that are bound for the border and meter them back onto Huron Church Road.

5.3 Efficiency of the Proposed Truck Bypass in Improving Traffic Flows

One of the goals of the recommended Schwartz bypass is to get international and commercial traffic off the section of Huron Church Road between E.C. Row and Talbot Road. However, the 8 km bypass would take about 10 minutes to traverse (assuming a constant 50 km/hr travel speed) from Talbot to Huron Church Road north of E.C. Row. Given an option, driver's destined for the border would have to weigh this bypass travel time against going through a net possible 5 traffic signals[8]. With proper coordination and signal timing phasing, however, the number of signal which would cause actual stoppage to Huron Church Road traffic flow would be much less.

To be of any benefit in reducing congestion on Huron Church Road, the proposed truck bypass must attract most, if not all, of the trucks bound for the border. The use of the proposed truck bypass must either be sufficiently attractive to drivers (i.e. offering them a benefit) or the use of Huron Church Road must be sufficiently unattractive. Drivers must somehow be compelled to use the truck bypass (and therefore endure metering) and not elect to take any other route or this truck bypass would offer no improvement to traffic congestion on Huron Church Road.

[8] Total of 7 traffic signals on Huron Church Road from Talbot Road to E.C. Row north ramp intersections minus an estimated 2 traffic signals for the bypass at Ojibway Parkway and E.C. Row crossings.

The method by which truck traffic from Highway 401 would be compelled or forced to use this truck bypass is not evident in the Schwartz Report. It is possible that the use of Huron Church Road between Todd Lane and E.C. Row Expressway by trucks could be restricted either physically, legislatively or financially (e.g. tolls); however, alternate routes to the Ambassador Bridge could be used by trucks to bypass the proposed truck bypass, such as using Provincial Road / Division Road or Dougall Avenue to access E.C. Row Expressway. Unless the participation of the Detroit International Bridge Company and the Canadian Transit Company is obtained and all trucks forced to present documentation that can only be obtained at the Brighton Beach Transportation Centre before being processed at the border, it is not clear how the use of the truck bypass could be enforced.

Prior to 2013 even if one were to assume that the majority of trucks could be forced to use the truck bypass, metering of this portion of the traffic would result in only a very modest improvement in traffic operations and congestion. After 2013 metering may not prove effective and provision of an auxiliary route to the bridge is the preferred solution.

5.4 Impacts during Construction

Construction of the suggested Schwartz Bypass would have some impacts on the traffic flow and current users of the roads. As shown in **Figure 6**, there would be some locations where there are major road crossing and minor road crossing impacts.

In particular, the tunneling from Talbot Road adjacent to the residential area crossing Huron Church Road would create some traffic diversion and delays to drivers. Also, the by-pass connection or crossing on Ojibway Parkway at the north end and south end would need more detailed investigation in order to design minimize the delays to the traffic flow and current accesses. With proper phasing and construction techniques, these impacts could be mitigated. Other locations of potential roadway crossings are identified on Figure 5 and construction of the by-pass would have some impact at these crossing, albeit to a lesser degree than the major roads. Diversion and access management during construction of the crossing would be required.

5.5 Operations

5.5.1 Feasibility of Ramp Metering onto Huron Church Road and Operations of Intersection

As suggested in the Schwartz Report, the metering of truck traffic from the truck bypass onto Huron Church Road has been suggested as a method of addressing the congestion that is anticipated to occur on Huron Church Road in the future. Based on a review of the available traffic modeling, it is not expected that the metering of truck traffic will result in a significant improvement in traffic operations or congestion relief. Despite the anticipated minimal benefit, the possible operation of how the ramp metering may be accommodated at Huron Church Road was investigated.

Note: Concept Only

FIGURE NO. 6

REVIEW OF PROPOSED TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS, CITY OF WINDSOR

IMPACTED INTERSECTIONS DUE TO PROPOSED SCHWARTZ BY-PASS

Diagrams addressing the possible configuration and operation of the intersection of the truckway with Huron Church Road, including modifications to Ramp E-S at Huron Church Road, are presented in **Figure 7**. The operation of the intersection for a metered truckway with Huron Church Road, located roughly opposite of the Ramp E-S intersection (identified as Alternative 2, Figure 7), is expected to perform well, with the current signal phase used for left-turning vehicles (two-lanes) from Ramp E-S shared with left-turning vehicles (two-lanes) from the truckway. Improvements to the channelized right-turn lane from Ramp E-N to Huron Church Road may be warranted under this scenario, including the provision of a parallel acceleration lane and taper or a "lane-away" so that right-turning traffic is not unduly impacted by the metered truck traffic.

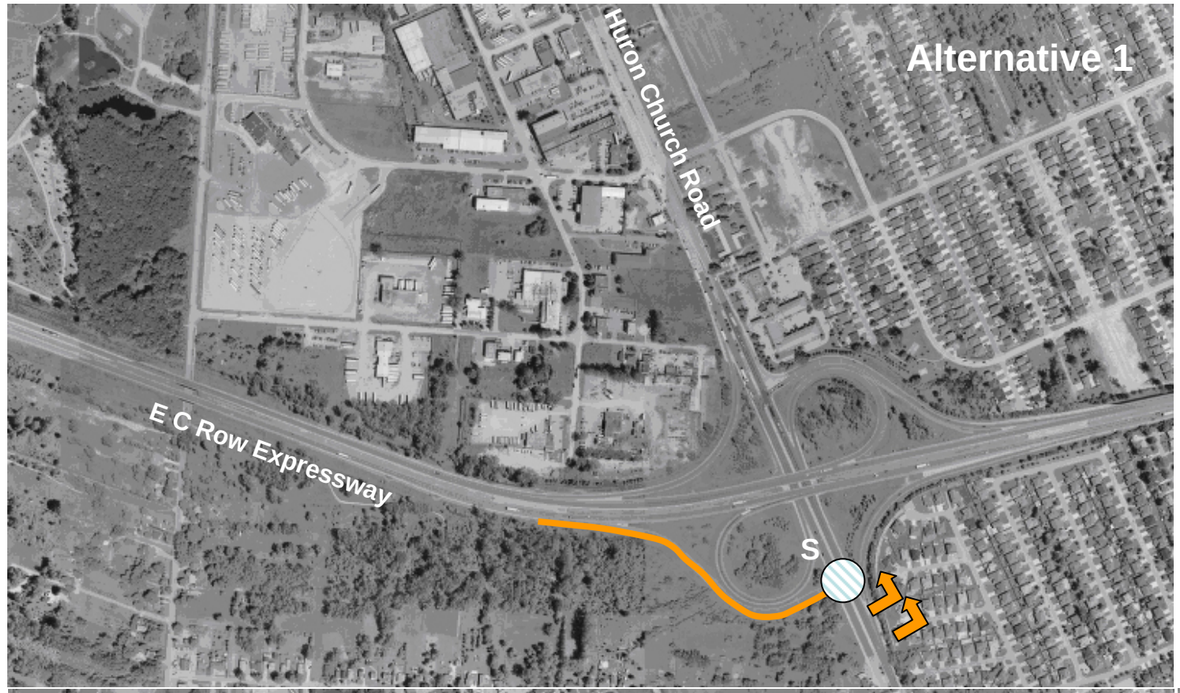
5.5.2 Brighton Beach Transportation Center

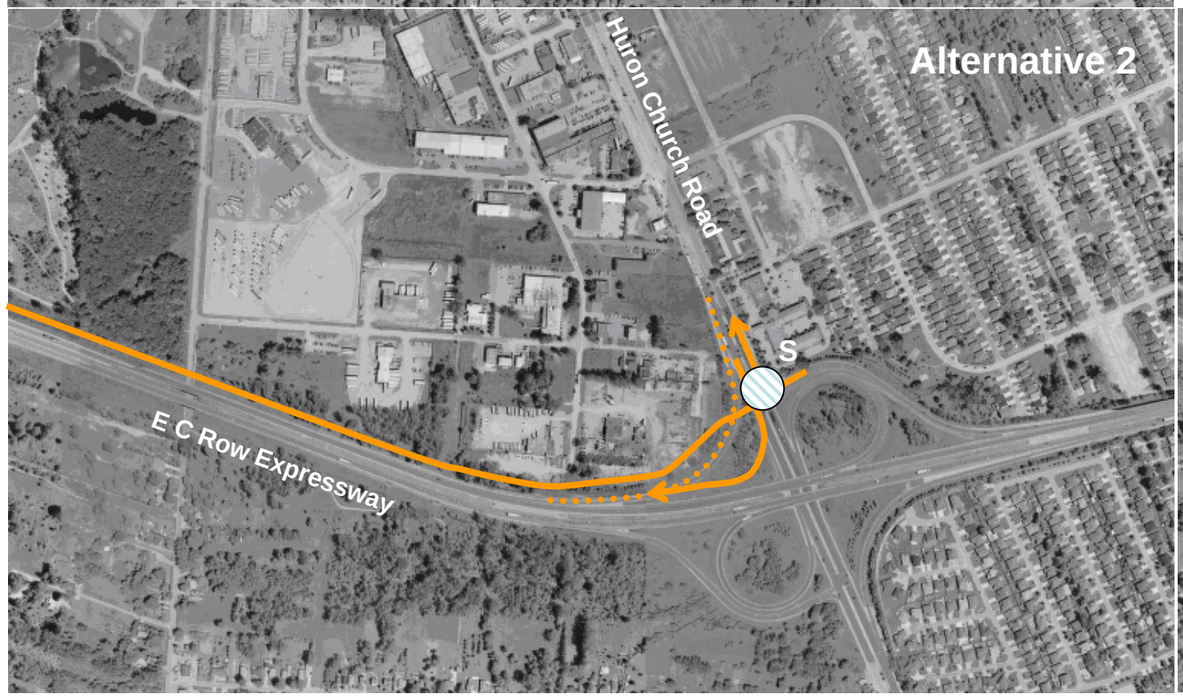
In the Schwartz Report, the truck bypass diverts traffic from Huron Church Road at Todd Lane and directs it to an industrial area of Windsor referred to as Brighton Beach, where a Transportation Center was proposed to be located. It is unclear from the Schwartz Report what the purpose or function of the Brighton Beach Transportation Center (BBTC) would be, apart from housing the ITS Traffic Control Center that would monitor and control the metering of trucks onto Huron Church Road and to provide short-term storage or marshaling facilities for border-bound trucks. Presumably, the Transportation Center could also serve as a Pre-Processing Center (PPC) for vehicles whose border crossing paperwork has not previously been prepared. With respect to the potential use as a PPC, however, there are a number of local PPC's already in operation (in Windsor, as well as in London) that would minimize the value of this service.

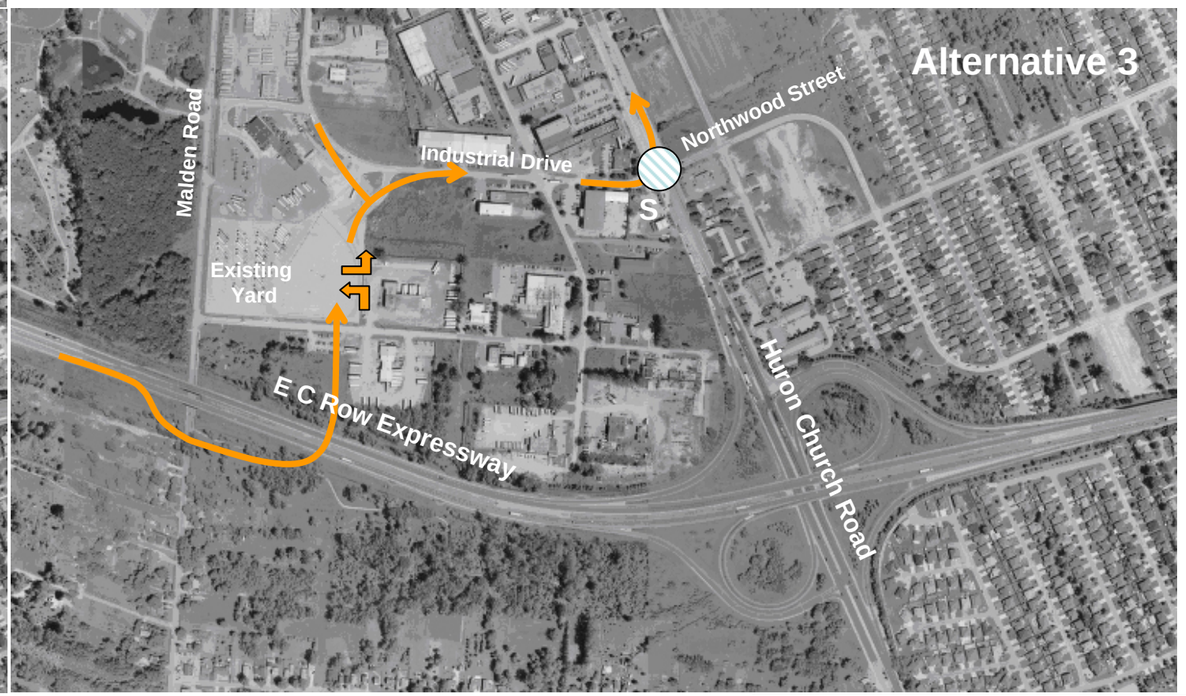
The proposed metering of trucks from the truck bypass onto Huron Church Road could also be undertaken at the BBTC, as opposed to occurring at the intersection of the truckway with Huron Church Road. The BBTC could be used as a marshalling yard for the trucks as they are metered onto the truckway, as opposed to marshalling the vehicles along the truckway as could occur if the metering were at the intersection.

It is not evident in the Schwartz Report why this particular 8 km long truck bypass route (bypassing only 2 km of Huron Church Road) would be necessary to store and then meter truck traffic, as opposed to providing a similar storage and metering area somewhere to the east of Windsor along Highway 401 (for example, on the north side of Highway 401 between 9th Concession Road and Manning Road) where there is available rural land and ready access from Highway 401 requiring no detour. It would seem logical to conclude that such a transportation center located along Highway 401 could offer similar if not improved benefits in metering traffic to one located at Brighton Beach.

In summary, while a Transportation Center / marshalling yard could be of some minimal benefit in addressing congestion along Huron Church Road, the proposed location at Brighton Beach, in combination with the truck bypass, does not seem to be practical or cost-effective.







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Alternative 1: Metered truck traffic arrives from Brighton Beach Marshalling Yard at Huron Church Road / EC Row Expressway.
Two left turn lanes exist at signalized intersection.

Alternative 2: Metered truck traffic arrives from Brighton Beach Marshalling Yard at Huron Church Road via a new two-way service road along the north side of the EC Row Expressway.
The existing signalized T-intersection is modified to a 4-leg intersection by relocating the N-W ramp traffic through the signal.

Alternative 3: Metered truck traffic arrives via the Huron Church by-pass at the existing Yard on Malden Road. The Yard will be modified for truck traffic metering.
Trucks are then released onto Huron Church Road at the (modified) signalized intersection with Industrial Drive/Northwood Street.

FIGURE NO. 7

REVIEW OF TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS, CITY OF WINDSOR

HURON CHURCH ROAD TRUCK BY-PASS ROUTE, METERED TRUCKS ENTER HURON CHURCH ROAD

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5.5.3 Emissions / Noise Impacts

Vehicles on the proposed by-pass would traverse a distance of approximately 8 km versus a distance of 2 km on the section of Huron Church Road between E.C. Row and Talbot Road. With this additional travel distance on the by-pass, it is expected that vehicles will generally emit a greater amount of exhaust, and possibly up to 4 times the amount if there is no intersection delay on Huron Church Road.

Although the by-pass would be mostly located to concentrate traffic within the industrial areas of Windsor, it is proposed to cross some of the most environmentally sensitive areas in the city. The additional vehicle emissions would be in the vicinity of the Ojibway Prairie Grass Provincial Nature Reserve. The design of the tunnel would require a suitable ventilation system and a detailed investigation of the environmental impacts.

Noise along the proposed by-pass would be most noticeable to residents in the vicinity of Todd Lane. The potential above-grade sections over Turkey Creek and Malden Road would expose the residents to additional vehicle noise. There may be significant noise impacts to these residents which need further investigation. The current route on Huron Church Road also has adjacent residential areas; however, there are some locations where set-backs and noise attenuation have been implemented. With continuing growth in heavy vehicle traffic, further review of noise mitigation measures for the 2 km stretch of Huron Church Road including noise attenuation walls or additional planting are recommended.

5.5.4 Need for Additional Improvements on Huron Church Road

As indicated previously, it is considered unlikely that the metering of trucks inbound from Highway 401 by diverting them through the Schwartz-proposed truck bypass will be of any significant benefit. All diverted trucks will simply be returned to Huron Church Road (albeit in a metered fashion) to merge with other traffic on the approach to the Ambassador Bridge. It stands to reason that the critical link that should be addressed in any mid-term improvement plan would be the section of Huron Church Road from E.C. Row to the Ambassador Bridge.

There are a number of potential solutions that could be considered in the mid-term to address the congestion that is anticipated to occur on Huron Church Road, particularly for the stretch from E.C. Row Expressway to the Ambassador Bridge where a widening of the facility would be very difficult or impractical to undertake. Given that this section of Huron Church Road is anticipated to reach capacity about 2013, consideration could be given to any one or a combination of the following solutions:

- Further increase the border crossing capacity and efficiencies (i.e. more custom stations);
- Traffic signal optimization and intersection improvements along Huron Church Road;
- Increase in border crossing capacity and efficiencies at the Detroit River Tunnel and signal optimization on the route to the tunnel;
- Metering of border-bound truck traffic, potentially at the proposed marshalling yard (Project 5, in Table 1);
- Increased capacity of the existing ferry crossing; and
- Provision of auxiliary routes for trucks and/or public traffic to the Ambassador Bridge.

In the event that congestion increases beyond what is currently anticipated in the mid-term or the opening of the new border crossing is delayed, then the need for a mid-term auxiliary route

to supplement Huron Church Road may be indicated. In background documents prepared by others related to the twinning of the Ambassador Bridge, a possible alternate corridor was proposed running from the end of E.C. Row Expressway northerly to the foot of the Ambassador Bridge along the Essex Terminal route. **Figure 8** has been prepared showing the possible routes that could realistically be used to access such a Huron Church Road bypass.

For the section of Huron Church Road south of E.C. Row Expressway to the City limit; selected intersection improvements including additional turn lanes, signal timing changes, and localized widening; an adequate level of service for the future traffic volumes could be accommodated in the mid-term without the construction of the Schwartz-proposed truck bypass. From a purely traffic capacity perspective, with the potential for E.C. Row improvements and other localized improvements, the section of Huron Church Road south of E.C. Row is anticipated to be adequate beyond the 2018 horizon. These improvements include:

- Consolidation of traffic signals through the use of service roads parallel to the Huron Church Road at Springarden Road, Lambton Street and Pulford Street, and
- Combining the intersections of Huron Church /Cabana/Todd with Huron Church/Talbot Road through an interchange or grade-separated design.

5.6 Implementation Potential

5.6.1 Approvals Process

Any transportation infrastructure project in Ontario will be subject to requirements of the Canadian Environmental Assessment Act and the Ontario Environmental Assessment Act. Each of these Acts would require that an intensive environmental assessment process be undertaken to ensure that the proposed transportation facility is fully justified in terms of its need and in the best overall public interest given its cost and expected impacts to the environment (both natural and social).

As such, an Environmental Assessment Study must be undertaken by the Proponent and this Study must include a Transportation Needs Assessment (justifying why this project is needed), an evaluation of the alternatives to the project (alternative methods or modes of addressing the transportation needs), an evaluation of the alternative alignments and configurations for the selected mode of transportation, an assessment of the existing natural and social environment including potential impacts of the project and mitigation measures that could be implemented, and meaningful public consultation on both the process followed and the details of the alternatives and technically-preferred alternative.

As part of the EA Study process, the following major approvals would be required:

- Ministry of Natural Resources (MNR), Department of Fisheries and Oceans and Essex Region Conservation Authority (ERCA) for any possible impacts on fish habitat (such as Turkey Creek, Lennon Drain and Cahill Drain);
- Transport Canada related to approvals under the Navigable Waters Protection Act (again for Turkey Creek, Lennon Drain and Cahill Drain);
- MNR, Ministry of the Environment (MOE) and ERCA for possible environmental impacts on the Ojibway Prairie Grass Provincial Nature Reserve; and
- MOE for possible waste management issues related to construction in the vicinity of the West Windsor Malden Landfill (the location of the proposed truckway).

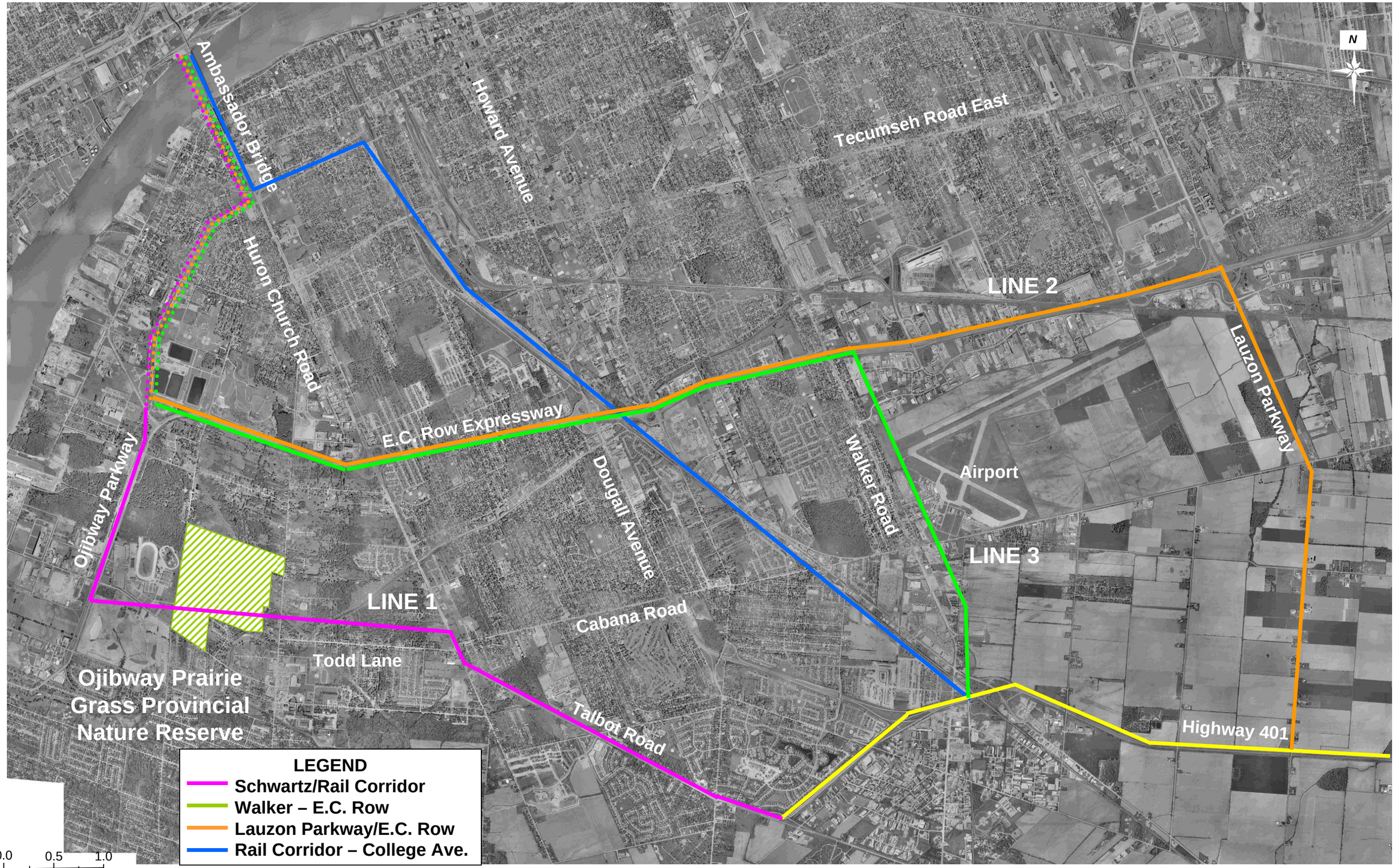

FIGURE NO. 8

REVIEW OF PROPOSED TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS, CITY OF WINDSOR

HURON CHURCH ROAD AUXILIARY (RELIEVERS) POSSIBLE ROUTING OPTIONS

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Also as part of the EA Study process, concurrence of the Ministry of Transportation Ontario (MTO) would be required on the basis that the truck bypass would necessitate significant construction impacts on MTO infrastructure. In discharging their legislated obligations in terms of CEAA and OEAA, MTO would be obligated to ensure that the environmental assessment process followed by the City of Windsor was appropriately undertaken and represented the best interests of the overall public before granting the City of Windsor access to their right-of-way for construction purposes (Encroachment Permit).

It is reasonable to expect, given the fact that an Environmental Assessment is currently underway for the international border crossing (DRIC) with the full support and participation of the Canadian and American federal and provincial/state governments, that the public would be confused by the seemingly parallel studies. With the knowledge that the DRIC project is scheduled to identify the technically-preferred border crossing by the end of 2007 and finish construction of the new crossing and approach roadways by 2013, the public may also object to planning and construction of the truck bypass on the basis that the need for such an expensive facility could be potentially be eliminated by the year 2013 if the crossing constructed as a result of the DRIC project is located in a different area. The public could potentially view the truck bypass project as pre-supposing the outcome of the DRIC project and thus dismissing the validity of the CEAA and OEAA.

5.6.2 Implementation Schedule

Following the completion of an Environmental Assessment as described above, a detailed engineering design process would be required to refine the Preliminary Design developed as part of the EA Study. As part of the detailed design process, the property requirements for the project confirmed that property acquisition would then be required and, if property owners are unwilling to sell their property, a property expropriation process would be required. Following acquisition of the necessary property, construction could commence on the acquired property.

It is possible that the City of Windsor could proceed directly with property acquisition following the completion of the Environmental Assessment Study based on the details of Preliminary Design of the Technically-Preferred Alternative detailed in the Environmental Study Report. Design and construction, perhaps in a Design-Build or a Design-Build-Operate-Transfer approach, could also commence immediately upon completion and approval of the Environmental Study Report; certainly, it is reasonable to expect that some preparatory construction works (such as utility relocations and right-of-way clearing operations) could proceed immediately with little design input.

The Environmental Assessment Process would require a relatively extensive period of time to complete. As examples:

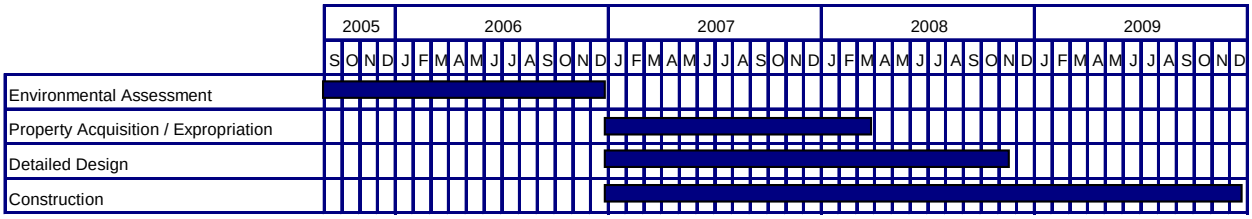
- The EA for the DRIC project has been estimated to last 3 years;
- The EA for the new rail and truck tunnel solution proposed by the Detroit River Tunnel Partnership was estimated optimistically to last 1.5 years; and
- The EA, design and construction for the proposed rail link from Toronto's Union Station to Lester B. Pearson International Airport (at an estimated cost of $200M) was originally proposed to last 4 – 5 years and be fully operational in 2008. The EA alone will now take a minimum of two years (2005 – 2006).

The minimum length of time that an Environmental Assessment for the truck bypass would be expected to take would be 1.5 years. Realistically, it is expected that the duration of such an EA would be more likely to exceed 2 years.

In the event that expropriation is required to purchase any necessary properties along the proposed truck bypass route, a time frame of between 6 and 18 months could reasonably be expected. Given the expected objections to the validity of this project by impacted residents, at least 12-15 months is anticipated to be required to acquire all of the necessary properties.

Given the amount of construction that is currently on-going in southwestern Ontario and the local environs, together with the technical complexity of the proposed construction, limited availability of boring equipment and the significant traffic impacts anticipated to result, the construction of a conservatively estimated $200M truck bypass (including a single two lane, one-way tunnel) under the Nature Reserve would be at least 3 years.

Accordingly, a very optimistic schedule for the proposed truck bypass using an accelerated Design-Build approach has been developed and is presented below:



If tunnel boring equipment cannot be readily obtained the implementation schedule could be much longer.

On this basis, if the environmental assessment process for the truck bypass were commenced in earnest in September 2005, the earliest possible timeframe that the truck bypass could be in operation would be 2010. In the event that the estimate for the border crossing as proposed by the DRIC project is completed on schedule, the truck bypass could be in operation for as little as 3 years before potentially becoming obsolete.

5.6.3 Construction Cost

In researching the concept of using Tunnel Boring Machines for the 1.3 km tunnel proposed in the Schwartz Report, the following cost estimates were identified:

- 57 km twin transportation tunnels through the Swiss Alps - $100,000,000 (US) per km;
- 4.5 km twin transportation tunnels in Dublin, Ireland - $125,000,000 (US) per km; and
- 300 m twin LRT tunnels (6 m in diameter) in Alberta - $100,000,000 (CAN) per km.

Without knowledge of the subsurface conditions along the proposed route of the truck bypass, it is not possible to develop a firm cost estimate for the tunnelling (tunnelling cost is expected to vary significantly on the basis of the diameter of the tunnel, as well as the subsurface material to be tunnelled through). Even using a conservative estimate of $100M (CAN) per km (based on the Alberta LRT tunnelling project cost), however, would yield a cost of at least $65M for a single tunnel, or $130M for a twin tunnel and potentially much higher. It is reasonable to expect the cost of construction for an urban at-grade truck bypass (including property acquisition costs) to be in the order of $10 – 15M per km. Therefore, the total cost of construction for a two tube truck bypass should be expected to cost at least $200M and, with reasonable contingencies

factored in (together with the premium cost of such a short section of tunnel), could easily reach a cost of over $200M. If all three tunnels of the ultimate Schwartz-proposed tunnel were constructed, the cost of construction could easily exceed $300M.

For the same $200 - $300M expenditure for constructing a potentially short-term 8 km truck bypass, a six-lane urban at-grade freeway of anywhere between 14 – 30 km (depending upon the details of the alignment) could be constructed in a location suitable for the long-term border crossing ultimately selected by the DRIC project.

6.0 E.C. ROW EXPRESSWAY

6.1 Potential Improvements to Manage Traffic During Construction of Other Projects

Introduction

During construction of the projects associated with Phase 1 and Phase 2 of the "Let's Get Windsor-Essex Moving" program, existing traffic is expected to be impacted and traffic patterns modified. The proposed construction that will be on-going over the next several years is identified in Section 2.2.2.

Currently, there is very limited capacity along the parallel routes such as E.C. Row or other facilities to accommodate the shift in traffic. As mentioned previously, E.C. Row is already congested with local traffic in the vicinity of the Dougall Avenue and Howard Avenue interchanges. Although some limited cross border through traffic may find this route more suitable, it must be a viable alternative in terms of travel time for drivers to divert from the Highway 401/Talbot Road/Huron Church Road route to the Highway 401 delays. This would mean that an adequate high speed connection from Highway 401 to E.C. Row would need to be in place so that driver's have a choice once construction delays are recognized well in advance of the decision point.

Widening of E.C.Row to a basic 6-lanes is needed for local traffic and usage for significant volumes of international traffic would require further widening, which is a major undertaking. Implementation of the Lauzon Parkway extension and/or Manning widening at an early enough stage of the Phase 2 Windsor Gateway as well as upgrading E.C. Row may not be practical improvements to be completed prior to construction of the Highway 401 and Talbot widening. It is concluded that widening of Talbot Road can best proceed at an early stage with appropriate traffic management to at least maintain existing capacity on Talbot Road.

This may also have impacts at the Huron Church Road/E.C. Row north ramp intersection. The westbound right turn could be fairly high (over 1,000 vph in the A.M.) and may warrant some mitigation. In addition the southbound to eastbound interchange loop would see an increase from the current 800 vph flow rate and may become unstable during surges in the peak hour.

Given the increased volume of local traffic expected to use E.C. Row over and above the volume of traffic already using the expressway as indicated above, it may be appropriate to consider the potential of making improvements to E.C. Row to better accommodate the existing and future traffic.

Improvements to E.C. Row Expressway

A review of the General Arrangements of the E.C. Row Expressway bridge sites from Matchette Road at the west end of the expressway easterly to Lauzon Parkway reveals that, as part of the planning and design for the E.C. Row Expressway, allowances had been made for a third lane in each direction within the existing median width in twelve (12) of the sixteen (16) sites. Furthermore, provisions had been made at four (4) structure locations for an ultimate collector-distributor system, namely from just east of Dominion Boulevard easterly to east of Howard Avenue. In that area, the two (2) lanes in each direction, which would function as the collector lanes in the future, have been constructed, while the future core lanes, two (2) in each direction, will be placed within the existing "median" space. There is no space for additional lanes beyond that provision. Traffic data also indicates that this part of the expressway carries the highest volumes now and in the future.

A summary of the existing structures located along E.C. Row Expressway is provided in **Table 2.**

Table 2: Existing Structures Along E.C. Row Expressway

#	LOCATION	YEAR CONSTRUCTED	STRUCTURE TYPE
1	Matchette Road Overpass	WB – 1981; EB – 1990	prestressed concrete beams prestressed AASHTO beams
2	Malden Road Overpass	WB – 1981; EB – 1990	prestressed concrete beams prestressed AASHTO beams
3	Huron Church Road Overpass	1989	concrete post tensioned deck slab
4	Mark Avenue Pedestrian Underpass	1981	concrete box beams with slab
5	Dominion Boulevard Overpass	1989	concrete post tensioned deck slab
6	Academy/Dandurand Pedestrian U'pass	1980	concrete box beams with slab
7	Dougall Avenue Overpass	1972	prestressed concrete box beams
8	CNR (formerly Penn Central Railway) Overhead	1972	concrete, post tensioned deck slab
9	Howard Avenue Overpass	1972	concrete, post tensioned deck slab
10	Conservation Drive Overpass	1976	rigid frame concrete structure
11	Walker Road Overpass	1976	prestressed concrete beams
12	CNR (formerly C & O Railway) Overhead	1978	prestressed concrete beams
13	Central Avenue Underpass	1980	prestressed concrete beams
14	BL & H Railway (fomerly CPR) Overhead	1980	concrete rigid frame
15	Jefferson Boulevard Overpass	1980	concrete box beams
16	Lauzon Parkway Underpass	1980	concrete post tensioned deck slab

At bridge sites 1 to 5 provisions have been made for a third lane in each direction within the existing median. At bridge sites 6 to 9, provisions have been made for two (2) additional core lanes in each direction within the existing median, independent of the two (2) collector lanes currently in operation in each direction. At bridge sites 10 to 16, provisions have been made for a third lane in each direction within the existing median.

It is understood that the existing condition of the concrete base on the expressway and at least several of the interchange structures is less than satisfactory due to alkali-silica reactions occurring due to the type of aggregate used. As a result, it may be appropriate to consider the possibility of coordinating the rehabilitation / reconstruction of the expressway at the same time that the median widening is undertaken to take advantage of the traffic staging and cost efficiencies.

Huron Church Road / E.C. Row Expressway Interchange

On the basis that a particular increase in traffic volumes may occur at the Huron Church Road interchange, it may also be appropriate to consider improvements at this interchange, particularly Ramps E-NS and Ramp N-E (i.e. the ramps expected to be used by traffic from and bound for the Ambassador Bridge crossing. The existing interchange is a Parclo A-4 interchange.

Ramp E-NS is an outer loop ramp and features a standard two-lane exit (a deceleration lane and taper is developed and an either-or movement is permitted from Lane #2 of the through lanes on the expressway). Within the limits of this ramp, a third lane is developed and directed via a single-lane channelization to serve traffic bound for the border; this E-N ramp merges onto Huron Church Road via a short taper. Given the increase in traffic volumes expected, it may be appropriate to consider modifying the existing ramp terminal to eliminate the channelization and permit two-lanes of traffic to make the right-hand turn onto Huron Church Road.

To avoid significant impacts on the volume of traffic expected to turn right onto Huron Church Road, it may also be appropriate to consider widening this ramp from 3 to 4 lanes, and modifying the ramp exit from the expressway to feature a 3-lane exit. A 3-lane exit could be accomplished by forcing one of the through lanes of traffic on the expressway to exit; this could only be achieved with the provision of an additional WB median lane (as discussed above).

Ramp N-E is an inner loop ramp and features a single lane exiting Huron Church Road via a direct taper exit and entering the expressway via a parallel lane and taper. With the potential increase in traffic demand on this ramp, it may be appropriate to reconstruct this ramp to accommodate two lanes as the capacity of the existing single lane ramp may be exceeded. Although a two lane inner loop ramp is not a typical design, there are other examples of such ramps operating satisfactorily in Ontario; the existing 90 m ± radii for this ramp will also help to facilitate the conversion to two lanes.

With two lanes of traffic entering the E.C. Row Expressway via this loop ramp, it would be appropriate to make one of the lanes continuous to the east; the other lane would merge after approximately 400 – 500 m as is standard for expressway on-ramps. The addition of a continuous lane at this ramp is the ideal introduction for a third eastbound lane on the expressway.

For the Huron Church Road Interchange improvements identified above, it should be possible to avoid the need for a widening of the WB interchange structure since the third WB lane would exit in advance of the structure. For the EB interchange structure, however, a widening would be necessary, unless a separate ramp structure were constructed.

Under normal circumstances, it would be expected that, with a widening necessitated by the addition of a lane on the right side of the structure, a widening of the EB structure on the right side would be indicated; however, given the potentially short-lived need for a two-lane Ramp N-E and the anticipated need for a future median widening across this structure, it would be appropriate to widen this structure toward the median and shift Lanes 1 and 2 to the left. Given the type of existing structure (concrete post-tensioned deck slab), the future need to widen E.C. Row Expressway to 6-lanes across Huron Church Road, and the possible desire to make the EB and WB structures contiguous (to facilitate current and future staging of construction), it may be appropriate to construct the future median widening of both the EB and WB structures at this time.

6.2 Need to Reconstruct Huron Church / E.C. Row Expressway Interchange

In the event that the widening of the E.C. Row Expressway is deemed to be justified to suit the anticipated permanent increase in traffic volumes, an investigation of the technical difficulties that may be encountered in constructing the widening would be appropriate. Widening of the at-grade portion of the expressway is considered to be relatively straight-forward and readily achievable. The widening of some of the existing structures into the median may pose certain difficulties.

Focussing on Huron Church Road Interchange, the existing EB and WB structures are concrete post-tensioned deck slab structures and, according to some reports, are of some concern regarding the condition of the structures. The widening of a concrete post-tensioned deck slab structure is not a simple procedure. Widening of a multi-span post-tensioned solid slab bridge structure involves both widening of the substructure and superstructure components. Substructure widening has been completed on several bridge structures in Ontario and practical methods have been developed to deal with several substructure types. However, widening

post-tensioned structures is not commonly undertaken as structural compatibility between the existing and widened structure is not uniform due to the time related effects of concrete shrinkage, creep, and deformation of the structure due to post-tensioning. Although not practical, widening of a post-tensioned structure will involve constructing an independent structure along side of the existing structure separated by a longitudinal isolation joint along the entire length of the bridge. History has demonstrated longitudinal isolation joints are not good long-term performance details and typically deteriorate quickly resulting in accelerated deterioration of the structures caused by leakage of salt laden water run off. Costly rehabilitation of these joints and deck underside approximately every 10 to 20 years makes widening of the existing superstructure an ineffective solution. From a practical perspective, the long term cost effective approach to widening a post-tensioned structure is to replace the superstructure in is entirety.

Accordingly, in the event that additional capacity is required across these structures, it may be necessary to completely replace the existing structures. The replacement of these structures, while minimizing the impacts on existing traffic, would necessitate the development of relatively extensive staging of construction plans. As part of this review, an evaluation of the potential staging of construction approach was undertaken and the results are provided below.

6.2.1 Horizontal and Vertical Clearances

Each existing structure features concrete deck thickness of approximately 1.2 m (with a 90 mm asphalt riding surface), a minimum vertical clearance recorded as 5.296 m and a maximum span length of approximately 29.3 m. In the event that this structure is replaced with a slab-on-girder type structure, the expected structure depth would be increased to approximately 1.5 m (using a span-to-depth ratio of 25.5:1), indicating that sufficient vertical clearance would be available without the need for a grade raise on the expressway; in the event that a grade raise is required, it is expected that this could be provided relatively easily. In the event that a similar post-tensioned structure is constructed as a replacement, it is expected that the final vertical clearance and temporary vertical clearance during construction (accounting for the falsework) will also be satisfactory.

The existing structure spans provide sufficient horizontal and vertical clearance to accommodate the provision of at least one extra lane in each direction on Huron Church Road, should such a widening be required; if retaining walls are constructed in front of the existing abutments, it is expected that two extra lanes could be accommodated. These extra lanes could be accommodated while maintaining a direct taper exit terminal to the inner loop ramps.

6.2.2 Staging of Construction for Structure Replacement

The Huron Church Road Interchange is located near the end of a horizontal curve in the alignment of the E.C. Row Expressway; as such, in evaluating the manner in which the structures could be replaced while minimizing traffic impacts of construction, a permanent realignment of the E.C. Row Expressway to the south by slightly flattening the existing horizontal curve would be an attractive solution.

In Stage 1, construction of a new EB structure would be undertaken, together with the approach roadway and south-side ramps for the realigned E.C. Row Expressway; minor traffic detouring would be required to maintain uninterrupted traffic flow along all roadways and ramps. In Stage 2, EB traffic on the expressway would be diverted to the new EB structure and the existing structure demolished; demolition of the existing structure would be undertaken during a single night full closure of Huron Church Road, with traffic temporarily diverted to other roadways.

Following this demolition, the construction of a new WB structure and approach roadways would be undertaken, together with a temporary connection to the existing north-side ramps. In Stage 3, WB traffic would be diverted to the new WB structure and the existing WB structure would be demolished in a similar manner to the EB structure. Following demolition of the structure, final modifications to the existing north-side ramps would be undertaken.

Instead of permanently realigning the WB lanes to the south to parallel the relocated EB lanes, it is possible to modify the staging of construction approach so that the new WB structure is constructed at the same location as existing. An additional stage of construction would be required to affect this. The possible staging of construction for the replacement of the Huron Church Road Interchange is illustrated in **Figure 9**.

Realigning the E.C. Row Expressway to the south may require a relocation of the south-side ramps. Based on our review, a relocation of these ramps appears to be achievable with minimal property impacts. If additional property is not available, it is considered possible to modify the interchange geometrics to respect the existing limits. As an example, the existing Ramp N-E features an existing radius of 90 m and, according to the Geometric Design Standards for Ontario Highways Manual; it is permissible to reduce the radius of such an inner loop ramp to 55 m. Accordingly, the "footprint" of this inner loop ramp can be reduced and maintained within the existing property limits.

6.2.3 New Structure Type

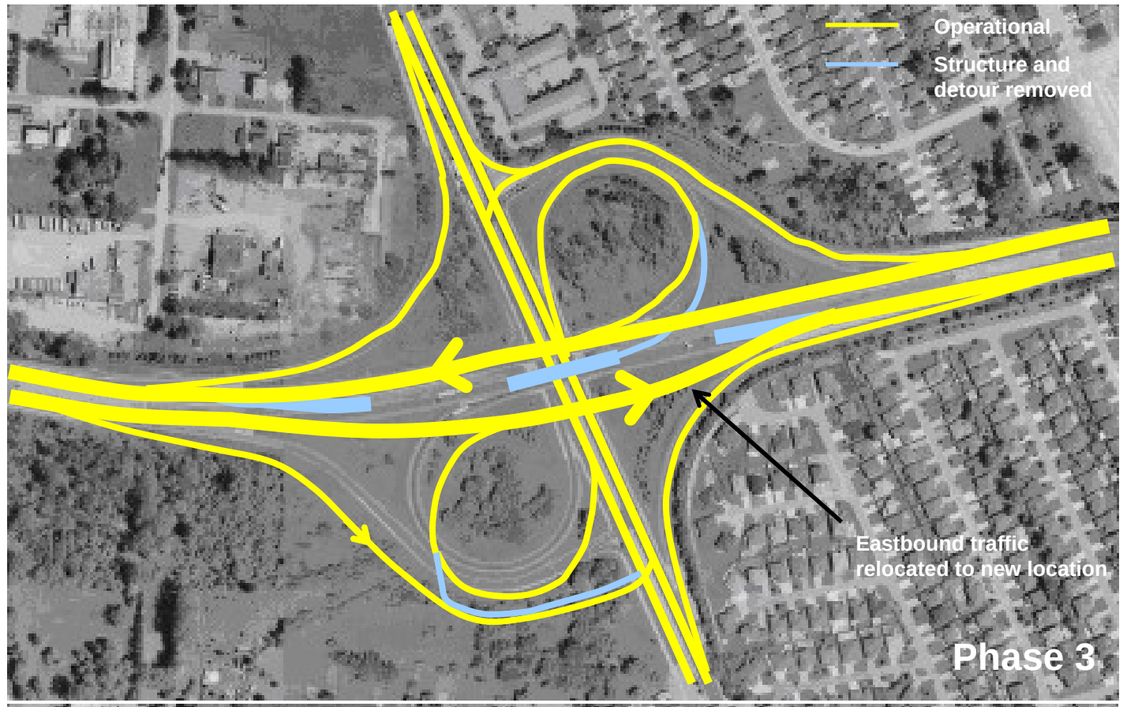
The type of structure that could be provided for the new EB and WB lanes at Huron Church Road is dependant upon whether or not the EB and WB lanes are both realigned or not, and whether it is expected that further widening of the replaced structures may be required in the future. In the event that both structures are realigned or if future widening is anticipated, it may be advisable to select a structure type that can be built in stages or widened in the future. On this basis, the replacement in-kind with a post-tensioned concrete deck slab structure may not be appropriate.

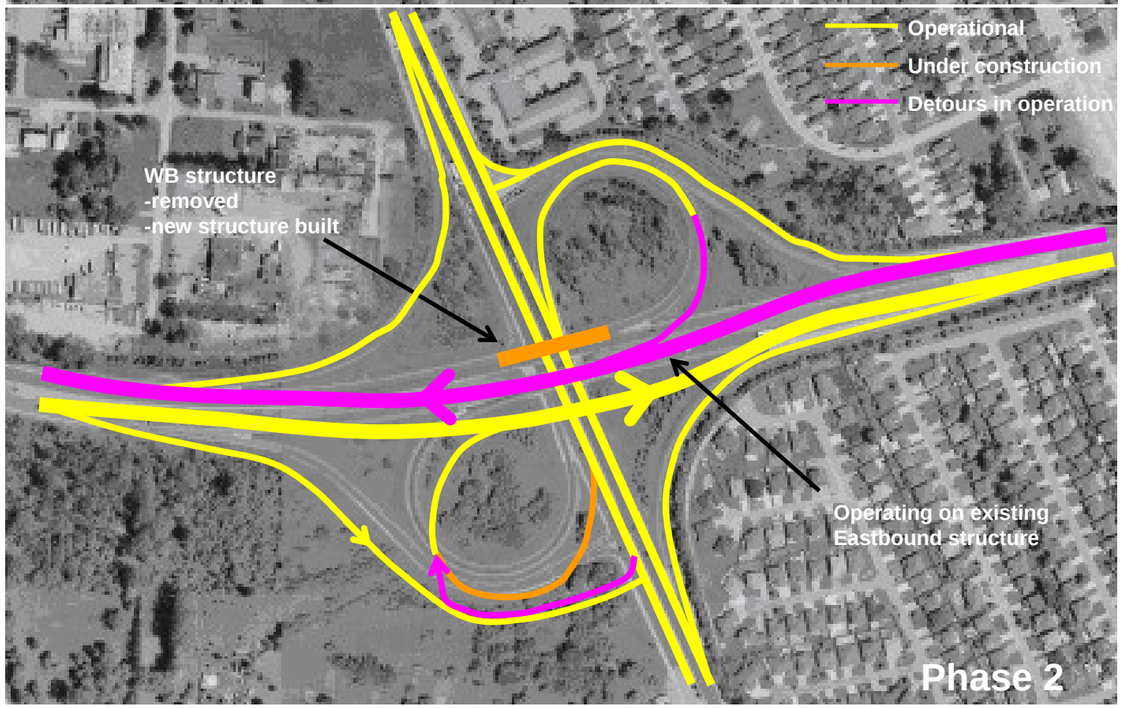
6.2.4 Impacts at Other Interchanges

It should be noted that the same concrete post-tensioned deck slab structure type exists at both Dominion and Howard Avenues. Accordingly, if and when the widening of E.C. Row is undertaken, similar widening and staging of construction difficulties will be experienced. Although the staging of construction at these interchanges has not been thoroughly investigated, it is expected that the work is achievable.

At Dominion Avenue, it may be possible to divert the two-lanes of WB traffic onto the existing EB structure and accommodate all four lanes of traffic, separated by median barrier. Such a situation would require a relocation of the noted collector ramp, reduction of lane and shoulder widths and a reduction of the posted speed to 60 – 70 km/h. While this staging is not a desirable approach, it should be acceptable.

At Howard Avenue, the existing structures have been identified as "collector structures", suggesting that the future "express structures" could be built to accommodate the increased traffic volumes. As such, staging of construction for this approach would be relatively straight-forward. In the event that a replacement of the existing "collector structures" is selected instead, a similar staging of construction approach as proposed at Huron Church Road or Dominion Avenue could be considered.





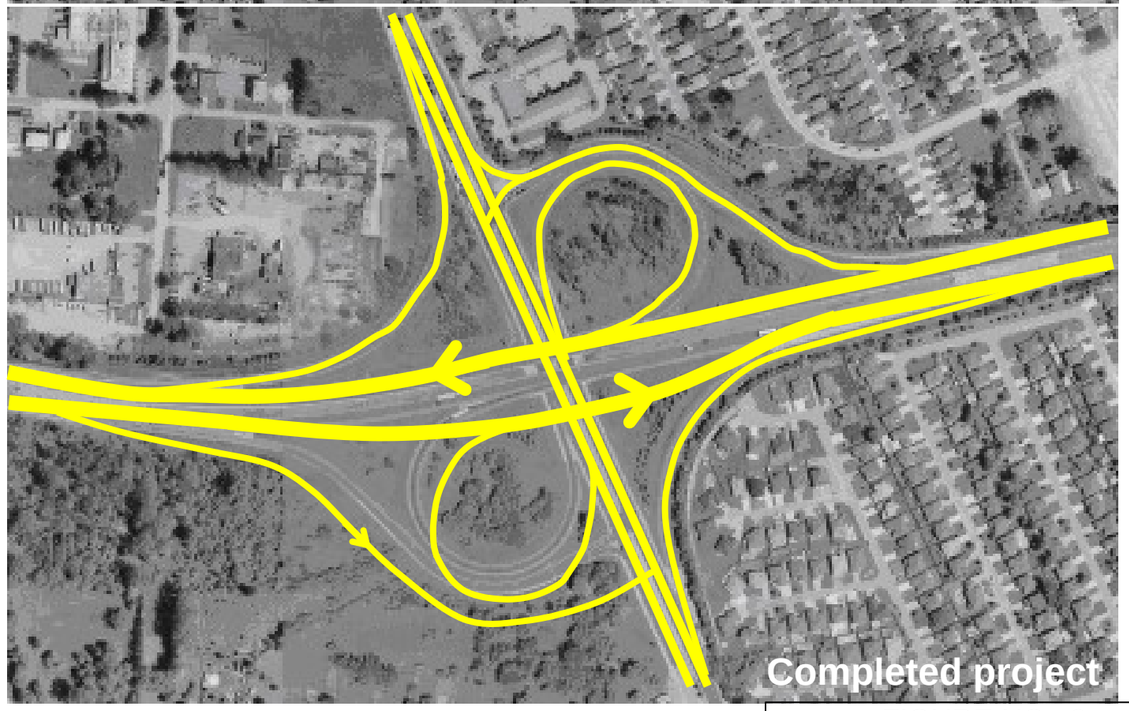


FIGURE NO. 9

REVIEW OF PROPOSED TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS, CITY OF WINDSOR

HURON CHURCH RD - EC ROW EXPWY INTERCHANGE BRIDGE RECONSTRUCTION
BASIC IMPLEMENTATION PHASES

6.3 Potential Use to Accommodate Increased Truck Traffic

As indicated previously, the widening of E.C. Row Expressway to at least six lanes had been incorporated into the planning and design of the facility and traffic volumes have increased since opening to the point that some sections of the expressway are operating at or near capacity. The traffic using E.C. Row is generally local in nature and does not contain a significant percentage of traffic bound to or originating from the border crossings. A widening to address the current levels of congestion on E.C. Row may already be warranted. Such a widening would also help to mitigate the impacts from the increased volume of traffic (both temporary and permanent increases) expected to divert to this facility during the construction of the Phase 1 and Phase 2 "Let's Get Windsor/Essex Moving" projects.

If the widening of E.C. Row Expressway to six lanes were undertaken, some spare capacity may exist in the mid-term to consider the use of E.C. Row itself as a secondary route to Huron Church Road, in lieu of the over $200 - $300 million truck bypass route proposed in the Schwartz Report. In the anticipation that the use of E.C. Row Expressway as a secondary route would only be a mid-term condition (until a new border crossing is constructed), the work associated with the widening and upgrading of the expressway would serve a double duty in satisfying both the mid-term and longer-term needs of the City of Windsor. However, this dual function would operate efficiently only in the short term.

In contrast to the obvious mid-term and long-term benefits of widening and upgrading E.C. Row Expressway to the residents of Windsor, the long-term use of the truck bypass proposed in the Schwartz Report could conceivably be of little local benefit.

It is acknowledged that, for at least a section of E.C. Row Expressway (specifically on the approach to Huron Church Road), there is a potential for trucks to mingle with general purpose traffic and result in some operational difficulties. To address these concerns, it may be possible (with appropriate regulatory/legislative modifications) to direct trucks bound for the border to use a separate centre median lane along E.C. Row. This separate lane is envisaged as being akin to a High Occupancy Vehicle lane, offering physical separation of the different streams of traffic. To minimize conflicts at exits from the expressway, a separate median truck-lane exit from the expressway could be provided.

Regardless of the precise details of how trucks could be accommodated along the E.C. Row, it is evident that increased benefits accrue to the local community with the use of a widened E.C. Row Expressway as compared to the construction of the Schwartz-proposed truck bypass.

6.4 Noise and Emissions

With the potential for additional lanes and traffic on E.C. Row, it is likely that residents within a 200 m corridor may experience a noticeable increase in noise levels unless mitigation measures are implemented. Noise walls, improved pavement surface and other mitigative measures should be considered.

Currently, the congestion on key sections of E.C. Row is causing some undesirable vehicle idling and emissions. With the potential widening from the existing 4 core travel lanes to 6 lanes, some relief would be realized and in turn, reduce the vehicle emissions.

The suggested roadway improvements would help to alleviate the bottlenecks and reduce the amount of delay to drivers and consequently reduce vehicle emissions. Further investigation of noise and emission impacts due to the E.C. Row improvements should be undertaken.

6.5 Further Studies

In recognition of the potential for E.C. Row improvements a feasibility study of the corridor is recommended including future lane requirements, rehabilitation needs, traffic management during construction, safety, noise and emissions.

7.0 OTHER POTENTIAL MID-TERM IMPROVEMENTS

7.1 Interim Traffic Operation and Intersection Improvements

As indicated earlier, Huron Church Road between the Ambassador Bridge and E.C. Row Expressway will reach capacity by about 2013, and should a new international crossing be delayed, mid-term improvements should be identified and protected to ensure continuation of adequate traffic operations.

A number of mid-term improvements as identified in Section 5.5.4 could be considered for the sections north of E.C. Row and the intermodal facilities.

7.2 Huron Church Road Auxiliary Route, E.C. Row to the Ambassador Bridge

If the improvements suggested above are not adequate to address the mid-term needs, other alternatives should be explored to get traffic to the Ambassador Bridge off Huron Church Road. The only currently identified road improvement proposals that by-pass this section of Huron Church Road are the development of a new road corridor from the E.C. Row/Ojibway Parkway intersection to the Huron Church Road/College Avenue intersection and a new road alignment along the Essex Terminal right-of-way from the vicinity of Highway 401/Walker Road to College Avenue.

Unless other alternatives are identified, it is suggested that studies/property acquisition proceed on a schedule such that its implementation could be undertaken by 2013, if required.

Alternative routes would supplement the existing Ambassador Bridge access route as shown in **Figure 8** and would have residual benefits to the City of Windsor, independent of the selected border crossing.

APPENDIX

Terms of Reference & Study Approach

Government of Canada | Gouvernement Du Canada

TERMS OF REFERENCE

TRANSPORT CANADA

Independent Engineering Review of Transportation Infrastructure Improvements Recommended by the City of Windsor

Transport Canada
Surface Transportation Policy
June 17, 2005

June 17, 2005

Statement of Work

Requirement

Transport Canada's Surface Transportation Policy Directorate urgently requires the services of an expert consultant engineer to assist the department in evaluating and validating some of the recommendations by the City of Windsor as proposed in the Schwartz Report and improve access to the existing border crossings at the Windsor Gateway, in a manner that is consistent with the long-term planning process already underway.

Background

Windsor is Canada's single most important trade and transportation link between Canada and the United States (U.S.). Over 16 million vehicles and approximately $120 billion in road-based merchandise trade pass through the crossing annually. The many challenges that face the Windsor-Detroit border crossing need urgent attention and resolution. Travel demand on the Ambassador Bridge is expected to reach capacity around 2012 to 2015. As well, additional capacity is needed for redundancy and national security in the event of a temporary closure of the Ambassador Bridge. Consequently, additional border crossing capacity is required.

The governments of Canada, the U.S., Ontario and Michigan established the Bi-National Partnership in 2001 to undertake the long-term planning for additional border crossing capacity in the Windsor-Detroit area. The Bi-National Partnership has developed a cross-border 30-year transportation strategy that sets out the process for considering new border crossing capacity for the Windsor-Detroit gateway. The Bi-National Study is using a single coordinated planning and environmental study process, which will meet the legislative requirements of all four members of the Partnership. Due to the stringent legislative and regulatory requirements, the EA study will take approximately three years to complete. It is expected that the preferred corridor will be announced between the end of 2006 and Spring 2007 and the Environmental Assessment Report will be submitted to the Ontario Minister of the Environment at the end of 2007. It is anticipated that construction would begin in 2010, with the opening of additional crossing capacity occurring is 2013. Thus, with a long-term solution requiring considerable lead-time, the federal/provincial strategy is currently addressing border capacity issues through short and medium-term solutions in order to improve the traffic flow leading to the existing crossings. The three levels of government signed a Memorandum of Understanding (MOU) on March 11, 2004, titled *Let's Get Windsor-Essex Moving Strategy*. This MOU proposed two project phases. Phase 1 includes five projects originally estimated at approximately $83 million and was announced on March 11, 2004.

The Schwartz Report

In 2004, the City of Windsor commissioned a traffic engineer, Sam Schwartz, to develop a proposal for Phase 2 of the "Let's Get Windsor-Essex Moving Strategy". The "Schwartz Report", intended to address congestion problems in the Windsor area, was released in January 2005, and recommended a multi-modal package of projects including a Huron Church Road truck by-pass and a related truck pre-processing center (PPC) at Brighton Beach, upgrading of

Lauzon Parkway and Manning Road, and upgrading of Talbot Road and Highway 401. Both city and county councils received the Schwartz Report positively.

Canada and Ontario Agreement for Phase 2

Using the Schwartz Report as the foundation, Canada and Ontario announced on April 21, 2005, a funding commitment of $129 million for Phase 2 of the "Let's Get Windsor-Essex Moving Strategy". This funding commitment includes environmental assessments and detailed design for a number of road improvements and upgrades including those to Highway 3/Talbot Road, Lauzon Parkway and Manning Road. Additionally, Phase 2 also includes improvements to access truck ferry services, development of a truck marshalling yard on Highway 401, a rail rationalization study and implementation of Intelligent Transportation Systems.

Presently, Transport Canada is of the opinion that the proposed Huron Church Road truck by-pass and the Brighton Beach PPC recommended by the Schwartz Report and the City of Windsor could pose a risk to the Bi-National Partnership environmental assessment process and be seen as prejudicing the selection process for additional international border crossing capacity.

As well, Transport Canada is not convinced that the construction of the Brighton Beach PPC and the Huron Church Road truck by-pass are the most practical, efficient and cost-effective solution for the medium-term to improve traffic flow to existing border crossings or to provide an effective diversion route for traffic in the Windsor area during construction of the other road-based projects. Consequently, the services of an independent, third-party expert engineer are required to provide a neutral and informed perspective on these important concerns.

Scope of Work

The consultant will work closely with Transport Canada, provincial and city officials. The specific task of this project is to provide technical expertise on various engineering questions. The following is a list of questions that forms a basis for the scope of work and would be refined in consultation with the consultant to ensure that a balanced opinion is provided.

1. Traffic Flow Management

   How can commercial and passenger traffic flows to the existing border crossings be managed during construction of the road projects that the federal and provincial governments have agreed to fund?

   Is the existing road infrastructure sufficient to handle traffic that would be diverted during construction? If not, where would be the capacity problems and what could be the possible solution?

   Can the resulting diverted traffic be managed through phasing of construction or other techniques? How should the Phase 2 projects be phased in order to minimize disruption to cross-border traffic?

2. Huron Church Road Truck By-pass

Are the Brighton Beach PPC and the Huron Church Road truck by-pass needed to address traffic problems in the Windsor area in the medium-term, i.e. prior to the availability of new crossing capacity in 2013, through the Bi-National Process?

Is there a duplication of effort, given existing privately owned PPCs and the proposed Brighton Beach PPC?

Given the large volume of trucks that would need to enter Huron Church Road from the Bypass, would ramp metering trucks onto Huron Church Road north of the E.C.Row Expressway be technically feasible or necessary? How would the intersection of the Bypass and Huron Church Road function?

Given the additional out of way travel that trucks using the Bypass would experience, would the Huron Church Road by-pass represent an efficient way of improving traffic flows to existing border crossings and to diverting commercial traffic during construction of other road improvements?

Would there be more or less truck emissions and noise if trucks were moved from Huron Church Road to the Bypass?

Given that no improvements to Huron Church Road are being considered from the E.C.Row Expressway to the Ambassador Bridge, how would this project reduce travel times and benefit border congestion?

Are the benefits of this project likely to outweigh the impacts? Are there alternate routes that would provide similar or greater benefits while minimizing impacts?

Does this project provide a necessary redundancy in the transportation network?

The Schwartz proposal for this project is to have parts of the by-pass road at grade, above grade and below grade. Is this feasible from a technical point of view and cost effective (good value for what the project would accomplish)?

What is the estimated completion date for construction of Huron Church truck bypass relative to all other projects and completion of new crossing capacity?

How does the completion date impact its effectiveness in addressing medium term traffic concerns?

What is the impact of the truck by-pass construction upon Windsor traffic if the other projects are ongoing?

What would the impact be to Windsor traffic if Phase 2 projects were not constructed prior to construction activity and completion of the truck by-pass as suggested by the Schwartz report?

3. E.C. Row Expressway

What will the impact on E.C. Row Expressway be when construction of other road projects commences?

What will be the impact of completion of the other road projects on E.C. Row Expressway?

Would improvements to the E.C. Row Expressway help manage traffic during construction of the recommended road projects? If so, what type of improvements should be considered?

If improvements were to be made to the E.C. Row Expressway to facilitate getting trucks to the Ambassador Bridge during the construction of other projects such as Hwy 3/Talbot Road, is it necessary to reconstruct the Huron Church/E.C.Row Interchange? If so, would this interchange need to be closed to traffic during construction of the improvements to E.C. Row?

What is the age and condition of the Huron Church/EC Row interchange structures? If reconstruction is necessary immediately, can it be staged with night work etc, so truck traffic can be maintained on Huron Church Road, without closing all the lanes on Huron Church completely? If not, can reconstruction be deferred until a new crossing is in place?

Deliverables

The consultant will prepare a concise and well-documented report responding to the above questions and provide any other views or opinions that would help support the position taken. After submission of a draft report, the consultant will be available to provide one or more oral briefings to Transport Canada and municipal and provincial officials. The scope of work must be completed by August 29, 2005.

Reference Material

Transport Canada will provide the consultant with any and all information that relates to the scope of work as well as work related to the Bi-National Partnership process. Transport Canada will make every effort to provide the consultant with access to any and all related documents from the Province of Ontario and the City of Windsor. The consultant will need to conduct a site

visit of the proposed project sites. The consultant may need to meet with officials or representatives or contractors from the Province of Ontario and/or the City of Windsor.

Confidentiality

The consultant will be required to sign a Confidentiality Undertaking as part of this contract (see attached).

Conflict of Interest

The proposal must contain a statement from the consultant that the consultant is not aware of any real or perceived conflict of interest and provide assurance that the consultant will advise Transport Canada immediately should a potential conflict of interest situation arise during the execution of this contract.

Project Budget

Total costs for this project may not exceed including professional fees, travel costs, and miscellaneous expenses.

Payments will be made as follows: 70% upon receipt of the draft report, 30% upon receipt and acceptance by Transport Canada of the final report.

Departmental Representative

The Departmental Representatives for this project are:

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STUDY APPROACH AS PER SUBMISSION TO TRANSPORT CANADA JUNE 20, 2005

The general study approach has been developed based upon a review of the available background studies and the statement of work. This approach will be refined as necessary in consultation with Transport Canada during the course of the study. It is assumed that all necessary background information including copies of reports, technical analyses, maps and aerial photography, as-built drawings, travel forecast data, traffic models (e.g. VISSUM), etc. will be provided to the consulting team and that no new data collection or model development is envisaged. As well it is assumed that Transport Canada will obtain cooperation from other levels of government (Ontario, City of Windsor) in obtaining confirmation and scheduling meetings with staff and their consultants in a timely fashion.

The study is structured to address the issues identified in the Statement of Work dated June 17, 2005; however, it is anticipated that some issues may require further study or analysis beyond the scope of this assignment to fully address these issues and the scope of further studies will be clearly identified in the final report.

The proposed study approach is as follows:

1. Assembly and Review of Background Documentation

Available background documents, mapping and aerial photography, technical analyses, traffic volumes, travel forecast data and as-built drawings of road infrastructure will be obtained from Transport Canada or other involved agencies, reviewed and key information summarized for analysis.

2. Site Inspection

A detailed field review of the study area will be scheduled early in the study to confirm existing conditions and traffic conditions. This inspection will include visual inventories and condition assessment of key infrastructure elements, a photo inventory and identification of key issues for further review. It is anticipated that two senior team members will spend two days each on site.

3. Meetings with Key Agencies

Meetings with key agency representatives will be held early in the study to confirm base information, current study status, options and issues. Meetings will be held at a minimum with Transport Canada staff involved in the border crossing environmental assessment and related improvements, Ministry of Transportation, Southwest Region and City of Windsor. Meetings with City of Windsor should involve transportation engineering staff and representatives from S. Schwartz Engineering PLLC and possibly other consultants retained by the City. Minutes of meetings and summaries of data provided will be provided to Transport Canada.

4. Traffic Flow Management

A review and summary of existing and mid-term traffic flows to the existing border crossings will be undertaken and compared with available capacity. As well the proposed road improvement projects and their likely construction schedule would be summarized. The impact of construction of road projects agreed by the federal and provincial governments will be addressed in terms of road system capacity. If deficiencies are anticipated possible

solutions in terms of construction staging or alternative improvements/traffic management strategies will be identified. It is likely that potential solutions will require more detailed investigation subsequent to the completion of this investigation.

5. Huron Church Road Truck By-Pass

The proposed Huron Church Road truck by-pass as proposed by Schwartz would be reviewed in terms of:

1) mid-term needs prior to 2013 (including consideration of other planned construction and effectiveness in light of costs and completion dates);
2) efficiency in improving traffic flow;
3) impacts on traffic during construction;
4) feasibility/need for ramp metering onto Huron Church Road north of the E.C. Row Expressway;
5) operations of By-pass/Huron Church Road intersection;
6) impact of emissions/noise (comparative assessment only);
7) need for additional road improvement on Huron Church Road from E.C. Row Expressway to Ambassador Bridge;
8) benefits/redundancy vs. costs/impacts;
9) need for Brighton Beach PPC; and
10) impact of construction by-pass prior to other Phase 2 projects.

6. E.C. Row Expressway

An assessment of impacts on E.C. Row Expressway will be undertaken to assess the impact on E.C. Row Expressway during and after construction of other projects, potential improvements to manage traffic during construction, need to reconstruct Huron Church/E.C. Row interchange and traffic management strategies during such construction. As well, a brief assessment of the use of E.C. Row Expressway as part of an alternative truck by-pass route will be addressed. This assessment will be in the form of a strategic overview that will look at corridor issues and solutions use typical cross-sections to reach initial findings subsequent detailed analyses will be required to confirm these initial findings.

7. Report

A draft summary report will be prepared to present the study approach, key findings and views and opinions. The report will include necessary text, charts and figures to clearly identify the positions/findings of the Consultant Team and up to five copies provided to Transport Canada for review.

The Consultant will be available to provide up to two oral briefings to Transport Canada and municipal/provincial officials. After input from the agencies, the report will be edited as necessary and a final document will be provided. It is proposed to provide 10 bound copies of the document as well as one camera ready unbound original.