

1.0 INTRODUCTION

1.1 Purpose Of The Study

Dillon Consulting Limited is working with the City of Windsor and the Windsor Detroit Tunnel Commission to identify development constraints associated with any potential construction on lands that are in close proximity to the Detroit-Windsor Tunnel corridor (refer to **Figure 1.0 – Location Map**). This project will be completed as an Official Plan Amendment, adopted by City Council, and form part of the City of Windsor



View of Tunnel Plaza (c. 1993)

Official Plan policies. The purpose of this report is to develop a set of comprehensive Official Plan policies that will aid in the future development of lands adjacent to and protect the importance and integrity of the Detroit-Windsor Tunnel as an International Crossing and a City of Windsor asset. Material presented will include:

- Background information related to the existing land uses in the area;
- Existing Official Plan Policies;
- Opportunities associated with development in close proximity to the tunnel;
- Civil, structural, mechanical and geotechnical limitations of construction near the tunnel corridor;
- Information gathered from a Public Information Centre that allowed for public input and comments on the project; and
- Draft Official Plan Policies to be incorporated into the City of Windsor Official Plan.

While the City has a number of policies that apply primarily to environmental concerns, former land fills, flood prone areas, natural heritage, etc., there are no policies related to construction within close proximity to the Detroit-Windsor Tunnel. The introduction of the policies will not be to preclude development near or above the tunnel but to make the public and private agencies aware of the Detroit-Windsor Tunnel Corridor and inform them that the City of Windsor may require additional studies and information prior to development or redevelopment in a defined “constraints area”. This area of influence and rationale for defining it will be discussed in this report.

2.0 BACKGROUND

2.1 Existing Windsor-Detroit Corridor

The Detroit-Windsor Tunnel is one of the busiest border crossings between Canada and the United States. The tunnel, opened in 1930 connecting downtown Windsor, Ontario with downtown Detroit, Michigan. The Detroit-Windsor tunnel is approximately 1.6 km (1 mile) long and the Windsor portal is located in the heart of Windsor's downtown business district (refer to **Figure 2.0 – Detroit - Windsor Tunnel Alignment**).



The tunnel corridor extends from the portal at Park Street East and Freedom Way northerly toward the Detroit River. The alignment of the tunnel follows Freedom Way and then proceeds under the footings of several buildings until it reaches the Detroit River. The cover on the tunnel (existing grade to the top of the structure) ranges from 0.6m (2 feet) at Park Street to 18m (60 feet) at Riverside Drive East. Unfortunately, the alignment of the tunnel is not easily recognizable

above grade as development and redevelopment of properties has occurred in close proximity to or above the Detroit-Windsor Tunnel (refer to **Figure 2.0 – Detroit - Windsor Tunnel Alignment**).

To develop appropriate Official Plan policies several constraints associated with development adjacent to the Detroit-Windsor Tunnel have been identified below:

- Civil Engineering Constraints - The need to maintain or repair specific municipal and tunnel infrastructure.
- Mechanical Engineering Constraints - The need to replace or repair the ventilation infrastructure within the tunnel.
- Structural Engineering Constraints - Loading weights applied to the infrastructure and tunnel housing.
- Geotechnical Engineering Constraints - Large deep excavation causing a partial unloading and redistribution of stresses in the soil and tunnel.
- Land Use Designations and Zoning - Allows for a range of uses and range of building heights that could have a negative impact on the condition of the tunnel.

3.0 THE PROCESS FOLLOWED

The City of Windsor is implementing the proposed policies through an Official Plan Amendment permitted by Section 16(21) of the Planning Act (R.S.O. 1990) and will follow a transparent and open planning process that include public information sessions, presentations to the Planning Advisory Committee, Windsor Tunnel Commission and ultimately City Council.

The process for this project included:

- Interviews and discussions with a number of municipal departments and utilities related to public and private operations in, around and adjacent to the Detroit-Windsor Tunnel;
- Interviews and discussions with individuals and companies associated with the day to day maintenance and rehabilitation of the Detroit-Windsor Tunnel;
- Collection of background information associated with the Detroit-Windsor Tunnel including:
 - Registered agreements in favour of the municipality and other public authorities for lands adjacent to and above the Detroit-Windsor Tunnel;
 - Existing municipal infrastructure located on rights-of-ways and on municipally owned lands adjacent to, on top of and/or traversing the Detroit-Windsor Tunnel;
 - Existing and proposed improvements to the Detroit-Windsor Tunnel infrastructure, primarily related to the rehabilitation of the Windsor Ventilation Building;
 - Relocation/demolition of the City of Windsor Downtown Bus Terminal; and
 - Opportunities for redevelopment of city owned lands above the Detroit-Windsor Tunnel.
- A Public Information Centre to highlight the project and solicit public input into the planning of this project;
- Preparation of this background report and draft Official Plan policies; and
- Presentations to the Planning Advisory Committee, Council and submission of the Official Plan Amendment for provincial (Ministry of Municipal Affairs and Housing) approval.



4.0 EXISTING DETROIT-WINDSOR TUNNEL CORRIDOR

The Detroit-Windsor Tunnel is located east of Ouellette Avenue, west of Goyeau Street, north of Park Street and south of the Detroit River in the central part of downtown Windsor (refer to **Figure 2.0 – Detroit - Windsor Tunnel Alignment**).

For purposes of this report the Detroit-Windsor Tunnel Corridor has been shown as a 20m (66 foot) wide corridor crossing through or following:

- Park Street East;
- Freedom Way
- University Avenue East;
- Chatham Street East;
- Pitt Street East;
- Riverside Drive East and
- The Civic Terrace (Waterfront Lands)



View of the Civic Terrace and Riverside

The alignment of the tunnel ascends from approximately 18m (60 feet) below Riverside Drive East at the Detroit River edge to 0.6m (2 feet) below grade at Park Street East. The cross-section varies depending on the location throughout the tunnel.

To assist the City in the analysis, a number of plans and legal agreements registered on title for properties in close proximity to the Detroit-Windsor Tunnel Corridor were compiled. These agreements and plans can be found in two separate documents (refer to **Volume B and C**).

The tunnel was constructed in 1930 using three construction practices (refer to **Figure 8.0 – Municipal Servicing Constraints**):

- The section under the Detroit River was cast on land, floated into the Detroit River in sections connected in then sunk into place;
- The portion of the tunnel from the Detroit River southerly to University Avenue East was “shield driven”. This process is completed by pushing a steel liner through undisturbed clay, excavating the material in the liner and casting the tunnel; and
- The portion from University Avenue East southerly to Park Street (the portal) was “open cut” and cast in place due to the shallow excavation depth.

Regardless of the construction practice, the exterior tunnel cross-section is approximately 10m (33 feet) in diameter or width. Each type of construction provides for its own set of development constraints that require a specific set of policies to follow.

5.0 OFFICIAL PLAN POLICIES

Currently there are no Official Plan policies in place to identify development constraints for the lands adjacent to the Detroit-Windsor Tunnel.

Section 5.0 on the Environment in the City of Windsor's Official Plan (refer to **Appendix A**) presents policies associated with lands that are subject to special policies due to unique situations (i.e. special requirements for development on existing shorelines or flood prone areas). **Schedule C - Development Constraint Areas** also illustrates where these areas are generally found within the City of Windsor. In most cases these policies do not preclude development. In these often sensitive areas, the policies provide additional information and the framework to require additional studies prior to administration, and ultimately Council, making a decision related to development, redevelopment or enhancements in these areas.

5.1 Existing Official Plan Designation

The purpose of this report, and ultimately the policies enacted by Council, will require land owners and developers to complete additional investigation and analysis prior to improvements to public and private investments in close proximity to the Detroit-Windsor Tunnel Corridor. By ensuring that the appropriate background studies, analysis and professional recommendations are incorporated into the redevelopment of lands in close proximity to the Detroit-Windsor Tunnel Corridor, the structural integrity of the tunnel can and will be maintained.

The City of Windsor's Official Plan designates lands and provides policy direction on how land in the City will develop over the next 20 years. The lands adjacent to the Detroit-Windsor Tunnel Corridor are designated "mixed use" in the Official Plan (refer to **Figure 3.0 - Official Plan Designations**).

A "Mixed Use" designation permits a range of land uses, which are envisioned to be areas where there are clusters of commercial, office, institutional, open space and residential uses taking place. They are therefore, by definition, multi-use areas where form and function come together to create focal points within the community. The lands adjacent to the Detroit-Windsor Tunnel Corridor are no exception, as they form the easterly portion of the downtown core.

6.0 EXISTING ZONING

In the City of Windsor, each parcel of land is assigned a specific type of zoning which defines the type of use permitted. The zoning in the area surrounding the Detroit-Windsor Tunnel is primarily zoned Commercial District 3.1 (CD3.1) which permits a wide range of commercial, residential and institutional uses (refer to **Appendix B – Zoning Bylaw – CD3.1 and GD1.1**). This zoning is in keeping with the desire for larger scale, more dense development in the downtown core (i.e. Multi-storey apartment/condominiums, hotel, office towers, etc). The lands located along the Riverfront are zoned Green District 1.1 (GD1.1), which permits low density green space (refer to **Figure 4.0 - Existing Zoning**). The GD1.1 zoning provides the regulations to permit the development of the waterfront for passive and active park-type land uses, such as walking/biking trails, public parking areas and some limited commercial development.

Each of these zoning types has specific regulations regarding uses that are permitted (refer to **Appendix B- Zoning By-law**)

7.0 EXISTING LAND USES

In keeping with the Official Plan designations and the existing zoning regulations there are a number of existing land uses within the corridor that can be described as “mixed use” (refer to **Figure 5.0 - Existing Land Uses**).



View of Freedom Way, facing north

The existing land uses within the built up area are generally commercial and include:

- financial institutions;
- restaurants and taverns;
- parking areas; and
- hotels.

There are also several institutional uses:

- municipal parking garage and surface parking lots;
- Detroit-Windsor Tunnel Ventilation Building;
- Municipal Bus Station;
- Former Armouries Building; and
- Open space/amenity areas.

There are also two residential towers located in close proximity to the Detroit-Windsor Tunnel Corridor on Goyeau Street.

One of the often overloaded land uses in an urban environment is the existing right-of-ways. This land uses is of importance for this type of study as there are a number of subsurface utilities that have an impact on the maintenance, condition and viability of the Detroit-Windsor Tunnel. Contained within each right-of-way are numerous public and private utilities such as:

- Sanitary and storm sewers;
- Watermains;
- Hydro;
- Telephone and fibre optics;
- District energy piping; and
- Gas lines.

All these land uses have a major impact on policies to protect the Detroit-Windsor Tunnel.

Figure 5 - Existing Land Uses illustrates the various land uses that are currently located on the parcels directly adjacent to the Detroit-Windsor Tunnel.

The types of land use vary under the zoned Commercial District 3.1, to allow for residential, commercial, institutional, mixed use, both commercial and municipal parking lots, and open space/ parkland (refer to **Figures 6.0 and 6.1 – Photos of Existing Land Use**). The majority of the lands in this area are used for commercial purposes. Under the GD1.1 classification, the only type of land use outlined is waterfront recreation, which is located along the Civic Terrace.

8.0 POTENTIAL DEVELOPABLE LANDS



View of Pitt Street looking east

As noted in **Figure 7.0 - Potential Redevelopable Lands**, there are several parcels that may have an impact the Detroit-Windsor Tunnel, should redevelopment occur. The lands have been categorized and grouped together for each city block and are outlined as follows:

- Civic Terrace;
- Riverside Drive East Frontage (Papa Cheney's Whiskey Well, Commercial Parking Lot, Fabs Bar and Grill);

- Pitt Street East Frontage (Private Parking Lot);
- Chatham Street East Frontage (Chatham Street Parkette);
- University Avenue East Frontage (Windsor Bus Station, Bus Parking Lot, Ventilation Building); and
- Freedom Way Frontage (Former Top Hat Restaurant, Vacant Parking Lot and Tunnel BBQ Restaurant, Armouries Building and Scotia Bank parking lot).

The alignment of the Detroit-Windsor Tunnel is outlined, and is located directly below several structures, primarily on the Riverside Drive, Pitt Street and University Avenue frontages. The Freedom Way Frontage also presents concerns due to the open construction technique used to build this portion of the tunnel. Redevelopment of these lands, adjacent to Freedom Way, will require additional consideration, prior to approval being given. It is due to the nature of the possible developments and their proximity to the location of the Detroit-Windsor Tunnel that there is a need for specific development constraints on these parcels.

9.0 MUNICIPAL SERVICING CONSTRAINTS

9.1 Infrastructure

As mentioned above, currently there are developments located above the Detroit-Windsor Tunnel, all of which have municipal services. All East-West corridors (Riverside Drive East, University Avenue East, Chatham Street East, Pitt Street East and Freedom Way) contain municipal services and private services which will require regular and emergency maintenance. Historically, both routine and the need for emergency maintenance of infrastructure have had an impact on the operation and subsequently maintenance of the Detroit-Windsor Tunnel.

9.2 Mechanical Engineering Constraints

Located above the Detroit-Windsor Tunnel, on University Avenue East, is the Tunnel Ventilation Building which provides for the necessary release of emissions from the traffic and the introduction of fresh air to the tunnel. There is only one ventilation building on the Canadian side of the tunnel, therefore for routine maintenance of the ventilation building, in case of emergency replacement, or in the event of reconstruction with the use of large cranes, a “working area” should be put into practice in order to ensure the tunnel below is not affected by the work above (refer to **Figure 8 - Municipal Servicing Development Constraints**).

9.3 Structural Engineering Constraints



There are a number of factors which may have structural impacts on the Detroit-Windsor Tunnel. As previously mentioned, the type of construction method employed to first build the tunnel, the proximity of the tunnel to existing grade, the location, size and the construction techniques of the adjacent structures (buildings) and utilities will all have an impact on the structural integrity of the tunnel. Careful consideration must be given to ensure that the proposed use will not negatively impact the condition,

operation or routine maintenance of the tunnel (refer to **Appendix C - Golder Geotechnical Report**).

9.4 Geotechnical Engineering Constraints

Through the drilling of boreholes near the tunnel, the presence of fill material was reported by Golder Associates (refer to **Appendix C - Geotechnical Report**). During their field study, the area's activities, such as ground loading, which could add stress on the Detroit-Windsor Tunnel, were outlined. More specifically, the development of a large, deep excavation above or adjacent to the tunnel could result in the partial unloading of the soil, causing a redistribution of stresses on the soil and the tunnel liner. Constructing structures in areas adjacent to or above the tunnel could result in their foundation load to be redistributed through the ground. The geotechnical analysis allowed for the identification of "areas of influence" which graphically showed, based on a variety of geotechnical considerations, lands that should be subject to additional study prior to redevelopment (refer to **Figure 8.0 - Development Constraints Area**). This "area of influence" can be described as a triangular area extending from the tunnel portal to the Detroit River. Due to the increasing depth of the tunnel from the portal, the area of influence is governed by a simple slope. At shallower depths, the area of influence has a slope of 1:1 and as the depth of the tunnel deepens that slope increases to 2.5:1, encompassing a greater area.

Again, it is important to reconfirm that the "area of influence" does not preclude redevelopment of those lands; it only requires additional study and investigation based on known geotechnical considerations.

10.0 PUBLIC INFORMATION CENTER

A notice was placed in the Windsor Star on September 23, 2006 and approximately 200 letters were mailed to residents, property owners and tenants in the area.

On September 26, 2006, from 4:00 p.m. to 7:00 p.m., a Public Information Centre was held for the Detroit-Windsor Tunnel development constraints plan and official plan review. The Public Information Centre was held at the Cleary International Centre and provided the public with an opportunity to review and comment on the results of this study.

A total of 11 persons attended the Public Information Centre and offered opinions on the operation of the tunnel and the apparent need for the study and development of these policies. There were several attendees that indicated they would be appreciative of knowing what the “ground rules” were, should they decide to redevelop their properties. One person was concerned that the City is attempting to preclude development from occurring on his site.

There were no additional points of contact (i.e. telephone discussions, meetings, etc.) following the Public Information Centre prior to the Planning Advisory Committee meeting.

11.0 DRAFT OFFICIAL PLAN POLICIES

The policies found in the Official Plan are a balance of a number of competing interests and long range goals for residents of the City of Windsor. In some cases, those policies are broad and open to interpretation; in other cases they are pre-scriptive and designed to control and provide strategic direction. The intent of these draft policies is to find a balance between the two competing interests. The policies are not meant to preclude development near the Detroit-Windsor Tunnel, they are designed to balance the need to preserve this important asset and allow for the highest and best use of the adjacent lands. To determine the appropriateness of that use, the scale and the proximity of the use and the building technique(s) will require additional study, investigation and rationalization of the proposal. These policies have been written to be incorporated into the current Official Plan (dated March 28, 2000 as approved by the Ontario Municipal Board November 1, 2002). It is envisioned that these policies will be incorporated in Section 5.0 -Environment of the Official Plan. The draft policies are as follows:

5.4.11 Detroit-Windsor Tunnel Constraint Area Policies

The following policies apply to lands identified on Schedule C: Development Constraints Area and Schedule E: City Centre Planning District and should be read in conjunction with Land Use and Infrastructure chapters of this Plan.

General Boundaries	5.4.11.1	For the purpose of this plan, the Detroit-Windsor Tunnel Development Constraint Area is defined as the triangular area of land beginning at the portal of the Detroit-Windsor Tunnel and Park Street East, extending Northeast to the Detroit River, as shown on Schedule C: Development Constraints and Schedule E: City Centre Planning District.
Incompatible Development	5.4.11.2	Council shall protect the integrity of the Detroit-Windsor Tunnel from damage as a result of incompatible construction and maintenance activities in the Detroit-Windsor Tunnel Development Constraints Area
Development Criteria	5.4.11.3	New Development, as well as renovations, minor additions and alterations to existing buildings adjacent to the Detroit-Windsor Tunnel is permitted provided that the development does not: (a) Negatively impact the structure of the Detroit-Windsor Tunnel; (b) Have a negative impact on the maintenance of the Detroit-Windsor Tunnel; and (c) Take place in a manner that the continued operation and maintenance of the Detroit-Windsor Tunnel does not have a negative impact on the proposed development.
Municipal Works	5.4.11.4	Any municipal works in the right-of-way within the Detroit-Windsor Tunnel Constraint Area shall be bound to the policies set forth in this section.
Support Studies	5.4.11.5	Proponents of development within or adjacent to the Detroit-Windsor Tunnel Development Constraint Area, as designated on Schedule C: Development Constraints and Schedule E: City Centre Planning District shall successfully complete a geotechnical study, prepared by a qualified professional, to confirm that the development will be compatible with the Detroit-Windsor Tunnel.

- Review Procedure**
- 5.4.11.6 The qualified professional who completed the required geotechnical investigation shall:
- (a) Sign and submit a statement, to the Municipality, confirming that the site is suitable for the proposed development; and
 - (b) Submit all documentation to the Municipality regarding the geotechnical investigation for review and concurrence by an independent peer reviewer, prior to the issuance of any building permit.
- Peer Review**
- 5.4.11.8 Where an independent peer review is required by the Municipality, the proponent shall be required to pay for the review.