

**Detroit River International Crossing Study
Tunnelling
Frequently Asked Questions**

Q. Are you seriously considering a tunnel?

A. Yes. Tunnelling is one of five options that are being considered within this corridor. The study team is studying the benefits, impacts and feasibility of all alternatives, including tunnelling. Decisions will not be based on any one single factor. Ongoing consultation with the community will improve our understanding of community concerns, desires and values.

Q. I heard you are looking for the least expensive solution. Are you more concerned about cost than our community?

A. The DRIC study team is working with the community to find the solution that provides the best balance of transportation benefits with community impacts. Cost is only one of seven important factors we are considering throughout the EA process. As taxpayers, we all expect our public funds to be spent wisely, and we expect governments to make responsible fiscal decisions.

Q. What specific tests are you doing that relate to the tunnelling option?

A. For all five access road options we are looking at drainage requirements, existing utilities, constructability, traffic staging and safety. Specific concerns related to tunnelling include ventilation and emergency access and escape.

Q. What are the soil and groundwater conditions along the access road corridor?

A. We have found that between Highway 401 and E.C. Row Expressway, the first layer of soil is composed of between 25 m to 35 m of silty clay and silty sand. Under this layer are sedimentary rock formations with deep salt beds. The groundwater in this area is high and is located 0.5 m to 6 m below ground.

Q. What tunnelling methods exist?

A. There are two tunnelling methods that the DRIC study team has investigated: Bored and Cut-and-Cover.

In general, the bored tunnelling method involves tunnelling underground without having to cut open the ground. Tunnel boring machines are used to drill through the soil and create the tunnel.

There are two cut-and-cover tunnelling methods. The bottom-up method involves excavation to the final required depth with the use of retaining walls and struts to support the soil. Construction then begins with the base of the tunnel being laid down followed by the side walls and then the roof.

The top-down method begins with the installation of the diaphragm walls (or side walls), then constructing the roof slab. This will act as support while excavation continues below the finished roof. When the required depth is reached, the base of the tunnel is laid.

Specific approaches to the tunnelling methods were looked at by the study team that kept in mind the unique soil conditions of this area along with the requirements of the project.

Q. What tunnelling method would be used to construct a tunnelled access road along the Highway 3/HuronChurch corridor?

A. When the soil conditions along with corridor were examined, it was determined that the layer of soft ground available for boring is generally 25 m to 30 m, which is not thick enough for the tunnel required to meet the needs of this project. There were also risks associated with dewatering and groundwater and with respect to stability. As a result, it was concluded that bored tunnels are not considered practical along this corridor.

Cut-and-cover tunnels are generally feasible at depths up to 15 m. It was determined that tunnelling using cut-and-cover techniques would be analyzed and evaluated.

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Q. Where will traffic go during construction of any of the access road options?

A. Construction staging is an important consideration for all access road options. Keeping international and national traffic moving through the Windsor-Detroit Gateway on Highway 3 is a priority for the study team. Maintaining traffic in the existing corridor during construction is a priority in the ongoing study process. We will report on this, and other aspects of our technical work, at Open Houses scheduled for December 2006.

Q. Isn't a tunnel the best solution in terms of reducing impacts to air quality?

A. The DRIC study team is conducting comprehensive technical studies, including air quality assessments. Through this work we will be able to understand the benefits and impacts of each alternative, including at-grade, depressed, and tunnelled roadways. The evaluation of alternatives will consider seven evaluation factors, including air quality. The goal is to identify the solution that best meets current and future transportation needs, while minimizing impacts to communities on both sides of the border.

Q. Why is tunnel ventilation required?

A. The need for ventilation depends on the length of tunnel under consideration. For tunnels over 200 metres in length, ventilation is required to address:

- Air quality within the tunnel;
- Air emissions from the tunnel's entrance and exit portals; and
- Fire and/or other emergency conditions within the tunnel.

Q. How would a tunnelled access road be ventilated?

A. Ventilation is one of many aspects of the tunnel option currently under investigation. For any tunnel greater than 200 metres in length, natural ventilation would not be sufficient, and mechanical ventilation would be required. Mechanical ventilation is done either through "Longitudinal Ventilation" which utilizes jet fans to push air through the tunnel (for example, the Cassiar Tunnel in Vancouver) or through "Full Transverse Ventilation" which uses above ground ventilation buildings (for example, the Windsor-Detroit Tunnel). Any ventilation buildings would be designed to comply with federal and provincial air quality guidelines and provincial noise guidelines. Since no guidelines exist for vibration, Health and Safety standards would be applied.

Q. What is the cost of tunnelling?

A. Cost is one of seven factors that will be used for the evaluation of alternatives. Comprehensive technical studies are underway for all of these factors. Information on the costs associated with each alternative will be developed as part of this ongoing work.

Q. Are there any other types of tunnels that could be considered?

A. One possibility is to build short tunnel sections in the most sensitive locations. For example across the border in the Detroit area, tunnels were built along Interstate 696. The resulting land bridge provided space for a public park, and continuity of access for residents of communities on both sides of the highway.

By developing a similar approach in Windsor, we would provide an improvement over the current conditions in the Highway 3/Huron Church corridor.