Detroit River
INTERNATIONAL CROSSING
S T U D Y

DRIC STUDY TEAM'S ASSESSMENT OF GREENLINK PROPOSAL'S HIGHWAY SPECIFICATIONS

The Detroit River International Crossing (DRIC) study team continues to assess the City of Windsor's GreenLink proposal using information provided by the City. In terms of road safety, the team concluded that there are significant safety standard gaps in the GreenLink proposal.

Shoulder Widths

The GreenLink concept proposes 1.2 m (4 ft) wide shoulders running along the right side of the roadway and left side shoulders ranging from 0.6 m to 1.9 m (2 ft to 6 ft). These shoulder widths are insufficient. The Ontario standard for construction of shoulders on new 6 lane freeways is 3 m (10 ft) shoulders on both sides.

Shoulder width may seem unimportant but it influences highway safety and capacity.

- A wider shoulder provides a lane for emergency vehicle access.
- A wider shoulder provides more time and space for a driver to correct their steering when inadvertently leaving the lane.
- A wider shoulder provides a refuge area to avoid collisions.
- A wider shoulder allows a driver who needs to pull off the road the room to do so more safely for both the stopped driver and the passing driver, allowing moving vehicles to continue on with minimal or no delay.
- Wider shoulders allow for increased space for maintenance activities without impacting traffic (ie.guiderail repair, litter pick up).
- Wider shoulders allow for increased space for snow storage which is critical in a below-grade roadway.
- Wider shoulders allow area for surface water to collect during heavy rain storms without encroaching on the driving lane.
- Wider shoulders allow faster incident clearance resulting in increased traffic flow, reduced green house gas emissions, and increased safety by reducing incidents downstream (i.e. rear-end collisions or side swipes when merging).

As part of the consultation process, the DRIC study team has met with local and provincial emergency services organizations to discuss how best to design a roadway that improves the movement of traffic while also being safe for road users and accessible for emergency services workers. Emergency services vehicles (police, fire and ambulance) need to get to those in need quickly and safely. In heavy traffic, emergency vehicles can use wide shoulders to get to an accident scene.

Emergency personnel can also use the wider shoulders to remove disabled vehicles and attend to people in need while allowing drivers to resume travelling at close to normal speeds with fewer disruptions to traffic flow.

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Side Slope

The GreenLink proposal has suggested extensive use of vertical retaining walls. This design aspect in conjunction with narrow shoulders could affect response capabilities of emergency services. In a below-grade access road, flatter slopes would provide improved access for emergency personnel and evacuation for injured or stranded drivers if access points are compromised.

Storm Drainage

The GreenLink cost analysis allows for a drainage system designed for a 20-year storm. The DRIC study team has concluded that this is not sufficient. In order for the access road to be a safe, reliable and sustainable transportation corridor it must include a more robust and durable drainage system designed to adequately handle the minor and major flows without impeding the passage of vehicles under severe weather conditions. This is in line with the Ontario standards for such a highway.

The term “100-year storm” means that the drainage system is designed to handle, on average, a storm of such magnitude that the likelihood of the storm taking place is once every one hundred years. Likewise, the term “20-year storm” means the drainage system is designed to handle a storm that is likely to take place, on average, once every 20 years. This does not mean that a significant storm will take place only once per century. In fact, major storm events may take place a number of years in a row. What it does mean is that the drainage system would be designed to adequately handle heavy precipitation.

GreenLink’s 20 year storm allowance generates, on average, a five times greater risk of flooding than the 100-year storm drainage capability for the same flow spread criteria. Flooding can:

- endanger motorists caught on the highway when it floods
- result in highway closures, putting trucks back on local streets
- limit the use of the highway for the passage of emergency vehicles during extreme rainfall events
- cause extensive damage to the roadway that could close the highway for an extended period of time, diverting trucks back on local streets until reconstruction was completed.

Safety and reliability are major considerations in the planning for the access road. The potential impact of climate change on the intensity and duration of storm events is also becoming an important consideration. The best available standards must be applied in designing new highway infrastructure to address all of these concerns. A drainage system designed for a 100-year storm is consistent with the Ontario Ministry of Transportation’s Highway Drainage Design Standards that set the standard for below-grade roadways.

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These standards generally require that the design safely convey both the minor system design flow and the major system design flow (100-year return period) and achieve the corresponding flow spread on the travel lanes. The standards provide different details for roads on a tangent, at sags, for below-grade roadways and for underpasses. Pump systems would be designed to accommodate the 100-year return period.

The DRIC study team will rely on Ontario's successful approach to highway design and construction. This means using best practices and standards to ensure road safety is the number one priority. It is no accident that year-in year-out Ontario has among the safest road systems in North America.