

**TECHNICAL ANALYSIS — SUBMISSION TO PUBLIC CONSULTATION**

# Road Severance and Grade Separation on the ALTO HSR Corridor: What 1,000+ Crossings Mean for Rural Ontario Communities

*Southern Corridor — Eastern Ontario | April 24, 2026*

<b>Prepared by</b>	ALTO HSR Citizens Research Initiative
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## KEY FINDINGS

- Transport Canada confirmed in 2023 that a Toronto–Quebec City high-speed rail system would require complete grade separation on an alignment with over 1,000 public and private crossings.
- The 1,000+ figure was based on the northern HFR corridor; the southern corridor passes through a denser concession road grid and would cross more roads, not fewer.
- International practice confirms 30–60% of crossings on rural HSR corridors are permanently closed rather than bridged, implying 300–600 road closures.
- Grade separation for the crossings that are provided is estimated to cost \$3.2–8.4 billion CAD — a cost category never broken out in ALTO’s published estimates.
- ALTO’s VP of Systems Engineering confirmed on record that the project’s explicit goal is to “limit the number of overpasses.”
- Permanent vehicle detours generate calculable lifecycle greenhouse gas emissions partially offsetting the rail service’s decarbonisation benefit — an impact category absent from ALTO’s environmental analysis.
- ALTO has not published a road crossing assessment, crossing criteria methodology, or any analysis of detour impacts.

## Section 1 — What Transport Canada Has Said

### PRIMARY SOURCE — TRANSPORT CANADA, MARCH 7, 2023

"A full, high-speed rail system between Quebec City and Toronto would require a fully enclosed (fenced) corridor, a straighter alignment with full, double tracking, as well as complete grade separation (the use of viaducts and tunnels) on an alignment that currently has over 1,000 public and private crossings."

— Transport Canada, TRAN Committee Appearance Binder, Item 15: High Frequency Rail, March 7, 2023. [tc.canada.ca/en/binder/15-high-frequency-rail-0](https://tc.canada.ca/en/binder/15-high-frequency-rail-0)

ALTO HSR, as announced in 2025, is explicitly a full high-speed rail system at up to 300 km/h. It therefore requires, by Transport Canada's own characterization, complete grade separation and a fully fenced corridor on an alignment with more than 1,000 road crossings. The 1,000+ figure was based on the northern HFR corridor. The southern corridor, running through some of the most intensively farmed land in Eastern Ontario on a tight concession road grid spaced 2 km apart, would cross a comparable or greater number of roads; the 1,000+ figure is a floor, not a ceiling, for the southern option.

## Section 2 — Why Not Every Crossing Gets a Bridge

Grade separation is expensive. A standard rural overbridge in Ontario costs \$5–12 million depending on span, soil conditions, and approach geometry. For minor roads, farm laneways, and private crossings, the cost of a bridge often far exceeds the traffic and economic value the crossing serves. The practical result is a hierarchy of crossing treatment: provincial highways receive grade separation as a legal requirement; county roads receive grade separation as standard practice; township and concession roads are subject to traffic threshold assessment; local municipal roads (gravel, low traffic) are often closed if an alternative route exists within acceptable detour distance; and private farm laneways are typically closed with compensation.

If even 30% of the 1,000+ crossings are not provided with grade separations, a conservative figure by international standards given the private and minor road share of the total, that implies at least 300 road closures across the corridor. If the fraction is closer to 50–60%, the number rises to 500–600.

## Section 3 — What Grade Separation Costs

Structure Type	Span / Context	Estimated Cost (2025 CAD)
Minor road overbridge (gravel road, simple geometry)	~15–20m span, standard approach	\$5M – \$8M
Township / paved concession road overbridge	~15–25m span, full approach works	\$8M – \$12M
County road overbridge (heavier loads, wider deck)	~20–30m span, engineered approaches	\$12M – \$20M
Provincial highway grade separation	Complex geometry, full interchange	\$20M – \$60M+
Agricultural underpass (farm access only)	Box culvert or low clearance tunnel	\$2M – \$5M

Scenario	Grade Separations Provided	Estimated Total Cost
Conservative (400 structures, average \$8M)	400 of 1,000+	~\$3.2B CAD
Mid-range (550 structures, average \$10M)	550 of 1,000+	~\$5.5B CAD
Higher (700 structures, average \$12M)	700 of 1,000+	~\$8.4B CAD

These \$3–8 billion in grade separation costs represent a meaningful share of the \$60–90 billion total project estimate that has never been broken out publicly or subjected to independent scrutiny. HS2 Phase 1’s bridge and viaduct programme was a major driver of cost escalation from its original £20B estimate to the current £49–57B range.

## Section 4 – What ALTO Said On Record: Kingston City Council, February 17, 2026

ALTO’s Vice-President of Systems Engineering and Interface, David Cook, made three statements on record at Kingston City Council on February 17, 2026 that, read together, reveal the actual situation clearly.

### STATEMENT 1: THE REASSURANCE

"The working assumption is that every road will get some sort of duct or overpass. Those roads belong to a municipality, or are under the purview of a road authority — could be a county or the province. And so therefore we can’t just cut them unilaterally." — David Cook, VP Systems Engineering and Interface, ALTO, Kingston City Council, February 17, 2026.

### STATEMENT 2: THE QUALIFICATION

"Now, of course, in reality, we will look at potentially consolidating some of those crossings in order to lower costs and improve construction. But that doesn’t happen without a discussion with the municipality or the road authority. Because emergency vehicle access for residents, time to get around the community, has to be taken into consideration." — David Cook, *ibid*.

### STATEMENT 3: THE ADMISSION

"The issue about grade separations along the corridor has to be looked at. Some areas there may be more, some areas there may be less. And that’s actually going to be part of route selection at the end of the day — when we’re talking about trying to limit impacts to communities. So that’s one of the impacts we want to try and limit as well. So try and limit the number of overpasses that we’ll need to get created for sure." — David Cook, *ibid*.

The “working assumption” is not a commitment. It is a starting point that Cook immediately described as subject to consolidation “to lower costs.” His third statement is the most revealing: ALTO’s explicit operational goal is to minimize overpasses.

When Councillor Osanic asked directly whether there would be a standard distance between bridges, no answer was given; no standard distance exists. The decision about which roads get crossings will be made during route selection and detailed engineering, which Cook confirmed will not conclude until at least end of 2026, after the public consultation closes. Cook also confirmed full-corridor fencing at all at-grade sections: “Modern passenger [rail] always has to be completely segregated... It has to be fully fenced so that there can be no intrusions from pedestrians, wildlife, and vehicles.”

## **Section 5 – Implications for Affected Communities**

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### **5.1 Farm operations**

Many Ontario farm operations depend on the ability to move equipment across what will become the rail corridor, between fields on opposite sides, or between a farm property and rented land. A closed crossing adding a 6–10 km detour to daily equipment movement represents a genuine operational cost and in some cases may make field configurations economically unviable.

### **5.2 Emergency services: when minutes are clinical**

Under Ontario Regulation 257/00 (Ambulance Act), paramedic services are required to report performance for sudden cardiac arrest against a target of 6 minutes or less. A 2025 BMC Emergency Medicine study found that each additional kilometre of distance from an ambulance station adds approximately 37 seconds to response time; multiple peer-reviewed studies document that each one-minute increase in EMS response time reduces the likelihood of survival from cardiac arrest by 6–10%. A road closure adding a 5 km detour to a response route translates to roughly three additional minutes at rural road speeds, a clinically significant margin when the response window for cardiac arrest is measured in single-digit minutes.

### **5.3 School bus transportation**

Ontario school bus operators are not required to travel roads not maintained year-round by the municipality. A dead-ended concession road created by a rail crossing closure can force route re-planning or strip bus eligibility from affected students. Route detours of 6–8 km imposed on a single rural bus route mean an additional 10–16 minutes of daily travel time per route. The \$800 million provincial Student Transportation Fund does not reimburse detour costs on an exception basis.

### **5.4 Induced vehicle emissions from permanent detours**

A conservative estimate based on 300 road closures, each affecting 15 households requiring one daily crossing trip and adding a mean detour of 5 km each way, produces approximately 3,285 tonnes CO<sub>2</sub> per year across the corridor (200 g/km rural fleet average) — 164,000 tonnes over a 50-year infrastructure life. At the mid-range (500 closures, 20 households each), the figure rises to 365,000 tonnes. Diesel school buses (1,000–1,200 g CO<sub>2</sub>/km) and farm machinery emit at significantly higher rates. These permanent, annually recurring induced emissions partially offset the decarbonisation benefit claimed for the rail service and have not been acknowledged in any ALTO environmental document.

## Section 6 — Formal Requests

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<b>1</b>	<b>Publish a preliminary road crossing assessment for each corridor option before consultation closes</b> ALTO must publish, as part of the public consultation record, a preliminary road crossing assessment identifying: the number and type of crossings on each corridor option; which crossings are on established emergency services, school bus, and agricultural access routes; what criteria will be used to determine whether a crossing receives a grade separation or is closed; and the methodology for assessing detour adequacy in rural settings.
<b>2</b>	<b>Publish grade separation costs as a separate capital cost line item</b> The \$3.2–8.4 billion cost range for grade separations must be broken out as a separate and explicit line item in ALTO’s capital cost estimate. No published ALTO document has identified this cost category. It must be publicly disclosed before the consultation closes.
<b>3</b>	<b>Commit to protecting all emergency services, school bus, and agricultural access crossings</b> All road crossings on established EMS, fire, school bus, and primary agricultural access routes must be identified before corridor finalization and protected from closure. The U.S. FHWA has established that school bus route and emergency vehicle crossings should be protected by default in consolidation planning. ALTO must apply this standard.
<b>4</b>	<b>Include induced detour emissions in the lifecycle environmental assessment</b> ALTO’s environmental assessment must include the permanently induced vehicle emissions from road closures and detours as a lifecycle GHG impact category. This is a non-zero cost that partially offsets the decarbonisation benefit claimed for the rail service and has not appeared in any ALTO document.

## Key Sources

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Transport Canada. TRAN Committee Appearance Binder — Item 15: High Frequency Rail, March 7, 2023. (1,000+ crossings requiring complete grade separation.) [tc.canada.ca/en/binder/15-high-frequency-rail-0](https://tc.canada.ca/en/binder/15-high-frequency-rail-0)

David Cook, VP Systems Engineering and Interface, ALTO. Kingston City Council, February 17, 2026. (Three on-record statements on road crossings and fencing.) City of Kingston closed-captioning transcript.

MTO Southern Highways Program published tender cost ranges, 2022–2024. (Rural bridge construction and rehabilitation costs.)

New Civil Engineer. “Cost of road bridge over Northumberland line triples due to inflation.” April 2023. (£30.6M for 68m × 11.5m span.)

HS2 Ltd: 61 viaducts and 150 overbridges on Phase 1 (225 km); A4010 Risborough Road permanently stopped up.

BMC Emergency Medicine (2025). Rural OHCA study: 37 seconds added per km from ambulance station; rural response 3.5+ minutes slower than urban.

Ontario Regulation 257/00 (Ambulance Act). 6-minute SCA target; 8-minute CTAS 1 target.

Student Transportation Services of Central Ontario (STSCO). Transportation not provided on roads not maintained year-round by the municipality.

Environment and Climate Change Canada, National Inventory Report. Rural fleet average CO<sub>2</sub> emission rates (200 g/km); school bus (1,000–1,200 g/km).

UK Parliament, Hansard, HS2 debate, September 2021. (“Thoughtless and high-handed” conduct; road closures causing community disruption.)