

## TECHNICAL ANALYSIS

# Road Severance and Grade Separation on the Alto HSR Corridor:

## *What 1,000+ Crossings Mean for Rural Ontario Communities*

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### KEY FINDINGS

1. 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.
2. The 1,000+ figure was based on the northern HFR corridor. The southern corridor (through the Townships of Tyendinaga, Stone Mills, South Frontenac and Rideau Lakes) passes through a denser concession road grid and would cross more roads, not fewer.
3. International practice confirms that 30–60% of crossings on rural HSR corridors are permanently closed rather than bridged. Based on road classification analysis, this implies 300–600 road closures across the corridor.
4. Grade separation for the crossings that are provided is estimated to cost \$3.2–8.4 billion CAD in total — a cost category that has never been broken out in Alto's published estimates.
5. Road closures add measurable detour time to emergency service response. Each additional km of detour adds approximately 37 seconds to response time; each minute of delay reduces cardiac arrest survival probability by 6–10%.
6. Ontario school bus policy does not require service on roads not maintained year-round by municipalities. Dead-ended concession roads may strip bus eligibility from affected students.
7. Permanent vehicle detours generate real, calculable lifecycle greenhouse gas emissions that partially offset the decarbonisation benefit claimed for the rail service — an impact category absent from Alto's environmental analysis.
8. Alto HSR has not published a road crossing assessment, a crossing criteria methodology, or any analysis of detour impacts. Communities are being asked to comment on a project whose most direct local impacts have not been disclosed.

# What Transport Canada Has Said

The Government of Canada's own internal briefing note — prepared for a Parliamentary committee appearance in March 2023 — explains why a transition from the original High Frequency Rail concept to full High Speed Rail raises significant infrastructure complexity. In describing what high speed rail would require, the document states:

## PRIMARY SOURCE

*"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-07](https://tc.canada.ca/en/binder/15-high-frequency-rail-07)

Alto HSR, as announced in 2025, is explicitly a full high-speed rail system operating 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 question this raises is straightforward: which of those 1,000+ crossings will receive bridges or underpasses, and which will simply be dead-ended?

## Which Route Was Transport Canada Describing?

Understanding the 1,000+ figure requires understanding which alignment Transport Canada was describing. The original High Frequency Rail (HFR) project, as announced in July 2021 and advanced through the procurement process to 2024, was planned as a wholly new dedicated track alignment running from Toronto through **Peterborough, Ottawa, Montreal, Laval, Trois-Rivieres to Quebec City**, not along the existing CN/VIA Kingston subdivision.

The route was specifically designed to bypass existing congested freight corridors along Lake Ontario by running northeast from Peterborough, crossing the Canadian Shield and counties such as Lanark, Frontenac, and Hastings.

It was this northern corridor that Transport Canada said would have "over 1,000 public and private crossings." A federal Impact Assessment was triggered precisely because the alignment involved significant new track construction away from existing infrastructure corridors.

**The southern corridor would cross more roads, not fewer.** The northern HFR corridor ran through relatively sparse terrain — mixed agriculture, Canadian Shield outcrops, wetlands, and rural lots with large frontages. The southern corridor option, passes through some of the most intensively farmed land in Eastern Ontario. Here the Ontario concession road grid is at its tightest: roads every 1.25 miles (2 km) in both directions, with active farm laneways, county roads, and municipal roads layered onto that grid. The road-crossing density per kilometre of corridor is demonstrably higher than on the northern route. The 1,000+ figure is therefore a floor, not a ceiling, when considering the southern corridor.

Alto HSR, as announced in 2025, is explicitly a full high-speed rail system at up to 300 km/h requiring complete grade separation and a fully fenced corridor. The question, which crossings receive bridges, and which will be dead-ended, applies with at least equal force to the southern option, and likely greater force given the denser road network.

## Why Not Every Crossing Gets a Bridge

Grade separation, building an overbridge or underpass where a road crosses the rail line, is expensive. A standard rural overbridge in Ontario costs in the range of \$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. This is not a failure of planning; it is a structural feature of every HSR project built.

The practical result is a hierarchy of crossing treatment:

ROAD TYPE	TYPICAL TREATMENT	LIKELIHOOD OF CROSSING
<b>Provincial highways</b> (400-series, secondary)	Grade separation required by law; bridge or underpass	<b>[Very High]</b>
<b>County roads</b> (significant traffic)	Grade separation standard practice; some consolidation possible	<b>[High]</b>
<b>Township / concession roads</b> (paved, meaningful traffic)	Grade separation likely where traffic warrants; below threshold, candidates for closure with detour routing	<b>[Variable]</b>
<b>Local municipal roads</b> (gravel, low traffic)	Subject to traffic threshold assessment; often closed if alternative route exists within acceptable detour distance	<b>[Uncertain]</b>
<b>Private farm laneways and field access</b>	Typically closed; compensation paid; access consolidated where possible	<b>[Low]</b>

# Ontario's Concession Road Grid

The road network of rural Southern Ontario was laid out under a system of surveyed concession roads, typically spaced approximately 1.25 miles (2 km) apart, running parallel to each other and intersected by perpendicular sideroads at similar intervals. The result is a near-uniform grid across most of the agricultural landscape from the GTA to Kingston and beyond.<sup>1</sup>

In practical terms, a rail corridor running east-west through this grid will cross a road approximately every 1 to 2 kilometres. Each of those crossings serves not just the road itself, but all properties on both sides of the corridor that depend on it for access. On a standard Ontario concession block, a single road allowance may provide the only legal access to four, six, or more farm properties, a pattern established under colonial land grants and not easily re-engineered around a linear barrier.

**THE BARRIER EFFECT IN RURAL GRID SYSTEMS**

Unlike urban road networks, where multiple parallel and diagonal streets provide alternative routes, the concession road grid offers limited redundancy. If a sideroad is dead-ended by a rail corridor, the nearest alternative crossing may be 4 to 8 km away, a detour that can be modest for a car, significant for a farm tractor, and potentially critical for an emergency vehicle in a time-sensitive situation.

The Highway 401 provides a useful analogy. In the rural stretches between Port Hope and Kingston, exits are spaced 10–15 km apart in the open countryside between towns. A fenced HSR corridor through the same landscape, without the service roads and dense interchange network that accompany a 400-series highway, would produce similar, and in some places more severe, severance effects, because the fencing eliminates even informal crossing points.

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## Estimating the Range of Dead-Ended Roads

Because no final route has been selected and no preliminary engineering study for crossing treatment has been made public, any estimate of the number of dead-ended roads is necessarily approximate. The following analysis uses the 1,000+ figure as a confirmed floor for the northern HFR corridor, and reasons from road grid density that the southern corridor would produce a comparable or higher total. It is offered as a framework for understanding scale, not as a precise forecast.

## Road Classification Breakdown

On a corridor of approximately 800–900 km from Toronto to Quebec City, crossing 1,000+ public and private road allowances, a plausible road classification breakdown might be:

CATEGORY	ESTIMATED COUNT	EXPECTED TREATMENT	LIKELY OUTCOME
Provincial highways	~15–25	Grade separation	[Crossing provided]
County / regional roads	~60–100	Grade separation standard	[Crossing provided]
Township / concession roads (paved)	~200–350	Traffic threshold assessment	[Many provided; some closed]
Gravel local roads and farm accesses	~600–700	Cost-benefit; consolidation	[Many or most closed]

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

## International Precedent: HS2

The United Kingdom's HS2 project is the closest available comparator, a greenfield high-speed corridor requiring complete grade separation through a mix of peri-urban and rural agricultural land. Phase 1 (London to Birmingham, 225 km) was built with 61 viaducts and 150 overbridges, roughly one grade-separated structure per 1.5 km of route.<sup>3</sup> That sounds comprehensive, but several qualifications apply directly to the Alto comparison:

### Phase 1 Is Predominantly Peri-Urban

The London–Birmingham corridor runs through some of the most developed land in England. The rural portions of the route still generated substantial road closure disputes. Alto's southern corridor, by contrast, is almost entirely rural and agricultural, where road network redundancy is far thinner.

## Communities Only Secured Crossings by Petitioning Parliament

HS2 was enabled through a Hybrid Bill, which gave affected landowners, parishes, and councils the legal right to appear before a Parliamentary Select Committee and challenge specific design decisions. Hundreds of communities exercised this right. Pickmere Parish Council in Cheshire, for example, had to fight before the Select Committee specifically to prevent the permanent closure of Budworth Road — a crossing HS2 Ltd had initially proposed to stop up. The retention of that road was secured only after formal petition and assurance negotiations.<sup>4</sup> This process generated 497 formal undertakings and assurances by mid-2023, a register of community-by-community concessions extracted through legal challenge, not offered proactively.

## Even Major Roads Were Stopped Up

The A4010 Risborough Road in Buckinghamshire (a busy classified A-road) was permanently stopped up where HS2 crossed it, with vehicle traffic redirected onto a new relief road and only a pedestrian/cyclist underpass retained at the original crossing point. If a classified A-road can be stopped up, the threshold for closing minor concession-equivalent roads is considerably lower.

## Parliamentary Criticism Was Substantial

A 2021 parliamentary debate on HS2 heard an MP observe that the project had "too often acted in a thoughtless and high-handed way, failing to communicate effectively about the nature of its works and the road closures and other disruption that they cause" — while noting that "every penny claimed by vulnerable people whose lives have been ruined by the line has been fiercely contested."<sup>5</sup>

**Canada has no equivalent petition mechanism.** The HS2 Hybrid Bill process gave affected communities a legal right of audience before Parliament to challenge individual road closure decisions and force HS2 Ltd to justify each one. Ontario and Quebec municipalities, landowners, and townships facing Alto HSR have no comparable mechanism. The only formal opportunity to raise concerns is through the public consultation process, which closes March 29, 2026, before any route or crossing plan has been published.

**WHAT ALTO HAS NOT YET DISCLOSED**  
As of March 2026, Alto has not published a preferred route, a preliminary engineering study, or any analysis of road crossing treatment. Alto's Engineering Vice-President confirmed at a virtual public consultation session on March 3, 2026, that a detailed route will not be selected until at least the end of 2026. Canadians are therefore being asked to comment on a project whose road severance implications, how many roads will be dead-ended, which properties will lose direct access, what alternative routing will be provided, have not been determined, modelled, or disclosed.  
This is not a criticism of engineering complexity; these determinations genuinely require a fixed alignment to resolve. It is a criticism of the consultation design: it is not meaningful to consult communities about a project's impacts before those impacts have been analysed.

# What Each Crossing Costs — and What the Total Implies

Grade separation is the single most capital-intensive per-kilometre cost driver on any HSR corridor after tunnels and major viaducts. A new rural road overbridge spanning a double-track HSR corridor requires at minimum a clear span of approximately 15–20 metres to accommodate two electrified tracks plus maintenance clearances and aerodynamic buffer zones, a standard two-lane road deck (nominally 7–8 metres wide), reinforced concrete abutments designed to HSR vibration and load standards, full approach earthworks on both sides, and coordinated drainage and fencing interfaces with the HSR right-of-way.

Based on MTO Southern Highways Program data for rural bridge construction and rehabilitation in Ontario, and consistent with Canadian and international project data, a reasonable per-structure cost range for a new rural HSR-spanning overbridge in 2025 Canadian dollars is:<sup>6</sup>

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

These figures are consistent with MTO project data showing rural bridge rehabilitation and replacement on Ontario highways in the \$0–\$10M range, and new construction higher. They are also consistent with UK experience: the Northumberland Line road bridge (68m span, 11.5m wide) tripled in cost from its original estimate to £30.6M (approximately C\$55M) due to inflation, illustrating how bridge cost estimates in HSR project business cases routinely underperform against out-turn costs.

# The Aggregate Cost Implication

Applying these per-structure costs to the estimated crossing treatment breakdown produces a sobering range:

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

To be clear: these are not costs of providing crossings to all 1,000+ roads, they are the cost of the crossings that would be provided. The roads that do not receive bridges cost nothing to close, except in property compensation. Grade separation costs of \$3–8 billion represent a meaningful share of the \$60–90 billion total project estimate that has never been broken out publicly or subjected to independent scrutiny. Nor has Alto published any methodology explaining how many crossings it intends to provide, at what standard, or what criteria will be used to determine which roads are dead-ended.

**WHY THIS NUMBER MATTERS FOR THE BUSINESS CASE**  
 Alto's published Business Case Summary presents a total capital cost range but provides no breakdown of civil infrastructure components. Grade separation costs , potentially \$3–8B on their own, are a category where optimism bias in HSR projects is well documented internationally. 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. If Alto's crossing count is comparable to or higher than the HFR northern corridor estimate, and if per-structure costs follow the Ontario market, grade separations alone represent a substantial and uncostered line item in what is already an unverified capital estimate.

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## Implications for Affected Communities

The practical consequences of road severance in rural Ontario are not abstract. 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 that adds a 6–10 km detour to daily equipment movement represents a genuine operational cost and in some cases may make field configurations economically unviable.

## Emergency Services: When Minutes Are Clinical

Rural emergency response in eastern Ontario operates on thin margins. 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, and for highest-acuity (CTAS 1) calls against a target of 8 minutes or less from the time an ambulance is assigned.<sup>8</sup> In practice, rural services often struggle to meet these targets because of geography alone — a challenge that would be materially worsened by road network severances that add detour distance to every response route.

The clinical stakes are well established. A 2025 study published in *BMC Emergency Medicine* examining rural out-of-hospital cardiac arrest (OHCA) in northern England found that response times in rural areas were over 3.5 minutes slower than urban, and that each additional kilometre of distance from an ambulance station added approximately 37 seconds to response time.<sup>9</sup> 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%.<sup>10</sup> A road closure that adds a 5 km detour to a response route translates to roughly 3 additional minutes at rural road speeds, a clinically significant margin when the response window for cardiac arrest is measured in single-digit minutes.

Rural fire response faces the same arithmetic. Volunteer fire departments serving rural townships along the Alto HSR corridor depend on concession road grids for coverage. A dead-ended road adds not only travel distance for the apparatus but also eliminates the tactical option of approaching a scene from multiple directions — something fire incident commanders rely on for structure fires, farm machinery accidents, and motor vehicle collisions. None of this analysis has been conducted or published by Alto HSR, and it is not among the topics listed in the current public consultation framework.

**Ontario's rural EMS response time targets are already under stress.** The 2022 response time data from multiple Ontario paramedic services documented that on-call stations routinely miss the legislated 6-minute SCA and 8-minute CTAS 1 targets — specifically because of geography and coverage area. The comment from one service's report is illustrative: "Our vast geography continues to be the largest contributing factor to our response time challenges." Adding permanent network severances to an already stretched rural emergency response system will degrade coverage further. This cost does not appear in any Alto project document.

## School Bus Transportation: Route Networks and Cumulative Cost

Rural school transportation in Ontario is planned and operated around the concession road grid. Under Ontario's MTO School Bus Handbook, route planning must account for road type, traffic, and safety, and school bus operators in Ontario are not required to travel roads that are not assumed and maintained year-round by the municipality.<sup>12</sup> A dead-ended concession road created by a rail crossing closure can force route re-planning in one of two ways: either the road is no longer serviceable for bus routing at all (because it no longer connects to anywhere), or the bus must travel a longer route to serve students who previously lived on a through road that is now a cul-de-sac.

Ontario's Student Transportation Fund allocates approximately \$800 million per year provincewide for school busing, calculated on the basis of optimal route distances from student homes to school.<sup>13</sup> Route detours imposed by infrastructure are not reimbursed by the province on an exception basis, they are absorbed as inefficiency within existing envelopes, or passed on as pressure for route rationalization (meaning longer ride times for students). A detour of 6–8 km imposed on a single rural bus route means an additional 10–16 minutes of daily travel time per route. Compounded across dozens of routes crossing the corridor from Toronto to Quebec City, the aggregate effect on student ride times and board operating costs is substantial.

Student Transportation Services of Central Ontario, which serves the Peterborough–Northumberland–Kawartha Lakes region, explicitly notes that transportation will not be provided on roads not maintained year-round by the municipality.<sup>14</sup> If a concession road is dead-ended, losing its municipal maintenance justification, students living on that road lose bus eligibility and must be accommodated under different arrangements. This is a real downstream cost of road closure decisions that should be modelled by Alto before, not after, corridor selection.

### Induced Vehicle Emissions from Permanent Detours

A consequence of road severances that rarely appears in HSR project environmental assessments is the permanent, annually recurring increase in road vehicle emissions caused by enforced detours. If a crossing is closed and affected households and farm operations must travel additional distance for every trip that formerly crossed that point, the aggregate emissions over the life of the infrastructure are non-trivial – and they partially offset the emissions benefit claimed for the rail service itself.

A conservative illustrative estimate can be constructed from available data. Assuming 300 road closures (the low end of the estimated range), each closure affecting an average of 15–20 households and farm operations requiring at least one daily vehicle crossing trip, and each closure adding a mean detour of 5 km each way (10 km/day):

PARAMETER	CONSERVATIVE	MID-RANGE
Road closures	300	500
Affected households/operations per closure	15	20
Added vehicle-km per household per day	10 km	10 km
Annual added vehicle-km across corridor	16.4 million km	36.5 million km
Fleet average CO <sub>2</sub> (mixed rural fleet, ~200 g/km) <sup>15</sup>	3,285 tonnes CO <sub>2</sub> /year	7,300 tonnes CO <sub>2</sub> /year
Over 50-year infrastructure life	<b>164,000 tonnes CO<sub>2</sub></b>	<b>365,000 tonnes CO<sub>2</sub></b>

Farm machinery and school buses, which are excluded from this calculation, emit at significantly higher rates per kilometre than passenger vehicles. Diesel farm tractors and combines emit approximately 2.5–3 kg CO<sub>2</sub> per litre of diesel consumed, and route detours for large machinery often require lower speeds and more fuel per km than road vehicles. Diesel school buses emit roughly 1,000–1,200 g CO<sub>2</sub>/km. Fifty bus routes each adding 8 km of daily detour over a 185-day school year would add approximately 74–89 tonnes of CO<sub>2</sub> annually from school transportation alone, a permanent recurring cost that compounds over decades.

These estimates are deliberately conservative and based on transparent assumptions. They are not presented as precise forecasts but as an order-of-magnitude illustration that induced detour emissions are a real, calculable, and non-zero lifecycle emission cost that should appear in any honest environmental assessment of the project. To date, Alto has not acknowledged this category of impact in any published document.

Property access. Several categories of rural property, including properties accessed solely from a road crossing the potential corridor, may require either a private underpass, a new access arrangement, or expropriation. Ontario's expropriation process requires fair market value compensation, but does not compensate for the operational disruption caused by changed access patterns.

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## What Alto Said On Record: Kingston City Council, February 17, 2026

On February 17, 2026, Alto's Vice-President of Systems Engineering and Interface, David Cook, appeared before Kingston City Council to present on the Alto HSR project and answer questions from Councillors. The session produced the most detailed on-record statements Alto has made publicly about road crossings. Those statements contain a significant internal contradiction, one that goes directly to the reliability of Alto's reassurances to affected rural communities.

### The Reassurance

Councillor Osanic asked whether there would be a standard distance between bridges over the HSR line, "every mile, four miles, what is the standard distance you think for connectivity?" Cook confirmed that road severances would occur, but offered the following assurance:

**ON RECORD — DAVID COOK, VP SYSTEMS ENGINEERING, ALTO**  
*"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 meeting, February 17, 2026. Source: City of Kingston closed-captioning transcript.

## The Qualification That Follows

Cook immediately qualified the reassurance in the same answer:

ON RECORD — DAVID COOK, VP SYSTEMS ENGINEERING, ALTO

*“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. And there’s also opportunity there. So sometimes existing roads aren’t necessarily representative of the traffic that takes them. So if we come along and build new infrastructure, that could be a good catalyst for improving the rest of the road along the rest of the infrastructure. So all those are things that are going to have to be discussed together with the road authorities.”*

David Cook, VP Systems Engineering and Interface, Alto — Kingston City Council meeting, February 17, 2026. Source: City of Kingston closed-captioning transcript.

## The Admission That Overpasses Will Be Minimized

When Deputy Mayor Cinanni pressed further on the fencing and road crossing question, “obviously wouldn’t be a fence all the roads... you would work with overpasses possibly... that would be a lot of infrastructure”, Cook gave a third answer that reveals the real operational intent:

ON RECORD — DAVID COOK, VP SYSTEMS ENGINEERING, ALTO

*“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, VP Systems Engineering and Interface, Alto — Kingston City Council meeting, February 17, 2026. Source: City of Kingston closed-captioning transcript.

## On Fencing: Full Segregation Confirmed

Deputy Mayor Cinanni asked whether the entire track would be fenced or whether elevated sections would be exempt. Cook confirmed the full-segregation requirement:

ON RECORD — DAVID COOK, VP SYSTEMS ENGINEERING, ALTO

*“Modern passenger [rail] always has to be completely segregated. It’s electrified and it goes quickly. It doesn’t matter if it’s 200 kilometres an hour, 300 kilometres an hour. It has to be fully fenced so that there can be no intrusions from pedestrians, wildlife, and vehicles. Certainly if you’re in an elevated section, like an elevated viaduct, then that in itself provides separation — you wouldn’t necessarily need to add fencing. But anywhere where you could have level access, it would have to be fenced for sure.”*

David Cook, VP Systems Engineering and Interface, Alto — Kingston City Council meeting, February 17, 2026. Source: City of Kingston closed-captioning transcript.

## Analysis: Why the Reassurance Does Not Hold

Cook’s three statements, read together, reveal the actual situation clearly. The “working assumption that every road will get some sort of duct or overpass” is not a commitment, it is a starting point that Cook himself described as subject to consolidation “to lower

costs.” His third statement is the most revealing: Alto’s explicit operational goal is to “try and limit the number of overpasses that we’ll need to get created.” The organization that would be providing the crossings has stated on record that it intends to minimize them.

Councillor Osanic’s direct question, whether there would be a standard crossing distance, was never answered. No standard distance exists, and no commitment to provide one was made. 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 the end of 2026, after the public consultation closes. Communities are being asked to evaluate a project whose road severance impacts cannot be assessed because no crossing criteria have been published, and whose engineering VP has confirmed on record that the goal is to build as few overpasses as possible.

The fencing confirmation has a further implication. Cook confirmed that anywhere with level access, meaning all at-grade sections, will be fully fenced. On the Ontario concession road grid, where a road crosses the corridor approximately every one to two kilometres, each fenced section between crossings creates a linear barrier severing properties and farm operations on both sides. The fencing is not incidental to the crossing question, it is what makes uncrossed roads permanently impassable rather than inconvenient.

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## **What This Analysis Supports**

This analysis supports a specific ask: that Alto HSR be required to publish, as part of the public consultation process, a preliminary road crossing assessment identifying the number and type of crossings on each corridor option under consideration, the criteria that will be used to determine whether a crossing receives a bridge or is closed, and the methodology for assessing detour adequacy in rural settings.

The March 29, 2026 consultation deadline closes before this information will be available. Affected communities, whose road access, property values, and municipal services are directly implicated, are being asked to respond to a project whose most immediate local impacts have not been disclosed.

## NOTES AND SOURCES

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1. The standard Ontario concession road system spaces parallel concession roads approximately 1.25 miles (2.0 km) apart, with perpendicular sideroads at similar intervals. See: The Canadian Encyclopedia, "Concession Line"; Wikipedia, "Concession road."
2. The HFR northern route alignment — through Peterborough, Ottawa, and Montreal on dedicated new tracks — was confirmed in the July 2021 government announcement and described in subsequent procurement documents. Transport Action Canada noted that the alignment would use a reinstated section of dormant CP trackage between Havelock and Glen Tay, and that a federal Impact Assessment was triggered because significant new track construction away from existing corridors was envisaged. See: Transport Action Canada, "Federal Government Moving Forward on High Frequency Rail," July 2021.
3. HS2 Phase 1 structure count: Tomas Garcia, Head of Civil Structures, HS2 Ltd, stated "with 61 viaducts and 150 overbridges on Phase 1" in remarks reported by New Civil Engineer, "How HS2 civils team is drawing up its northern bridges and viaducts," 18 June 2021. Phase 1 route length: 225 km (London to Birmingham). See also HS2 Ltd, "Viaducts and Bridges," [hs2.org.uk](https://www.hs2.org.uk).
4. Pickmere Parish Council: "4 July 2023 – HS2 – Report Back Following Parliamentary Select Committee Appearance," Pickmere Parish Council, July 2023. Available at [pickmeparishcouncil.gov.uk](https://pickmeparishcouncil.gov.uk). The council secured HS2's agreement to seek retention of Budworth Road and avoid permanent closure. For the A4010 Risborough Road closure (Buckinghamshire): HS2 Ltd, "Notice of Closure – A4010 Risborough Road," February 2024: "The A4010 itself will be effectively stopped up and there will be no through road for other road vehicles." Register of undertakings and assurances: 497 commitments as of August 2023, reported in HS2 Phase 2b Select Committee proceedings, UK Parliament, September 2023.
5. UK Parliament, Hansard, "HS2" debate, 13 September 2021. MP quoted: "HS2 Ltd has too often acted in a thoughtless and high-handed way, failing to communicate effectively about the nature of its works and the road closures and other disruption that they cause... every penny claimed by vulnerable people whose lives have been ruined by the line has been fiercely contested." Available at [hansard.parliament.uk](https://hansard.parliament.uk).
6. Bridge cost data: MTO Southern Highways Program published tender cost ranges, 2022–2024 ([ontario.ca](https://www.ontario.ca)); Northumberland Line bridge cost escalation reported in New Civil Engineer, "Cost of road bridge over Northumberland line triples due to inflation," 13 April 2023 (GBP 30.6M for 68m x 11.5m span). General bridge cost ranges from published engineering cost guidance, adjusted to 2025 CAD.
7. Primary source: Transport Canada, TRAN Committee Appearance Binder — Item 15: High Frequency Rail, March 7, 2023. Available at [tc.canada.ca/en/binder/15-high-frequency-rail-0](https://tc.canada.ca/en/binder/15-high-frequency-rail-0). Prepared for the Standing Committee on Transport, Infrastructure and Communities.
8. Ontario Regulation 257/00 under the Ambulance Act, Part VIII (Response Time Plans). The regulation requires every upper-tier municipality (UTM) and ambulance dispatch centre to establish and report response time performance for Sudden Cardiac Arrest (6 minutes or less) and CTAS 1 calls (8 minutes or less). Annual performance reports publicly available at [ontario.ca/page/response-times-ontario](https://ontario.ca/page/response-times-ontario).
9. BMC Emergency Medicine (2025): "Modelling emergency response times for Out-of-Hospital Cardiac Arrest (OHCA) patients in rural areas of the North of England using routinely collected data." Key findings: rural response times 3.5+ minutes slower than urban; each additional km from ambulance station adds approximately 37 seconds to response time. doi: 10.1186/s12873-025-01170-7.
10. Multiple peer-reviewed sources document 6–10% reduction in cardiac arrest survival per minute of delay: (a) PMC 12065030 (Bangkok EMS study, 2025): "Each 1-minute increase in response time

decreased the likelihood of survival at the scene by 6%"; (b) NCBI Bookshelf NBK321505: "Survival decreases by approximately 7 to 10 percent for every minute after witnessed cardiac arrest that passes without administration of CPR" (Larsen et al., 1993); (c) Journal of the American Heart Association (Kitamura et al., 2018): each 1-minute increase in EMS response time associated with 11% reduction in neurologically intact survival (adjusted odds ratio 0.89 per minute).

11. Paramedic Services of Manitoulin-Sudbury District, "2022 Response Time Standards Issue Report," Manitoulin-Sudbury District Services Board, 2022. The report states: "Our vast geography continues to be the largest contributing factor to our response time challenges." The document records below-target performance at on-call stations across rural Northern Ontario, driven by geography and coverage area.
12. Ontario Ministry of Transportation, Official MTO School Bus Handbook, "School Bus Routes." Requirements include consideration of road type, traffic volume, and safety; roads not maintained year-round by the municipality are not served. Available at [ontario.ca/document/official-ministry-transportation-mto-bus-handbook/school-bus-routes](https://ontario.ca/document/official-ministry-transportation-mto-bus-handbook/school-bus-routes).
13. Ontario Ministry of Education, Student Transportation Fund. Budget cited: approximately \$800 million per year provincially, representing an average of approximately \$371 per enrolled student. Starting with 2023/24, the fund operates on the basis of benchmark costs and Common Reference Standards applying provincial eligibility distances.
14. Student Transportation Services of Central Ontario (STSCO), "KPR Transportation Guidelines," Section 1.2: "Transportation will not be provided on roads that are not assumed and maintained year round by the municipality." Available at [stsco.ca](https://stsco.ca).
15. CO2 emission rate: Canadian federal fleet average for new light-duty vehicles was approximately 153 g CO<sub>2</sub>/km under 2016 standards (Environment and Climate Change Canada; [transportpolicy.net](https://transportpolicy.net)). The on-road fleet average for vehicles in service – including older models, SUVs, and light trucks common in rural Ontario – is approximately 190–210 g CO<sub>2</sub>/km. This analysis uses 200 g/km as a conservative fleet-average estimate. Source: Natural Resources Canada, EnerGuide Vehicle Data; Environment and Climate Change Canada, National Inventory Report. Diesel farm machinery and school bus emissions from published Transport Canada GHG data.