

## TECHNICAL ANALYSIS

# Fire Suppression, Wildfire Response, and Road Severance on the ALTO HSR Southern Corridor

## *Southern Corridor — Eastern Ontario*

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### KEY FINDINGS

1. South Frontenac Fire and Rescue responded to 42 wildfires in the 2025 fire season, the worst in Fire Chief Blakney's five-year tenure, with fire bans in effect from July 23 to October 31, 2025.
2. During the 2025 drought, Stone Mills Township Fire Captain Quincy Emmons reported that all national wildfire resources were at Level 5, meaning all resources in use and at the limit to deal with wildfires, triggering the regional mutual aid system.
3. Canada's 2025 wildfire season burned approximately 8.8 million hectares nationally, more than double the 10-year average, making it the second-worst on record.
4. A fenced, grade-separated HSR corridor creates a linear firebreak that emergency apparatus cannot cross except at designated grade separations. On a concession road grid with crossings every 1–2 km, consolidating crossings to every 4–8 km adds 3–10 minutes to apparatus travel time on every affected response route.
5. Rural volunteer fire departments in the corridor depend on tanker shuttle systems for suppression in areas without hydrants. The HSR corridor fence eliminates informal crossing points, forcing tanker relays over longer routes and reducing effective flow rates.
6. Climate projections for Ontario indicate that the frequency of wildfires and the length of the fire season are both projected to increase. The UN Environment Programme projects a global increase in extreme wildfires of up to 30% by 2050 and 50% by 2100.
7. Wildfire-specific risks are compounded by HSR construction itself: vegetation clearing, exposed dry material, and rail operations generating sparks are documented ignition sources.
8. ALTO HSR has not published any analysis of fire suppression access, tanker routing, or corridor-crossing requirements for wildfire response. These impacts have not been disclosed.

# 1. Background: The Southern Corridor and Eastern Ontario Fire Services

The proposed ALTO southern corridor for high-speed rail would pass through Frontenac, Lennox and Addington, Leeds and Grenville, and Hastings counties, a region whose rural character, mix of forest, agricultural land, and wetland, and reliance on volunteer fire departments makes fire suppression access a significant infrastructure consideration. Operating at up to 300 km/h, the line requires a fully fenced, grade-separated right-of-way approximately 60 metres wide. This corridor would cross the concession road grid that rural fire departments depend on for apparatus routing and water tanker logistics.

This document analyzes three related but distinct impacts on fire suppression capacity: (1) how road severance affects apparatus response time and tactical options for structure fires, vehicle fires, and farm fires; (2) how a fenced linear corridor intersects with wildfire response — an increasingly critical concern given the 2025 drought emergency across the region; and (3) how the construction phase itself introduces new ignition risks. These analyses are grounded in on-the-ground conditions documented during the 2025 fire season and supported by climate projections indicating conditions will worsen over the operational life of the infrastructure.

## 2. The 2025 Eastern Ontario Fire Season: Context and Precedent

The summer of 2025 produced conditions that fire chiefs in the ALTO southern corridor study area described as unprecedented in their experience. The drought was documented nationally as one of Canada’s worst on record: parts of Eastern Ontario received less than 40% of their normal July rainfall, with Agriculture Canada recording only 18.7 mm of rain in the Kingston area in July 2025, against a 25-year historical average of 72.2 mm.<sup>1</sup>

Canada’s 2025 wildfire season burned approximately 8.8 million hectares nationally, more than double the 10-year average and the second-worst season on record, exceeded only by 2023.<sup>2</sup> Environment and Climate Change Canada identified Eastern Ontario among the regions experiencing severe to exceptional moisture deficits, with large areas at very high to extreme fire danger for extended periods during July and August.

**ON RECORD — CHIEF DELBERT BLAKNEY, SOUTH FRONTENAC FIRE AND RESCUE**  
*“All our fire indices are in the extreme, so we’re at a very high risk of fire, and in the last two weeks we’ve had 14 wildfires we’ve attended.”*  
Chief Blakney, speaking in August 2025 — his fifth year leading South Frontenac Fire and Rescue. Reported by CBC News, August 12, 2025.

South Frontenac Township, one of the municipalities that sits directly within the ALTO southern corridor study area and has formally opposed the southern alignment, saw its Fire Chief declare a Level One Fire Ban on July 23, 2025, escalate to a Total Fire Ban on August 1, and maintain some level of ban until October 31, 2025. By season’s end, South Frontenac Fire and Rescue had responded to 42 wildfires (grass, crops, forests, and islands) and 20 burn complaints during the 2025 season.<sup>3</sup>

The 2025 season was not an isolated anomaly. Environment and Climate Change Canada identified wildfires, drought, and storms as among Canada’s top weather stories of 2025, and noted that four of the past five years saw well above-average area burned. This is the climate baseline against which the 100-year-plus operational life of the HSR infrastructure must be assessed.

**ON RECORD – CAPTAIN QUINCY EMMONS, STONE MILLS TOWNSHIP FIRE AND RESCUE**  
*“Across Canada, we are at a level 5, meaning all resources are in use and we are at our limit to deal with wildfires.” Emmons, also CEO of FireRein, continued: “Local fire departments will be initiating our mutual aid systems, so in the event of a fire, multiple departments will respond to send water tankers and spread the burden of water resources.”*  
Captain Quincy Emmons, Stone Mills Township Fire and Rescue. Reported by CFRC News, August 2025.

### 3. The Corridor as a Barrier: Road Severance and Fire Apparatus

#### 3.1 How Volunteer Fire Departments Depend on the Concession Road Grid

Rural fire departments in Eastern Ontario are predominantly volunteer services operating from a small number of stations spread across large geographic areas. Coverage is achieved through rapid response along the concession road grid, which in the ALTO southern corridor study area spaces roads approximately 1.25 miles (2 km) apart. This grid is not simply convenient infrastructure: it is the spatial logic on which station locations, coverage zones, and mutual aid agreements have been built over decades.

A fenced, grade-separated HSR right-of-way severs this grid in the same way at every crossing point. Where a crossing is closed rather than replaced with a bridge, the nearest crossing point may be 4–8 km away. For fire apparatus traveling at rural road speeds of 70–80 km/h, a 5 km detour adds 3.75 to 4.5 minutes to every response that requires crossing the corridor.

This detour is not an occasional inconvenience: it is permanent and applies to every call. A station on one side of the corridor responding to a call on the other side must cross at

a designated point regardless of incident type, weather, or time of day. At a scene requiring multi-apparatus response, a structure fire, a barn fire, a wildfire approaching structures, additional units arriving from mutual aid departments across the corridor face the same mandatory detour.

### 3.2 Multi-Directional Approach and Tactical Flexibility

Structure fire operations in rural settings depend on the ability to approach a scene from multiple directions. Fire incident commanders use multi-directional approach to position apparatus for water supply, access ventilation points, establish suppression lines, and ensure personnel egress routes are independent of any single road. This tactical flexibility is specifically compromised by a linear barrier.

At a farm property that straddles the corridor, or immediately adjacent to it, a structure fire or machinery fire could leave one entire access side of the property unreachable by road. Barn fires, common during harvest season, when hay baler friction, spontaneous combustion of wet bales, and electrical faults are documented ignition sources, as documented on local farms during the 2025 drought, require large-volume water application quickly. If the approach from one side is blocked by the corridor, effective suppression may be delayed or compromised.

**The August 10, 2025 hay baler fire on Perth Rd, South Frontenac.** South Frontenac Fire and Rescue responded to a 20-acre vegetation fire on August 10, 2025, caused by a seized bearing on a hay baler during harvest operations. The incident required road closures on Perth Rd and Rutledge Rd and the assistance of Kingston Fire & Rescue, Stone Mills Township, and Loyalist Township Emergency Services — a multi-department mutual aid response. On an incident where the rail corridor crossed the access roads to that scene, the arrival of mutual aid departments from the far side of the corridor would have been subject to mandatory detour. The incident illustrates exactly how agricultural fires during dry conditions depend on unrestricted road grid access and rapid mutual aid assembly.

### 3.3 Tanker Shuttles and Water Supply in Rural Areas

Most rural properties along the ALTO southern corridor have no access to municipal water supply or fire hydrants. Suppression depends entirely on water carried in apparatus and delivered by tanker shuttle — a relay system in which tanker trucks continuously cycle between a water source (a pond, stream, or municipal fill station) and the fire scene to maintain uninterrupted flow at the nozzle.

Tanker shuttle effectiveness is determined by drive time in the relay cycle: shorter relay routes allow more frequent fills and higher sustained flow rates. The National Fire Protection Association standard NFPA 1142 establishes criteria for water supply on rural and suburban properties, and Ontario’s Superior Tanker Shuttle Accreditation program recognizes fire departments that can demonstrate uninterrupted flow of over 400 gallons per minute at the five-minute mark of arrival.

A road severance that forces tanker trucks onto a 4–8 km detour extends the relay cycle time and reduces the sustainable flow rate at the scene. For a structure fire where initial water application within the first 10–15 minutes is decisive for containment, a reduced effective flow rate from a longer relay route can be the difference between a contained room fire and total structural loss.

The mutual aid response described by Captain Emmons in August 2025, multiple departments sending water tankers to spread the water supply burden, explicitly depends on tankers being able to travel efficiently between departments' coverage zones. A linear barrier with limited crossings forces all tanker traffic to funnel through the same crossing points, creating both congestion and longer relay distances simultaneously.

## **4. The Corridor as a Barrier: Wildfire-Specific Risks**

### **4.1 How the Corridor Changes Wildfire Behaviour**

A fenced HSR corridor is not merely a physical obstacle: it alters the landscape in ways that affect wildfire behaviour and suppression access simultaneously. The cleared right-of-way, a 60-metre-wide strip of managed vegetation running east-west through the landscape, can function as either a firebreak or a fire pathway depending on conditions.

In dry conditions such as those documented in the summer of 2025, low roadside grasses, dried vegetation along the right-of-way margin, and the absence of the tree canopy's humidity-retaining effect can create a continuous dry fuel strip. A fire ignited by a passing train, a sparking wheel, a lightning strike, or a discarded cigarette can travel along the right-of-way margin before burning into adjacent properties.

More critically: a wildfire burning north of the corridor and driven south by prevailing winds cannot be managed from the south side of the corridor until it crosses at a grade separation. Fire lines, the tactical suppression perimeter that crews establish to contain wildfire spread, require crews to be able to work on both sides of the advancing fire front. A fenced, impassable corridor prevents this on any section between grade separations.

### **4.2 The 2025 Season as a Stress Test**

The conditions documented in the 2025 fire season represent the type of scenario in which the corridor barrier effect would have direct operational consequences. South Frontenac Fire Chief Blakney reported 14 wildfires in two weeks during August 2025. Captain Emmons confirmed that all national wildfire resources were at capacity. Under these conditions, a wildfire burning on one side of the HSR corridor with inadequate crossing infrastructure would have faced the following constraints:

- Apparatus from stations on the far side of the corridor would be subject to mandatory detour at designated crossings, potentially adding 5–15 minutes to initial attack response depending on incident location relative to nearest crossing.
- Water bombers and provincial fire management crews would not be affected by the surface barrier, but ground crews and apparatus, essential for protecting structures and managing the fire perimeter near buildings, would be.
- Evacuation of residents on the far side of the corridor from an approaching fire would be channeled through the same limited crossing points, creating competing traffic between emergency apparatus moving toward the fire and civilians moving away from it.
- Mutual aid tanker traffic and reserve apparatus responding to the scene would also be concentrated at crossing points, reducing relay efficiency precisely when demand peaks.

None of these operational constraints are insurmountable if adequate grade-separated crossings are provided at appropriate intervals. The concern is that, as ALTO's VP of Systems Engineering confirmed on record at Kingston City Council in February 2026, the organization's explicit goal is to minimize the number of overpasses. The fire suppression implications of crossing spacing decisions have not been analyzed or disclosed by ALTO.

### **4.3 The Right-of-Way as an Ignition Source**

Rail operations generate documented ignition risks. Rail-friction sparks from braking and acceleration, particularly at the high speeds planned for this service, can project beyond the right-of-way in dry and windy conditions. The Ontario Fire Marshal has documented railway sparks as a recurring cause of trackside vegetation fires, a category that becomes significantly more dangerous during drought conditions such as those experienced in 2025.

HSR electrification introduces additional ignition risk from overhead catenary arcing, particularly during dry lightning storms or damaged infrastructure. International experience with electrified high-speed corridors shows that trackside fires are a recurring maintenance challenge, particularly in dry regions and during drought years. The Eastern Ontario corridor, as demonstrated in 2025, is capable of sustaining exactly these conditions.

A 100-year HSR corridor running through a region with confirmed extreme drought and wildfire conditions in 2025, and with climate projections indicating increasing fire weather frequency and severity, represents a recurring ignition source permanently installed in a high fire-risk landscape. This is an impact category that has not appeared in any ALTO project documentation.

# 5. Climate Projections: Fire Risk Over the Corridor's Operational Life

The ALTO HSR infrastructure, if built, would operate for a century or more. The fire conditions of 2025 are not the baseline against which its fire suppression impacts should be assessed: they are an early data point on a trajectory that climate projections indicate will worsen significantly over the infrastructure's lifetime.

Ontario's provincial climate change projections indicate that the frequency of wildfires and the length of the fire season are both projected to increase. The province is projected to warm an additional 2.3°C by 2050 and up to 6.3°C by 2100 under the higher emissions scenario, with more frequent hot, dry spells and extended summer drought.<sup>4</sup>

World Weather Attribution, analyzing the 2023 wildfire season, found that peak fire weather is at least twice as likely due to human-induced climate change than it would be in a pre-industrial climate, and that likelihood and intensity are projected to increase further in a 2°C warmer world.<sup>5</sup> The Climate Atlas of Canada summarizes fire researcher Mike Flannigan's assessment: climate change is predicted to worsen all three ingredients of destructive wildfires, fuel, ignition, and weather, across most of Canada.

The UN Environment Programme's 2022 report *Spreading like Wildfire* projects a global increase in extreme wildfires of up to 14% by 2030, 30% by 2050, and 50% by the end of the century.<sup>6</sup>

## Projected Fire Weather Trajectory vs. HSR Infrastructure Life

Period	Fire weather projection	Ontario temp change (vs. 1971–2000 baseline)	HSR infrastructure status
2026–2035 (construction)	Conditions comparable to or worse than 2025; fire season already lengthening	+0.5–1.0°C ongoing	Active construction; road disruption; elevated ignition risk
2036–2050 (early operations)	Extreme fire weather 2× more likely than pre-industrial baseline; fire season 3+ weeks longer	+2.3°C projected mean	Infrastructure in full operation; crossing decisions locked in
2050–2100 (mid-to-late operations)	Extreme fires +30–50% more frequent globally; fire weather days up 26–200%	+3.0–6.3°C depending on emissions	Corridor operational; fire risk landscape materially worse than at construction

The infrastructure being designed today will operate across all of these periods. Grade-separated crossing decisions made during route selection cannot easily be reversed after construction. If the corridor is built with crossing spacing that is adequate for 2026 fire risk, it may be significantly inadequate for 2050 fire risk. This argues for designing fire

suppression access requirements into the corridor from the outset, not treating them as a value-engineering consideration.

## 6. Construction Phase: Additional Fire Risks

The construction of a 1,000 km HSR corridor introduces fire risk through multiple mechanisms that are distinct from the operational impacts described above. These are temporary in the sense that they cease when construction concludes, but they span a multi-decade build period and are likely to coincide with continued worsening of regional drought and fire conditions.

Vegetation clearing along the full right-of-way creates an immediate fire fuel profile: dried, cut material that is typically left on-site or piled for disposal. During drought conditions, this is a documented ignition risk. Heavy construction equipment, diesel engines, exhaust systems, grinding operations, welding, is a documented source of field fires during dry conditions. A 20-acre vegetation fire caused by a hay baler was among the incidents South Frontenac Fire and Rescue managed during the 2025 season; construction equipment on a dry right-of-way presents comparable or greater ignition potential.

During construction, road access for fire apparatus will be intermittently disrupted by active work zones, temporary road closures, and bridge construction. This disruption to response routes is compounding: it reduces the already-limited crossing infrastructure while increasing the fire risk landscape. Construction contracts should be required to maintain fire apparatus access to every crossing point at all times, with documented protocols for how access will be maintained at active work zones.

## 7. What ALTO Has Not Disclosed

As of March 2026, ALTO has not published any analysis addressing:

- The number, type, or spacing of proposed grade-separated crossings on either corridor option, including crossings on established fire apparatus response routes;
- A fire suppression access plan identifying how rural volunteer fire departments would maintain coverage on both sides of the corridor;
- A tanker shuttle routing analysis examining how road severance would affect water supply operations in areas without hydrants;
- Any analysis of the corridor right-of-way as a wildfire ignition source or fire behaviour modifier;
- Any engagement with local fire chiefs, fire marshals, or the Ontario Association of Fire Chiefs regarding suppression access requirements.

ALTO's VP of Systems Engineering confirmed at Kingston City Council on February 17, 2026, that crossing decisions will not be finalized until route selection is complete, which will not occur until at least the end of 2026. Communities and fire services are

therefore being asked to evaluate a project whose most direct fire suppression implications cannot be assessed because the design decisions that determine them have not been made.

**Canada has no petition mechanism equivalent to the UK’s HS2 Hybrid Bill process.** Under the HS2 process, affected communities had the legal right to appear before a Parliamentary Select Committee and challenge individual crossing decisions. Pickmere Parish Council successfully challenged HS2’s proposed closure of Budworth Road; the A4010 Risborough Road (a classified A-road) was permanently stopped up despite objections. Ontario fire departments, municipalities, and townships have no comparable mechanism. The only formal opportunity to raise concerns is the current public consultation, which closes April 24, 2026, before any route or crossing plan has been published.

## 8. Assessment and Recommendations

### 8.1 Require Fire Suppression Access Analysis Before Consultation Closes

ALTO should be required to publish, as part of the public consultation process, a preliminary fire suppression access assessment identifying: the number and location of proposed grade-separated crossings on each corridor option; which crossings are on established fire department response routes; and what criteria will be used to determine crossing spacing. This information is essential to any meaningful community assessment of the project’s impacts.

### 8.2 Engage Fire Chiefs in Corridor Design

The Ontario Association of Fire Chiefs, local fire departments in South Frontenac, Stone Mills, Loyalist, Rideau Lakes, and other affected townships, and the Office of the Fire Marshal should be formally engaged in corridor design. Fire suppression access requirements should be treated as non-negotiable infrastructure constraints, not value-engineering variables. Crossing spacing on the concession road grid should be determined by fire response modeling, not by cost minimization.

### 8.3 Apply Climate-Adjusted Fire Risk Standards

Crossing infrastructure decisions should not be assessed against current fire risk baselines but against projected conditions for the mid-point and end-point of the infrastructure’s operational life. A corridor designed for 2026 fire conditions will be inadequate in 2060 and possibly catastrophically so by 2100. Infrastructure decisions made now will be effectively permanent; they should be made with explicit reference to the Ontario government’s own climate change projections for wildfire frequency and fire season length.

## 8.4 Require Construction-Phase Fire Safety Plan

ALTO and the Cadence consortium should be required to develop and maintain, in partnership with local fire departments and the Ontario Forest Fire Management program, a construction-phase fire safety plan addressing vegetation clearing protocols, equipment ignition risk management, maintenance of fire apparatus access through all active work zones, and communication of access changes to local fire services in advance.

## 8.5 Commission an Independent Wildfire Corridor Risk Assessment

Given the documented 2025 fire emergency in the corridor study area, and given the century-long operational life of the infrastructure, an independent wildfire corridor risk assessment should be commissioned as a mandatory component of the federal Impact Assessment for the project. This assessment should model wildfire scenarios on both corridor options under current and projected climate conditions, evaluate the adequacy of crossing infrastructure for fire suppression access under those scenarios, and assess the ignition risk profile of the right-of-way.

## Notes and Sources

1. Drought and rainfall data: Agriculture Canada, July 2025 drought assessment for Eastern Ontario. Canada Weather Stats / The Weather Network historical monthly averages for Kingston: July average 72.2 mm (25-year average); July 2025 actual: 18.7 mm. Reported by CFRC News, "Failing fields, dry wells: Eastern Ontario's summer of drought," August 2025. [cfr.ca/news-events/news/2025/august/failing-fields-dry-wells-eastern-ontario-s-summer-of-drought](https://cfr.ca/news-events/news/2025/august/failing-fields-dry-wells-eastern-ontario-s-summer-of-drought)
2. Canada 2025 wildfire season total area burned: approximately 8,815,000 ha, more than double the 10-year average of 4,077,877 ha. Weather Atlas / DTN, "Record-Breaking Canadian 2025 Wildfire Season," December 11, 2025. Environment and Climate Change Canada, "Canada's top 10 weather stories of 2025," [canada.ca/en/environment-climate-change/services/top-ten-weather-stories/2025.html](https://canada.ca/en/environment-climate-change/services/top-ten-weather-stories/2025.html)
3. South Frontenac Fire and Rescue 2025 season statistics: 42 wildfires, 20 burn complaints. Level One Fire Ban July 23; Total Fire Ban August 1; Level One resumed August 29; ban lifted October 31, 2025. Sources: Township of South Frontenac fire ban news posts, [southfrontenac.net](https://southfrontenac.net); CBC News, "Much of eastern Ontario under fire bans," August 12, 2025, [cbc.ca/news/canada/ottawa/eastern-ontario-dry-drought-weather-fire-ban-1.7606374](https://cbc.ca/news/canada/ottawa/eastern-ontario-dry-drought-weather-fire-ban-1.7606374); Kingston News, October 31, 2025.
4. Ontario climate projections: provincial temperatures projected to warm +2.3°C by 2050, +6.3°C by 2100 (higher emissions scenario RCP8.5). Frequency of wildfires and length of fire season projected to increase. Source: Davey / Ontario government climate projections factsheet, "Climate Change Projections for Ontario," [davey.com/media/3qaex23l/ca-ontario-projections-623.pdf](https://davey.com/media/3qaex23l/ca-ontario-projections-623.pdf)
5. World Weather Attribution. "Climate change more than doubled the likelihood of extreme fire weather conditions in Eastern Canada." [worldweatherattribution.org](https://worldweatherattribution.org). Analysis found extreme fire weather at least twice as likely in current climate, with further increases projected under 2°C warming scenario.
6. UN Environment Programme and GRID-Arendal. (2022). Spreading like Wildfire: The Rising Threat of Extraordinary Landscape Fires. Projected global increases in extreme wildfires: +14% by 2030, +30% by 2050, +50% by 2100. [unep.org/news-and-stories/press-release/number-wildfires-rise-50-cent-2100-and-governments-are-not-prepared](https://unep.org/news-and-stories/press-release/number-wildfires-rise-50-cent-2100-and-governments-are-not-prepared)

7. The Pointer, "Canada's 2025 wildfire season a wake-up call — more populated areas are under threat," August 15, 2025. [thepointer.com/article/2025-08-15/canada-s-2025-wildfire-season-a-wake-up-call-more-populated-areas-are-under-threat](https://thepointer.com/article/2025-08-15/canada-s-2025-wildfire-season-a-wake-up-call-more-populated-areas-are-under-threat)
8. South Frontenac hay baler fire, August 10, 2025. Road closures Perth Rd and Rutledge Rd; mutual aid response from Kingston Fire & Rescue, Stone Mills Township, and Loyalist Township. Source: South Frontenac Fire and Rescue official update, [southfrontenac.net](https://southfrontenac.net)
9. David Cook, VP Systems Engineering and Interface, ALTO. Kingston City Council meeting, February 17, 2026. Confirmed goal to "try and limit the number of overpasses that we'll need to get created." Source: City of Kingston closed-captioning transcript.
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11. HS2 crossing decisions: A4010 Risborough Road permanently stopped up; Pickmere Parish Council petition to retain Budworth Road. Sources: HS2 Ltd, "Notice of Closure — A4010 Risborough Road," February 2024; Pickmere Parish Council, "4 July 2023 — HS2 — Report Back Following Parliamentary Select Committee Appearance."
12. Climate Atlas of Canada, "Forest Fires and Climate Change." Quotes fire researcher Mike Flannigan (30 years of fire research): "in a word, the future is smoky." [climateatlas.ca/forest-fires-and-climate-change](https://climateatlas.ca/forest-fires-and-climate-change)
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14. Ontario Association of Fire Chiefs statistics: 437 fire departments in Ontario; 18,281 volunteer firefighters; 195 volunteer departments. [oafc.on.ca](https://oafc.on.ca)
15. NFPA 1142, Standard on Water Supplies for Suburban and Rural Fire Fighting. Establishes criteria for tanker shuttle operations in areas without hydrant systems, including flow rate and relay cycle time requirements.
16. Transport Canada. TRAN Committee Appearance Binder — Item 15: High Frequency Rail, March 7, 2023. Confirms over 1,000 public and private 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)