

**SUBMISSION TO PUBLIC CONSULTATION**

# **Wild Turkey Collision Risk, Fencing Limitations, Operational Damage, and the Unassessed Threat to a 40-Year Conservation Investment**

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## **EXECUTIVE SUMMARY**

Ontario invested 40 years rebuilding its wild turkey population from provincial extinction to approximately 100,000 birds. The Trenton–Belleville–Kingston–Napaneé corridor is identified prime turkey habitat. ALTO’s proposed southern route runs directly through this corridor. No study has ever examined HSR bird collision risk in North America, and no study anywhere has examined collisions with gallinaceous ground-nesting birds comparable to wild turkeys. The only HSR bird-collision research (Spain) found mortality of 60–91 birds/km/year in agricultural landscapes. Standard HSR fencing cannot exclude turkeys, which routinely fly over 2-metre barriers. A 14 kg turkey at 300 km/h delivers approximately 48,600 joules of kinetic energy, **nearly eight times the aviation windshield certification standard**, posing risks of windshield damage, sensor destruction, and service disruption. ALTO has not assessed bird collision risk for any corridor option.

## **Section 1 — Ontario’s Wild Turkey Recovery: A Conservation Investment at Risk**

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The eastern wild turkey was extirpated from Ontario by 1909. Beginning in 1984, the Ontario Ministry of Natural Resources, the Ontario Federation of Anglers and Hunters, and the National Wild Turkey Federation conducted one of the world’s most successful wildlife reintroduction programs, importing 274 live-trapped birds from US states. Between 1985 and 2005, an additional 4,400 birds were trapped and relocated to 275 locations across the province. Today approximately 100,000 eastern wild turkeys live in eastern and southern Ontario. The Trenton–Belleville–Kingston–Napaneé corridor was specifically identified by OFAH as a region of burgeoning turkey populations, with Wildlife Management Units 65, 64B, 69A, and 72 opened for both spring and fall hunting seasons. Fall seasons are only approved when spring harvests exceed 200 birds per WMU for three consecutive years, confirming robust and established populations. Turkey hunting supports a recreation economy of outfitters, accommodations, and equipment retailers across the affected WMUs. The reintroduction cost \$120,000, of which \$100,000 came from conservation organizations and volunteers, not government. ALTO’s consultation materials contain no reference to this conservation investment or to the collision risks its southern corridor poses to it.

## **Section 2 — Why Wild Turkeys Are Uniquely Vulnerable to High-Speed Rail**

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### **2.1 Ground foraging and ballast attraction**

All gallinaceous birds require small angular stones (grit) for their gizzards. Railway ballast is crushed angular stone (30–50 mm). “Turkey grit” is a commercial product name for functionally identical material. A ballasted rail corridor through turkey habitat would act as an attractive nuisance, drawing flocks onto the right-of-way to collect grit, dust-bathe in dry crushed stone, and forage for insects along cleared embankment edges. This is not a speculative risk — it is a direct consequence of turkey biology and the physical composition of the track bed.

### **2.2 Inability to evade high-speed trains**

Spanish HSR cockpit-camera research (García de la Morena et al., 2017) found birds react to approaching trains at 60–136 metres. At 300 km/h, a train covers 136 metres in 1.6 seconds. A 14 kg bird on the ground in railway ballast has under two seconds to detect the train, decide to flee, achieve liftoff with a heavy body requiring a running start, and clear the 8.5-metre danger zone between the tracks and catenary. Wild turkeys also have very poor night vision; trains operate around the clock. Research by DeVault et al. (2015) established that birds have ineffective escape responses to oncoming vehicles at high speed — findings directly applicable to rail at 300 km/h.

### **2.3 The highest-risk landscape configuration**

The most recent Spanish HSR collision research (García de la Morena et al., 2025; Malo et al., 2025) found that tall embankments significantly increase the probability of dangerous bird crossings, and that species associated with human-modified agricultural landscapes were the most prone to collision. The Napanee Plain is flat terrain requiring elevated embankments, set in a mixed agricultural/forest mosaic, precisely the highest-risk landscape configuration identified in the research. Spanish research documented mortality of 60.5 birds/km/year on one line section and 91.3 birds/km/year on another in agricultural landscapes.

### **2.4 Southern corridor is far worse than northern**

Wild turkeys are present along both proposed corridors. However, population density and management status differ dramatically. The southern corridor (Kingston–Belleville–Napanee) passes through high-density established populations in WMUs 65, 64B, 69A, and 72, all supporting both spring and fall hunting seasons. The northern corridor passes through transitional boreal/mixed forest where turkey populations are spotty and lower-density; WMUs 42, 47, 49, and 50 only received spring hunting seasons in 2014 with no fall seasons approved, indicating populations below the 200-bird harvest threshold. Bird collision risk should be a formal route-selection criterion.

## **Section 3 — Why Fencing Cannot Protect Turkeys**

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All HSR lines are fenced (typically 2-metre chain-link) for human safety and large-mammal exclusion. Wild turkeys fly at speeds up to 90 km/h and routinely clear fences, barn roofs, and power poles 30–40 feet high. Standard security fencing is not a barrier for a wild turkey — it is a perching spot. Spain’s LIFE Impacto Cero project (2013–2019) is the only study worldwide that tested anti-bird barriers on HSR: tubular screens 4–5 metres high reduced mortality by approximately 30% for small and medium birds flying across the tracks. They do nothing for birds foraging in ballast, resting on embankments, or dust-bathing. The concept addresses crossing behaviour, not occupation behaviour. More critically: a fence that keeps deer out keeps turkeys in. Once inside the fenced right-of-way having entered through a gate, access point, or low section, a turkey attracted to the ballast for grit has under two seconds to evade a 300 km/h train.

## **Section 4 – Operational Risk: Train Damage and Service Disruption**

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Bird-train collisions are not only an ecological concern. A 14 kg wild turkey striking a train at 300 km/h delivers approximately 48,600 joules of kinetic energy ( $KE = \frac{1}{2}mv^2$ ). Aircraft windshields are certified to withstand impacts from a 1.8 kg (4 lb) bird; a wild turkey tom is nearly eight times heavier than the certification standard. The Spanish HSR researchers explicitly noted that “the possibility of collision with large birds or with large flocks is significant, given the potential cost of stopping the trains and repairing the damage.”

### **4.1 Damage to windshield, nose cone, and sensors**

HSR cab windshields are laminated glass designed for debris resistance but not certified against 14 kg impacts at 300 km/h. A cracked or shattered cab windshield forces immediate train withdrawal from service. Modern HSR trains carry forward-facing radar, signalling receivers, and aerodynamic fairings in the nose assembly. A 14 kg bird impact could damage critical systems, impairing train control and requiring depot inspection. Wild turkeys travel in flocks of 6 to 50 birds. A flock on or near the tracks presents the possibility of multiple simultaneous strikes. This is the rail equivalent of the flock strike aviation considers the most dangerous bird collision scenario.

### **4.2 Service disruption cascade**

With collision rates of 60–91 birds/km/year documented in Spain for much smaller species, and the southern route traversing approximately 150 km of dense turkey habitat, the projected frequency of operationally significant bird strikes is a material business risk that ALTO has not quantified. Every turkey strike requiring inspection or windshield replacement takes a trainset out of revenue service. On a corridor with limited trainsets, each withdrawal affects every subsequent departure. This operational dimension must be assessed and included in the project business case.

## **Section 5 – The Research Gap and Its Significance**

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No HSR bird collision study has ever been conducted in North America. No country with operational HSR has wild turkeys. The collision risk to North America’s largest ground-nesting bird from 300 km/h trains is entirely unquantified. This is not a gap that can be filled during construction: baseline population surveys and route-specific habitat assessments must be completed before route selection, not after. Additionally, continuous corridor fencing creates a secondary problem: habitat fragmentation for turtles, snakes, amphibians, and turkey hens with flightless poults during the 4–5 week period before chicks develop flight feathers.

## Section 6 — Formal Requests

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1	<p><b>Require a bird collision risk assessment before route selection</b></p> <p>No HSR bird collision study has been conducted in North America. ALTO must commission pre-construction baseline surveys of bird populations along all proposed corridors, with bird collision risk as a formal route-selection criterion. The assessment must specifically address gallinaceous ground-nesting birds in agricultural landscapes.</p>
2	<p><b>Incorporate bird collision risk as a formal route-selection criterion</b></p> <p>The southern route traverses the heartland of Ontario's turkey recovery in exactly the highest-risk landscape configuration identified in peer-reviewed research. The northern route passes through lower-density, marginal turkey habitat. Bird collision risk and operational disruption potential must be quantified and compared across corridor options before route selection is finalised.</p>
3	<p><b>Disclose rolling stock bird-strike certifications and projected operational costs</b></p> <p>ALTO must disclose windshield and nose cone impact certifications for proposed rolling stock and confirm whether they have been tested against 14 kg impacts at 300 km/h. Projected annual costs of bird-strike-related maintenance, service delays, and trainset withdrawal through 150 km of turkey habitat must be included in the business case.</p>
4	<p><b>Mandate slab track through high-density turkey habitat</b></p> <p>Eliminating ballast removes the primary grit attraction that draws turkeys onto the right-of-way. ALTO must assess whether slab track (as used on many European HSR systems) is feasible through identified high-density turkey habitat in the Napanee Plain corridor.</p>
5	<p><b>Formally consult MNRF, OFAH, NWTF, and affected WMU stakeholders</b></p> <p>The turkey recovery was driven by hunters and conservation organizations who funded \$100,000 of the reintroduction. The Ontario Ministry of Natural Resources and Forestry, Ontario Federation of Anglers and Hunters, National Wild Turkey Federation, and affected WMU stakeholders must be formally consulted on corridor selection and mitigation design.</p>

## Key References

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