High–Speed Rail in Canada

Insights from a corridorwide survey & a financial analysis

TRAM TRANSPORTATION RESEARCH AT MCGILL

McGill

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All photos and maps used in this report have been sourced from the Transportation Research at McGill (TRAM) lab.

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Territorial Acknowledgment

We would like to acknowledge that McGill University is located on unceded Indigenous lands. Tiohtià:ke/Montréal has long served as a site of meeting and exchange amongst Indigenous peoples, including the Kanien'kehaì:ka of the Haudenosaunee Confederacy, Huron/Wendat, Abenaki, and Anishinaabeg, among others. TRAM recognizes and respects these nations as the traditional stewards of the lands and waters. We respect the continued relationship these diverse Indigenous peoples have with the territory upon which we now gather.

Research Acknowledgment

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I.1 Introduction

In February 2025, the Government of Canada announced plans for the development of a high-speed rail (HSR) network which will span approximately 1,000 km along the Toronto-Québec City corridor. The HSR, officially named "Alto", has planned stops in Toronto (TOR), Peterborough (PET), Ottawa-Gatineau (OTT), Montréal (MTL), Laval, Trois-Rivières (TRV), and Québec City (QBC).

The HSR network is anticipated to bring a wide range of benefits including creating jobs, boosting the economy, reducing greenhouse gas emissions, increasing tourism revenue, alleviating congestion, and saving travel time. With dedicated passenger tracks and estimated speeds of up to 300 km/h, the system is expected to offer shorter and more predictable journeys without delays caused by freight traffic, reducing current travel times by half, with the Montréal–Toronto trip estimated to take about three hours.

To gauge public attitudes, perceptions, and expectations of the Alto network, a survey was conducted in October 2025 across all cities along the planned route. The survey collected data on current travel patterns, anticipated use and expectations of the new high-speed service, and the perceived benefits and concerns of the HSR network. This report presents the key findings of the survey, offering insights into how residents view the Alto project, what they hope for, what they expect, and what barriers they foresee. The findings will help transport providers and decision-makers better understand service demand and potential markets, with the goal of improving mobility options for Canadians.

Illustrative map of the Toronto-Québec High-Speed Rail

I.2 Recruitment and Validation Methods

2.1 Recruitment

Recruitment was conducted in October 2025, targeting individuals aged 18 years and older. Digital flyers, in English or French depending on the region, were promoted via paid advertisements on Facebook and Instagram, targeting users within each region.

In keeping with best practices for survey recruitment, incentives were employed to encourage participation. The following prizes were advertised to respondents and distributed based on a draw after finishing data collection:

1 x iPad Air 11-inch (M3) (128 GB)
1 x AirPods 4
1 x Soundcore Earbuds P20i
3 x Fujifilm Instax Mini 12
3 x Anker Soundcore 2 Speaker
1 x Bose Soundlink Speaker
3 x Anker Powerbank (10,000 mAh)
2 x Anker Open-Ear Headphones
2 x Anker Noise Cancelling Headphones
5 x $50 Gift Cards
5 x $10 Gift Cards

2.2 Data Validation

Following data collection, a thorough data-cleaning procedure was applied to the data. The cleaning process was subdivided into several sequential steps, each of which constituted a filter, reducing the number of valid responses and ensuring their validity. What follows is a description of each step of the cleaning process, which were applied sequentially in the following order:

1. Incomplete answers: All surveys that were not answered to completion were dropped.
2. Multiple IP addresses: If more than two surveys were submitted from the same IP address, all observations from this IP were dropped.
3. Repeated e-mail addresses: If the same e-mail was submitted for more than one survey, all observations from this address were dropped.
4. Age above 90: If a respondent reported being over 90 years old at the time of the survey, their response was dropped.
5. Weekly travel: If a person indicated that they make more than 40 round trips to different destinations per week, their response was dropped.
6. Invalid home location: If a respondent's home location was either not provided, outside of the Census Metropolitan Area (CMA) boundaries, or located in an invalid location (e.g., on water or on a bridge), the observation was dropped.
7. Answer speed: Surveys in the top 5% of speed of completion were dropped. It must be noted that different groups of respondents, depending on their answers, got different sets of questions. Each of these groups were cleaned according to their own respective top 5% speed.

Out of 7,852 initial responses, the cleaning and validation process yielded 6,738 complete and valid responses. The resulting sample sizes for the complete and valid responses by region are presented in the table below.

Complete and valid responses per region

Region	Valid responses
Toronto	1,548
Montréal	2,318
Ottawa-Gatineau	1,066
Québec City	1,068
Trois-Rivières	308
Peterborough	430
Total	6,738

I.3 Prospective Ridership

Participants were asked about their likelihood to travel to major HSR destinations if the service were available today. Their responses were used to estimate prospective ridership, assuming a 100% transfer of stated preference into future demand. The total population from the 2021 Census was 13.1 million. Total ridership is projected to be 8.3 million along the Toronto–Québec City HSR corridor as of 2025, meaning one out of three people along the corridor indicated they would take the HSR at least once per year.

Using city-level population projections from Ontario and Québec, future ridership was adjusted for population growth. By 2035, when the HSR is expected to begin operation, ridership could reach 8.7 million, rising to 9.7 million by 2050 after 15 years of service, serving a large share of the population in their long-distance travel. Comparable projects under development, such as the California HSR, are forecasted to reach 11.8 million annual riders by 2030.

The Toronto–Montréal and Montréal–Ottawa segments are expected to be the busiest, while Québec City would be more often a destination rather than an origin. Toronto is projected to experience the fastest growth in boardings between 2035 and 2050, followed by Ottawa–Gatineau. The Montréal region is expected to see moderate growth while maintaining a large ridership base.

1 out of 3 people along the corridor would take the HSR at least once a year.

Prospective **Daily Boarding** along the HSR Corridor (one-way)

	TOR	PET	OTT	MTL	TRV	QBC	**Total Boarding**
TOR		782	1,077	1,604	336	782	**4,582**
PET	142		34	26	9	14	**226**
OTT	708	62		877	62	208	**1,917**
MTL	969	81	1,091		466	1,045	**3,653**
TRV	16	2	14	109		84	**224**
QBC	138	61	139	311	128		**778**
Total Alighting	1,974	989	2,355	2,927	1,002	2,133	**11,380**

Prospective **Annual Ridership** along the HSR Corridor (one-way) **(x1,000)**

	TOR	PET	OTT	MTL	TRV	QBC	**Total Boarding**
TOR		286	393	586	123	285	**1,672**
PET	52		12	10	3	5	**82**
OTT	259	23		320	23	76	**700**
MTL	354	30	398		170	381	**1,333**
TRV	6	1	5	40		31	**82**
QBC	50	22	51	113	47		**284**
Total Alighting	721	361	860	1,068	366	778	**4,154**

Future Ridership Projection with Population Growth (one-way)

CMA	2035	2040	2050
TOR	1,749,000	1,831,000	2,025,000
PET	90,000	94,000	102,000
OTT	802,000	858,000	973,000
MTL	1,338,000	1,348,000	1,351,000
TRV	84,000	85,000	86,000
QBC	298,000	306,000	317,000
Corridor	4,362,000	4,521,000	4,855,000

I.4 Willingness to Pay

When asked about the willingness-to-pay (WTP) for specific destinations, participants are, on average, willing to pay about C$20 more for HSR service compared with the current VIA Rail fare. The willingness-to-pay values are closely related to travel distance, which exhibits an approximately linear relationship across origin–destination pairs. As shown in the table below, longer intercity trips such as Toronto–Québec City and Toronto–Montréal correspond to the highest WTP values, while shorter-distance pairs such as Toronto–Peterborough and Montréal–Trois-Rivières show substantially lower WTP.

The results also suggest that popularity and travel purpose play a role in willingness to pay. For instance, trips involving Trois-Rivières show notably lower WTP values despite comparable distances, which may reflect lower perceived travel demand or fewer major trip purposes associated with this destination.

Willingness to pay reflects passengers' preference and perceived value of the service, and it is typically lower than the maximum fare they would be willing to pay. Monetary costs of competing modes should be considered in determining the fare structure, such as airfares and driving costs, to ensure that HSR fares remain attractive while supporting financial sustainability. Fare and subsidy policies could therefore be designed in accordance with WTP levels, such as offer targeted discounts or subsidies to balance demand, improve accessibility, and maintain revenue efficiency across the HSR corridor.

Willingness-to-pay indicated for each OD pair (Unit in C$)

	TOR	PET	OTT	MTL	TRV	QBC
TOR		44	82	101	87	119
PET	31		50	69	62	85
OTT	88	56		57	62	89
MTL	93	71	58		43	62
TRV	88	83	66	42		39
QBC	111	81	84	64	41	

+C$20

than VIA Rail fare

Canadians are willing to pay about C$20 more for HSR service compared with the current VIA Rail fare.

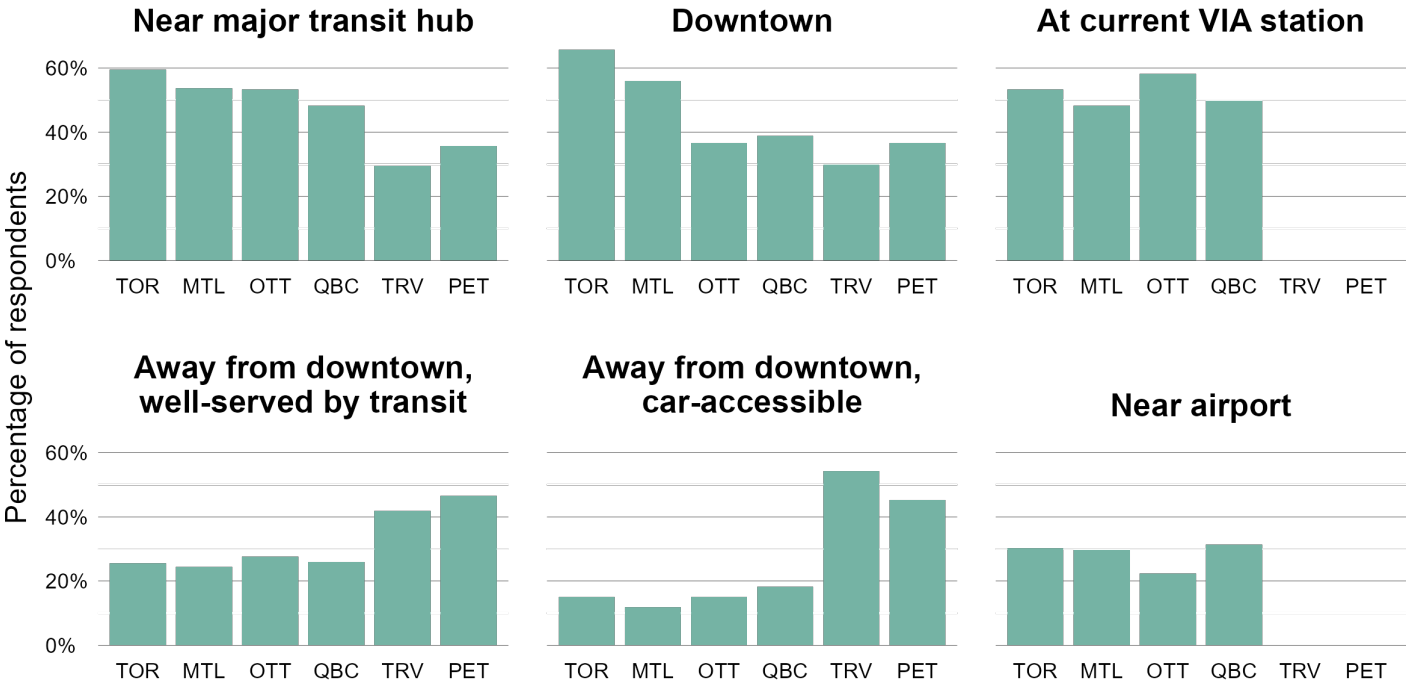
I.5 Station Location Preference

Canadians show a similar level of preference for the HSR stations to be located in the downtown area and near major transit hubs. The survey results reveal distinct preference patterns for station locations across city sizes. In larger metropolitan areas such as Toronto and Montréal, respondents show a strong preference for multimodal connectivity in station location, and "Near major transit hub" received higher or the same level of preference than Downtown in most cases.

In mid-sized cities, including Ottawa–Gatineau and Québec City, preferences shift slightly toward the current VIA station and locations near major transit hubs, which reflects the potential of integrating new HSR services with existing intercity rail infrastructure and established travel nodes.

In smaller cities such as Peterborough and Trois-Rivières, car accessibility is the main consideration. Preferred locations are away from downtown but car accessible, such as near highways or park-and-ride facilities. Transit-accessible sites away from downtown are also somewhat preferred.

Across most cities, stations near major transit hubs receive preference levels comparable to downtown locations, indicating that well-connected intermodal transfer points can serve as effective alternatives to central city stations. Providing ample parking near these stations is essential for business-class users, and in cities like Montréal and Toronto, where downtown parking is limited, direct and timely transit connections will be critical to ensure accessibility and attractiveness.

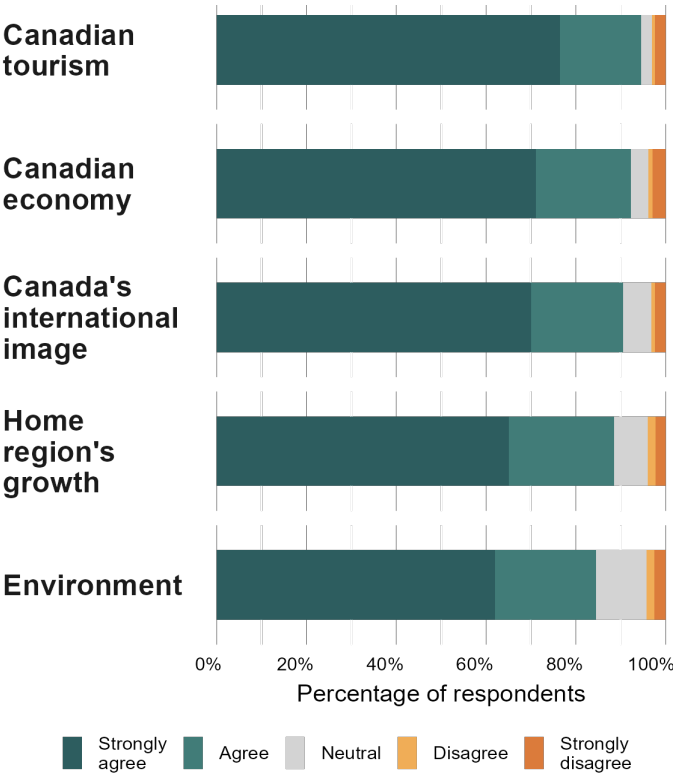


Station location preference by region along the HSR corridor

I.6 Perceived Benefits of the HSR

When asked about the potential benefits of the proposed HSR, residents along the Toronto–Quebec City corridor expressed overwhelmingly positive perceptions. Nearly 90% of respondents believe that HSR would generate substantial benefits for Canada's international image, economy, and tourism, as well as contribute positively to the environment and the economic growth of regions along the corridor.

Public sentiment strongly supports the view that HSR would be a transformative project for Canada. Respondents recognize it not only as a faster, more convenient and more sustainable mode of travel, but also as an important national infrastructure investment that could enhance regional connectivity and competitiveness. The high level of agreement observed across all surveyed regions demonstrates that the public perceives HSR as a project that aligns with both local and national development goals.



Perceived **benefits** of the HSR
(The HSR is good for..)

Nearly 90% of respondents believe that HSR would generate substantial benefits for Canada's international image, economy, and tourism, as well as contribute positively to the environment and the economic growth of regions along the corridor.

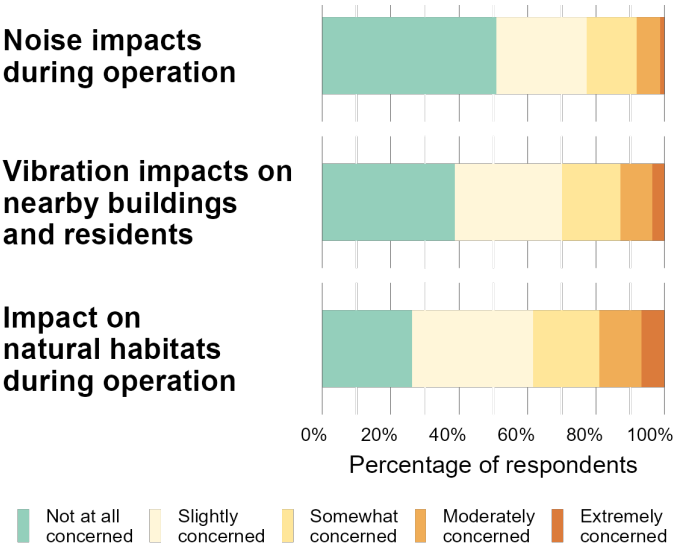
I.7 Perceived Concerns About the HSR

Respondents expressed several concerns about the construction phase of HSR. More than 75% of participants indicated concern about potential construction delays and cost overruns, which shows a widespread awareness of challenges commonly faced by large-scale infrastructure projects. These concerns suggest that transparency and efficiency during project implementation will be important to sustain the public confidence.

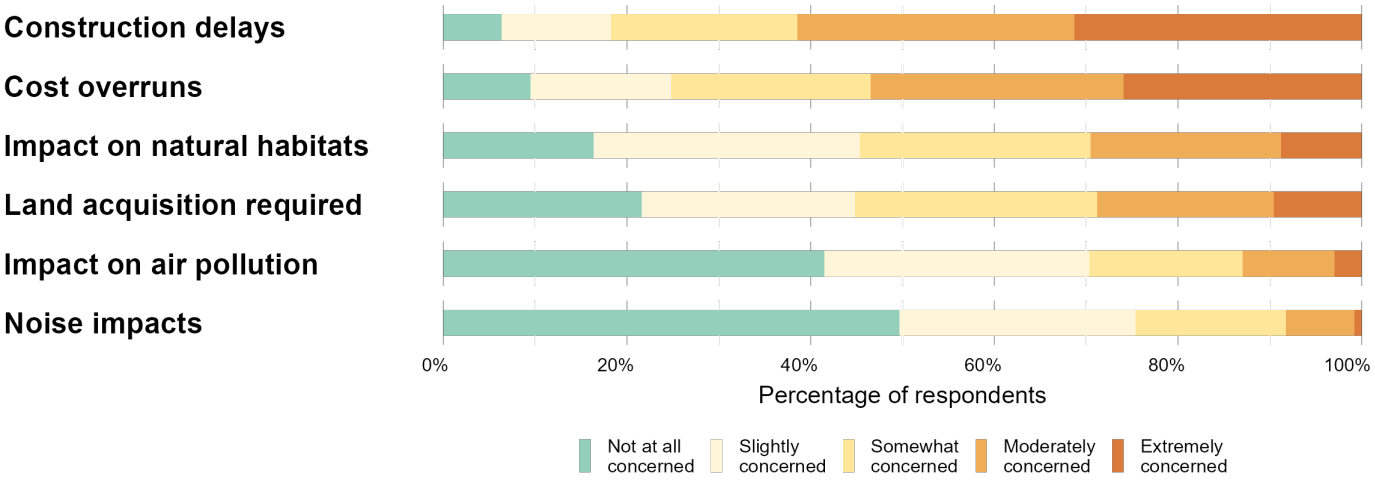
In comparison, concerns related to environmental impacts are relatively moderate. Approximately 40% of respondents reported being not at all concerned about the air pollution impacts of HSR construction, and 50% were unconcerned about the noise impacts. Concerns over impact on natural habitats and land acquisition process were slightly higher, with around 30% of respondents being moderately or extremely concerned.

Perceived environmental concerns during the operation phase of the HSR generally mirror the patterns observed for construction concerns. Respondents expressed relatively low levels of worry regarding natural habitat disturbance and noise impacts, with fewer than 10% of participants indicating that they were extremely concerned about these issues.

Vibration impacts were also regarded as minor concerns. The relatively low intensity of operational concerns may reflect the general expectation that HSR corridors will be located away from residential areas, thereby direct exposure to noise and vibration effects are reduced.



Perceived **operation concerns** of the HSR



Perceived **construction concerns** of the HSR

II. Financial Analysis

Using the prospective ridership (Section I.3) and willingness-to-pay (Section I.4) results, we conducted a **financial accounting analysis** to assess the project's **feasibility** and to examine costs and revenues. The system we evaluated consists of two types of service, the first service (**regular line**) is the full-line length of 1,000 kilometres serving six regions Toronto, Peterborough, Ottawa, Montréal, Trois-Rivières, and Québec City with an expected end-to-end travel time of 5 hours and 42 minutes. The second service (**express line**) is a non-stop service running between Toronto and Montréal, spanning 538 kilometres. This design substantially reduces travel time along the corridor; **the express service shortens the Toronto–Montréal travel time** from 5 hours and 30 minutes **to approximately 2 hours and 36 minutes** one way compared to VIA's existing service. The analysis presumes an average operating speed of 200 km/h on the regular line and 250 km/h on the express line. We also assume a 30-minutes layover time at both ends of the routes for both services.

Ridership and Fleet Size

Using the projected ridership based on the survey data in section I.3, the total number of one-way riders in a day is expected to be 11,380*. This corresponds to a total daily ridership of 22,760* trips when accounting for return journeys. Since the survey did not include international tourists, we applied an additional 10 to the estimate. With this addition, the **projected ridership** for the first year of operation is **25,289 passengers per day***.

Assuming that peak days (Friday and Sunday) reach 120 percent of regular-day ridership, and that induced demand of 6.8 percent per year will occur from Year 1 to Year 6, 0.8 percent per year from Year 7 to Year 11, and 1 percent per year from Year 12 to Year 50, based on past experience, the **projected daily ridership for Year 50** is **53,904 riders*** for a **regular day** and **64,685 riders*** on a **peak day**. Our calculations use the expected demand in Year 50 and an approximate headway of 43 minutes for the regular line and 40 minutes for the express one with departures between 6 am to 9 pm. The system is assumed to operate with two coupled eight-car trainsets, with each trainset designed to accommodate 650 passengers (1,300 passengers per departure).

To meet the demand in Year 50, the system will require a total of 40 coupled trainsets, equivalent to 80 eight-car trainsets. These calculations account for an additional 5 percent of trainsets for emergencies. At a cost of **C$60 million per eight-car trainset**, the **total procurement cost** is approximately **C$4.8 billion***.

To meet the demand in Year 50, the system will require a total of 40 coupled trainsets*, equivalent to 80 eight-car trainsets.

Construction Costs

The construction cost is assumed to be C$70 million per kilometre, which includes track construction, station construction, and utilities, with an additional C$5 billion allocated for land acquisition based on similar North American case studies. **The total capital cost** is estimated at **C$79.8 billion***, inclusive of vehicle procurement. This estimation aligns with the federal government announcement of investing C$60–90 billion in the HSR project.

The total capital cost is estimated at C$79.8 billion*, inclusive of vehicle procurement.

PPP Model and Land Value Capture

To support feasibility, **a public–private partnership model** could be adopted in which the **federal government** finances **one-third** of the total cost (C$26.6 billion*), and private investors finance the remaining two-thirds, repaid at an annual interest rate of approximately 8 percent.

Land value capture is expected to generate land and real estate development gains equivalent to roughly 15 percent of the total cost (C$12 billion). Under this framework, the **net capital cost**, i.e. the amount to be borrowed, is approximately **C$41.23 billion***, which is a manageable level over a 50-year term.

Land value capture is expected to generate land and real estate development gains equivalent to roughly 15 percent of the total cost (C$12 billion*).

Fare and Revenue

The standard fare is set at 1.2 times the survey-based willingness to pay (section I.4) to account for inflation as the line is expected to operate in the near future, and the premium fare is set at twice the standard fare. Each eight-car HSR trainset has a designed capacity of 650 passengers, with two cars allocated to premium class and six cars to standard class. Premium-class cars contain 70 seats each, arranged in 17.5 rows with four seats per row, while standard-class cars contain 85 seats each, arranged in 17 rows with five seats per row. Under these assumptions and the projected ridership, with a 1 percent annual increase in ticket prices, the **average projected yearly revenue** is around **C$2.60 billion*** for the 50 years.

Assessment of annual HSR demand, revenue, and subsidy needs
(The table is displaying selected results at 5-year intervals)

Year	Annual Demand (pax/year)	Revenue ($C/year)	Subsidy ($C/year)
1	9.76 million	C$1.18 billion	C$2.61 billion
5	12.69 million	C$1.60 billion	C$2.20 billion
10	14.00 million	C$1.85 billion	C$1.95 billion
15	14.68 million	C$2.04 billion	C$1.77 billion
20	15.43 million	C$2.25 billion	C$1.57 billion
25	16.22 million	C$2.49 billion	C$1.34 billion
30	17.04 million	C$2.75 billion	C$1.09 billion
35	17.91 million	C$3.04 billion	C$0.81 billion
40	18.83 million	C$3.35 billion	C$0.50 billion
45	19.79 million	C$3.70 billion	C$0.16 billion
50	20.80 million	C$4.09 billion	- C$0.22 billion
Total by end of Year 50	**814.43 million* passengers**	**C$129.83 billion***	**C$61.62 billion***

These calculations assume the PPP Model proposed of one-third of the total cost being paid by the government and 15 percent of the total cost being covered by land value capture.

Loan Payment

With a loan of C$41.23 billion directed toward the capital cost and an annual interest rate of 8 percent, the required annual repayment over 50 years is approximately C$3.66 billion* to the developer. The annual operating cost is estimated at C$84,000 per kilometre following similar case studies in North America, with a 1 percent annual increase, the average operating cost per year is C$166.56 million*. After accounting for annual revenue and deducting capital repayment and operating costs, the projected subsidies required each year is around C$1.23 billion*. The system becomes self-sustaining starting Year 48 onwards, with full cost recovery from farebox revenue and land value capture. Over the 47-year period, **the government will need to pay C$62.0 billion*** to the developer for capital and operation costs, **in addition to an initial investment of C$26.6 billion***. The government can start collecting back these C$88.6 billion* after year 47 from the revenues of the HSR.

The success of the HSR relies on C$12 billion* of land value capture.

*These results rely on ALTO's announced information, survey data, and stated assumptions. They should be interpreted with caution as results may change with updated inputs. Further financing models will be evaluated to explore alternative financial scenarios as more information becomes available.

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Importance of Land Value Capture regarding the Canada High-speed Rail

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Land value capture (LVC) recognizes that **public investments**, such as new transport infrastructure, often **raise surrounding land value**. Since these gains reflect public investment rather than private effort, LVC allows the public sector to **reclaim part of the uplift to finance the project** that created it [1-3]. Since 2008 this concept has gained traction among international agencies, which view LVC as a practical response to fiscal pressures and infrastructure backlogs [4, 5].

LVC in practice: International evidence

International evidence suggests high-speed rail (HSR) can generate land value uplift, with gains concentrated around key nodes where development demand is strongest [8].

- **Hong Kong:** West Kowloon HSR illustrates station-area value capture through development rights and land sales; **the commercial site above the terminus sold for HK$42.2 billion**, roughly half of the project's HK$84.4 billion revised cost estimate [6, 7].
- **Australia:** A preliminary assessment of an East Coast HSR network estimates **station-area land value uplift of C$43–126 billion** against an estimated **construction cost of C$103 billion**, highlighting the potential scale of value capture if appropriate mechanisms are in place [8].
- **California, USA:** Planning for the state's HSR system includes proposals to capture station-area value uplift using **tax-based tools** (e.g., tax-increment financing) and **development-based tools** (e.g., joint development and station-area financing districts) [9].

To advance high-speed rail in Canada, a consolidated land value capture framework is needed to help capture station-area uplift to complement fare revenue and provide a stable, long-term funding stream consistent with internationally leading approaches. Mixed use development around stations will help in increasing ridership demand for the HSR, while injecting new housing units in the market.

LVC potential: Canadian HSR

A Transportation Research at McGill (TRAM) financial feasibility analysis suggests that **capturing land value uplift could improve the long-term fiscal viability of Canadian HSR** by complementing fare revenues and reducing subsidy needs [10].

- **Scenario 1 — No LVC:** With a **1:2 public–private capital funding ratio** and **no land value capture**, the system **does not reach financial self-sufficiency by Year 50** and would require ongoing subsidies averaging C$2.12 billion per year over the 50-year period.
- **Scenario 2 — LVC at 15% of capital cost:** Real estate development, land sales, and property development are expected to generate revenues equivalent to 15% of the HSR capital cost estimated at C$11.97 billion. With this added funding, **the system could reach full financial self-sufficiency by Year 44**, with operating revenues covering operating costs and loan payments.

These scenario results suggest that capturing land value uplift around stations and along the corridor could materially improve the fiscal viability of Canadian HSR.

Concluding remarks

- **Prioritize station locations with capture potential:** Focus on nodes with strong redevelopment and value-appreciation prospects rather than built-out downtown cores with limited capacity.
- **Enable LVC at scale:** Empower Alto to lead development and value capture within 2 km around the stations to reduce the burden of the estimated C$79.8 billion capital cost and strengthen the long-term sustainability impacts of the project.

El-Geneidy, A., Anabtawi, R., Zhang, B., Carvalho, T., Negm, H., Alousi-Jones, M. & Page, M. – December 2025

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