Market Segmentation for the ALTO High-Speed Rail Corridor

Identifying Passenger Segments to Maximize Ridership on the Toronto-Québec City Corridor

Kennedy Magee | Supervised Research Project | McGill University, School of Urban Planning | Supervisor: Ahmed El-Geneidy

The Corridor at a Glance

- *The Toronto-Québec City corridor spans 13.1 million residents and generates 44% of Canada's GDP*
- *The ALTO project carries a projected budget of $90 billion with $122 million already allocated*
- *Despite the budget and committed funds, no reliable market information exists on who will use the line or how to maximize ridership.*

Source: Zhang, Negm, & El-Geneidy. (2026)

Background and Policy Problem

High-speed rail (HSR) is a capital-intensive, long-horizon public investment that depends on sustained ridership to create high-level economic gains and justify its high cost. The ALTO corridor will link Toronto, Peterborough, Ottawa-Gatineau, Trois-Rivières, Montréal, and Québec City; a network that, if successful, could meaningfully reorient inter-city travel in Canada's most densely populated and economically productive region. However, data-based service planning, pricing, and infrastructure design require a nuanced understanding of the people who will actually use the system.

HSR in this corridor primarily competes with air travel and non-business car trips, rather than rail services. Without understanding who these users are and how they will interact with the HSR system, ALTO risks underperforming on ridership metrics. This research addresses that gap directly.

Research Approach

This study draws on the Canadian High-Speed Rail Survey, conducted across the six regions hosting ALTO stations, grouping Montreal and Laval into a single region due to their spatial proximity. After a multi-step cleaning process, the final useable sample comprised 6,633 observations. The survey captured both stated preference data (hypothetical HSR use patterns and frequencies) and revealed preference data (actual travel behaviour capturing corridor and local travel), combining them to produce segments that are more predictive of real ridership than intent-based measures alone.

The analytical pipeline consists of two stages:

1. **Exploratory factor analysis (EFA)** *reduces perception variables into underlying attitudinal dimensions, identifying latent patterns in respondents' concerns and preferences. Factors were then used as variables in the cluster analysis*

2. **K-means clustering** *groups respondents into discrete market segments based on those factor scores alongside behavioural and sociodemographic variables. Cluster count (k=6) was determined through silhouette analysis and informed manual review*

The result is six distinct user profiles each carrying specific policy implications.

Key Findings: Six Market Segments

The analysis identified six behaviourally distinct rider segments. The section below summarizes each segment and its priority policy concerns.

Work-Oriented Travellers 20%

High-income (40%) users who all intend to use the line for work. Frequent car users with 1.7 telework days per week on average. Highest % of students (19%), 68% use rideshare apps. Prefers station near mass-transit and downtown. Willing to pay $21/100km.

Top routes: *Montréal - Québec City, Montréal -Ottawa*

Policy priorities:

- *French & Japanese punctuality and consistency standards for reliable work travel*
- *Onboard workspace upgrades for hybrid/remote workers*
- *Minimized check-in wait times for convenience*
- *High capacity ride-share pickup zones*

Car-Oriented HSR-Experienced 28%

Largest segment. 100% have used HSR (58% in France/Japan); 79% corridor trips by car. 53% intend to use the line for events while nobody intends to use for work. Motivated to use by previous HSR experiences. Willing to pay $21/100km

Top routes: *Toronto - Montréal, Montréal - Québec City*

Policy priorities:

- *French/Japanese punctuality and consistency standards*
- *Flexible booking with free/easy changes and cancellations*
- *Secure, navigable park-and-ride facilities*
- *Higher service frequencies around popular events*

Car-Oriented HSR-Inexperienced 20%

None have prior HSR experience; 44% of local trips by car; 81% of corridor trips. Despite this, 75% say they would try HSR just to try it (strong latent demand). Willing to pay $18/100km (lowest)

Top routes: *Toronto - Montréal, Toronto - Ottawa*

Policy priorities:

- *Flexible booking with free changes and easy cancellations*
- *Off-peak discounts for discretionary travel*
- *Easy navigable pickup and dropoff zones*
- *Higher service frequencies around popular events*
- *Dedicated on-site staff for first-time users*

Highly-Concerned Skeptics 9%

Oldest segment (33% over 65 years), 40% low-income, highest anxiety on all risk metrics (75% moderately/extremely concerned about costs). Most likely to be retired. Prefers VIA station location. Willing to pay $19/100km.

Top Routes: *Ottawa - Toronto, Montréal - Toronto*

Policy priorities:

- *Free/easy changes & cancellations*
- *Dedicated on-site staff for first-time users*
- *Transparent cost and project progress reporting*
- *French & Japanese punctuality and consistency standards to build trust in the line*

Rail-Oriented Travellers 16%

Highest proportion of women (61%). Largest active travel share (47%) and intercity train share (71%). 70% support existing VIA station location. 38% low-income. Willing to pay $23/100km (2nd-highest).

Top routes: *Ottawa - Toronto, Montréal - Toronto*

Policy priorities:

- *New mass and para-transit connections to all stations*
- *Pedestrian-friendly, fully accessible station entrances*
- *Integrated local transit ticketing for seamless last mile connectivity*
- *Free/easy changes & cancellations*

Plane-Oriented Travellers 7%

Primary air diversion target. 60.6% high-income; 2+ telework days on average; 57% of corridor trips by plane. 64% interested in HSR for work. Least satisfied with last corridor trip. Willing to pay $23/100km (highest)

Top routes: *Toronto - Montréal, Toronto - Ottawa*

Policy priorities:

- *Japanese punctuality standards for reliable work travel*
- *Minimized check-in wait times to beat short-haul air*
- *Onboard workspace upgrades for hybrid/remote workers*

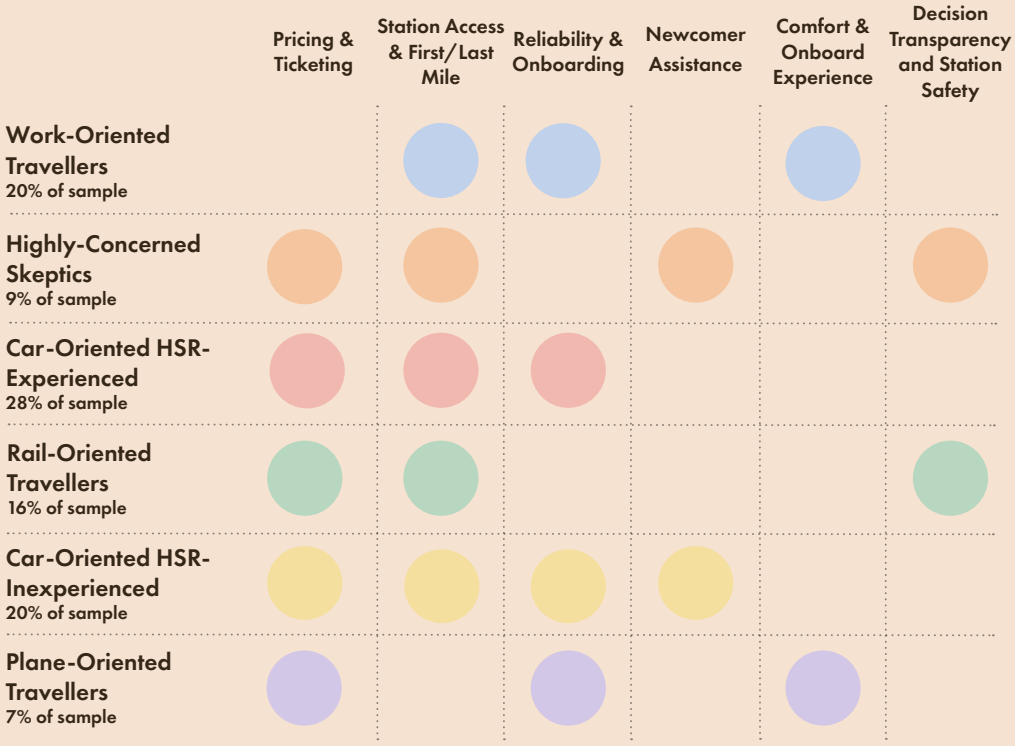
Cross-Cutting Policy Implications

Pricing and Ticketing: *The market contains at least three distinct pricing needs. Car-Oriented HSR-Inexperienced, Highly-Concerned Skeptics, and Rail-Oriented Travellers require affordable, flexible fares that do not preclude discretionary travel. The two Car-Oriented segments need pricing that competes directly with the cost of driving. Plane- and Work-Oriented Travellers need a high-comfort seating class with privacy and work capabilities.*

Station Access and First- and Last-Mile Connectivity: *For segments whose travel chain depends on seamless local connections, first- and last-mile infrastructure is a direct barrier to adoption regardless of how competitive the rail service itself is. Park-and-ride and dropoff infrastructure remain important for the car-oriented groups along with adequate space for future ride-share demand.*

Reliability and Onboarding: *Consistent on-time performance is essential to converting three distinct segments for different reasons: the Highly-Concerned, who are skeptical about whether the project will deliver; the Plane-Oriented, who need the line to be dependable enough to replace flying for work travel; and the Car-Oriented HSR-Experienced, who will benchmark ALTO directly against the French and Japanese systems they have already used.*

Prioritization: *Focus early ridership on Car-Oriented HSR-Experienced users (28%), expand demand by converting Car-Oriented HSR-Inexperienced travellers (20%), and maximize revenue from Work-Oriented (20%) users.*



**One colour per cluster. Empty cell = not a priority*

Conclusion

Market segmentation is not an academic exercise: it is a planning prerequisite for a project of ALTO's scale. The six segments identified here reveal a potential ridership base that is diverse in its travel habits, concerns, and expectations. Most travellers are not opposed to HSR; they are waiting for a service that meets them where they are. The Car-Oriented HSR-Inexperienced segment alone (20% of the sample) shows that latent demand is high even among travellers with no prior exposure to the technology. Behaviourally grounded, data-driven planning improves the precision and effectiveness of major transport investments. The findings presented here provide ALTO with an evidence base for service design, pricing strategy, and infrastructure decisions that can maximize ridership from the corridor's opening day.