



# **Public Opinion Research Study on Examining the social acceptance of Advanced Air Mobility (AAM) by the Canadian public**

EXECUTIVE SUMMARY

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**Ce rapport est aussi disponible en français**

This public opinion research report presents the results of two studies conducted by Léger Marketing Inc. on behalf of Transport Canada. The first study consisted in a quantitative study consisting in a survey conducted with 2,717 respondents between November 28 and December 12, 2023. The second study was qualitative research with four online focus groups and was conducted with 32 Canadians between January 30<sup>th</sup> and 31<sup>st</sup>, 2024.

Cette publication est aussi disponible en français sous le titre Étude de recherche sur l'acceptation sociale de la mobilité aérienne avancée (MAA) au sein du public canadien.

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## **Executive Summary**

Leger is pleased to present Transport Canada with this report on findings from a quantitative and a qualitative survey designed to examine Canadians' acceptance of advanced air mobility (AAM) technologies. This report was prepared by Léger Marketing Inc. who was contracted by Transport Canada (contract number T8053-23-0132 awarded October 3, 2023). This contract has a value of \$63,605.00 (excluding HST).

### **1.1 Background and Objectives**

As the federal institution responsible for regulating the safety and security of Canadian airspace and the aircraft that fly in it, Transport Canada (TC) closely studies new technologies to ensure a regulatory environment that keeps pace with innovation. AAM refers to a set of emerging and disruptive airborne technologies to transport goods, people, and services in new ways, such as autonomous drones, electric powered vertical take-off and landing (eVTOL) aircraft, flying air taxis, and more. In Canada, the deployment of AAM may offer social, economic, and environmental benefits, including improved access to remote communities, new business opportunities, and the potential for increased safety and reduced greenhouse gas (GHG) emissions; however, low levels of social acceptance by the Canadian public may limit the uptake of AAM in Canadian society.

Previous public opinion research conducted by the National Research Council of Canada (NRC) in July 2021 found that most respondents believed they did not have a solid understanding of the nature of AAM technologies and what their deployment in Canada could look like in their communities, which caused them to feel generally neutral toward the space. As such, the study suggested that the public needs more information about AAM in order to develop opinions on it, and that future research should reassess attitudes toward AAM once people are more informed.

The general objective of the research was to examine Canadians' acceptance of AAM technologies. The study examined the extent to which current and future AAM technologies are accepted by the general Canadian public in late-2023 to early-2024. The study also identified the nature of barriers to social acceptance of AAM, and ways in which social acceptance could be improved.

### **1.2 Quantitative Methodology**

The quantitative research consisted of online surveys, using Computer Aided Web Interviewing (CAWI) technology. Fieldwork for the survey was carried out from November 28 to December 12, 2023. A total of 2,717 Canadians aged 18 years old and older were interviewed.

A pre-test of 53 interviews was completed before launching data collection to validate the programming of the questionnaire in both official languages.

Since an actual probability sampling method was not used, the calculation of the margin of error cannot be done for this project.

Leger adheres to the most stringent guidelines for quantitative research. The survey instrument was compliant with the Standards of Conduct of Government of Canada Public Opinion Research.

**Sample Distribution**

The sample frame has been designed using a regional stratification scheme designed to accurately reflect the geographic distribution of Canada’s population, including the North (Yukon, Northwest Territories, and Nunavut). For weighting purposes, and as they represent less than 1% of the sample, respondents from Yukon, Northwest Territories, and Nunavut have been paired with other regions. The following table describes the regional quotas and the effective sample distribution achieved during the data collection.

**Table 1. Sample Regional Distribution**

	Proportion in the Canadian population (2021 Census)	% sample (n= 2,717)	Sample (n= 2,717)
n=			<b>2,717</b>
Atlantic	7%	7%	200
Québec	23%	23%	614
Ontario	39%	39%	1,026
Prairies (Manitoba + Saskatchewan and Nunavut)	7%	6%	204
Alberta (and Northwest Territories)	12%	11%	318
British Columbia (and Yukon)	13%	14%	355

The population targeted in this study was Canadian adults aged 18 and older. To meet the objectives of this research, the sample also had to include sufficient representation from the following key target groups:

- Indigenous People (First Nations, Inuit, Métis);
- People living in rural areas.

**Quotas Structure**

As per the specific target groups which need to be sufficiently represented to offer statistically valid results, Leger proposed a structure with quotas for each specific target.

The following table describes the quotas and the effective sample distribution achieved during the data collection for each of those specific targets.

**Table 2. Sample Size for Specific Target Groups**

		Proportion in the Canadian population (2021 Census)	% Achieved sample	Targeted Sample (n= 2700)	Achieved sample
n=				<b>2,700</b>	<b>2,717</b>
<b>INDIGENOUS STATUS</b>	Non-indigenous person	95%	96%	2,550	2,562
	Indigenous person	5%	4%	150	155
<b>PLACE OF RESIDENCE</b>	Urban	82%	79%	2,214	2,166
	Rural	18%	19%	486	513

Note: Totals may differ slightly from 100% due to non-response.

Leger weighted the results of this survey by age, gender, region, presence of children in the household, and education level, according to 2021 national census data from Statistics Canada. Results were weighted to account for specific demographic profiles: Indigenous individuals and those residing in rural or urban areas. This approach ensures the accurate representation of respondents with these characteristics, preventing their intentional overrepresentation in the sampling frame from distorting the overall sample.

Leger meets the strictest quantitative research guidelines. The questionnaire was prepared in accordance with the Standards for the Conduct of Government of Canada Public Opinion Research—Series D—Quantitative Research. Details on the methodology, Leger’s quality control mechanisms,

### 1.3 Overview of the Quantitative Findings

**Awareness and Familiarity with AAM:**

- Most respondents (77%) had never heard about AAM before, while less than a quarter of Canadians (23%) had heard about it before.
- Awareness of AAM is higher among respondents aged 18-34 years old (29%), those with a university diploma (29%), those belonging to BIPOC (Black, Indigenous, People of colour) communities (28%), men (28%), and people living in urban or suburban areas (24%).
- More than half of respondents (52%) believe the development of AAM is good for Canada, and 9% think it is bad.

- More than half of respondents who were aware of AAM (53%) said they are familiar with AAM, while 47% said they are unfamiliar with the concept.
- Two-thirds of respondents (67%) are aware of at least one application of AAM, while 31% have never heard of any of the applications presented. The applications most frequently mentioned by respondents are search and rescue operations (39%), emergency medical services (38%), and home deliveries (36%).

#### **Level of comfort with AAM applications in urban areas:**

- Most respondents are comfortable with the following AAM applications in urban areas: search and rescue operations (81% are comfortable), firefighting services (78%), emergency medical services (78%), aerial surveying and inspections (70%), and logistic and cargo transport (60%).
- Other types of applications receive a lower level of comfort, notably tourism and sightseeing (58%) and home deliveries (53%). Air mobility in urban areas is the only application falling below a 50% comfort level among respondents, with only 44% indicating comfort.

#### **Level of comfort with AAM applications in rural areas:**

- When it comes to rural areas, most respondents are comfortable with the following applications: search and rescue operations (80% are comfortable), firefighting services (80%), emergency medical services (79%), and aerial surveying (72%).
- Other applications, notably logistics and cargo transport (65%), tourism and sightseeing (62%), home deliveries (61%), and air mobility (52%) receive a lower level of comfort. Air mobility still ranks last; however, more respondents would be comfortable with this application occurring in a rural setting than in an urban one.

#### **Likelihood of trying AAM technology and feeling of safety:**

- Fewer than half of the respondents are likely to try any of the technologies surveyed. Drone delivery of consumer goods is identified as the technology most respondents are likely to try, with 45% indicating likelihood.
- Similar levels of likelihood are reported for air taxis with a pilot on board (41%) and autonomous delivery drones without a pilot (38%). Only one in five respondents are likely to try air taxis with a remote pilot (21%) or autonomous air taxis (20%).
- As pedestrians, half of respondents (52%) said they would feel safe if air taxis with a pilot on board would fly above them, 41% think the same about delivery of goods by drones with a remote pilot, 33% about autonomous delivery drones with no pilot, 27% about air taxis with a remote pilot and 25% consider autonomous air taxis to be safe.
- One out of four respondents (26%) would be comfortable living next to a vertiport. On the other hand, six out of ten respondents (60%) would be uncomfortable living next to a vertiport.

### **Perceptions of AAM:**

- Most respondents (70%) agree that AAM will improve access to services for people living in remote areas. Other positive statements surveyed received a lower level of agreement. Around half of respondents (47%) agree that AAM is the future of transportation and the same proportion (47%) agree that AAM will contribute to the economic growth of Canada. Forty-five percent (45%) of respondents agree that they trust the Government of Canada to ensure that AAM technologies are safe, and forty-four percent (44%) of respondents agree that AAM will have a positive impact on the quality of life of Canadians. About the same proportion (43%) agree with the idea that AAM will improve access to services in their region, and 40% trust that AAM technologies will be safe. Around a third of respondents (38%) agree that the advantages of AAM technologies outweigh their disadvantages, and 31% agree that they are usually among the first to embrace new technologies.
- On the other hand, around half of respondents agree with some negative statements about AAM. More than one respondent out of two (52%) agree that AAM technologies will only benefit rich people, 47% agree that AAM technologies are too risky.

### **Attitude towards AAM:**

- A majority of respondents (63%) have conditional support of AAM, indicating that their support depends on specific circumstances, such as application, operating environment, costs, benefits, risks, or aircraft characteristics.
- A small proportion of respondents (9%) oppose using AAM technology in all circumstances, and the same proportion (9%) support using AAM technology in all circumstances.
- Respondents who think the development of AAM is a bad thing for Canada (29%) are more likely to be opposed to AAM in all circumstances.
- Faster emergency response to disasters (60%), faster medical services (53%), and better connectivity to remote areas (46%) are the top three perceived benefits that respondents think AAM could bring. Only 4% of respondents think that AAM technology can't bring any benefits.
- When thinking about adjectives to describe AAM, more than half (58%) of respondents have positive feelings towards AAM, notably curiosity (41%), optimism (24%), excitement (14%) and confidence (8%). Half of the respondents (52%) have negative feelings towards AAM notably, skepticism (36%), suspicion (22%), fear (13%), and alarm (11%).

### **Concerns with regards to AAM:**

- Safety or crashing concerns (54%), security threats (43%), and privacy concerns (37%) are the top concerns of respondents with AAM. It is followed closely by affordability (32%), noise pollution (28%), and impact on the environment (27%). Other concerns, such as job losses (19%) and locations of landing spots (17%), were mentioned to a lesser extent. A vast majority of respondents expressed concerns about AAM. Only one out of ten respondents said they had no concerns (2%), didn't know (7%), or preferred not to answer (1%).

- After being exposed to information on AAM, the same proportion (53%) think that the development of AAM is good for Canada, while 16% think that it is bad for Canada, and 30% don't know. Compared to the results before exposure to information on AAM, there is a noticeable 7-point increase in respondents who believe that the development of AAM is bad for Canada and an 8-point decrease among respondents who were unable to answer.

#### **Reasons behind opinions towards AAM:**

- Among respondents expressing positive views on the advancement of AAM in Canada, primary reasons for their positive stance include its potential as the future of transport (18%), its capability to enhance access to remote areas (15%), its expected improvement in emergency response times and life-saving capabilities (14%), and its ability to increase transportation efficiency (10%).
- Conversely, individuals with negative perceptions of AAM's development in Canada cite safety issues and perceived risks as their principal concern (32%), followed by worries about privacy (15%), job displacement (15%), and environmental impacts (14%). A smaller fraction of respondents (under 10%) pointed out additional concerns, such as the belief that AAM would predominantly benefit the affluent, noise pollution, and potential for criminal uses.
- A third of respondents (31%) have a low trust in the Government of Canada to handle the implementation of AAM technology, meaning they gave a score of one or two on a scale of 1 to 5. About the same proportion (34%) have a high trust in the Government of Canada, meaning they gave a score of four or five. A quarter of respondents gave a more neutral rating of three out of five (27%).

#### **Information about AAM:**

- Six respondents out of ten (60%) would be interested in being informed on matters and issues related to AAM, while a third (33%) would not be interested in being informed about AAM.
- The primary sources of information that respondents access when looking for information regarding AAM in Canada are social media platforms (23%), followed by advertising campaigns on TV (15%) and radio (13%). About a third of respondents (30%) don't access any sources to get information regarding AAM in Canada.
- Respondents aged 18 to 34 years old are more likely to access sources online like social media platforms (32%), online ads on specialty websites (13%), collaboration with YouTubers or influencers (10%), or advertising on specialized online retailers' websites (10%). In contrast, respondents aged 55 or older are more likely to look for advertising campaigns on TV (18%).



## 1.4 Qualitative Methodology

The qualitative portion of the study consisted of four focus group sessions with French-speaking and English-speaking Canadians. Conducting the groups online offered the opportunity to regroup people from all the regions in Canada. All groups were conducted with individuals who have positive, neutral (proponents) or negative (opponents) attitude towards Advanced Air Mobility (AAM). To classify them into two groups, participants were asked the following question:

**In general, do you think that the development of Advanced Air Mobility is good or bad for Canada?**

*As a reminder, Advanced Air Mobility is a broad operational concept that refers to a variety of new and emerging ways to move people, goods and services by air. It describes an emerging future state for the aviation ecosystem and is often grouped into three categories: Urban Air Mobility, which refers to carrying people or goods by air within cities, such as by “air taxi” or drone delivery; Regional Air Mobility, which carries people and goods to rural and remote communities; and Remotely Piloted Aircraft Systems, or drones.*

*In the future, AAM could become an important part of our transportation system. Eventually, it is expected that some passenger aircraft will fly through remote piloting, or even autonomously.*

Participants who answered “Very good”, “Good”, or “I don’t know” were placed in groups 1 or 3 (If they spoke English, they were part of group 1; if they spoke French, they were placed in group 3). Those who answered “Bad” or “Very bad” were placed in groups 2 or 4 (If they spoke English, they were part of group 2; if they spoke French, they were placed in group 4).

Overall, two focus groups were conducted in French and the remaining two were conducted in English. Observers from Transport Canada attended the focus groups.

All groups were conducted with Canadians living across Canada, and with a diverse mix of age, gender, household income, education, place of residence (rural/urban) and province.

For each online discussion session, ten participants were recruited by our professional recruiters. A total of 32 recruits participated in the online discussion sessions. All participants in each discussion session received an honorarium of \$125. All groups were scheduled to be held on January 30<sup>th</sup> and 31<sup>st</sup>, 2024. Groups were held in the following criterion on the dates specified in Table 1.

**Table 3. Detailed recruitment**

GR	Region	Recruits	Participants	Target	Language	Date	Time
1	Canada	10	7	Canadians with <b>positive or neutral attitude</b> towards AAM	English	January 30	5pm EST
2	Canada	10	7	Canadians with <b>negative attitude</b> towards AAM	English	January 30	7pm EST
3	Canada	10	10	Canadians with <b>positive or neutral attitude</b> towards AAM*	French	January 31	5pm EST
4	Canada	10	8	Canadians with <b>negative attitude</b> towards AAM*	French	January 31	7pm EST
<b>Total</b>		<b>40</b>	<b>32</b>				

\* Quebec residents may be overrepresented.

## 1.5 Overview of the Qualitative Findings

### Initial Perceptions of Advanced Air Mobility (AAM)

- Participants frequently associated Advanced Air Mobility (AAM) with the application of drones for pioneering services, including the delivery of packages and provision of food services.
- There was a general sense of optimism about how AAM could revolutionize transportation, emergency response, and logistics, mostly in proponent groups; however, this optimism was tempered by a strong call for careful integration of AAM technologies, mostly in opponent groups, emphasizing the need to address potential challenges related to weather adaptability, safety, and societal impact.
- Concerns about AAM also centered around regulatory, safety, and environmental issues, with skeptic participants highlighting the importance of establishing clear guidelines and ensuring the technology's reliability and non-harmful nature before widespread adoption.

### Reaction After Definition of AAM

Once the AAM concept had been defined, some participants showed interest, particularly in its potential applications, while others maintained concerns about implementation and regulation.

- Supporters believed AAM could offer potential societal benefits, but they also emphasized the need for transparency in safety, sustainability, and regulations.
- Skeptics voiced concerns over safety, privacy, and environmental impacts, urging a focus on current transportation system improvements.
- Discussions uncovered linguistic disparities, where French-speaking participants highlighted social implications, while English-speaking participants concentrated on practical aspects, such as the logistics surrounding the deployment of AAM technology.

### **Medical/Healthcare Aviation**

Medical/Healthcare Aviation was recognized for its ability to save lives by enabling quicker emergency responses and healthcare delivery to remote areas. Although there were persistent questions regarding its cost-effectiveness and reliability, the necessity of integrating this technology with traditional healthcare systems was recognized. Furthermore, the safe incorporation of remotely controlled and autonomous drones into healthcare logistics underscored the necessity for strict regulations and oversight, particularly concerning safety and the importance of human oversight.

### **Aerial Firefighting**

Participants saw aerial firefighting technology, especially drones and autonomous systems, as transformative for firefighting efforts, providing rapid responses and accessing difficult areas. They valued the technology's potential to enhance efficiency, safety, and real-time strategy development without risking human lives. Despite this enthusiasm, concerns about operational reliability in challenging conditions and the necessity for human expertise persisted. Skepticism towards autonomous drones focused on decision-making capabilities in unpredictable scenarios, emphasizing the need for advanced AI, thorough testing, and a balance between technology and human judgment in firefighting operations.

### **Drone Delivery**

Participants saw drone delivery as a way to make sending and receiving packages faster and more efficient, especially in areas hard to reach by traditional means. They believed drones could save fuel and reduce pollution compared to trucks and trains. However, concerns about privacy, safety, and the noise from drones flying overhead were significant. Questions about how to secure packages from theft or tampering, and how drones would navigate busy urban skies, also arose. The transition to fully autonomous drone delivery raised additional questions about the technology's readiness and the ability to respond to unexpected challenges without human intervention.

### **Regional Air Mobility**

Regional Air Mobility (RAM) enjoyed support for its potential to enhance rural connectivity through quick, direct flights, using environmentally friendlier electric or hybrid technologies; however, there were significant concerns about safety, infrastructure development, and integration with existing transport systems. Economic feasibility and potential social inequalities also prompted discussion. The readiness of autonomous flight technology raised questions about safety and public trust, with a strong preference for human pilots, underscoring concerns about reliance on automation in transportation.

### **Urban Passenger-Carrying Aviation**

Urban Passenger-Carrying Aviation was welcomed for its promise to improve city travel, offering quicker, cleaner alternatives to ground transport. Enthusiasm covered reduced travel times and the potential to ease road congestion with eco-friendly vehicles. However, concerns about safety, infrastructure, and the implications of autonomous systems tempered optimism. The balance of efficiency gains against safety and infrastructure investment challenges remained a focal point of discussion, highlighting the complexity of integrating new air mobility solutions into urban environments.

### **Living Near a Vertiport**

Participants generally expressed discomfort with the idea of living near a vertiport, citing noise, privacy, and safety concerns. Those residing in urban centres feared increased pollution and infrastructure costs, while rural residents suggested locating vertiports away from homes. Despite some openness to the idea, if properly regulated, the consensus leaned towards improving existing transport systems rather than adding new ones. Concerns varied by location, with a universal emphasis on minimizing impact on residential areas.

### **General Feelings about AAM Technology**

Participants generally viewed AAM technology with optimism for its revolutionary potential in transportation and services like medical services and firefighting. However, significant concerns existed about safety, regulation, environmental, and privacy impacts, especially without a pilot. To mitigate concerns, the importance of safety mechanisms, rigorous training for remote operators, advanced technology for error correction, and transparent communication about AAM's dependability was emphasized.

### **Transport Canada's Communication**

Participants suggested that Transport Canada's communication about AAM should have detailed safety protocols and environmental measures, emphasizing transparency and public involvement in decision-making. They recommended using both digital and traditional methods to inform and engage the public, ensuring accessibility and inclusivity in discussions about AAM's benefits and regulations.

### **Final Considerations**

Initial interest in AAM shifted to cautious optimism as participants learned more, questioning infrastructure, regulation, and integration with existing systems. Skeptics concerned about relevance and environmental impacts became more receptive to AAM's benefits, like emergency services, swayed by safety and environmental assurances.

## **1.6 Notes on Interpretation of the Research Findings**

The opinions and observations expressed in this document do not reflect those of Transport Canada. This report was compiled by Leger based on research conducted specifically for this project.

The results of the quantitative research use a sample drawn from an internet panel, which is not probabilistic in nature. As a result, the margin of error cannot be calculated for this survey and the results cannot be described as statistically projectable to the target population.

Qualitative research is designed to reveal a rich range of participants' opinions, perceptions and interpretations. It does not and cannot measure what percentage of the target population holds a given opinion or perception. Findings are qualitative in nature and cannot be used quantitatively to estimate the numeric proportion or number of individuals in the population who hold a particular opinion.

## **1.7 Political Neutrality Statement and Contact Information**

Leger certifies that the final deliverables fully comply with the Government of Canada's political neutrality requirements outlined in the Policy on Communications and Federal Identity and the Directive on the Management of Communications.

Specifically, the deliverables do not include information on electoral voting intentions, political party preferences, standings with the electorate, or ratings of the performance of a political party or its leaders.

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