



Transport
Canada

Transports
Canada

Canadians' Awareness of and Confidence in Automated Vehicles Final Report

Prepared for Transport Canada

Supplier Name: Environics Research

Contract Number: T8053-180120/001/CY

Contract Value: \$114,959.59 (including HST)

Award Date: 2019-11-23

Delivery Date: 2019-03-08

Registration Number: POR 073-18

For more information on this report, please contact Transport Canada at:

TC.Publicopinion-Opinionpublique.TC@tc.gc.ca

Ce rapport est aussi disponible en Français

Canada

Canadians' Awareness of and Confidence in Automated Vehicles
Final report

Prepared for Transport Canada by Environics Research

March 2019

Permission to reproduce

This publication may be reproduced for non-commercial purposes only. Prior written permission must be obtained from Transport Canada. For more information on this report, please contact Transport Canada at: TC.Publicopinion-Opinionpublique.TC@tc.gc.ca

© Her Majesty the Queen in Right of Canada, as represented by the Minister of Public Services and Procurement Canada, 2019.

Cat. No. T46-60/2019E-PDF

ISBN 978-0-660-29853-5

Cette publication est aussi disponible en français sous le titre *Connaissance et confiance des Canadiens à l'égard des véhicules automatisés*.

Table of contents

Executive summary	i
Introduction	1
Detailed findings	3
<u>I.</u> Awareness and impressions of automated vehicles (AVs).....	3
<u>II.</u> Impressions of specific advanced driver assistance systems (ADAS)	11
<u>III.</u> Information sources regarding advanced driver assistance systems (ADAS)	20
<u>IV.</u> Conclusions	23
<u>V.</u> Profile of Canadian drivers	24
Appendix A: Methodology	31
Appendix B: Quantitative research instrument.....	36

Executive summary

Background and objectives

Transport Canada (TC) wants to better understand what Canadian drivers know about automated vehicle (AV) technology and how they learn about it. The findings will be used to develop tools and resources to help educate the public, thereby promoting road safety as well as public confidence in these new technologies. The study was designed to look at how much Canadians know about AV technology and how they choose to educate themselves on it, particularly in terms of the lower level automation technologies currently available to Canadian consumers. The data will create a baseline from which comparative data can be drawn in future studies. The findings will help inform Transport Canada and relevant stakeholders on the types of tools/resources/forums they should produce to educate the public on this issue and promote motor vehicle safety on Canadian roads.

The specific objectives of this research were to:

- Measure Canadians' awareness and confidence in AVs;
- Collect data to assist Transport Canada in creating non-regulatory tools/forums to enhance Canadians' knowledge of AVs;
- Provide feedback that will enable Transport Canada to inform relevant stakeholders (e.g. provinces, territories, municipalities, industry) about Canadians' perceptions of AVs, which will help guide the resources/tools they produce to educate the public;
- Provide reliable statistical support to Transport Canada in the development of Memoranda of Understanding (MoUs) with industry/states to advance public awareness on AVs.

Methodology

EnviroNics Research conducted an online survey of 3,113 Canadians who are members of an online panel, from January 31 to February 16, 2019. The sampling method was designed to complete interviews with Canadians between the ages of 16 to 80, 2,700 with a valid drivers' license and 300 without a driver's license. Quotas were set by age, gender, and region, as well as by EnviroNics Analytics PRIZM5 segments to make the sample as close to representative as possible.¹ The data were statistically weighted to ensure the sample is representative of this population according to the most recently available Census information (region, gender, age).

As an online survey is a non-probability sample, no margin of sampling error is reported. Although opt-in panels are not random probability samples, online surveys can be used for general population surveys provided they are well designed and employ a large, well-maintained panel. This survey's large and carefully designed sample provides robust data for understanding the attitudes of the Canadian population and subgroups of interest, and supports a custom segmentation of the driver population, based on interest in, and affinity for, advanced automobile technology.

¹ PRIZM divides Canadians into 68 lifestyle segments, based on their postal codes. Proportionally including PRIZM segments into the sample design, in addition to standard region, age and gender demographics, allows EnviroNics to balance online panel samples in a way that makes them more representative and comparable to telephone survey samples.

Target group	Target (quota)	Actual Unweighted	Actual Weighted
Total	3,000	3,113	3,113
Licensed drivers	2,700	2,700	2,789
Non-licensed	300	300	325

More information about the methodology for this survey is included in Appendix A.

Cost of research

The cost of this research was \$114,959.59 (HST included).

Key findings

Awareness and impressions of automated vehicles (AVs)

- The dominant view of Canadians currently is that automated vehicles are ones that drive themselves. One-third of Canadians indicate the term “automated vehicles” refers to a car that drives itself, and still others specify a driverless car or one driven by a computer. Small proportions would include automatic transmissions, electric vehicles or artificial intelligence systems as constituting an AV.
- One-third of Canadians say they are at least somewhat familiar with automated vehicles, and two-thirds admit to being not very or at all familiar.
- When presented with a list of vehicle technologies, over eight in ten indicate having heard of at least one of the six ADAS features explored in the survey. Of these the best known, and most used, is blind spot monitoring (BSM).
- When presented with a list of potential advantages of AVs, the top advantages identified by Canadians are a reduction in driver error, and easier vehicle operation for elderly or disabled persons. The main disadvantages identified are the potential for equipment failure, failure to react to unexpected situations, or that drivers will become lazy or pay less attention.
- There is currently a relatively high level of concern about automated vehicles and how they will function on the nation’s roads. A majority of Canadians agree to some extent with negative statements about automated vehicles, most notably that system security and data privacy will become more of a concern when vehicles are more automated (almost three-quarters agreeing to some extent), or that the idea of fully automated delivery vehicles concerns them (two-thirds agree at least somewhat). In contrast, just over four in ten agree to some extent that automated vehicles perform better than human drivers in routine driving conditions or that automated vehicles will keep the road safer for everyone.
- While close to half of Canadians are currently neutral, the remainder are twice as likely to feel experiencing an automated vehicle would be stressful than to think it would be relaxing.

Impressions of specific advanced driver assistance systems (ADAS)

- Four in ten Canadians have used at least one of the three ADAS features about which they were asked; six in ten have not. Around one in ten report owning a vehicle with an ADAS technology and similar proportions report driving one equipped with an ADAS, that they do not currently own (e.g. a previous vehicle, rental or car share) or having ridden in one they did not drive. Between six and eight in ten indicate they either have no experience with ADAS as a driver or passenger, or are not able to say. When

all of the ADAS technologies are taken together, four in ten report being a user of at least one, while six in ten are non-users.

- When driver owners were asked how often they use the ADAS feature on their vehicle, the technology most likely to be used frequently is blind spot monitoring, followed by lane keeping assist. Not using an ADAS frequently mostly comes down to people feeling their driving is good, so the feature's assistance is not needed. However, three in ten who do not frequently use lane departure warning say it is because it is annoying, and around one-quarter say they do not frequently use lane keeping assist or blind spot monitoring because it is distracting.
- Three-quarters of driver owners say it was at least somewhat important to them that their vehicle had blind spot monitoring; this is also the technology others think will be most important for future purchase decisions. Three in ten driver owners say lane departure warning was very important, and around two in ten each say other ADAS features were very important when they selected their current vehicle.
- Canadians are most likely to say they are familiar with what blind spot monitoring does, and are least familiar with automatic emergency braking. When asked to identify the correct function of an ADAS from a list of three options, seven in ten or more identify the correct functions of blind spot monitoring, lane keeping assist or lane departure warning; only one-quarter identify the function of adaptive cruise control.

Information sources regarding advanced driver assistance systems (ADAS)

- When shown a list of possible information sources, users of ADAS are most likely to have consulted an owner's manual, friends or family, the manufacturer's web site or the dealership to learn about the ADAS features with which they are familiar.
- If they needed information on AV features in the future, close to half of Canadians would seek this on a manufacturer's web site, and around three in ten each would look at the owner's manual, ask the dealership, or seek out a video online. Just under two in ten would ask friends or family, or use a book, brochure or pamphlet. Fewer than one in ten would use any other listed information sources.
- From a list of four different ways of learning about ADAS technologies, Canadians are most likely to think in-person training at the dealership would be very useful, followed by having ADAS-specific training as part of new driver training programs. Around one-quarter each think onboard videos or printed information offered by rental car companies or car share programs would be very useful ways for Canadians to learn about ADAS functions.

Political neutrality statement and contact information

I hereby certify as senior officer of Environics that the deliverables fully comply with the Government of Canada political neutrality requirements outlined in the Communications Policy of the Government of Canada, and Procedures for Planning and Contracting Public Opinion Research. 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.



Sarah Robertson
Vice President, Public Affairs
Environics Research Group
sarah.roberson@environics.ca
613-699-6884

Supplier name: Environics Research Group
PWGSC contract number: T8053-180120/001/CY
Original contract date: 2018-11-23

For more information, contact TC.Publicopinion-Opinionpublique.TC@tc.gc.ca

Introduction

1. Background

In a country as large as Canada, vehicles are a necessity for many people. Technologies are constantly being developed to improve vehicle performance and safety. Automated vehicle (AV) technology harnesses the best of innovation to make vehicles more functional and safe for drivers; some may think of fully automated vehicles, which can operate without a driver in all environments, as being the ultimate expression of this technology. It is likely many Canadians may not be aware what lower-level AV technology currently exists, possibly even in their own vehicles. Transport Canada identified a need to gather information about the general Canadian population's knowledge, attitudes and behaviours regarding these technologies, to ensure they can produce and distribute information to promote safe AV usage practices among the country's drivers. This research will be used to support Transport Canada action items and will align with its strategic transportation plan.

2. Research rationale and objectives

Transport Canada (TC) wanted to better understand what Canadian drivers know about AV technology and how they learn about it. The findings will be used to develop tools and resources to help educate the public, thereby promoting road safety as well as public confidence in these new technologies.

For the purpose of this study, AV technologies are defined as those meeting any of the six levels of automation as defined by SAE International (level 0 to level 5), with an emphasis on level 0 to level 2 advanced driver assistance systems (ADAS) features which are becoming increasingly common in the Canadian market. The study looks at how much Canadians know about AV technology and how they choose to educate themselves on it, particularly in terms of the lower level automation technologies currently available to Canadian consumers. It creates a baseline of data from which comparative data can be drawn in future studies. The findings will help inform Transport Canada and relevant stakeholders on the types of tools, resources and forums they might produce to educate the public on this issue and promote motor vehicle safety on Canadian roads.

The specific objectives of this research are to:

- Measure Canadians' awareness and confidence in AVs;
- Collect data to assist Transport Canada in creating non-regulatory tools/forums to enhance Canadians' knowledge of AVs;
- Provide feedback that will enable Transport Canada to inform relevant stakeholders (e.g. provinces, territories, municipalities, industry) about Canadians' perceptions of AVs which will help guide the resources/tools they produce to educate the public;
- Provide reliable statistical support to Transport Canada in the development of Memoranda of Understanding (MoUs) with industry/states to advance public awareness on AVs.

3. Report

This report begins with an executive summary outlining key findings and conclusions, followed by a detailed analysis of the results. A detailed description of the methodology used to conduct this research is presented in Appendix A. The research instruments are presented in Appendix B.

Note: Some columns and rows may not add to 100% due to rounding or multiple mentions. Any base sizes not indicated are total sample.

Detailed findings

I. Awareness and impressions of automated vehicles (AVs)

It was important for this baseline data collection to assess awareness and attitudes of the population toward automated vehicles (AVs). The survey began with an unprompted question asking what first comes to mind when the term “automated vehicles” is used. Canadians were then asked to give their personal assessment of how familiar with AVs they feel they are, and later they were asked to indicate which of a list of vehicle technologies they have heard of and have used. Their impressions of AVs were assessed by asking what they feel are their advantages and disadvantages, by asking level of agreement with a series of statements about AVs, and getting them to indicate whether the use of AVs would be more relaxing or more stressful.

1. Top-of mind impressions of AVs

One-third of Canadians think the term “automated vehicles” implies a car that drives itself; still others specify a driverless car or one driven by a computer.

When asked what kinds of technology comes to mind when the term “automated vehicles” is used, one-third of Canadians specify a car that drives itself or is autonomous. A further one in six mention a driverless vehicle, and just under one in ten say it brings to mind a car driven or controlled by a computer. Fewer make other specific mentions.

Top-of-mind impressions of automated vehicles (AVs)
(Top mentions 3% or more) – by age

Technology that come to mind with term “automated vehicles”	Total sample (n=3,113)	Age				
		16-24 (n=123)	25-34 (n=773)	35-49 (n=732)	50-64 (n=826)	65+ (n=659)
A car that drives itself/ autonomous/self-driving	33%	42%	35%	30%	36%	30%
A driverless vehicle	13%	8%	11%	13%	13%	17%
A car driven by a computer/robotic	7%	4%	4%	6%	10%	10%
Automatic (not standard) transmission cars/everything automated	6%	9%	9%	6%	5%	6%
Electric/hybrid/battery operated	5%	4%	4%	4%	6%	8%
AI/Artificial Intelligence built in car	5%	4%	5%	6%	5%	4%
Can park itself/automatic parallel parking	5%	1%	7%	4%	5%	3%
Advanced electronic features/ innovative technology for safety	3%	1%	3%	4%	2%	5%
Collision avoidance sensors/lane changing warning	3%	1%	2%	4%	4%	3%
Tesla	3%	7%	5%	3%	2%	2%
Built-in GPS	3%	2%	2%	2%	4%	3%

Q13 When you hear the term “automated vehicles,” what kinds of technology come to mind?

Responses are generally similar by subgroup. Saying an AV is a car that drives itself is the top response across the country and all subgroups of the population; it is higher among licensed drivers than non-drivers, among those who have a university degree than those with less education, and among Anglophones than Francophones, the latter of whom are among the most likely to mention electric or hybrid cars.

2. Familiarity with AVs

One-third of Canadians say they are at least somewhat familiar with automated vehicles. The vehicle features most heard of and most used are normal cruise control and back up cameras. Of the six ADAS technologies explored in this survey, the best known, and most used, is blind spot monitoring.

Without providing a definition of automated vehicles, Canadians were asked how familiar they are with them. One-third are very or somewhat familiar (fewer than one in ten being very familiar), while over six in ten are not very or at all familiar.

Familiarity with automated vehicles – by gender and age

Level of familiarity with AVs	Total sample (n=3,113)	Gender		Age				
		Women (n=1,582)	Men (n=1,522)	16-24 (n=123)	25-34 (n=773)	35-49 (n=732)	50-64 (n=826)	65+ (n=659)
Net: familiar	34%	27%	41%	58%	40%	32%	30%	28%
Very familiar	6%	4%	8%	16%	8%	5%	5%	3%
Somewhat familiar	28%	23%	33%	42%	32%	27%	25%	25%
Net: not familiar	63%	69%	57%	40%	55%	66%	67%	69%
Not very familiar	38%	37%	39%	29%	35%	39%	40%	40%
Not at all familiar	25%	32%	18%	11%	20%	27%	27%	29%
Not sure	3%	4%	3%	3%	5%	2%	3%	3%

Q14 How familiar would you say you are with automated vehicles?

Being familiar with AVs is fairly similar across the country (although lower in Quebec). The following groups are more likely to indicate they have at least some familiarity with AVs:

- Urban residents (39%)
- Men (41%)
- Age 16 to 24 (58%)
- Household income \$80,000 + (40%)
- Post-graduate degree (43%)
- Allophones (49%)
- Licensed drivers (35%)
- Heavy weekday vehicle users (43%)

A bit later in the survey Canadians were asked to indicate which of a list of 11 vehicle technologies they have heard of, and which, of those they are aware of, they have on their most used vehicle. The most familiar and most used features are normal cruise control and back up cameras. Over eight in ten have heard of at least one of the six ADAS technologies covered in the survey, with blind spot monitoring being the most heard of and the most used, and with adaptive cruise control having the lowest recognition.

Familiarity with AV technologies

Technologies heard of/have on most used vehicle	Heard of (Total sample: n=3,113)	Have on most used vehicle (Those aware of technologies: n=2,943)
NET: ADAS	84%	26%
Blind spot monitoring/alert system	66%	15%
Lane departure warning	55%	10%
Forward collision warning	54%	10%
Lane keeping assist	52%	8%
Automatic emergency braking	49%	8%
Adaptive cruise control	39%	9%
Back-up camera	86%	44%
Cruise control	81%	63%
Back-up warning system	71%	20%
Automatic parking	63%	3%
Electronic Stability Control (ESC)	31%	16%
None of the above	2%	17%
Not sure	4%	5%

Q23 Please select which of these vehicle technologies you have heard of (including those you have interacted with, experienced as a passenger, seen on a commercial or heard about elsewhere):

Q24 Which, if any, of the following features are on the vehicle you (IF 01 AT Q4: drive most often?/IF 02 AT Q4: ride in most often?)

Having heard of these technologies is generally fairly similar by region, although lower in Quebec than other provinces, and Albertans are more likely than others to have heard of lane departure warning. Having heard of the six ADAS technologies is higher among men than women, with the gender difference being particularly noticeable for forward collision warning (21 percentage points difference), adaptive cruise control (19 percentage points), lane departure warning (18 points), lane keeping assist (17 points) and automatic emergency braking (17 points). Having heard of specific ADAS technologies is higher among Canadians age 50 and over than their younger counterparts, and highest among Canadians age 65 and over. Having heard of ADAS technologies increases as household income increases; there is a less predictable pattern with level of education, but those having a post graduate degree are the most likely to have heard of these, especially compared to those with high school or less.

Interestingly, there is no clear pattern of having heard of vehicle technologies relating to self-assessed familiarity with AVs. Those saying they are not very familiar with AVs are as likely as those saying they are very or somewhat familiar to indicate they have heard of the ADAS technologies in this list. However, saying one's own vehicle is equipped with ADAS features is higher among those who claim to be more familiar with AVs, and having heard of the ADAS features is linked to being users of ADAS technologies, established later in the survey.

3. Advantages of AVs

The top advantages of AVs identified by Canadians are a reduction in driver error, and easier vehicle operation for elderly or disabled persons.

Canadians were asked to indicate, from a presented list, which they feel are the *advantages*, if any, of AVs. Multiple responses were permitted. The top advantage, selected by half, is that they will be safer, reducing driver error and the impact of bad or impaired drivers. Four in ten also think a key advantage will be making driving easier for the elderly or persons with disabilities. Three in ten each say an advantage is reduced stress and worry about driving, or that it will be convenient to be able to multitask while driving. Around one-quarter also feel better traffic flow and reduced congestion will be a good outcome. Other advantages are mentioned by two in ten or fewer; just over one in ten do not think there will be any advantages of AVs.

Advantages of automated vehicles

Advantages of AVs	Total sample (n=3,113)
Safer/reduces driver error/fewer bad or impaired drivers	51%
Easier for elderly/persons with (a) disability(ies)	40%
Less stressful/don't have to worry as much about driving	31%
Convenience/can do other things while driving	29%
Better traffic flow/reduces congestion	27%
Better for the environment/reduced emissions	21%
Better fuel economy/cheaper to run	21%
Lower insurance premiums	18%
Anyone can drive/don't need a driving license	14%
Reduced travel times	12%
Better for the economy e.g. improved productivity	11%
Other	1%
No advantages	13%
Not sure	11%

Q15 What do you think are the advantages, if any, of automated vehicles?

That AVs would be safer/reduce driver error is the top response across the country and most subgroups, although Quebec and Atlantic residents are somewhat less likely than others to think this, and most other listed options, will be advantages. Those living in rural and small communities are also somewhat less likely than those in mid-size and larger cities to think most of these will be an advantage of AVs, but still, close to half expect improved safety and reduced error to be a potential advantage. Saying a number of these options would be advantages is higher among university graduates and men, although similar proportions by gender think AVs will make life easier for the elderly and disabled persons, or that they will be better for the environment. Thinking AVs will make life easier for the elderly or disabled, or that they will reduce driver stress, is somewhat higher among non-drivers than those with current licenses. Thinking any of these will be advantages is higher among those with even marginal self-assessed familiarity with AVs than those who say they are not at all familiar with them. Indicating there are no advantages to AVs is a minority view, but is slightly higher among rural dwellers, those age 35 and over, and those with household incomes under \$40,000.

4. Disadvantages of AVs

The main disadvantages of AVs are thought to be the potential for equipment failure, a failure to react to an unexpected situation, or that drivers will become lazy or pay less attention.

Canadians were also asked what they think would be the main *disadvantages*, if any, of AVs, from a provided list. The main disadvantages identified, each by over six in ten, are the potential for equipment or system failure; that the vehicle may fail to respond to unexpected situations; or that drivers may become lazy or pay insufficient attention. Over half also think AVs may contribute to drivers becoming less skilful, and half express concern about AV operation during Canadian winters.

Disadvantages of automated vehicles

Disadvantages of AVs	Total sample (n=3,113)
Equipment/system failure	65%
Vehicle fails to react to unexpected situations	64%
Drivers will become lazy/pay less attention	62%
Drivers will become less skillful	54%
Concerns about operation in winter/Canadian weather	50%
Security/hackers/terrorists/fraud	45%
Legal liability/knowning who is at fault	45%
Loss of driver control	43%
Interacting with pedestrians/cyclists	41%
Interacting with other human drivers	37%
Data privacy (e.g., location tracking)	33%
Driving becomes less fun/enjoyable	25%
Impact on jobs/drivers losing jobs	24%
Other	1%
No disadvantages	2%
Not sure	6%

Q16 What do you think are the disadvantages, if any, of automated vehicles?

Responses regarding disadvantages are fairly similar by region, although once again, somewhat lower proportions of Quebecers and Francophones indicate most will be a disadvantage. Responses are also generally similar by community size and gender. Saying most of these will be disadvantages tend to be higher among those age 65 and over and retired people, although mentions of security and interacting with human drivers do not differ substantially by age. That driving will become less enjoyable or that jobs will be impacted is somewhat higher among those with education under the bachelor degree level. Drivers are more likely than non-drivers to see as disadvantages that drivers will become lazy, lose control, or that driving will become less enjoyable.

Saying each item listed is a disadvantage of AVs is notably lower among those who say they are very familiar with AVs, that AVs will be more relaxing than stressful, and non-driver users of ADAS technologies.

5. Agreement with statements about AVs

Majorities of Canadians agree to some extent with negative statements about automated vehicles.

Canadians were shown a series of statements about automated vehicles and asked to indicate their level of agreement or disagreement with each. The results indicate there is currently a relatively high level of concern and pessimism about automated vehicles and how they will function on the nation's roads. Canadians are most likely to agree at least somewhat that system security and data privacy needs will become more concerning when vehicles are more automated (almost three-quarters agree to some extent), or that they are concerned by the idea of fully automated delivery vehicles (two-thirds agree at least somewhat). Agreement is lower for three statements that are positive about AVs: that they perform better than humans under routine conditions, that they will help keep the roads safer, or that they would be comfortable riding in a fully automated vehicle.

Agreement with statements about AVs

Level of agreement with statements about AVs	Net agree (strongly+ somewhat)	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	Not sure
When vehicles become more automated, system security and data privacy will become more of a concern.	73%	29%	44%	12%	3%	12%
The idea of fully automated delivery vehicles concerns me.	66%	28%	38%	17%	8%	10%
Automated vehicles perform better than human drivers in routine driving conditions.	43%	10%	34%	22%	12%	23%
Automated vehicles will help keep the roads safer for everyone.	42%	9%	34%	23%	15%	20%
I would be comfortable riding in a fully automated vehicle.	33%	8%	25%	26%	28%	13%

Q17-21 Please indicate your level of agreement with the following statements about automated vehicles.

Agreement with negative statements about AVs is relatively similar by region; Atlantic region residents are somewhat less likely to strongly agree with positive statements than are those living elsewhere. Those living in major urban centres tend to be more positive than those living in mid-size or rural communities. Licensed drivers are more likely than non-drivers to agree with negative statements about AVs, but agreement with positive statements is fairly similar, except being comfortable riding in a fully automated vehicle where non-drivers are somewhat more in agreement (40%) than drivers (32%).

There are some notable demographic differences in agreement with these statements. While majorities of all ages agree with the negative statements about AVs to some extent, agreement with these increases along with an increase in age; conversely, younger Canadians (especially those age 16 to 24) are more likely than their older counterparts to agree with positive AV statements. Men are more likely than women to agree with positive AV statements, notably about being comfortable riding in a fully automated vehicle (39% at least somewhat agreeing vs. 27% of women) or that AVs will help keep the roads safer for everyone (50% vs. 35% of women).

The survey results indicate that having additional exposure to AVs will improve impressions of them. Agreeing with positive AV statements is linked to higher levels of household income and education and, later in the

survey, to self-reporting as very familiar with AVs, to thinking using AVs would be more relaxing than stressful, and to being a current owner of a vehicle with ADAS technology.

6. Impressions of driving/riding in AVs

While about half of Canadians are currently neutral, the remainder are more likely to think experiencing an automated vehicle would be more stressful than relaxing.

Canadians were asked if they think driving or riding in a vehicle with these kinds of automated technologies would be more relaxing or more stressful than being in a conventional vehicle. They were provided with a sliding scale of 1 to 10, where the lower end of the scale was relaxed and the upper end was stressful. Just under half would be neutral; three in ten feel it would be more stressful, and few (around one in seven) think it would be more relaxing. One in ten were not able to provide a rating. Giving a neutral rating (score of 4 to 7) is the dominant response across most subgroups.

Impressions of driving or riding in automated vehicles – by gender and age

Impressions of driving/riding in automated vehicles compared to conventional	Total sample (n=3,113)	Gender		Age				
		Women (n=1,582)	Men (n=1,522)	16-24 (n=123)	25-34 (n=773)	35-49 (n=732)	50-64 (n=826)	65+ (n=659)
Net: Relaxing (score 0-3)	13%	9%	17%	21%	16%	12%	14%	10%
Relaxing (1)	4%	3%	5%	6%	6%	4%	3%	1%
2	3%	2%	5%	4%	3%	2%	4%	3%
3	6%	5%	8%	10%	7%	6%	7%	5%
Net: Neutral (score 4 to 7)	46%	46%	46%	51%	48%	48%	44%	43%
4	9%	8%	10%	13%	9%	11%	7%	9%
5	12%	11%	12%	11%	13%	12%	11%	11%
6	14%	14%	13%	12%	13%	14%	14%	14%
7	12%	12%	11%	16%	13%	12%	12%	9%
Net: Stressful (score 8-10)	30%	33%	27%	20%	25%	29%	31%	36%
8	13%	13%	12%	11%	10%	12%	15%	14%
9	7%	7%	6%	2%	6%	6%	6%	9%
10	10%	12%	9%	7%	9%	11%	11%	12%
Not sure	11%	12%	9%	7%	11%	10%	11%	12%

Q22 Do you think (IF 01 AT Q4: driving/IF 02 AT Q4: riding in) a vehicle with these kinds of automated technologies would be more relaxing, or more stressful, than being in a conventional vehicle?

That an AV experience would be more stressful (scoring 8-10) is a minority view but somewhat higher among the following groups:

- Women (33%)
- Rural residents (35%)
- Education below university level (34%)
- Retired people (35%)
- Not at all familiar with AVs (39%)

- Non-users who have not heard of specific ADAS technologies covered in the survey (37%)

Saying an AV experience would be more relaxing (scoring 1-3) is a minority view but somewhat higher among the following groups:

- Men (17%)
- Major urban centres (17%)
- Age 16 to 24 (21%) and 25 to 34 (16%)
- Household income \$150,000 and over (22%)
- University degree and over (17%)
- Very familiar with AVs (37%)
- Current driver owner of an ADAS feature (19%)

II. Impressions of specific advanced driver assistance systems (ADAS)

1. Experience with ADAS technologies

Four in ten Canadians have used at least one of the three ADAS features about which they were asked; six in ten have not.

Each respondent was asked questions about three of six specific ADAS technologies. The technologies each person was asked about were randomly selected, rather than based on self-identified awareness or experience. This ensured each technology was presented to half of the sample, preventing oversampling of the most common features.

- The majority asked about each of the six technologies indicate they have neither driven nor been a passenger in a vehicle so equipped – they are referred to in this report as a **non-user** (the small percentages who were not sure were treated as non-users). Altogether, non-users make up 60 percent of Canadians.
- For each of the six technologies, around one in ten Canadians report currently owning or leasing a vehicle equipped with that specific feature – these people are referred to in this report as **driver owners**. Driver users of at least one ADAS technology make up 17 percent of Canadians.
- One in ten or fewer report having driven a vehicle equipped with an ADAS technology (e.g. they previously owned a vehicle equipped with the feature, or have driven another vehicle with it, for example a rental or car share) but that they do not own or lease one currently. These people are referred to in this report as a **driver user**. Driver users make up 21 percent of Canadians.
- Just around one in ten or so report having been a passenger in a vehicle equipped with that technology, but not driving one personally – referred to in this report as a **non-driver user**. Two percent of Canadians are non-driver users.

The table below provides an overall summary of how the Canadian population falls out in terms of experience with the six AVs covered in this survey:

Summary of ADAS user types – by gender and age

ADAS User type - summary	Total sample (n=3,113)	Gender		Age				
		Women (n=1,582)	Men (n=1,522)	16-24 (n=123)	25-34 (n=773)	35-49 (n=732)	50-64 (n=826)	65+ (n=659)
Net: Users	40%	35%	44%	55%	44%	36%	39%	37%
Driver owner of at least one ADAS	17%	20%	10%	18%	13%	19%	18%	20%
Driver user of at least one ADAS (excluding owners)	21%	23%	39%	24%	19%	19%	17%	23%
Non-driver user of at least one ADAS (excluding driver owners/users)	2%	1%	7%	1%	3%	1%	2%	1%
Net: Non-users	60%	56%	45%	56%	64%	61%	63%	56%
Non-users but heard of at least one ADAS	47%	46%	36%	44%	50%	45%	54%	46%
Non-users and not heard of any ADAS	13%	10%	9%	13%	14%	16%	9%	10%

Q26 ASK ALL: Have you ever driven, or been a passenger in, a vehicle equipped with _____ (bold name)?

Although a minority in all cases, the following are the subgroups most likely to be a **driver owner** of an ADAS technology currently:

- Alberta residents (21%)
- Men (20%)
- Household income \$150,000 or more (24%)
- Post-graduate degree (27%)
- Allophone (28%)

At this stage of their adoption, the ADAS features covered in the survey most likely for Canadians to have used already are blind spot monitoring, adaptive cruise control and lane departure warning; the least likely to be used is lane keeping assist:

Experience with specific ADAS technologies

Experience with ADAS technologies (base: those asked about each)	Driver owner	Driver user	Non driver user	Non user	Not sure
Blind spot monitoring (BSM) (n=1,556)	14%	10%	14%	57%	5%
Adaptive cruise control (ACC) (n=1,555)	13%	7%	8%	60%	11%
Lane departure warning (LDW) (n=1,557)	12%	9%	11%	61%	7%
Automatic emergency braking (AEB) (n=1,556)	11%	6%	8%	64%	10%
Forward collision warning (FCW) (n=1,557)	11%	5%	7%	69%	7%
Lane keeping assist (LKA) (n=1,558)	8%	9%	9%	67%	8%

Q26 ASK ALL: Have you ever driven, or been a passenger in, a vehicle equipped with _____ (bold name)?

2. Driver owner frequency of use of ADAS technologies

The ADAS technology most likely to be used frequently is blind spot monitoring, followed by lane keeping assist. Not using an ADAS frequently mostly comes down to feeling its assistance is not needed.

Those identifying as current driver owners of the technologies were queried about how often they use that feature. The most frequently used is blind spot monitoring, with three-quarters saying they use this frequently. Fewer than half report frequent use of other ADAS features, which can be expected given some are engaged only under specific driving conditions. Automatic emergency braking is the ADAS with the least reported use; lane departure warning is the feature most likely to have been turned off (by one in ten of its driver users).

Driver owner frequency of using ADAS technologies

Frequency of use of ADAS technologies (base: those asked about each)	Frequently	Some- times	Rarely	Never	Turned off	NA/not sure
Blind spot monitoring (BSM) (n=211)	75%	21%	3%	1%	<1%	<1%
Lane keeping assist (LKA) (n=124)	46%	31%	14%	6%	3%	-
Lane departure warning (LDW) (n=180)	43%	32%	12%	1%	11%	<1%
Adaptive cruise control (ACC) (n=195)	36%	37%	17%	8%	1%	1%
Forward collision warning (FCW) (n=163)	31%	29%	30%	4%	2%	4%
Automatic emergency braking (AEB) (n=154)	20%	23%	30%	16%	4%	7%

Q27 How often do you use the _____ feature in your vehicle?

The bases of driver owners responding about each of these features are too small to permit subgroup analysis.

The driver users who did not report frequent use of their ADAS technology were asked why they did not use this feature more often, or at all. They were shown a list of possible reasons, and also allowed to specify something else. Regardless of the specific ADAS feature queried, driver owners are most likely to say it is because they are a good driver or don't need to use it. Notable proportions of those discussing lane departure warning (30%) or lane keeping assist (22%) say it is because the feature is annoying; two in ten or more lane departure warning or blind spot monitoring users do not use that feature frequently because they find it to be distracting. Almost two in ten lane keeping assist driver owners report not using the feature because it doesn't work.

Reasons for not using ADAS

Reason for not using ADAS	AEB (n=113)	FCW (n=103)	ACC (n=127)	LDW (n=99*)	LKA (n=71*)	BSM (n=58*)
My driving is good/not needed	62%	50%	40%	40%	36%	39%
I don't know how to use it	11%	4%	10%	6%	12%	4%
It is annoying	10%	15%	14%	30%	22%	10%
It's distracting	9%	13%	10%	22%	13%	25%
It doesn't work	2%	4%	2%	7%	18%	12%
Don't drive on highways a lot	-	-	11%	4%	3%	-
Other**	2%	8%	6%	2%	6%	2%
Not applicable	10%	12%	11%	10%	7%	18%
Not sure	4%	3%	9%	4%	5%	12%

* Note small base size (<100)

** Other mentions, cited by very small proportions of driver owners, include the feature not being on their primary vehicle/being on spouse's vehicle, the vehicle being new, or the feature being impractical in higher volume traffic situations.

Q28 ASK IF DRIVER OWNER AND IF 02-06 AT Q27: Which, if any, of the following is a reason why you don't use the _____ feature (IF 02-03 AT Q27 ADD: more often)?

The bases of driver owners not using these features frequently are too small to permit subgroup analysis.

3. Importance of ADAS technologies in vehicle purchase

Three-quarters of driver owners say it was at least somewhat important to them that their vehicle had blind spot monitoring; this is also the technology others think will be most important for future purchase decisions.

Driver owners of ADAS technologies were asked how important the feature was in their decision to purchase or lease their vehicle: between half and three-quarters say it was at least somewhat important. Saying it was very important is highest for blind spot monitoring (43%), followed by lane departure warning (29%). Around two in ten say each of the other ADAS technologies was a very important factor in making their vehicle decision.

Importance of ADAS features in driver user's vehicle purchase or lease

Importance of ADAS technology in vehicle purchase or lease (base: those asked about each)	Very important	Somewhat important	Not very important	Not at all important	NET: Important
Blind spot monitoring (BSM) (n=211)	43%	32%	10%	14%	75%
Lane departure warning (LDW) (n=180)	29%	29%	18%	21%	59%
Automatic emergency braking (AEB) (n=154)	23%	37%	16%	19%	60%
Forward collision warning (FCW) (n=163)	22%	30%	23%	21%	52%
Adaptive cruise control (ACC) (n=195)	20%	33%	21%	23%	54%
Lane keeping assist (LKA) (n=124)	18%	45%	17%	18%	63%

Q29 IF DRIVER OWNER ASK: How important a factor was _____ in the decision to purchase or lease this vehicle?

The bases of driver owners of these features are too small to permit subgroup analysis.

Those aware of each technology who are not driver owners were asked how important they think having this feature will be to future vehicle purchase or lease decisions. Canadians asked about these ADAS features in a hypothetical way are less likely to feel each will be important in making a vehicle purchasing decision than the extent of importance expressed by driver owners in the table above.

Blind spot monitoring is considered the top ADAS feature in a potential vehicle selection decision, with two-thirds saying it will be at least somewhat important. In contrast, just over four in ten think adaptive cruise control will be important on some level.

Hypothetical importance of ADAS features to future vehicle purchase or lease

Hypothetical importance of ADAS technology in vehicle purchase or lease (base: those asked about each)	Very important	Somewhat important	Not very important	Not at all important	N/A/not sure
Blind spot monitoring (BSM) (n=915)	24%	41%	20%	10%	5%
Forward collision warning (FCW) (n=788)	17%	38%	23%	12%	10%
Automatic emergency braking (AEB) (n=752)	14%	42%	20%	13%	11%
Lane keeping assist (LKA) (n=800)	11%	37%	28%	16%	9%
Lane departure warning (LDW) (n=815)	10%	38%	28%	18%	7%
Adaptive cruise control (ACC) (n=559)	10%	35%	28%	18%	10%

Q30 IF DRIVER USER (NON OWNER) OR NON-DRIVER USER, OR NON USER IF FAMILIAR AT Q23 ASK: How important a factor do you think having _____ will be in making a decision about which vehicle to purchase or lease in the future?

Opinions on this are generally fairly similar across the population. ADAS users are more likely than non-users to think specific technologies will be important to some degree in future vehicle purchase decisions. The proportions thinking these technologies will be important are fairly similar for licensed drivers and non-drivers.

4. Knowledge of what ADAS technologies do

Canadians are most likely to express familiarity with what blind spot monitoring does.

Respondents asked about each ADAS technology were asked to indicate how familiar they feel they are with what it does. Being at least somewhat familiar ranges from a low of one-third each when asked about adaptive cruise control and automatic emergency braking, to a high of around half each regarding blind spot monitoring and lane departure warning. Just under four in ten feel at least somewhat familiar with the functions of lane keeping assist or forward collision warning.

Familiarity with function of ADAS features

Level of familiarity with what ADAS technology does (base: those asked about each)	Very familiar	Some-what familiar	Not very familiar	Not at all familiar	Not sure
Blind spot monitoring (BSM) (n=1,556)	17%	33%	23%	23%	3%
Lane departure warning (LDW) (n=1,557)	14%	31%	23%	30%	3%
Adaptive cruise control (ACC) (n=1,555)	11%	23%	26%	37%	4%
Lane keeping assist (LKA) (n=1,558)	10%	29%	25%	32%	4%
Forward collision warning (FCW) (n=1,557)	8%	29%	28%	31%	3%
Automatic emergency braking (AEB) (n=1,556)	7%	27%	32%	31%	3%

Q31 ASK ALL: How familiar would you say you are with what a _____ feature does?

In general, self-assessing as being at least somewhat familiar with any of these technologies is higher among men, licensed drivers, and those in the highest education and household income strata. Familiarity also tends to be higher among those who use their current vehicle at least 25 km per day on an average weekday. Familiarity with specific ADAS technologies is usually highest in Ontario, and lowest in Quebec. Being familiar with specific ADAS features is linked to higher levels of familiarity with AVs in general, with thinking being in an AV will be more relaxing than stressful, and to being a user of ADAS technology currently.

Users of each of the six ADAS technologies, plus non-users who indicated they were aware of that feature, were asked a knowledge-testing question about each.² They were asked what the specific technology is designed to do, and presented with three potential responses (i.e. the responses were prompted, not top-of-mind).

Over three-quarters of respondents know or guess the correct response about the function of blind spot monitoring (the ADAS technology in the survey with the highest level of previous awareness of the six). Around seven in ten each know or guess the correct purpose of lane keeping assist or lane departure warning, and close to two-thirds correctly identify the function of automatic emergency braking. Only four in ten indicate the correct function of forward collision warning, and only one-quarter correctly note the response regarding adaptive cruise control.

Correct identification of function of ADAS features

Correctly identifies what ADAS technology is designed to do (base: those asked about each)	% giving correct response
Blind spot monitoring (BSM) (n=1,126)	78%
Lane keeping assist (LKA) (n=924)	71%
Lane departure warning (LDW) (n=995)	69%
Automatic emergency braking (AEB) (n=906)	64%
Forward collision warning (FCW) (n=951)	40%
Adaptive cruise control (ACC) (n=754)	24%

Q32-37 Based on your experience with _____, what is this feature designed to do?

While not directly comparable due to important methodological differences, a fairly similar pattern was also observed in the 2018 AAA survey of owners who actually had these technologies installed in their vehicles. It should be noted that in most cases the identifying name of the technology is quite descriptive of its function, meaning someone who was not especially aware of the technology prior to the survey might be able to guess from the name what it does. It is notable that the function with the name providing the fewest clues about its precise function, adaptive cruise control, has the lowest proportion of correct responses.

The tables below show the responses to each of the ADAS knowledge testing questions. In general, identifying the correct function is fairly similar by region, but tends to increase along with increases in age, household income and education. Being able to provide a correct response is actually linked to being less than very familiar with AVs, and, in the case of automatic emergency braking, lane departure warning and blind spot monitoring, to being driver users of ADAS rather than driver owners. In each of these cases a majority of owners of these technologies indicate the correct answer, but a notable minority proportion, higher than for users, indicate one of the incorrect answers. The survey does not provide clear information on why this is the case; however it could be that those who think they are more familiar credit more capabilities to these technologies than is actually the case.

² These questions were sourced from the *Vehicle Owners Experiences with and Reactions to Advanced Driver Assistance Systems* survey conducted by the AAA Foundation for Traffic Safety, September 2018. It should be noted the target audiences and methodologies of the two surveys differ considerably, so the results are not directly comparable.

Understanding of what automatic emergency braking is designed to do

What automatic emergency braking (AEB) is designed to do	Users or familiar with AEB (n=906)
Automatically applies the brakes if a collision is imminent in front of the vehicle— CORRECT RESPONSE	64%
Avoid collisions from the front, rear, and/or sides of the vehicle	13%
Alert the driver of an imminent collision in the rear of the vehicle	9%
I am unsure of the correct response	13%
Prefer not to answer	1%

Q32 ASK IF AEB: Based on your experience with automatic emergency braking, what is this feature designed to do?

Understanding of what forward collision warning is designed to do

What forward collision warning (FCW) is designed to do	Users or familiar with FCW (n=951)
Detect a collision, and automatically apply the brakes if a collision is imminent	44%
Detect and warn the driver of an imminent collision— CORRECT RESPONSE	40%
Detect when a collision is imminent, from the front, sides, and/or rear of the vehicle	5%
I am unsure of the correct response	11%

Q33 ASK IF FORWARD COLLISION WARNING: Based on your experience with forward collision warning, what is this feature designed to do?

Understanding of what adaptive cruise control is designed to do

What adaptive cruise control (ACC) is designed to do	Users or familiar with ACC (n=754)
It is able to successfully brake the vehicle in any situation, as long as the system has detected a vehicle ahead	28%
It may accelerate if the vehicle ahead moves out of the detection zone— CORRECT RESPONSE	24%
It works well in thick fog or heavy precipitation because it relies on radar	10%
I am unsure of the correct response	38%
Prefer not to answer	1%

Q34 ASK IF ADAPTIVE CRUISE CONTROL: Based on your experience with adaptive cruise control, which statement is correct about this feature?

Understanding of what lane departure warning is designed to do

What lane departure warning (LDW) is designed to do	Users or familiar with LDW (n=995)
Provide an alert if your vehicle is departing its lane— CORRECT RESPONSE	69%
Gently steer your vehicle back into the lane if it begins to depart from the lane	14%
Provide an alert if another vehicle is entering your lane	7%
I am unsure of the correct response	9%
Prefer not to answer	1%

Q35 ASK IF LANE DEPARTURE WARNING: Based on your experience with lane departure warning, what is this feature designed to do?

Understanding of what lane keeping assist is designed to do

What lane keeping assist (LKA) is designed to do	Users or familiar with LKA (n=924)
Prevent collisions caused by your vehicle unintentionally drifting out of its lane— CORRECT RESPONSE	71%
Prevent collisions caused by other vehicles that drift out of their lane	11%
Avoid collisions from the front, rear, and/or sides of the vehicle	6%
I am unsure of the correct response	11%

Q36 ASK IF LANE KEEPING ASSIST: Based on your experience with lane keeping assist, what is this feature designed to do?

Understanding of what blind spot monitoring is designed to do

What blind spot monitoring (BSM) is designed to do	Users or familiar with BSM (n=1,126)
Detect when another vehicle is located in my vehicle's blind spot— CORRECT RESPONSE	78%
Detect when my vehicle is located in another vehicle's blind spot	8%
Detect when my vehicle is located in another vehicle's blind spot & sound horn if other vehicle begins to move into my lane.	6%
I am unsure of the correct response	8%

Q37 ASK IF BLIND SPOT MONITORING: Based on your experience with blind spot monitoring, what is this feature designed to do?

III. Information sources regarding advanced driver assistance systems (ADAS)

1. Actual sources used

Users of ADAS are most likely to have used the owner's manual, friends or family, the manufacturer's web site or the dealership as their sources of information about the ADAS features with which they are familiar.

Users of any of the six technologies were asked which, of a provided list of sources of information, they may have used to learn about ADAS features (the question was asked only once as multiple responses were permitted, which would allow for different sources being used for different technologies). One-quarter turned to the owner's manual for this information, and two in ten each asked friends or family or consulted the manufacturer's web site or the dealership. Around one in six sought out online videos, and a similar proportion said they learned about the feature by trial and error. One in ten or fewer indicate other individual sources of information; two in ten say they did not use any information.

Actual sources used to learn about ADAS features

Actual sources used	Driver owners, driver users or non-drivers of ANY ADAS technology (n=1,429)
Owner's manual	24%
Friends or family	22%
Manufacturer's web site	19%
Dealership	19%
Online video (YouTube, car company video, etc.)	17%
Trial and error	17%
Social media (Facebook, Twitter etc.)	11%
Books, brochures or pamphlets	11%
Garage/mechanic	6%
Federal government website	4%
Provincial/territorial government website	3%
TV ads	1%
TV car shows	1%
Test drive (rental/from dealership)	1%
Other mentions	1%
None	21%
Not sure	5%

Q38

ASK IF DRIVER OWNER, DRIVER USER (NON-OWNER) OR NON-DRIVER USER OF ANY ADAS TECHNOLOGY: Which of the following sources, if any, have you used to learn about the advanced driver assistance features you have experience with, for example, about what they do or how they work?

There are some subgroup differences in having used some of these sources. The following groups are some of the most likely to have report using these:

- **Owner's manual:** BC residents, men, age 65+, retired, driver owners of ADAS
- **Friends and family:** AB and Quebec, women, age 16-24, very familiar with AVs, AVs relaxing, non-driver users of ADAS
- **Manufacturer's web site:** men, postgraduate degree, licensed drivers, Allophones, very or somewhat familiar with AVs, AVs relaxing, ADAS users
- **Dealership:** Age 50+, Francophones, retired, licensed drivers, very familiar with AVs, ADAS driver owners
- **Online videos:** Age 16 to 34, men, urban residents, Allophones, very or somewhat familiar with AVs, those who would find AVs relaxing, driver users

2. Potential sources

Close to half of Canadians would seek out information about ADAS features on a manufacturer's web site, and around three in ten would look at the owner's manual, ask the dealership, or seek out a video online.

ADAS users who did not indicate using a source of information previously, and all non-users of ADAS technology, were asked what would be their preferred source(s) if they wanted to get more information about an advanced driver assistance feature in the future. The top mentions are very similar to those actually employed by users: a manufacturer's web site, owner's manual, the dealership, online videos, or friends and family. One in six also say they might consult books, brochures or pamphlets. Fewer than one in ten indicate other individual potential sources; one in ten also say they do not want to learn about ADAS features. Subgroup differences tend to echo those of the previous question.

Potential sources for learning about ADAS features

Potential ADAS information sources	All those not asked Q38, or responding none/not sure at Q38 (n=2,064)
Manufacturer's web site	46%
Owner's manual	34%
Dealership	32%
Online video (YouTube, car company video, etc.)	31%
Friends or family	18%
Books, brochures or pamphlets	17%
Garage/mechanic	8%
Federal government website	7%
Trial and error	5%
Social media (Facebook, Twitter etc.)	5%
Other mentions	1%
None - do not want to learn about it	10%
Not sure	9%

Q39

ASK ANYONE NOT ASKED Q38 OR IF 97 OR 99 AT 38: If you wanted to get more information about an advanced driver assistance feature, for example, about what they do or how they work, which, if any, of the sources listed below would be your preferred source?

3. Usefulness of proposed resources

Canadians are most likely to think in-person training at the dealership would be a very useful way to learn about ADAS features.

Canadians were shown four different ways of learning about ADAS technologies and asked how useful they think each would be. Seven in ten or more think each would be at least somewhat useful, but close to half think in-person training at the dealership about the actual features of a vehicle would be very helpful. Just over one-third think covering ADAS features in new driver training would be very useful. Onboard videos or pamphlets via rental cars are thought to be very useful by around one-quarter each.

Rated usefulness of ways of learning about ADAS

Usefulness of ways of learning about ADAS	Very useful	Somewhat useful	Not very useful	Not at all useful	Not sure
In-person training at the dealership on the specific ADAS features of a vehicle someone is buying	46%	38%	6%	2%	8%
ADAS training as part of new driver training programs	36%	42%	9%	3%	10%
Onboard (in vehicle) video tutorials to learn about the ADAS features of that specific vehicle	28%	43%	13%	6%	10%
Pamphlets or information cards provided by rental car companies or car share programs	26%	46%	15%	4%	9%

Q40-43 ASK ALL: Please indicate how useful, if at all, you think the following methods of learning about advanced driver assistance systems (ADAS) would be to Canadians.

Thinking each of these would be at least somewhat useful is similar across the country but somewhat lower in Quebec. It is similar by most subgroups, including community size, gender and household income. Thinking in-person training or new driving training would be useful is higher among older Canadians; there are no clear age patterns for the other methods. Saying in-person training at dealerships or pamphlets from rental car companies would be useful is somewhat higher among those with lower levels of education. Other than in-person training, thinking any of these would be useful is somewhat higher among non-drivers. Saying each would be useful is higher among those saying they are very familiar with AVs or those who think AVs are more relaxing than stressful.

Potentially useful sources of information on ADAS features not currently available

Other potential ADAS information sources	Total (n=3,113)
Online/internet search/review forums/panels	5%
Car dealership/salesperson (demos, website)	2%
Google search	1%
Manufacturer's website	1%
Provided by government/info on website/service centres	1%
Books/brochures/pamphlets/magazines/newspapers	1%
Test driving a car	1%
Driving school/instructor/classes	1%
From a friend/family member	1%
Ads on TV/radio	1%
Car manual	1%
TV car shows/programs	1%
Social media (Facebook, Twitter etc.)	<1%
Car insurance companies	<1%
Apps on cellphone	<1%
Emails	<1%
From garage/mechanic	<1%
Other	1%
None/all is covered	54%
DK/NA	28%

Q44 Are there any other sources or means of obtaining information on ADAS features that you would find useful that aren't currently available?

IV. Conclusions

At this stage of AV introduction and at the current level of familiarity, Canadians are considerably more likely to be apprehensive about these technologies than to be welcoming of them. Because the predominant association of automated vehicles is with autonomous or self-driving cars, and potentially because of negative media stories about these (such as crashes in testing or potential cybersecurity risks), there is an understandable anxiety about mainstream adoption of AVs. Canadians need clear information on AVs, how they work and what the limitations are, to allay fears and help them make the right vehicle purchase or lease decisions in the future.

Level of exposure to AVs and ADAS features is a key influencer of attitudes. Familiarity with AVs and specific ADAS technologies is currently higher among men and those in higher socioeconomic (education and income) strata, while women and those with lower education and income levels are more likely to indicate they are not very or at all familiar with them.

V. Profile of Canadian drivers

The following questions were asked to understand the driving habits and approaches of the survey population.

1. Vehicle ownership

Almost all licensed drivers have regular access to a vehicle.

The survey was designed to limit responses of those without a valid driver's license to 10 percent of respondents. This means that majorities across the country and of all subgroups have a valid driver's license.

Licensed drivers were then asked to indicate if they own/lease, or have regular access to a vehicle. Almost all (96%) have regular access to a vehicle currently. Vehicle ownership is linked to higher levels of household income and increases with an increase in age, from 86 percent age 16 to 24 up to 99 percent age 65 and over.

Driver's license and vehicle ownership status

License and vehicle ownership	Total (n=3,113)	Gender		Household income			
		Women (n=1,582)	Men (n=1,522)	<\$40K (n=629)	\$40K- <\$80K (n=950)	\$80K- <150K (n=932)	\$150K+ (n=246)
Have a valid driver's license	90%	86%	94%	74%	92%	97%	97%
Do not have a valid driver's license	10%	14%	6%	26%	8%	3%	3%
Licensed drivers	(n=2,789)	(n=1,359)	(n=1,424)	(n=450)	(n=873)	(n=906)	(n=240)
Net: have access to vehicle	96%	98%	87%	90%	97%	98%	99%
Own or lease	90%	89%	92%	82%	90%	93%	97%
Regular access	6%	7%	5%	8%	7%	4%	2%
No regular access	4%	4%	3%	10%	3%	2%	1%

Q4 Do you currently have a valid driver's license?

Q5 Do you currently own or lease a vehicle, or have regular access to one?

Having a valid driver's license is still a majority of, but lower among, these subgroups:

- Women (86%)
- Age 16 to 24 (81%)
- Household income under \$40,000 (74%)
- High school or less education (82%)
- Not employed (74%)
- Not at all familiar with AVs (84%)
- Urban dwellers (87%)

2. Driving habits

Close to nine in ten drive mostly or exclusively for personal use. Half of drivers drive less than 25 km on a typical weekday or weekend day.

Type of driving

Canadian drivers were asked to indicate the main use of their vehicle. Close to nine in ten say it is mostly or exclusively for personal use; one in ten use it for both personal and business use.

Main use of vehicle

Type of driving	Licensed drivers with vehicle access (n=2,690)
Mostly or exclusively for personal use	88%
Mostly or exclusively for business purposes	1%
For both personal and business use	11%

Q9 Do you drive this vehicle...

Distance driven

Half of Canadian drivers drive under 25 kilometres in a typical, weekday or typical weekend day. Interestingly, this does not substantially differ by community size.

Typical daily driving distances

Distance driven by licensed drivers with vehicle access (n=2,690)	Typical weekday	Typical weekend day
Up to 10 km per day	23%	22%
11 to 24 km per day	27%	28%
25 to 49 km per day	22%	23%
50 to 99 km per day	13%	12%
100 or more km per day	5%	5%
Do not drive on typical day	6%	5%
Not stated	4%	5%

Q10 How many kilometers PER DAY do you drive on a typical week day, that is, Monday to Friday. Please include travelling to and returning from your destination and any trips in between.

Q11 How many kilometers PER DAY do you drive on a typical weekend day, Saturday and Sunday, including return trips?

Driving up to 10 km in a typical day is slightly more common among women, and among those with lower levels of household income.

3. Segmentation analysis

Of four segments identified based on attitudes to AVs, the most likely to be using them currently are those in Segment Three; those most concerned about the new technologies are those in Segment Two.

As part of this research, Environics developed an attitudinal segmentation of respondents based on selected questions in the survey, using industry-recognized techniques (more information on this is provided in Appendix A). After reviewing the results, four segments were identified based on their attitudes toward automated vehicles. The four segments are described below, based both on survey data and on additional data provided by Environics Analytics via their PRIZM5 consumer segmentation system.

Segment One (20% of the adult Canadian population) view vehicles more as an appliance, something that gets them from A to B. They are generally very comfortable with the notion of automated vehicle technology, even if they may have some justifiable concerns about privacy issues. They are aware of most AV technologies, but so far only tend to use a couple, notably those which have been in existence for a few years. Four in ten of them are at least somewhat familiar with AVs, and they are the most likely to believe several AV factors are advantages: that they will reduce driver error, that they will make things easier for elderly or disabled persons, or that they will make driving less stressful or more convenient due to multitasking. They are the segment least concerned with the idea of fully automated vehicles, and the most likely to say they would be comfortable riding in one, or to think AVs will be more relaxing than stressful. While few are currently using any of the six ADAS features covered in the survey, they generally think some of these features will be important to future vehicle purchase decisions.

Demographically speaking, Segment One members skew to having higher levels of education and to being age 25 to 49; they are evenly split by gender. They are the heaviest users of the Internet of the four segments, and are moderate users of television and radio.

In terms of their worldview, Segment One members adapt easily to the changes of modern life, and view complex situations as opportunities to learn and grow. They revel in discovering new products and services, and look for ways to integrate them into their lives. They like to take the lead among their peers in adopting brands and products, and in being brand champions within their social groups. They do not like to limit their purchasing habits. Driven by a desire to stand out from others and demonstrate their individuality, they are particularly prone to base purchasing decisions on the aesthetic look and feel of products.

Segment Two (44% of the population) view vehicles as an appliance, but unlike Segment One they are quite negative about the idea of automated vehicles, and in fact are unaware of the existence of most technologies. They are the least likely to say they are even somewhat familiar with AVs, and the most likely to say there are no advantages to AVs. They are among the least likely to agree with positive statements about AVs, and the most likely to think riding in or driving one would be stressful. They are the least likely to have heard of the ADAS technologies covered in the survey, to be familiar with them, to be a driver owner or user of at least one, or to be able to correctly identify what ADAS features are designed to do. Those who do have experience with ADAS features are among the least likely to have used any source of information to learn more about them, and the least likely to think specific methods of learning about ADAS features would be at least somewhat useful.

Segment Two members report higher proportions with lower levels of education and household income; they skew female and younger than Segment Three or Segment Four. They are the segment most likely to have only one vehicle in their household, and the heaviest users of media: television, radio, newspapers and magazines.

Psychographically, Segment Two members display a certain aversion to complex and uncertain situations, and may have some trouble adapting to the complexities of modern life. They can feel less capable of taking control of their lives, due to outside forces. Nonetheless, they view themselves as citizens of the world and are

concerned about the carbon footprint they leave behind, so they seek out products and services that reduce the environmental impact of their consumption.

Segment Three (11% of the population) are most notable for viewing vehicles as a form of status symbol – something more reflective of their personality than a simple appliance to go from point A to point B. They lean to being positive about automated vehicles, use a number of the vehicle technologies listed, and are aware of those they do not use. It is possible Segment Three members may not be using these features because of an interest in the technologies themselves, but because they tend to be present in the vehicles they are attracted to – newer and top-of-the-line. Members of this segment are the most likely to say they are at least somewhat familiar with AVs, and almost as likely as those in Segment One to identify potential advantages – but they are also quite likely to identify disadvantages. Half would be comfortable riding in a fully automated AV, and they are among the most likely to think AVs will perform better than human drivers and help keep the roads safer. However, they are also among the most concerned about data privacy and security becoming an issue with increased adoption of these technologies. Because they consider themselves skilled drivers, if they don't use an ADAS frequently it is because they think they don't need to. They are the most likely to think ADAS features will be important to future vehicle selection decisions, the most likely to be a current user of the ADAS technologies covered in the survey, and they most likely learned about using their ADAS feature by reading the owner's manual.

Segment Three members skew to the higher socioeconomic strata (income and education) and they skew older than Segment Two and Segment One; they are more than twice as likely to be male than female.

Those in Segment Three are more concerned about how they appear to others and, along with Segment One, see themselves as influencers within their social circles when it comes to championing particular brands, products and services. However, unlike those in Segment One, they focus on appearance not so much as a reflection of individuality, but as an expression of social status. Therefore, high quality brand names and products are particularly important among this group. They become very involved with their preferred products and services, and spend considerable effort researching topics of interest to them. Unlike members of Segment Two, they are generally unconcerned about environmental problems.

Segment Four (25% of the population) are divided on whether vehicles are appliances or a means to express themselves. As with those in Segment Two, they have a fairly negative view of the concept of automated vehicles. Unlike Segment Two, however, they are aware of most of those technologies, and are likely to use more established vehicle technologies. They are the most likely to identify several issues as potential disadvantages of AVs, including concerns about winter driving, legal liability, loss of driver control, and interacting with pedestrians or cyclists. They are the least likely to say they would be comfortable riding in a fully automatic vehicle and the most concerned about these. They say they would be likely to get information on ADASs from the manufacturer or dealership, and are among the least likely to think on boarding videos would be a useful way to learn about these features.

Segment Four skews male, older, and to lower levels of education, and is the segment most likely to live in a smaller or rural community. They are the most likely segment to have a multi-vehicle household (three or more vehicles) and are the segment most likely to be intending to spend at least \$25,000 on their next vehicle. They are moderate to heavy consumer of television and radio, and moderate users of print media, but relatively light Internet users.

From a psychographic standpoint, those in Segment Four have trouble adapting to the changes of modern life. This group is particularly disengaged when it comes to consumption habits. They distrust advertisements, lack confidence in big businesses in providing solutions to their problems, and think twice before making a purchase. While they share some concerns with the Segment Two in how modern life is getting more complicated, they

have a somewhat more inward-looking scope than does Segment Two, showing little concern about environmental issues. They are generally unconcerned about appearances, and make purchase decisions based on practicality rather than aesthetics.

The following tables provide additional demographic information regarding the segments.

Age – by segment

Age	TOTAL (n=3,113)	Segment 1 (n=636)	Segment 2 (n=1,362)	Segment 3 (n=329)	Segment 4 (n=786)
16-24	4%	5%	4%	2%	3%
25-34	25%	28%	30%	19%	18%
35-49	24%	28%	26%	17%	21%
50-64	26%	24%	24%	30%	29%
65+	21%	15%	16%	32%	30%
MEAN	48.41	45.84	45.97	53.93	52.35

Gender – by segment

Gender	TOTAL (n=3,113)	Segment 1 (n=636)	Segment 2 (n=1,362)	Segment 3 (n=329)	Segment 4 (n=786)
Female	51%	50%	62%	30%	40%
Male	49%	49%	37%	70%	60%
Other gender identity	*%	*%	*%	-	*%
Prefer not to answer	*%	-	-	-	*%

The following table shows the top information sources actually used by driver owners, driver users and non-drivers users of any ADAS technology, by segment.

Actual sources used to learn about ADAS features – by segment

Information source used	TOTAL (n=1,429)	Segment 1 (n=278)	Segment 2 (n=463)	Segment 3 (n=302)	Segment 4 (n=386)
Read the owner's manual	24%	14%	13%	51%	23%
Asked friends or family	22%	34%	21%	16%	21%
Manufacturer's web site	19%	19%	11%	32%	21%
Contacted/visited a dealership	19%	13%	12%	35%	18%
Online video (YouTube, car company video, etc.)	17%	25%	11%	16%	20%
Learned by trial and error	17%	15%	10%	32%	14%
Social media (Facebook, Twitter etc.)	11%	14%	15%	8%	8%
Books, brochures or pamphlets	11%	10%	8%	15%	11%
Contacted garage/mechanic	6%	6%	5%	9%	3%

The following tables provide insight into the age and type of vehicles typically owned by the segments.

Model year of most frequently driven vehicle – drivers, by segment

Model year	TOTAL (n=2,690)	Segment 1 (n=534)	Segment 2 (n=1,106)	Segment 3 (n=322)	Segment 4 (n=728)
2000 or earlier	3%	4%	4%	-	3%
2001-2005	9%	10%	9%	1%	9%
2006-2010	21%	25%	23%	5%	21%
2011-2013	19%	22%	20%	7%	21%
2014-2015	17%	17%	15%	19%	17%
2016-2017	19%	14%	16%	34%	21%
2018-2019	10%	5%	7%	32%	8%

Vehicle type of most frequently driven vehicle – drivers, by segment

Vehicle type	TOTAL (n=2,690)	Segment 1 (n=534)	Segment 2 (n=1,106)	Segment 3 (n=322)	Segment 4 (n=728)
C Car	20%	22%	24%	14%	17%
Small Utility	16%	16%	14%	18%	19%
CD Car	9%	10%	8%	11%	8%
B Car	7%	8%	10%	1%	5%
Medium Utility	6%	5%	5%	7%	6%
Full-Size Pickup	4%	4%	3%	4%	5%
Minivan	4%	5%	3%	3%	5%
Large Utility	3%	4%	2%	5%	5%
Medium Premium Utility	2%	1%	1%	8%	2%
CD Premium Car	2%	1%	1%	5%	3%
D/E Car	2%	2%	1%	1%	2%
Mini Utility	1%	2%	1%	1%	2%
Midsize Pickup	1%	1%	2%	1%	1%
Small Premium Utility	1%	*%	1%	1%	1%
D/E Premium Car	1%	*%	*%	3%	*%
Sports Car	1%	*%	1%	1%	1%
Large Traditional Utility	1%	1%	1%	1%	-
B/C Premium Car	1%	*%	1%	1%	1%
F/Sports Premium Car	*%	1%	*%	1%	*%
Large Crossover Premium Utility	*%	-	*%	1%	*%
Large Traditional Premium Utility	*%	*%	*%	-	*%
Other	17%	17%	19%	11%	16%

Appendix A: Methodology

This research consisted of an online survey of 3,113 Canadians. Survey respondents were selected from registered members of an online panel. Since the samples used in online panel surveys are based on self-selection and are not a random probability sample, no formal estimates of sampling error can be calculated. Although opt-in panels are not random probability samples, online surveys can be used for general population surveys provided they are well designed and employ a large, well-maintained panel.

Sample design and weighting

EnviroNics Research conducted an online survey of 3,113 Canadians who are members of an online panel, from January 31 to February 16, 2019. The sampling method was designed to complete interviews with at least 2,700 Canadians ages 16-80 with a valid drivers' license, and 300 Canadians without a driver's license, as requested by Transport Canada. Quotas were set by age, gender, and region, as well as for PRIZM5 segments to balance the sample. PRIZM5 divides Canadians into 68 lifestyle segments, based on their postal codes. Proportionally including PRIZM5 segments into the sample design, in addition to standard region, age and gender demographics, allows EnviroNics to balance online panel samples in a way that makes them more representative and comparable to telephone survey samples.

To get feedback from youth of driving age, invitations were sent to panellists profiled as parents, who were asked for permission to have their children aged 16 or 17 complete the survey themselves.

The following distribution of interviews was achieved:

Target group	Target (quota)	Actual Unweighted	Actual Weighted*
Total	3,000	3,113	3,113
Licensed drivers	2,700	2,789	2,805
Non-licensed	300	325	308

*Results are weighted by region, gender and age to 2016 Census data.

The survey obtained the following regional distribution:

Jurisdiction (% pop.)	Target (quota)	% of sample	Actual Unweighted	Actual Weighted*
Newfoundland and Labrador (2%)	120	4%	121	60
Nova Scotia (3%)	135	5%	141	64
Prince Edward Island (<1%)	75	3%	78	37
New Brunswick (2%)	120	4%	124	57
Quebec (23%)	660	22%	680	716
Ontario (38%)	675	23%	700	1,183
Manitoba (4%)	165	6%	175	125
Saskatchewan (3%)	165	6%	174	124
Alberta (11%)	420	14%	432	311
British Columbia (13%)	450	15%	474	416
Territories (<1%)	15	1%	14	20
CANADA	3,000	100%	3,113	3,113

*Results are weighted by region, gender and age to 2016 Census data.

Questionnaire design

Transport Canada provided Environics with examples of similar surveys to use as reference material for the study design; Environics also researched additional surveys on the topic. Environics then designed a questionnaire in consultation with Transport Canada to ensure its research objectives were met. Upon approval of the English questionnaire, Environics arranged for the questionnaire to be translated into French by professional translators.

Environics' data analysts programmed the questionnaires, then performed thorough testing to ensure accuracy in set-up and data collection. This validation ensured that the data entry process conformed to the surveys' basic logic. The data collection system handles sampling invitations, quotas and questionnaire completion (skip patterns, branching, and valid ranges).

Prior to finalizing the survey for field, a pre-test (soft launch) was conducted in English and French. The pre-test assessed the questionnaires in terms of question wording and sequencing, respondent sensitivity to specific questions and to the survey overall, and to determine the survey length; standard Government of Canada pre-testing questions were also asked. As no changes were required following the pre-test, the n=121 responses (83 English, 38 French) have been included in the final data set.

The final survey questionnaire is included in Appendix B.

Fieldwork

The survey was conducted by Environics using a secure, fully featured web-based survey environment. The interviews took place from January 31 (soft launch pre-test) to February 16, 2019. The average interview length was 15.2 minutes.

All respondents were offered the opportunity to complete the surveys in their official language of choice. All research work was conducted in accordance with the Standards for the Conduct of Government of Canada Public Opinion Research – Online Surveys and recognized industry standards, as well as applicable federal legislation (Personal Information Protection and Electronic Documents Act, or PIPEDA).

The data from this survey are statistically weighted to ensure the sample is as representative of this population as possible according to the most recently available Census information.

Completion results

The completion results are presented in the following table.

Contact disposition

Disposition	N
Total invitations (c)	22,048
Total completes (d)	3,113
Qualified break-offs (e)	622
Disqualified (f)	562
Not responded (g)	11,256
Quota filled (h)	6495
Contact rate = (d+e+f+h)/c	49%
Participation rate = (d+f+h)/c	46%

Respondent profile

The following table presents the weighted distribution of survey participants by key demographic and other variables.

Variable	Total sample %
Age	
16-24	4
25-34	25
35-49	24
50-64	26
65+	21
Gender	
Female	51
Male	49
Education	
High school or less	23
Apprentice/college/some university	37
University graduate/post-graduate	39
Employment status	
Full time/self employed	50
Part time	10
Not employed (student, unemployed, homemaker etc.)	12
Retired	26
Total annual household income	
Under \$20,000	6
\$20,000-<\$40,000	13
\$40,000-<\$60,000	16
\$60,000-<\$80,000	15
\$80,000-<\$100,000	14
\$100,000-<\$150,000	17
\$150,000 or more	8
Prefer not to say	11
Community size (self-reported)	
Rural (<30K)	29
Medium sized (30K-<500k)	37
Large urban centre (>500K)	34
Language spoke most at home	
English	79
French	22
Other	3

Non-response bias analysis

The table below presents a profile of the final sample, compared to the actual population of Canada (2016 Census information). As is the case with most surveys, final sample underrepresents those with high school or less education, which is a typical pattern for public opinion surveys in Canada (e.g., those with more education are more likely to respond to public opinion surveys).

Sample profile

Sample type	Sample*	Canada (2016 Census)
Gender (18+)		
Male	49%	49%
Female	51%	51%
Age		
16-34	29%	29%
35-49	24%	24%
50-64	27%	26%
65+	21%	21%
Education level ^α		
High school diploma or less	24%	35%
Trades/college/post sec no degree	38%	36%
University degree	38%	29%

* Data are unweighted and percentaged on those giving a response to each demographic question

^α Actual Census categories differ from those used in this survey and have been recalculated to correspond. Statistics Canada figures for education are for Canadians aged 25 to 64 years.

Segmentation

Environics Research developed an attitudinal segmentation based on the following survey questions: Q12, Q17, Q18, Q19, Q20, Q21, Q22, Q23 and Q24 (see Appendix B for the questionnaire). Prior to the application of the clustering techniques, the following manipulations of the data were applied:

- For all scaled rating questions, the “not sure” response was placed in the middle of the scale. Q23 and Q24 were combined such that, for each type of technology, respondents were placed into one of three categories: Use (selected at Q24), Aware but not used (selected at Q23 but not at Q24), and Unaware (not selected at Q23).
- After resetting the variables as described above, all questions were standardized - that is, they were centred so that their mean is equal to 0 and their standard deviation is set to 1. This is done to ensure each question has an equal contribution to the creation of the segments. Questions that have a larger variance, such as Q22 with its 10-point scale, would otherwise take up the largest importance in the creation of the segments.

After the completion of this manipulation, Environics employed a consensus method of clustering techniques for the segmentation. The method consists of applying a variety of different clustering techniques: in this case, k-means, non-negative matrix factorization, partition around medoids, gaussian mixture models, and hierarchical clustering. Each of these techniques were repeated five times at various starting points, and then observed across each of the techniques' outcomes which segments occurred most frequently. The idea behind consensus clustering is segments that can be replicated most often across the various techniques are most likely to be a natural occurrence of the segment within the data. In effect, the notion that a segment is consensual across the different clustering techniques provides validation of the existence of the segment.

This technique was applied to create solutions with two, three, four, five and six segments. After reviewing the different solutions, the four-segment solution was selected for having the most salient differences across segments. The four segments are described above beginning on page 27 of this report.

Appendix B: Quantitative research instrument

Environics Research Group

30 Jan 2019

Transport Canada

Canadians' Awareness of and Confidence in Automated Vehicles

Final Questionnaire

*Online survey conducted with n=3,000 Canadian drivers AGES 16-80;
15-minute average length*

LANDING PAGE

Please select your preferred language for completing the survey / Veuillez choisir votre langue préférée pour remplir le sondage

01–English / Anglais

02–Français / French

Welcome to this survey about new features on vehicles. The survey is being conducted by Environics Research Group, an independent research company, on behalf of Transport Canada, and will take about 15 minutes of your time.

Your participation is entirely voluntary and all of your answers will be kept completely confidential and anonymous. If you wish to verify the legitimacy of this research, get information about the survey industry or to ask technical questions about this survey, please contact Brenda Sharpe at Environics at

Brenda.sharpe@environics.ca.

Thank you in advance for your participation.

< PROGRAMMING NOTE: All questions are mandatory. Please prioritize accessibility; no carousels >

Screening

1. In what year were you born?

Drop down list – see quotas

IF UNDER 16 THANK AND TERMINATE

IF AGE 81+ THANK AND TERMINATE

2. In what province or territory do you live?

Select one only

DROP DOWN LIST – SEE QUOTAS

01-British Columbia

02-Alberta

03-Saskatchewan

04-Manitoba

- 05-Ontario
- 06-Quebec
- 07-New Brunswick
- 08-Nova Scotia
- 09-Prince Edward Island
- 10-Newfoundland and Labrador
- 11-Yukon
- 12-Northwest Territories
- 13-Nunavut

3. How do you identify yourself?

Select one only – see quotas

- 01-Female
- 02-Male
- 03-Other gender identity
- 99-Prefer not to answer

4. Do you currently have a valid driver's license?

Please select one

- 01–Yes, I have a valid driver's license
- 02–No, I do not have a valid driver's license – see quota limit – n =300 – skip to Q12

Vehicle type and use

5. Do you currently own or lease a vehicle, or have regular access to one?

Please select one

- 01–Yes, own or lease
- 02–Yes, regular access
- 03–No skip to Q12

Please consider the vehicle that you drive **most frequently** - this includes commuting to and from work. What is the make (e.g. Ford, Nissan, Chevrolet), model (e.g. Focus, Sentra, F150) and year of this vehicle?

6. Make _____

99 - Not sure

7. Model _____

99 - Not sure

8. Year _____

99 - Not sure

9. Do you drive this vehicle...

Please select one

- 01–Mostly or exclusively for personal use
- 02–Mostly or exclusively for business purposes
- 03–For both personal and business use

10. How many kilometers per day do you drive on a typical week day, that is, Monday to Friday. Please include travelling to and returning from your destination and any trips in between.

Please select one

- 01–Up to 10 km per day
- 02–11 to 24 km per day
- 03–25 to 49 km per day
- 04–50 to 99 km per day
- 05–100 or more km per day
- 97–Do not drive on a typical week day
- 99–Cannot say

11. How many kilometers PER DAY do you drive on a typical weekend day, Saturday and Sunday, including return trips?

Please select one

- 01–Up to 10 km per day
- 02–11 to 24 km per day
- 03–25 to 49 km per day
- 04–50 to 99 km per day
- 05–100 or more km per day
- 97– Do not drive on a typical weekend day
- 99– Cannot say

Put q10 and q11 on same page

12. SEGMENTATION QUESTION - ASK ALL: Below are two statements on attitudes towards vehicle ownership. Please indicate the extent to which you agree with the first or the second:

1. A car says a lot about a person — my car must reflect my personal style and image
2. A car is just an appliance — something to get me from point A to point B

Please select one

- 01–Strongly agree with 1
- 02–Somewhat agree with 1
- 03–Somewhat agree with 2
- 04–Strongly agree with 2
- 05–No opinion

Familiarity with automated vehicles

13. When you hear the term “automated vehicles,” what kinds of technology come to mind?

Please specify

Fully OE text box

14. How familiar would you say you are with automated vehicles?

Please select one

- 01–Very familiar
- 02–Somewhat familiar
- 03–Not very familiar
- 04–Not at all familiar

99–Not sure

Opinions about automated vehicles

SHOW TO ALL: Automated vehicles use sensors, onboard computers and software to make decisions. This technology allows the vehicle to take over control of some specific driving functions, under certain conditions - for example, steering, braking, acceleration, and checking and monitoring the driving environment. A fully automated vehicle (not yet available on the market) will be capable of doing all of the driving itself, without the need of a human driver.

15. What do you think are the *advantages*, if any, of automated vehicles?

Please select any that apply

- 01–Safer/reduces driver error/fewer bad or impaired drivers
- 02–Convenience/can do other things while driving
- 03–Less stressful/don't have to worry as much about driving
- 04–Better traffic flow/reduces congestion
- 05–Reduced travel times
- 06–Better for the environment/reduced emissions
- 07–Better fuel economy/cheaper to run
- 08–Lower insurance premiums
- 09–Easier for elderly/persons with (a) disability(ies)
- 10–Better for the economy e.g. improved productivity
- 11–Anyone can drive/don't need a driving license
- 97–Other (Please specify) _____
- 98–No advantages [SINGLE PUNCH]
- 99–Not sure [SINGLE PUNCH]

16. What do you think are the *disadvantages*, if any, of automated vehicles?

Please select any that apply

- 01–Equipment/system failure
- 02–Vehicle fails to react to unexpected situations
- 03–Interacting with other human drivers
- 04–Interacting with pedestrians/cyclists
- 05–Drivers will become lazy/pay less attention
- 06–Drivers will become less skillful
- 07–Loss of driver control
- 08–Legal liability/knowning who is at fault
- 09–Security/hackers/terrorists/fraud
- 10–Data privacy (e.g., location tracking)
- 11–Concerns about operation in winter/Canadian weather
- 12–Impact on jobs/drivers losing jobs
- 13–Driving becomes less fun/enjoyable
- 97–Other (Please specify) _____
- 98–No disadvantages [SINGLE PUNCH]
- 99–Not sure [SINGLE PUNCH]

Not shown: for analysis not shown: safety-net 01-04

Please indicate your level of agreement with the following statements about *automated* vehicles.

Please select one response for each statement

Randomize 17-21

- 17. I would be comfortable riding in a fully automated vehicle.
- 18. Automated vehicles will help keep the roads safer for everyone.
- 19. When vehicles become more automated, system security and data privacy will become more of a concern.
- 20. Automated vehicles perform better than human drivers in routine driving conditions.
- 21. The idea of fully automated delivery vehicles concerns me.

01–Strongly agree
02–Somewhat agree
03–Somewhat disagree
04–Strongly disagree
99–Not sure

22. Do you think (If 01 at Q4: driving/If 02 at Q4: riding in) a vehicle with these kinds of automated technologies would be more relaxing, or more stressful, than being in a conventional vehicle?

Please select one response

Slider or scale–10 points

Relaxing–Stressful

99–Not sure

23. Please select which of these vehicle technologies you have heard of (including those you have interacted with, experienced as a passenger, seen on a commercial or heard about elsewhere):

Please select any that apply

RANDOMIZE 01-11

01–Automatic emergency braking
02–Forward collision warning
03–Adaptive cruise control
04–Lane departure warning
05–Lane keeping assist
06–Blind spot monitoring/alert system
07–Back-up camera
08–Cruise control
09–Electronic Stability Control (ESC)
10–Back-up warning system
11–Automatic parking
98–None of the above [SINGLE PUNCH]
99–Not sure [SINGLE PUNCH]

24. Which, if any, of the following features are on the vehicle you (IF 01 AT Q4: drive most often?/IF 02 AT Q4: ride in most often?)

Please select any that apply

SHOW ANY HEARD OF IN Q23, IN SAME ORDER AS Q23

01–Automatic emergency braking
02–Forward collision warning
03–Adaptive cruise control

- 04–Lane departure warning
- 05–Lane keeping assist
- 06–Blind spot monitoring/alert system
- 07–Back-up camera
- 08–Cruise control
- 09–Electronic Stability Control (ESC)
- 10–Back-up warning system
- 11–Automatic parking
- 98–None of the above [SINGLE PUNCH]
- 99–Not sure/not applicable [SINGLE PUNCH]

Advanced driver assistance systems

Every respondent to be randomly assigned three of the following A.D.A.S. (show name + acronyms for AEB, FCW, ACC; name only for LDW, LKA, BSM)

NAME	TC DESCRIPTION
Automatic emergency braking (AEB)	This technology uses sensors to track cars in front of it. It automatically brakes to reduce the impact or severity of a collision, or stops the car to avoid it completely
Forward collision warning (FCW)	This technology alerts you about a possible collision with the vehicle ahead, so you can brake or turn in time.
Adaptive cruise control (ACC)	This technology keeps a set speed and constant distance between your vehicle and the car in front. It may offer some braking to achieve this,
Lane departure warning (LDW)	This technology alerts you if your vehicle drives outside of the lane, as long as the lane lines are visible on both sides of the road.
Lane keeping assist (LKA)	This technology steers your vehicle back into your lane if it begins to drift.
Blind spot monitoring (BSM)	This technology alerts you to vehicles in your blind spot.

Show to all: Now we would like to ask you a few questions about three specific **advanced driver assistance systems (ADAS)**. These are newer technologies included on some new vehicle models. You may or may not have had experience with these technologies, as a driver or a passenger.

The **first/next** technology is _____ (**bold name**). Show TC description.

Repeat questions 26-31 (and 32-37 as appropriate) for each of the three selected technologies

25. DELETED

26. Ask all: Have you ever driven, or been a passenger in, a vehicle equipped with _____ (bold name)?

Please select one

- 01–I currently own or lease a vehicle equipped with this
- 02– I have driven a vehicle equipped with this (e.g. previously owned a vehicle equipped with this, rental, carshare etc.) but do not own or lease one currently
- 03–Deleted
- 04–I have been a passenger in a vehicle with this, but have not driven one personally

05–No – have neither driven nor been a passenger in a vehicle with this-skip to Q31

99–Not sure-skip to Q31

If 01 at Q4 and 01 at Q26: driver owner of this technology – will be asked Q27, Q28, Q29, Q31, Q32-37 for chosen tech, Q38

If 01 at Q4 and 02 or 04 at Q26: driver user (non-owner) of this technology – will be asked Q30, Q31, Q32-37 for chosen tech, Q38

If 02 at Q4 and 01, 02 or 04 at Q26: non-driver user of this technology – will be asked Q30, Q31, Q32-37 for chosen tech, Q38

Others: non-users of this technology- if 01-06 at Q23 ask Q30 for chosen tech, 31, Q39 and if 01-06 at Q23 ask Q32-37 for chosen tech

Ask Q27 if driver owner

27. How often do you use the _____ feature in your vehicle?

Please select one

01–Frequently

02–Sometimes

03–Rarely

04–Never

05–I don't use it – temporarily turned it off

06–I have disabled it permanently

98–Not applicable

99–Not sure

28. Ask if driver owner and if 02-06 at Q27: Which, if any, of the following is a reason why you don't use the _____ feature (if 02-03 AT Q27 ADD: more often)?

Please select any that apply

01–It is annoying

02–It doesn't work

03–I don't know how to use it

04–It's distracting

05–My driving is good/not needed

97–Other (Please specify) _____

98–Not applicable [single punch]

99–Not sure [single punch]

29. If driver owner ask: How important a factor was _____ in the decision to purchase or lease this vehicle?

Please select one

01–Very important

02–Somewhat important

03–Not very important

04–Not at all important

98–Not applicable

99–Not sure

30. If driver user (non owner) or non-driver user, or non user if familiar at Q23 ask: How important a factor do you think having _____ will be in making a decision about which vehicle to purchase or lease in the future?

Please select one

01–Very important

02–Somewhat important

03–Not very important
 04–Not at all important
 98–Not applicable
 99–Not sure

31. Ask all: How familiar would you say you are with what a _____ feature does?

Please select one

01–Very familiar
 02–Somewhat familiar
 03–Not very familiar
 04–Not at all familiar
 99–Not sure

Depending on feature selected ask one of 32-37 of *driver owners, driver users (non-owners) and non-driver users* – *also ask if non-user and 01-06 at Q23*

FEATURE SELECTED	ASK Q	IF @ Q23
Automatic emergency braking (AEB)	32	01
Forward collision warning	33	02
Adaptive cruise control (ACC)	34	03
Lane departure warning	35	04
Lane keeping assist	36	05
Blind spot monitoring	37	06

32. Ask if AEB: Based on your experience with automatic emergency braking, what is this feature designed to do?

Please select one

01–Avoid collisions from the front, rear, and/or sides of the vehicle
 02–Alert the driver of an imminent collision in the rear of the vehicle
 03–Automatically applies the brakes if a collision is imminent in front of the vehicle - **CORRECT**
 04–I am unsure of the correct response
 99–Prefer not to answer

33. Ask if forward collision warning: Based on your experience with forward collision warning, what is this feature designed to do?

Please select one

01–Detect a collision, and automatically apply the brakes if a collision is imminent
 02–Detect and warn the driver of an imminent collision - **CORRECT**
 03–Detect when a collision is imminent, from the front, sides, and/or rear of the vehicle
 04–I am unsure of the correct response
 99–Prefer not to answer

34. Ask if adaptive cruise control: Based on your experience with adaptive cruise control, which statement is correct about this feature?

Please select one

- 01-It may accelerate if the vehicle ahead moves out of the detection zone - **CORRECT**
- 02-It works well in thick fog or heavy precipitation because it relies on radar
- 03-It is able to successfully brake the vehicle in any situation, as long as the system has detected a vehicle ahead
- 04-I am unsure of the correct response
- 05-Prefer not to answer

35. Ask if lane departure warning: Based on your experience with lane departure warning, what is this feature designed to do?

Please select one

- 01-Provide an alert if another vehicle is entering your lane
- 02-Provide an alert if your vehicle is departing its lane - **CORRECT**
- 03-Gently steer your vehicle back into the lane if it begins to depart from the lane
- 04-I am unsure of the correct response
- 99-Prefer not to answer

36. Ask if lane keeping assist: Based on your experience with lane keeping assist, what is this feature designed to do?

Please select one

- 01-Prevent collisions caused by your vehicle unintentionally drifting out of its lane - **CORRECT**
- 02-Prevent collisions caused by other vehicles that drift out of their lane.
- 03-Avoid collisions from the front, rear, and/or sides of the vehicle
- 04-I am unsure of the correct response
- 99-Prefer not to answer

37. Ask if blind spot monitoring: Based on your experience with blind spot monitoring, what is this feature designed to do?

Please select one

- 01-Detect when my vehicle is located in another vehicle's blind spot
- 02-Detect when another vehicle is located in my vehicle's blind spot - **CORRECT**
- 03-Detect when my vehicle is located in another vehicle's blind spot and will sound my vehicle's horn if the other vehicle begins to move into my lane
- 04-I am unsure of the correct response
- 99-Prefer not to answer

38. Ask if driver owner, driver user (non-owner) or non-driver user of any adas technology: Which of the following sources, if any, have you used to learn about the advanced driver assistance features you have experience with, for example, about what they do or how they work?

Please select any that apply

RANDOMIZE - LEAVE 97-99 LAST

- 01-Online video (YouTube, car company video, etc.)
- 02-Contacted garage/mechanic
- 03-Contacted/visited a dealership
- 04-Manufacturer's web site
- 05-Federal government web site
- 06-Provincial/territorial government web site
- 07-Books, brochures or pamphlets
- 08-Social media (Facebook, Twitter etc.)
- 09-Read the owner's manual

- 10–Asked friends or family
- 11–Learned by trial and error
- 97–None - have not learned about it [SINGLE PUNCH] – ASK Q39
- 98–Other - *please specify* DO NOT PROCEED WITHOUT PROMPTING TO SPECIFY
- 99–Not sure [SINGLE PUNCH] - ASK Q39

ADAS USERS NOW SKIP TO Q40

39. Ask anyone not asked Q38 or if 97 or 99 at 38: If you wanted to get more information about an advanced driver assistance feature, for example, about what they do or how they work, which, if any, of the sources listed below would be your preferred source?

Please select any that apply

RANDOMIZE - LEAVE OTHER/NOT SURE LAST

- 01–Online video (YouTube, car company video, etc.)
- 02–Contact garage/mechanic
- 03–Contact/visit a dealership
- 04–Manufacturer’s web site
- 05–Federal government web site
- 06–Provincial/territorial government web site
- 07–Books, brochures or pamphlets
- 08–Social media (Facebook, Twitter etc.)
- 09–Read the owner’s manual
- 10–Ask friends or family
- 11–Learn by trial and error
- 97–None – do not want to learn about it [SINGLE PUNCH]
- 98–Other - *please specify* DO NOT PROCEED WITHOUT PROMPTING TO SPECIFY
- 99–Not sure [SINGLE PUNCH]

Ask all: Please indicate how useful, if at all, you think the following methods of learning about advanced driver assistance systems (ADAS) would be to Canadians.

RANDOMIZE ORDER – SHOW IN GRID

40. In-person training at the dealership on the specific ADAS features of a vehicle someone is buying.

41. Onboard (in vehicle) video tutorials to learn about the ADAS features of that specific vehicle.

42. ADAS training as part of new driver training programs.

43. Pamphlets or information cards provided by rental car companies or car share programs.

- 01–Very useful
- 02–Somewhat useful
- 03–Not very useful
- 04–Not at all useful
- 99–Not sure

44. Are there any other sources or means of obtaining information on ADAS features that you would find useful that aren’t currently available?

Please specify

Fully OE text box

Demographics

The following are a few questions about you and your household, for statistical purposes only. Please be assured all of your answers will remain completely confidential.

45. What is the highest level of formal education you have completed?

Select one only

- 01–Up to high school
- 02–Some high school
- 03–High school diploma or equivalent
- 04–Registered Apprenticeship or other trades certificate or diploma
- 05–College, CEGEP or other non-university certificate or diploma
- 06–University certificate or diploma below bachelor's level
- 07–Bachelor's degree
- 08–Post graduate degree above bachelor's level
- 99–Prefer not to answer

46. Which of the following categories best describes your current employment status?

Select one only

- 01–Working full-time (35 or more hours per week)
- 02–Working part-time (less than 35 hours per week)
- 03–Self-employed
- 04–Unemployed, but looking for work
- 05–A student attending school full-time
- 06–Retired
- 07–Not in the workforce (a full-time homemaker OR unemployed and not looking for work)
- 08–Other (DO NOT SPECIFY)
- 99–Prefer not to answer

47. What language do you speak most often at home?

[ACCEPT ALL THAT APPLY]

- 01–English
- 02–French
- 03–Other (specify but do not code)
- 99–Prefer not to answer [single punch]

48. How big is the community in which you live? Would you say it is:

- 01–A rural or small community (with a population below 30,000)
- 02–A medium-sized community or city (with a population over 30,000 but under 500,000)
- 03–A large urban centre (with a population over 500,000)

49. Which of the following categories best describes your total household income? That is, the total income of all persons in your household combined, before taxes?

Select one only

- 01–Under \$20,000
- 02–\$20,000 to just under \$40,000
- 03–\$40,000 to just under \$60,000
- 04–\$60,000 to just under \$80,000

05—\$80,000 to just under \$100,000

06—\$100,000 to just under \$150,000

07—\$150,000 and above

99—Prefer not to answer

This completes the survey. On behalf of Transport Canada, thank you for your valuable input. In the coming months, the results of this survey will be available on the Library and Archives Canada website.