

Public opinion research study: Consumer awareness of, and confidence in, automated vehicles (AVs) and advanced driver assistance systems (ADAS)

Findings report

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Opinionpublique.TC@tc.gc.ca

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This public opinion research report presents the results of an online survey conducted by Ipsos on behalf of Transport Canada. The research study was conducted with n=2500 Canadians in December 2020. It also presents the qualitative results of questions posed on Ipsos Conversations - an omnibus online qualitative community designed to provide clients with qualitative insights. A total of 159 Ipsos Conversations community members shared their thoughts on topics related to advanced driver assistance systems (ADAS) as well as automated vehicle (AV) technologies between January 28th and January 30th, 2021.

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Transport Canada

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Executive summary

This report presents findings from qualitative and quantitative public opinion research conducted to gauge Canadians' confidence in and expectations of AVs (automated vehicles), including ADAS (advanced driver assistance system) features currently available on the market.

This research builds upon the 2019 AV POR (public opinion research) findings by: (i) using the 2019 data as a baseline for tracking changes in Canadian attitudes and knowledge toward AVs; (ii) exploring the sources of Canadians' concerns and misperceptions about AVs, and how they might be overcome; and (iii) seeking to understand ADAS user habits in greater detail in order to learn how drivers' knowledge affects their behaviour.

The findings from this research will allow Transport Canada to better understand Canadians' views on AVs which will help create relevant resources for Canadians that enhance their understanding and build appropriate trust in these technologies.

Noting that when used properly, AV technologies have the potential to reduce the severity and frequency of vehicle collisions, it will be important that Canadians feel confident in using these features while respecting their limitations. In turn, greater use of AV technologies has the potential to make Canadian roads safer for both vehicle occupants and other road users.

Background and objectives

Vehicle automation comprises a series of innovative and evolving technologies that are changing the Canadian motor vehicle landscape. As more and more AV technology enters the market, it is important that Canadians become more familiar with this evolving technology in order to increase safety and security on Canadian roads.

Although numerous studies have been conducted on AV technologies, including some that have touched on Canadian perspectives, there is limited information about what the general Canadian population knows about these technologies and whether or not they learn about them in a manner that promotes safe driving practices. Attention to the issues of consumer awareness and understanding of AVs have also been brought to the forefront in light of recent crashes in the United States, and incidents in Canada, involving vehicles with low-level automation technologies.

For the purpose of this study, automated vehicles are defined as vehicles that 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. Fully automated vehicles are capable of doing all of the driving themselves, without the need of a human driver. (These types of vehicles are not currently available to the general public on the Canadian market.)

This study considers technologies that meet any of the six levels of automation as defined by SAE International (Level 0 to Level 5), but a particular emphasis will be placed on exploring consumer understanding of Level 0 to Level 2 advanced driver assistance systems (ADAS) features – technologies that are becoming increasingly present on the Canadian consumer market. ADAS features may serve as the building blocks for higher level AVs in the future. While AV technologies hold great potential to enhance the safety, mobility, and productivity of Canadians, building public confidence in these technologies will begin with the safe use of these assistance features.

The research findings will help:

- 1. Inform Transport Canada on Canadians' current awareness of and confidence in AVs;
- 2. Transport Canada understand how drivers' knowledge affects their behaviour;
- 3. Support Transport Canada to create tools/forums that enhance Canadians' knowledge and understanding of AVs; and,
- 4. Transport Canada inform relevant stakeholders (e.g. provinces, territories, municipalities, industry, Transport Canada counterparts in other countries) of Canadians' perceptions of AVs which will help guide the resources/tools they produce to educate the public.

The objectives of the research are summarized in the table below.

Methodology	Objectives							
Quantitative survey	 To provide an accurate and up-to-date estimate of Canadians' awareness and understanding of AVs (against the 2019 baseline), particularly the lower level automation technologies that are currently available to Canadian consumers; and, To understand ADAS user habits in greater detail in order to learn how drivers' knowledge affects their behaviour. 							
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Methodology

The research consisted of a mixed-methodology approach through an online/telephone survey and a qualitative online community.

Quantitative survey

A mixed-methodology survey was conducted with a total of n=2500 Canadians age 16-80 where 90% of the sample have a valid driver's licence and 10% do not. A total of n=2000 sample was conducted online to replicate the methodology used in 2019. The online sample was drawn from Ipsos' online and partner panels (non-probability sample, no margin of sampling error is reported). A total of n=500 random-digit-dial (RDD) sample was conducted by telephone using a dual frame landline and cell phone households (70% cell phone primary and 30% landline). This is a probability-based sample. The addition of the probability-based telephone sample was a valuable addition as it provides greater coverage and inclusion of the perspectives of those Canadians not part of an online panel. This allows us to have the ability to make

projections about the opinions and behaviours of the Canadian population as well as explore different styles of questions (e.g. open-ended vs. prompted lists) and understand mode effects on a survey of this topic.

Quotas were set by age, gender, and region on each sample separately, to make each sample closely reflect the composition of the actual population. The samples were statistically weighted independently to ensure each sample matches this population according to the most recently available Census information (region, age, gender). Where tracking to 2019 data, the online sample of n=2,000 will be reported in order to match the methodology of the 2019 survey (n=3,113 online sample of Canadians age 16-80), otherwise the data reported reflects the combined n=2500 sample.

The survey was conducted between December 9 and 21, 2020. The telephone version averaged 11 minutes in length and the online survey average about 9 minutes in length.

Qualitative online community

Qualitative results are based on questions posed on Ipsos Conversations - an omnibus online qualitative community designed to provide clients with qualitative insights. Findings flowing from the qualitative component of the research are not drawn from a representative sample of the Canadian population. They should be considered directional and thematic in nature; they should not and cannot be extrapolated to the wider research audience

A total of 159 Ipsos Conversations community members shared their thoughts on topics related to advanced driver assistance systems (ADAS) as well as automated vehicle (AV) technologies between January 28th and January 30th, 2021. The table below provides additional context related to the volume and nature of interactions within the Ipsos Conversations Community environment.

Total number of participants	159
Total number of Posts	1775
Total number of Likes	540
Average number of contributions per participant	11.16

Community members took part in online bulletin board style activities – they were invited to answer a series of openended questions individually *before* being exposed to the answers of other community members and were encouraged to interact with each other.

Cost of research

The cost of this research was \$98,157.99 (HST included).

Key findings

Awareness and impressions of advanced driver assistance systems (ADAS)

According to study results, Half of Canadians are familiar with ADAS.¹ Within this half, 14% describe themselves as very familiar, with men declaring more familiarity than women, and little difference by age. The declared familiarity increases with education level and household income, meaning those with higher levels of education and household income are more familiar than those with lower levels of education and income. One-quarter of Canadians without a driver's license are familiar with ADAS technologies.

Overall, 70% of Canadians agree ADAS technologies make roads safer.² Agreement is higher among those Canadians who are familiar with ADAS technologies at 84%. Comparatively, only 55% of those unfamiliar with ADAS technologies agree they make roads safer (after being informed by a description of these technologies).³ Therefore, familiarity is positively correlated with perceptions that ADAS technologies make roads safer. In other words, the more familiar you are, the more you agree these technologies improve the safety of our roads.

Notably, very few Canadians outright disagree that ADAS technologies help make roads safer (5%). And similarly, a small percentage disagree that these technologies assist the driver with unexpected events (4%). A much larger percentage (24%) either have a neutral opinion (middle score on the scale) or don't know. Therefore, it can be concluded that the issue is not that significant proportions of Canadians disbelieve the value proposition that these technologies make roads safer. The challenge is to educate those unfamiliar with the technologies.

The strongest driver of opinions that these technologies make our roads safer is that these technologies assist the driver with unexpected events. That correlation is reasonably strong (0.60). Therefore, demonstrating ways ADAS manage unexpected events better than drivers do could increase public perceptions of the value these technologies hold for improved road safety.

Incidence of awareness, and users of vehicles, with specific ADAS technologies

The survey found that 85% of Canadians have heard of at least one of the ADAS features measured in the survey — unchanged from 2019 (84%). Over the past year, instead of making more (new) people aware of ADAS technologies, those who were already aware of at least one feature learned about other features. While the total percentage of Canadians aware of at least one of the 7 technologies measured in the survey did not statistically increase year over year (85% in 2020 vs. 84% in 2019), awareness of some individual technologies did increase, specifically, automatic emergency braking from 49% of Canadians to 54%, adaptive cruise control from 39% to 46%, and lane departure warning from 55% to 60%. In other words, over the past year there has been greater market penetration in awareness of these technologies (making those already aware of at least one ADAS technology, aware of more of them), but little market growth (new people becoming aware of any or at least one ADAS technology). The most commonly known

¹ Notably, 62% of the phone respondents are familiar versus 47% of online respondents. While there are as many respondents under age 35 by phone or online, there is a skew toward more younger respondents within the 16-24 age category by phone. However, even when controlling for age, the phone sample familiarity is higher over the phone. This may suggest a bias between online respondents and phone respondents when it comes to either their actual level of familiarity or their impulse to characterize their familiarity. It could be that online respondents are less inclined to say familiar and more inclined to say not very familiar if they are doubting the amount they know about these technologies.

 $^{^{2}}$ – this higher among phone respondents at 76% than online respondents at 69%. The higher agreement among phone respondents is likely correlated with their higher degree of familiarity.

³ There are driver assistance technologies on many new vehicles today. These are called Advanced Driver Assistance Systems (ADAS). Some driver assistance technologies like blind spot warning, are designed to warn you if you are at risk of an accident, while others, like automatic emergency braking, are designed to take action to help avoid a crash. Note that manufacturers may use different names for these technologies.

⁴ Based on online data only to be directly comparable with the 2019 incidence figures.

features continue to be normal back-up camera (84%) and blind spot warning (69%). The least known are lane keeping assistance (50%) and adaptive cruise control (46%).

The incidence of Canadians who have used at least one of the ADAS technologies (defined as being a driver or passenger in a vehicle with ADAS) has remained fairly constant between 2019 and 2020, and ranges from 22% for automated emergency braking to 41% for blind spot warning.

Attitudes and experiences of users of ADAS

Half of ADAS users (drivers/passengers) say they feel safer when using it. This is a key factor that needs to resonate more strongly in order to increase support for these technologies. Correlation analysis confirms that feeling safe using the technology contributes greatly to opinions that they make our roads safer -- and represents the strongest correlation of the options tested in the survey. The second strongest relationship with confidence the technologies make our roads safer is feeling that the technology in fact works well. Therefore, not only do Canadians need to feel safe using ADAS, they need to have confidence they work well – meaning the technology does what it is intended to do and will not fail.

At present, two out of three Canadians who are aware of at least one type of technology believe it works well and know how to use it properly and comfortably, and half believe they feel safer when using it. As noted, as the strong driver of the main value proposition of ADAS, safety is a key factor in increasing support for these technologies among Canadians.

Improving perceptions of safety

The qualitative community sessions confirmed that improved safety for vehicle drivers in the form of preventing accidents and reducing the severity of accidents, as well as safety for other road users are top advantages of ADAS. At the same time, the potential for driver complacency, questions related to the reliability of the systems, creating distractions for the driver, lack of familiarity with the ADAS and the learning curve in using these technologies were revealed to be impediments to building the confidence of both users and non-users of the technologies.

Furthermore, the qualitative community sessions found that many believe that ADAS technologies are, first and foremost, intended to be assistive devices; they do not absolve drivers of these vehicles from adopting defensive driving habits. If used as intended, ADAS technology can indeed prove helpful and assist in making one's driving experience safer. Community members also acknowledge the potential for driver complacency and, consequently, potential dire outcomes are very real and that this is largely due to an over-reliance on or a lack of understanding of how ADAS should be used.

Community members tend to agree that ADAS technology can be an annoyance and a source of distraction. There does not appear to be any one ADAS that stands out in particular; members reference a range of systems. For several community members, these ADAS technologies can, at times, fuel a perceived loss of control and, more precisely, the ability to make snap decisions on their own. These feelings tend to be driven by a relative mistrust in the underlying technology that powers these systems.

Importance of ADAS in purchasing/leasing decisions

Seven in ten (69%) of those aware of blind spot warning say it is an important factor in their decision to purchase or lease a vehicle in the future, while six in ten consider forward collision warning important to their decision-making. All other technologies are hovering around five in ten.

Sources of information about ADAS technologies

Canadians who want to learn about an ADAS feature, for example, about what they do or how they work, are most likely to go to the internet first and look for related online forums for information. A basic google search is also common, as is information from the car manual (particularly older Canadians age 65+), the manufacturer's website or car dealerships.

Awareness and impressions of automated vehicles (AVs)

Between 2019-2020 there has been a small increase in Canadians' familiarity with automated vehicles. In 2019, 34% of Canadians indicated they are at least somewhat familiar with automated vehicles – without seeing a definition of automated vehicles. (6% indicated being very familiar). In 2020, 37% report being familiar, including 7% very familiar. Notably, phone respondents (probability sample) report much higher levels of familiarity at 56% including 19% very familiar.

There continues to be a relatively high level of concern and pessimism about automated vehicles and how they will function on the nation's roads. 30% agree they would be comfortable riding in a fully automated car, while 47% disagree, and 23% have a neutral opinion or don't know. Compared with rebalanced data from 2019 (when no neutral option was offered), this represents a 10 point increase in respondents who would feel comfortable riding in a fully automated vehicle. Comfort is strongly correlated with perceived safety⁵, and at present 41% of Canadians agree that fully automated vehicles make our roads safer. Until more Canadians are convinced that fully automated vehicles make our roads safer, it is unlikely that comfort with riding in such a vehicle will increase.

Also contributing to Canadians' lack of comfort riding in a fully automated vehicle are concerns about cyber security⁶. Based on the survey results, two in ten Canadians (17%) agree that automated vehicles are cyber secure (e.g. secure from hackers, terrorists, fraud or unwanted access), while a substantial minority (42%) disagree. Therefore, efforts to demonstrate the safety benefits of automated vehicles should also consider cyber security concerns.

Safety/reduction in driver error and easier vehicle operation for elderly and/or persons with a disability (prompted) continue to be the top advantages Canadians believe AVs will provide for the future. The percentage of Canadians that identify easier operation for the elderly and persons with a disability as an advantage of fully automated vehicles increased over the past year. The only other advantage that increased in frequency from 2019 is lower insurance premiums.

The top disadvantages of AVs identified by Canadians in 2019 were again cited by many respondents. These are equipment/system failure (59%) and vehicles failing to react to unexpected situations (53%). However, an increasing number of Canadians point to the following disadvantages:

- 1. Drivers will become lazy/pay less attention (60%)
- 2. Drivers will become less skillful (51%)
- 3. Loss of driver control (42%)
- 4. Legal liability/knowing who is at fault (42%)
- 5. Concerns about cyber security threats (e.g. hackers, terrorists, fraud) (48%)

⁵ Pearson correlation coefficient 0.731, where 0 reflects no correlation and 1 reflects a perfect correlation.

⁶ Pearson correlation coefficient 0.604, where 0 reflects no correlation and 1 reflects a perfect correlation.

- 6. Data privacy (e.g., location tracking) (34%)
- 7. Concerns about operation in winter/Canadian weather (48%)

The qualitative community revealed that the skepticism is fueled by a lack of knowledge and general understanding of how automated vehicles operate as well as a perceived loss of control.

Conclusions

Analysis of the survey responses indicate that there is a large opportunity to increase the public's familiarity with ADAS technologies noting that greater familiarity breeds greater support. The survey found that many Canadians remain unfamiliar with advanced driver assistance systems. Half of Canadians report being familiar and of that half, 84% agree that these technologies make our roads safer. Educating Canadians about how ADAS assist the driver with unexpected events is an effective way to increase support for these technologies. The survey found that the strongest driver of opinions that ADAS make our roads safer is the belief that these technologies assist the driver with unexpected events. The survey also found that Canadians could be more informed about the potential benefits of the technology. Future education efforts may be more effective if they target women, younger and less affluent Canadians, as they are least familiar and less supportive in general.

ADAS technologies are important to future vehicle purchase decisions among those who have used them, but the pool of Canadians who have used them is similar in size to last year. Building greater support for the value proposition of ADAS and growing uptake will depend on understanding how to make users feel safer when using the technology. At present 52% of ADAS users feel this way.

When it comes to fully automated vehicles, many Canadians are skeptical, largely due to a lack of knowledge about these vehicles. They are not convinced they make roads safer and many believe that these vehicles are not cyber secure. These factors can impact willingness/comfort to consider riding in a fully automated vehicle. More research could provide additional understanding of how Canadians form their opinions about the impact on road safety and cyber security of automated vehicles.

Political neutrality statement and contact information

I hereby certify as Senior Officer of Ipsos 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.

M. COOK

Mike Colledge President Ipsos Public Affairs

Supplier name: Ipsos LP

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For more information, contact <u>TC.Publicopinion-Opinionpublique.TC@tc.gc.ca</u>

Introduction

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 with the goal of making 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 inform the material they produce and distribute 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.

Research rationale and objectives

AVs are an innovative and evolving technology that are changing the Canadian motor vehicle landscape. As more and more AV technology enters the market, it is important for the Government of Canada to support Canadians' familiarity with this evolving technology in order to increase safety and security on Canadian roads.

Although numerous studies have been conducted on AV technologies, including some that have touched on Canadian perspectives, there is limited information about what the general Canadian population knows about these technologies and whether or not they learn about them in a manner that promotes safe driving practices. Attention to the issues of consumer awareness and understanding of AVs have also been brought to the forefront in light of recent incidents involving vehicles with low-level automation technologies in Canada and the United States.

For the purpose of this study, automated vehicles are defined as vehicles that 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. Fully automated vehicles are capable of doing all of the driving themselves, without the need of a human driver. (These types of vehicles are not currently available to the general public on the Canadian market.)

This study considers technologies that meet any of the six levels of automation as defined by SAE International (Level 0 to Level 5). A particular emphasis will be placed on exploring consumer understanding of Level 0 to Level 2 advanced driver assistance systems (ADAS) features – technologies that are becoming increasingly present on the Canadian consumer market. ADAS features may serve as the building blocks for higher level AVs in the future. While AV technologies hold great potential to enhance the safety, mobility, and productivity of Canadians, building public confidence in these technologies will begin with the safe use of these low-level automation features.

The research findings will help:

- 1. Inform Transport Canada on Canadians' awareness and confidence of AVs;
- 2. Transport Canada understand how drivers' knowledge affects their behaviour;
- 3. Support Transport Canada to create tools/forums that enhance Canadians' knowledge and understanding of AVs; and,
- 4. Transport Canada inform relevant stakeholders (e.g. provinces, territories, municipalities, industry, Transport Canada counterparts in other countries) of Canadians' perceptions of AVs which will help guide the resources/tools they produce to educate the public.

The objectives of the research are summarized in the table below.

Methodology	Objectives
Quantitative survey	 To provide an accurate and up-to-date estimate of Canadians' awareness and understanding of AVs (against the 2019 baseline), particularly the lower level automation technologies that are currently available to Canadian consumers; and, To understand ADAS user habits in greater detail in order to learn how drivers' knowledge affects their behaviour.
Qualitative online community	 To understand what knowledge promotes safe driving practice and any barriers that may limit comprehension of the benefits and applications or contribute to skepticism toward AVs To further deepen learning flowing from the quantitative research initiative by: Gaining a better understanding of the perceived advantages and drawbacks of ADAS technologies Attempting to determine the most effective messaging to promote and reassure the public with regards to ADAS technologies. For example, determining what information, if any, would be most effective in addressing outstanding questions and concerns related to ADAS.

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 methodologies 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

1. Awareness and impressions of advanced driver assistance systems (ADAS)

Familiarity with ADAS

Half of Canadians are familiar with ADAS⁷. This half includes 14% who describe themselves as very familiar. Men are more familiar than women, but there is little difference by age. Familiarity increases with education and household income, meaning those with higher levels of education and household income are more familiar than those with lower levels of education and household income. One-quarter of Canadians without a driver's license are familiar with ADAS technologies.

Familiarity by gender and age

	TOTAL	Male	Female	16-24	25-34	35-49	50-64	65+
Base: All respondents	2500	1199	1277	202	532	564	646	556
Very familiar	14%	20%	8%	19%	14%	16%	12%	13%
Somewhat familiar	36%	40%	33%	28%	34%	36%	39%	39%
Not very familiar	26%	22%	29%	26%	23%	25%	28%	27%
Not at all familiar	22%	16%	27%	22%	25%	21%	20%	21%
Not sure	2%	1%	3%	4%	4%	2%	1%	1%
Summary								
Very or somewhat	50%	60%	41%	47%	47%	52%	51%	52%
Not very or not at all	48%	38%	56%	48%	48%	46%	48%	47%

Q5. How familiar would you say you are with Advanced Driver Assistance Systems (ADAS)?

Familiarity by education, household income and between driver's license holders/non-holders

	<hs< th=""><th>HS</th><th>Post Sec</th><th>Univ Grad</th><th><\$40K</th><th>\$40K - <\$80K</th><th>\$80K - <\$150K</th><th>\$150K+</th><th>Licensed drivers</th><th>Non- licensed drivers</th></hs<>	HS	Post Sec	Univ Grad	<\$40K	\$40K - <\$80K	\$80K - <\$150K	\$150K+	Licensed drivers	Non- licensed drivers
Base: All respondents	139	428	861	1039	348	554	589	195	2246	254
Very familiar	11%	10%	13%	16%	7%	9%	14%	18%	15%	7%
Somewhat familiar	25%	32%	38%	39%	26%	36%	41%	39%	38%	18%
Not very familiar	32%	29%	25%	25%	30%	27%	28%	25%	26%	26%
Not at all familiar	28%	25%	22%	18%	34%	26%	16%	18%	19%	43%
Not sure	3%	3%	2%	1%	2%	1%	1%	0	2%	6%
Summary										
Very or somewhat	36%	43%	51%	55%	33%	45%	55%	57%	53%	25%
Not very or not at all	61%	55%	47%	43%	64%	54%	44%	42%	45%	69%

⁷ Notably, 62% of the phone respondents are familiar versus 47% of online respondents. While there are as many respondents under age 35 in the phone as the online sample, there is a skew toward more younger respondents within the 16-24 age category. However, even when controlling for age, the phone sample familiarity remains higher. This may suggest a bias between online respondents and phone respondents when it comes to either their actual level of familiarity or their impulse to characterize their familiarity. It could be that online respondents are less inclined to say they are familiar and more inclined to say not very familiar if they are doubting the amount they know about these technologies.

Usage and impressions of specific ADAS technologies

Overall, seventy percent of Canadians agree ADAS technologies make roads safer. Notably, very few (5%) Canadians disagree, essentially indicating that these features do not make roads safer. Those who do not lean toward these features making roads safer are unclear of the link to roads being safer or don't know enough about them to have an opinion.

There are notable differences by gender, age, education and household income:

- Men are more likely to agree with the main value proposition ADAS features help make roads safer, and that ADAS
 technologies assist the driver with unexpected events. They are also more likely to believe that information about
 proper usage is easily accessible.
- Agreement with the main value proposition and that these technologies assist the driver with unexpected events increases with age, education and household income.

Impressions of ADAS - % agreement (strongly and somewhat agree)

	TOTAL	Male	Female	16-24	25-34	35-49	50-64	65+	Familiar	Not Familiar
Base: All respondents	2500	1199	1277	202	532	564	646	556	1255	1189
When used properly, ADAS features help make roads safer.	70%	74%	66%	68%	66%	68%	70%	77%	85%	56%
Information about the proper use of ADAS technologies is not easily accessible.	31%	35%	27%	36%	33%	31%	27%	32%	37%	25%
ADAS technologies make drivers over-confident.	56%	57%	55%	47%	55%	55%	61%	53%	62%	50%
ADAS technologies assist the driver with unexpected events.	71%	76%	66%	67%	64%	71%	74%	76%	87%	56%

Q6. Please indicate your level of agreement or disagreement with the following statements about Advanced Driver Assistance Systems (ADAS).

Notably, very few Canadians outright disagree that ADAS technologies help make roads safer (5%) or disagree these technologies assist the driver with unexpected events (4%). Those who do not agree tend to have a neutral opinion (middle score on the scale) or don't know (24% of Canadians fall into this category for each of these statements). Therefore, the situation is not one where Canadians disbelieve. Rather, the challenge is to educate more Canadians about these technologies in general.

Interestingly, while Canadians familiar with ADAS are more likely to agree with the main value proposition that ADAS systems make roads safer and that drivers are assisted in unexpected events, they are also more likely to agree that these technologies make drivers over-confident and that proper use information is not easily accessible.

⁸ – this higher among phone respondents at 76% than online respondents are 69%. The higher agreement among phone respondents is likely correlated with their higher degree of familiarity.

This suggests that over-confidence and even the belief that proper use information may not be easily accessible are not strongly correlated with acceptance of the value proposition. The strongest driver of the attitudes measured in the survey is that these technologies assist the driver with unexpected events. Therefore, perceptions of road safety could be impacted by demonstrating ways that ADAS technologies protect against unexpected events or respond effectively to such events.

Correlation with when used properly, ADAS features help make roads safer

	Pearson Correlation Coefficient*
Information about the proper use of ADAS technologies is not easily accessible.	061
ADAS technologies make drivers over-confident.	122
ADAS technologies assist the driver with unexpected events.	.615

^{*}correlation coefficients range between 0 and 1. The closer to 1 the stronger the correlation. Positive signs indicate direct correlation, and negative signs indicate inverse correlation.

Advantages associated with ADAS technology

When asked to discuss advantages related to ADAS, the qualitative community members focus on direct benefits to vehicle operators such as improved driver safety resulting from increased accident prevention, reductions in the severity of accidents, a safer driving environment for those sharing the roads (cyclists, pedestrians, other drivers). Additionally, several community members suggest that ADAS, and what some see as the added 'fail safe' measures these systems afford drivers, contribute to increased reliability, predictability and, a less stressful driving experience overall.

Others speak of ADAS technologies as important tools that can contribute to lessening the potential impacts of distractions due to driver complacency or fatigue. There are also several references to ADAS as potentially promoting a more defensive driving posture among those operating vehicles equipped with this technology.

Beyond the direct advantage afforded by ADAS technologies, community members also identify a number of indirect benefits this technology might afford consumers including financial gains related to a relative reduction in repair costs associated with collisions, as well as the lowering of insurance premiums due to reductions in both the number and severity of collisions. A few say ADAS could potentially be of assistance to newer or less experienced drivers who may otherwise feel less secure while operating a motor vehicle.

It should be noted however that despite being specifically asked to provide perceived advantages and benefits associated with ADAS there are those who express relative skepticism and reticence towards advanced driving assistance systems. Concerns in this case are typically grounded in apprehension or distrust of technology and fears that an overreliance on these technologies might lead to increased complacency while at the wheel and consequently diminishing good driving habits.

"I can see advantages to this when long distance driving, or high-volume traffic, or even in the event of distractive driving. Mainly because this may reduce the number of accidents. It would reduce the risk of injury to not only the driver, but to any passengers."

"There is a safety aspect to the ADAS, but also a financial incentive for the car manufacturers. The safer the vehicles are the more people will spend on them."

"Advanced driver assistance systems are designed to help avoid road accidents, thereby reducing the risk of damage to people and properties.

« Ça rend la conduite beaucoup plus sécuritaire en évitant des accidents, ça aide à sauver des vies. Ça permet aussi d'être plus détendu en conduisant puisqu'on sait que ces systèmes sont là pour par exemple nous avertir s'il y a une voiture dans notre angle mort lorsqu'on change de voie. »

"These also make life easier. During a commute ACC [adaptive cruise control] can make the drive much more enjoyable. You keep a consistent speed, it's one less function you have to worry about over long distances, or even short distances. I use ACC very often."

"I think that it would provide some relief to those that have some anxiety when driving and it should reduce the amount of accidents once the majority of vehicles on the road have those features on them. There could be some discounts with insurance companies with the extra safety features on the vehicle. I know that some insurance companies give discounts if you have winter tires, security system or GPS on your vehicle."

« La surveillance des angles morts ou les alertes de collision sont pratiques pour éviter des accidents, mais je pense que, malheureusement, la plupart des systèmes avancés d'aide à la conduite déresponsabilisent les automobilistes au lieu de simplement les aider, et à la longue, ils finiront par nuire aux conducteurs, qui s'en remettront à ces systèmes plutôt que d'adopter une conduite vigilante. A-t-on vraiment besoin d'une caméra à l'arrière du véhicule pour se stationner? Toutes ces béquilles technologiques finiront par créer des conducteurs beaucoup moins chevronnés que dans les décennies passées. »

Drawbacks associated with ADAS

When asked to discuss disadvantages related to ADAS, the qualitative community members focus on:

- **Driver complacency** as a result of overreliance on these systems which can in some cases lead to diminished attention levels and consequently a higher probability for distraction while driving.
- **Reliability of systems** Some note that technology is not infallible, there is the possibility for false positives to occur, consequently there is a need to remain vigilant for glitches and other tech issues/potential for being hacked (mentioned by one member).
- ADAS as a source of distraction Visual and auditory alerts can be a source of distraction for some and disconcerting to others. In some cases, focus can and is shifted from driving the vehicle to managing/reacting to ADAS alerts.
- Familiarity with the systems There are a number of references to the innate challenges associated with the 'early days' of using ADAS, many point to the learning curve associated with driving ADAS equipped vehicles which can be quite the challenge whether they be owner operated or rental vehicles.
- Learning curve there are references to ADAS tech being somewhat overwhelming particularly if drivers are less technologically inclined. Some also suggest that this challenge may be further exacerbated along generational lines younger drivers for whom ADAS are second nature because they were exposed to them from very early on vs. older drivers for whom ADAS are seen as more of a hindrance and an inconvenience to their 'normal' driving habits.

Impressions of specific advanced driver assistance systems (ADAS)

In the survey, Canadians were asked to indicate which of a list of 7 ADAS technologies they have heard of. The survey shows there has been a modest increase in awareness for a few of these technologies, between 2019 and 2020. These include automatic emergency braking from 49% of Canadians to 54%, adaptive cruise control from 39% to 46%, and lane departure warning from 55% to 60%. Overall, the percentage of Canadians that have heard of at least one of six top ADAS technologies covered in the survey did not change (85% versus 84% in 2019). This suggests that over the past year instead of making more (new) people aware of ADAS technologies, those who were already aware of at least one have become aware of others. In other words, over the past year there has been greater market penetration (existing people aware of more ADAS technologies), but little market growth (new people becoming aware of any ADAS technology). The most commonly known features continue to be normal back-up camera (84%) and blind spot warning (69%). The least known are lane keeping assistance (50%) and adaptive cruise control (46%).

Awareness of specific advanced driver assistance systems (ADAS) year over year

	2020 (Online)	2019 (Online)
Base: All respondents	2000	3113
Any of the top 6 technologies (NET)	85%	84%
Automatic emergency braking	54%	49%
Forward collision warning	54%	54%
Adaptive cruise control	46%	39%
Lane departure warning	60%	55%
Lane keeping assistance	50%	52%
Blind spot warning	69%	66%
Back-up camera	84%	86%

Q7. Please select which of these ADAS technologies you have heard of (including those you have interacted with, experienced as a passenger, seen on a commercial or heard about elsewhere). Please note that you may know these technologies by other names.

Women trail men in awareness of ADAS technologies and awareness continues to be higher among older Canadians than younger Canadians, particularly when it comes to automatic emergency braking, forward collision warning, lane departure warning, lane keeping assistance, blind spot warning, back-up camera and active parking assistance.

Awareness of specific advanced driver assistance systems (ADAS) by gender and age

	TOTAL	Male	Female	16-24	25-34	35-49	50-64	65+
Base: All respondents	2500	1199	1277	202	532	564	646	556
Any top 6 (NET)	87%	90%	84%	83%	83%	85%	90%	92%
Automatic emergency braking	58%	64%	52%	54%	48%	58%	60%	67%
Forward collision warning	57%	66%	49%	47%	48%	56%	61%	67%
Adaptive cruise control	51%	59%	43%	50%	48%	51%	52%	54%
Lane departure warning	62%	69%	55%	47%	52%	62%	66%	71%
Lane keeping assistance	55%	63%	48%	45%	48%	53%	57%	64%
Blind spot warning	72%	76%	68%	66%	66%	69%	75%	78%
Back-up camera	86%	88%	85%	77%	77%	84%	93%	93%
Parking collision warning	44%	48%	40%	47%	43%	46%	43%	42%

Automatic emergency steering	25%	28%	23%	33%	23%	27%	23%	25%
Active Parking Assistance	62%	66%	58%	46%	51%	61%	71%	69%
None of the above	3%	2%	4%	3%	3%	4%	2%	2%
Not sure	4%	4%	5%	7%	8%	5%	3%	1%

Q7. Please select which of these ADAS technologies you have heard of (including those you have interacted with, experienced as a passenger, seen on a commercial or heard about elsewhere). Please note that you may know these technologies by other names.

While there is little difference in the percentage of Canadians aware of at least one ADAS technology across the country, there is greater recognition of certain technologies in certain regions. For example, awareness of blind spot warning, lane departure warning, lane keeping assistance and parking collision warning is higher in Ontario than Quebec.

Awareness of specific advanced driver assistance systems (ADAS) by region

	BC/ Territories	ALB	ON	QC	SK/MN	ATL
Base: All respondents	339	281	961	585	164	171
Any top 6 (NET)	86%	89%	88%	85%	89%	87%
Automatic emergency braking	56%	56%	58%	62%	55%	55%
Forward collision warning	56%	59%	60%	56%	56%	48%
Adaptive cruise control	48%	52%	52%	53%	51%	46%
Lane departure warning	61%	63%	67%	54%	65%	59%
Lane keeping assistance	54%	57%	58%	48%	54%	57%
Blind spot warning	70%	69%	77%	66%	68%	75%
Back-up camera	85%	85%	87%	86%	86%	89%
Parking collision warning	48%	49%	45%	37%	41%	42%
Automatic emergency steering	24%	26%	26%	26%	18%	25%
Active Parking Assistance	61%	63%	63%	63%	57%	62%
None of the above	4%	2%	3%	3%	2%	3%
Not sure	5%	5%	5%	4%	3%	4%

Q7. Please select which of these ADAS technologies you have heard of (including those you have interacted with, experienced as a passenger, seen on a commercial or heard about elsewhere). Please note that you may know these technologies by other names.

Similar to familiarity with ADAS technologies in general, Canadians with higher education and household income tend to have greater recognition of several of the individual technologies. Canadians show the greatest interest in blind spot warning, forward collision warning and lane departure warning being on all new vehicles (87%, 81% and 79% respectively). There is little difference by gender, but those 65+ show more interest in lane departure warning and lane keeping assistance than younger Canadians.

Opinions of specific advanced driver assistance systems (ADAS) on all new vehicles by gender and age

	TOTAL	Male	Female	16-24	25-34	35-49	50-64	65+
Base: Those who are aware of the specific ADAS technologies	varies							
Automatic emergency braking (AEB)	70%	71%	70%	71%	67%	71%	69%	74%
Forward collision warning (FCW)	81%	81%	80%	87%	78%	79%	78%	85%
Adaptive cruise control (ACC)	60%	61%	57%	68%	62%	57%	56%	61%

Lane departure warning (LDW)	79%	79%	79%	76%	76%	74%	78%	87%
Lane keeping assistance (LKA)	63%	64%	62%	68%	59%	62%	61%	68%
Blind spot warning (BSW)	87%	87%	88%	83%	86%	87%	85%	92%

⁸_yes. [Yes Summary] Do you think these features should be on all new vehicles?

2. Incidence of drivers and passengers of vehicles with ADAS

As shown in the table below, the incidence of drivers/passengers of vehicles with ADAS technologies has not changed much between 2019 and 2020 (when comparing online to online samples for consistency). However, when looking at the mixed-methodology sample that includes telephone sample, the incidence of drivers/passengers who have experience with forward collision warning, lane departure warning, lane keeping assistance and blind spot warning are higher.

Incidence of users of ADAS equipped vehicles

	2019 (Online)	2020 (Online)	2020 (CATI/Online)
Base: All Canadians	3113	2000	2500
Automatic emergency braking (AEB)	26%	22%	26%
Forward collision warning (FCW)	23%	25%	29%
Adaptive cruise control (ACC)	29%	26%	31%
Lane departure warning (LDW)	32%	33%	37%
Lane keeping assistance (LKA)	25%	26%	29%
Blind spot warning (BSW)	38%	41%	46%

Q9_user. Have you ever driven, or been a passenger in, a vehicle equipped with these features? Results have been re-based to ALL Canadians.

For automatic emergency braking, 45% of Canadians who are aware of automatic emergency braking report being a driver (30%) and/or a passenger (26%) of a vehicle with this technology. The online sample is showing 41% and phone sample showing 58%. When attempting to compare to 2019 data, we look at the online data of 41% and rebase it to the full population to match the 2019 methodology. When we do this the comparable figures are 26% in 2019 and 22% in 2020 which is a decline of 4 points.

For forward collision warning, 50% of Canadians who are aware of forward collision warning report being a driver (35%) and/or a passenger (25%) of a vehicle with this technology. The online sample is showing 46% and phone sample showing 60%. When attempting to compare to 2019 data, we look at the online data of 46% and rebase it to the full population to match the 2019 methodology. When we do this the comparable figures are 23% in 2019 and 25% in 2020, so an increase of 2 points.

For adaptive cruise control, 61% of Canadians aware of adaptive cruise control report being a driver (42%) and/or a passenger (32%) of a vehicle with this technology. The online sample is showing 56% and phone sample showing 74%. When attempting to compare to 2019 data, we look at the online data of 56% and rebase it to the full population to match the 2019 methodology. When we do this the comparable figures are 29% in 2019 and 26% in 2020, so a decline of 3 points.

For lane departure warning, 60% of Canadians who are aware of lane departure warning report being a driver (40%) and/or a passenger (33%) of a vehicle with this technology. The online sample is showing 56% and phone sample

showing 75%. When attempting to compare to 2019 data, we look at the online data of 56% and rebase it to the full population to match the 2019 methodology. When we do this the comparable figures are 32% in 2019 and 33% in 2020, so an increase of 1 point.

For lane keeping assistance, 52% of Canadians who are aware of lane keeping assistance report being a driver (34%) and/or a passenger (29%) of a vehicle with this technology. The online sample is showing 51% and phone sample showing 59%. When attempting to compare to 2019 data, we look at the online data of 51% and rebase it to the full population to match the 2019 methodology. When we do this the comparable figures are 25% in 2019 and 26% in 2020, so an increase of 1 point.

For blind spot warning, 63% of Canadians who are aware of blind spot warning report being a driver (42%) and/or a passenger (36%) of a vehicle with this technology. The online sample is showing 60% and phone sample showing 75%. When attempting to compare to 2019 data, we look at the online data of 60% and rebase it to the full population to match the 2019 methodology. When we do this the comparable figures are 38% in 2019 and 41% in 2020, so an increase of 3 points.

When it comes to drivers only, across each of the 6 main technologies included in the survey, men are more likely to have driven vehicles with this technology than women. Younger Canadians (under age 50) tend to be more experienced as drivers of vehicles with these technologies than older Canadians (over 50).

Incidence of drivers using ADAS by gender and age

	TOTAL	Male	Female	16-24	25-34	35-49	50-64	65+
Base: Those who are aware of ADAS technologies	varies							
Automatic emergency braking (AEB)	30%	36%	23%	34%	34%	35%	24%	29%
Forward collision warning (FCW)	35%	40%	29%	30%	40%	42%	30%	34%
Adaptive cruise control (ACC)	42%	46%	37%	29%	47%	47%	37%	43%
Lane departure warning (LDW)	40%	46%	32%	33%	39%	46%	37%	38%
Lane keeping assistance (LKA)	34%	39%	28%	30%	41%	41%	28%	33%
Blind spot warning (BSW)	42%	50%	35%	42%	45%	47%	39%	40%

Q9 driver. [Driver Summary] Have you ever driven a vehicle equipped with these features?

3. Attitudes and experiences of users of ADAS

Half of ADAS users (drivers/passengers) say they feel safer when using it, which is a key factor

in creating greater support for these technologies. Correlation analysis confirms the strength or importance of this aspect in building support for the value proposition. Of the attitudes tested in the survey, it correlates the most strongly with opinions about the main value proportion of ADAS – that is that they make roads safer. The second strongest relationship is feeling that it works well. Therefore, not only do Canadians need to feel safer using ADAS than not, they need to have confidence it works well – meaning it does what it is intended to do and will not fail.

Interestingly, the third strongest correlation is enjoyment using it. If users do not enjoy using it, they are less likely to believe it will make roads safer – so the user experience, making it easy and comfortable to use, thus enjoyable, is important as well to maximizing confidence ADAS in fact make roads safer.

Correlation with when used properly, ADAS features help make roads safer

	Pearson Correlation Coefficient*
I feel safer when using it	0.465
I think it works well	0.451
I enjoy using it	0.397
I feel comfortable using it	0.382
I feel less stressed when using it	0.321
It's distracting	-0.306
I find it annoying	-0.291
It impresses passengers	0.204
My driving is good enough so this feature is not needed	-0.202
I know how to use it properly	0.187
I had a bad experience with it	-0.187
I worry about my driving data being captured/privacy	-0.147
It is difficult to use	-0.119
I don't know how to use it properly	-0.084

^{*}correlation coefficients range between 0 and 1. The closer to 1 the stronger the correlation. Positive signs indicate direct correlation, and negative signs indicate inverse correlation.

At present, two out of three Canadians who are aware of at least one type of technology believe they work well and know how to use it property and comfortably, and half believe they feel safer when using it. As noted, as a strong driver of the main value proposition of ADAS, feeling safe while using these technologies is a key factor in increasing support for these technologies.

Attitudes of users of ADAS by gender and age

	% Agree (strongly or somewhat)
Base: Those who are aware of ADAS technologies	1078
I think it works well	67%
I feel comfortable using it	65%
I know how to use it properly	63%
I feel safer when using it	52%
I enjoy using it	43%
My driving is good enough so this feature is not needed	40%
I feel less stressed when using it	36%
Its distracting	25%
I worry about my driving data being captured/privacy	24%
It impresses passengers	23%
I find it annoying	21%
I don't know how to use it properly	15%
I had a bad experience with it	9%
It is difficult to use	8%

q10 [Total - T2B Summary] Please indicate your level of agreement or disagreement with the following statements about your experience using...

Blind spot warning is the technology that users are mostly likely to feel safer using at 64%. Adaptive cruise control is the technology that users are least likely to say they feel safer using at 45%. Notably, many users feel ADAS technologies are

not needed because their driving is good enough (no one technology stands out as one that users feel their driving is good enough to not need it), and as many as one-quarter find it distracting. Lane departure warning is directionally more to be identified as distracting as other technologies, but not significantly (35% agree lane departure warning is distracting vs. 27% automatic emergency braking and forward collision warning respectively and other technologies showing lower levels of agreement. In total 17% of users admit to turning off an ADAS technology and an additional 7% have wanted to, but don't know how to. So, roughly one-quarter admit to wanting to turn off the technology. Adaptive cruise control, lane keeping assistance and lane departure warning are the technologies users are most interested in turning off and most often to have in fact turned off.

ADAS technologies users want to turn off

	% Yes, I have turned off	% Want to turn off, but don't know how	% Combined
Base: Those who are aware of ADAS technologies	varies	varies	varies
Automatic emergency braking (AEB)	9%	8%	17%
Forward collision warning (FCW)	13%	7%	20%
Adaptive cruise control (ACC)	31%	6%	37%
Lane departure warning (LDW)	20%	8%	28%
Lane keeping assistance (LKA)	26%	6%	32%
Blind spot warning (BSW)	8%	7%	15%
ANY OF THE ABOVE	17%	7%	24%

Q11. Have you ever turned off [PIPE-IN BASED ON ALLOCATION]?

ADAS an added safety feature or the potential to lead to driver over-confidence?

Several community members underscore the fact that ADAS technologies are, first and foremost, intended to be assistive devices; they do not absolve drivers of these vehicles from adopting defensive driving habits. If used as intended, ADAS technology can indeed prove helpful and assist in making one's driving experience safer. Community members also acknowledge that the potential for driver complacency and, consequently, potential dire outcomes is very real and that this is largely due to an over-reliance on or a lack of understanding of how ADAS should be used.

Several members also mention that the introduction of ADAS technology is relatively recent and, therefore, there is a learning curve that must be considered. These members tend to focus on the fact that consumers are still familiarizing themselves with ADAS and, as such, initial mistrust is to be expected. However, as this technology becomes more commonplace consumers are likely to increasingly recognize the innate benefits it offers them.

Others appear less convinced of the benefits of ADAS; some of these members see this technology as the thin edge of the wedge leading to automated vehicles (AV) of which they are highly skeptical and distrustful. For those less convinced of the benefits of ADAS, much of their comments focussed on the likelihood this will encourage irresponsible, distracted or over reliant behaviours in some drivers (as highlighted above) and consequently make roads unsafe for all.

"I think in some cases we can rely on these technologies and they make us complacent. Blind spot warning, for example, should not take away from always being aware of your surrounding and the vehicles that are around you at all times."

"[...] These technologies are called 'assistive' for a reason. Every driver still needs to be aware of the environment around them, all 360 degrees of it."

« Je suis assez mitigée, je crois que c'est positif et ça peut aider à conduire de façon plus sécuritaire mais en même temps ça peut aussi nous rendre plus paresseux et moins alerte. »

ADAS and associated distractions or annoyances

Community members tend to agree that ADAS technology can be an annoyance and a source of distraction. There does not appear to be any one ADAS that stands out in particular; rather, members reference a range of systems. Those referenced most include lane departure warning lane keeping assist; blind spot warning; adaptive cruise control; road departure assist; forward collision braking; back up warning; and, automatic emergency braking. Members mentioned being prompted with unexpected noises and visual cues (lights) which, for some, can be overwhelming at times.

For several community members, these ADAS technologies can, at times, fuel a perceived loss of control and, more precisely, the ability to make snap decisions on their own. These feelings tend to be driven by a relative mistrust in the underlying technology that powers these systems. For example, some ADAS features can, at times, be too sensitive and consequently lead to potentially dangerous outcomes, whereas others felt that their own risk tolerance thresholds were more sensitive than the ADAS technology in their vehicle, which in turn served to fuel their sense of loss of control. Others simply feel these features could best be characterized as unnecessary annoyances. Again, a few community members wonder whether some of these issues were generationally based, suggesting that older drivers might find the transition and adaptation to ADAS technology more challenging than those who may have learned to drive more recently.

Conversely, it is possible that those who are less inclined to learn and observe the rules of the road could become overly reliant on these technologies, essentially relinquishing control to ADAS. Despite these views, it should be noted that many community members speak of how while ADAS may be somewhat overwhelming at first, drivers get used to them over time.

"Some of the warning sounds, lights, and in some cases even vibrations (in some lane keep assist systems) can be overwhelming and counterintuitively serve to distract us even further when the system should keep us more focused on our driving."

« Je pense que les conducteurs ayant plus d'expérience sur la route auront plus de difficultés à faire confiance à ces dispositifs. »

"I understand the benefits of these systems, but we have to be careful as to who uses them. Some older drivers will have lots of difficulty adjusting to new systems which might actually be distracting and unsafe. Proper training is required and must be taken by those who are in fact using these new systems."

4. Importance of ADAS in purchasing/leasing decisions

According to the survey, seven in ten (69%) of those aware of blind spot warning say it is an important factor in their decision to purchase or lease a vehicle in the future. In addition, six in ten consider forward collision warning important to their decision-making. All others are hovering around half. There is little difference by gender, but some differences by age. In general, older Canadians (age 65+) place greater importance on ADAS than younger Canadians, particularly when it comes to blind spot warning and forward collision warning. Interestingly, among those aware of these technologies there is little difference in the level of importance they place on ADAS when it comes to education or household income.

Importance of ADAS in decision to purchase or lease a vehicle

	TOTAL	Male	Female	16-24	25-34	35-49	50-64	65+
Base: Those who are aware of ADAS	varies							
Automatic emergency braking (AEB)	54%	58%	51%	59%	56%	47%	49%	63%
Forward collision warning (FCW)	60%	62%	58%	65%	57%	55%	53%	73%
Adaptive cruise control (ACC)	47%	49%	44%	41%	50%	38%	45%	57%
Lane departure warning (LDW)	54%	55%	52%	48%	52%	47%	49%	66%
Lane keeping assistance (LKA)	48%	51%	43%	54%	50%	39%	45%	54%
Blind spot warning (BSW)	69%	71%	66%	68%	65%	63%	64%	81%

Q12_t2b. [T2B Summary] How important a factor do you think each of these ADAS technologies will be in your decision to purchase or lease a vehicle in the future?

5. Sources of information about ADAS

Canadians who want to learn about an ADAS feature, for example, about what they do or how they work are most likely to go to the internet first and look for related online forums for information. A basic google search is also common, as is information from the car manual (particularly older Canadians age 65+), the manufacturer's website or even car dealerships.

	TOTAL	Male	Female	16-24	25-34	35-49	50-64	65+
Base: All respondents	2000	965	1023	143	444	453	505	455
Online/ internet search/ review forums/ panels	26%	24%	27%	15%	19%	24%	31%	32%
Google search	17%	17%	16%	18%	24%	19%	12%	12%
Car manual	15%	15%	14%	8%	10%	11%	16%	23%
Manufacturer's website	13%	14%	12%	11%	12%	15%	15%	10%
Car dealership/ salesperson (demos, website)	10%	9%	11%	3%	4%	8%	11%	19%
Car manufacturers	5%	5%	4%	1%	3%	4%	5%	8%
YouTube	4%	5%	2%	5%	5%	4%	3%	2%
From a friend/ family member	3%	2%	4%	3%	1%	1%	4%	5%
Ads on TV/ radio	1%	1%	2%	-	2%	1%	2%	1%
None/ all is covered	3%	3%	4%	5%	4%	3%	4%	2%
Other	8%	8%	8%	15%	8%	7%	7%	7%
DK/ NA	15%	12%	17%	21%	21%	18%	10%	8%

Q13 What sources do you/would you use if you want to learn about an ADAS feature, for example, about what they do or how they work?

Only one-third of Canadians who have driven a vehicle with ADAS say they have been offered information about ADAS features at a dealership. The survey shows that older Canadians age 65+ are most likely to have been offered information (46%). There are no other notable differences by demographic or socio-economic variables.

Incidence of being offered information at the dealership

	TOTAL	Male	Female	16-24	25-34	35-49	50-64	65+
Base: Those who have driven ADAS technology vehicles	780	451	326	53	176	182	181	188
Yes	34%	37%	30%	28%	28%	30%	33%	46%
No	47%	47%	47%	40%	55%	53%	42%	38%
Not sure	12%	10%	15%	18%	10%	9%	17%	11%
Not applicable	7%	6%	8%	14%	7%	8%	8%	5%

q14. Have you ever been offered information about any ADAS feature at a dealership?

6. ADAS: most compelling messages

Most community members tend to agree that ADAS technologies can in fact contribute to protecting other road users (pedestrians, cyclist and other drivers). According to some, any measures or efforts taken to raise drivers' 'awareness of their surroundings' is likely to be beneficial for all those using the road. That said, several community members do insist on noting that these technologies are indeed 'assistive devices' and as such they do not absolve drivers from having to remain aware of their surroundings. Once again, the discussion here focusses on the potential for overreliance on and potential distractions resulting from ADAS technologies which could potentially have negative consequences.

"A friend of mine was able to avoid a major collision on the highway when the warning system in his vehicle brought his attention to a vehicle in his blind spot. This was enough to convince me that their systems exist for a reason."

"I think it definitely helps stop accidents before they happen. Drivers are more distracted than ever so the possibility of a reminder to pay attention when needed is a big help. The idea of the car letting you know you are about to hit something when you otherwise might have not been paying attention or noticed it is a big deal. Also generally speaking in my area drivers are choosing larger and larger vehicles and the sight lines and general swing of the vehicle is making driving more difficult and harder to maintain visibility on all areas."

When questioned as to what it would take to convince them that ADAS makes driving safer, community members views can be grouped into 5 broad categories:

- Hard Data: Empirical data that has been peer reviewed and is longitudinal in scope would likely be most
 effective. Indeed, many community members say that evidence-based data that points to the effectiveness and
 reliability of the technology, as well as lives saved as a result of ADAS, would be preferred.
- **Testimonials/real life stories:** Use of real-life testimonials from drivers who have been positively impacted by ADAS tech could help convince them; however, this view is often countered by others who raise questions about the validity or legitimacy of these types of testimonials noting that verifying the accuracy of this information could be a challenge.
- **Financial benefits for the purchaser:** Illustrating the real life financial/monetary benefits for those driving ADAS equipped vehicles could be effective for instance, monies saved on vehicle repairs due to avoidable accidents.
- **Shift in focus at point of sale:** Sellers could do a better job of underscoring the innate benefits of ADAS equipped vehicles at point of sale.
- **Regulatory framework:** There could simply be legislation put in place that would make ADAS a regulatory requirement like wearing seatbelts.

"Yes, I think ADAS technologies can protect road users. If someone was trying to convince me that these technologies make driving safer, I would be looking for arguments and messages that are based in high quality research from academia that have no conflicts of interest."

"I do think they can help protect others from distracted drivers, whose cars alert them before it's too late. Stories of how it prevented accidents would most likely catch my attention."

"It would come down to data. The number of lives saved would get my attention. Also, the numbers have to be collected over a long period of time."

"Cela serait intéressant de voir les statistiques qui démontrent tous les avantages de ces systèmes !!! »

"To a point, yes they make the road safer for everyone. But people still need to rely on themselves and be aware of their surrounds at all times. I think the message that would convince me the most would have simple visuals attached to it. Something that is eye grabbing and contains facts but is short and to the point."

"[...] the message that resonates with me is less chance of a vehicle accident and if one does occur the severity and chance of injury should be reduced."

« Que ces systèmes peuvent sauver des vies et non seulement celle des autres mais la nôtre. Pour contrer la fatigue ou les distractions faciles »

« Je possède déjà ces systèmes de sécurité sur ma voiture [...)] et il est certain que cela protège autant les automobilistes que les piétons et les cyclistes. Pour me convaincre, pas très difficile puisque j'aime bien ces dispositifs qui sont déjà sur ma voiture. Quand on pense qu'on peut éviter des collisions avec une autre voiture, un cycliste, un piéton... on se rend compte que ces systèmes "intelligents" ont toute leur raison d'être. De plus, puisqu'on diminue le risque de dégâts matériel sur notre voiture (et sur celles des autres conducteurs), nos polices d'assurance pourraient être moins chère »

Who bears responsibility for ensuring ADAS tech is understood and used properly?

Community members tend to agree that more needs to be done to assist owners in familiarizing themselves with these systems.

When it comes to who or what organization should be primarily responsible for doing this, they typically see this as a shared responsibility between sellers, manufacturers, governments and purchasers/operators. Community members are most likely to feel that sellers (dealerships and re-sellers) as well as vehicle manufacturers are primarily responsible. Several members suggest dealerships should take the necessary steps to ensure purchasers are made aware of all ADAS their vehicle is equipped with before they take possession of the vehicle. Some of the ways this could be accomplished include:

- Required viewing of a manufacturer's video related specifically to functionality of ADAS technology available in the newly purchased vehicle.
- A mandatory road test at time of delivery where the seller/ representative from the dealership would ride
 along and point out the various systems the vehicle was equipped with and what to expect when they were
 activated.
- A review of manufacturer produced written educational materials related ADAS prior to leaving the dealership.

According to community members, car manufacturers should be responsible for preparing and making available YouTube-like videos to highlight vital ADAS information related to vehicles they produce and for posting relevant training materials online via manufacturers' websites etc. Some suggest that familiarization with ADAS technologies

should be part of the curriculum during drivers' education courses and a few members mention a role for government in terms of raising public awareness of ADAS.

It should be noted however that several members point out that notwithstanding all of the above, ultimately it was the purchasers/owners/drivers' responsibility to familiarize themselves with vehicles they are purchasing/operating.

"The manufacturers should create videos that are easy to watch and host them on their website or on YouTube. The dealers should advise you of such videos, but I don't think it's their responsibility to create them."

« Je crois que c'est aux constructeurs automobiles de les tester et de les améliorer. Ensuite ces dispositifs devraient être bien expliqués chez le concessionnaire quand on va chercher notre automobile. »

"The dealership and salesperson could spend some time to explain these features in depth and also of possible, show them on a test drive. I know this is a bit more difficult right now with Covid-19 though. I am not sure really who should be responsible for teaching new owners about the features. I guess at point of sale, they should be explained in depth and owners should also take some responsibility and learn the features safely."

"I think it is the responsibility of a combination between self-education and the seller/dealership. The seller/dealership should give a brief description and presentation to the new owner about the new technology that is equipped with the new car and the owner himself should read the manual and get himself familiarize with the new technology. There should be some form of digital demonstration available for the driver to learn the new technology as well."

7. Automated vehicles

Between 2019-2020 there has been a small increase in Canadians' familiarity with automated vehicles. In 2019, 34% of Canadians indicated they are at least somewhat familiar with automated vehicles -- without seeing a definition of automated vehicles. (6% indicated being very familiar.) In 2020, 37% report being familiar, including 7% very familiar. Notably, phone respondents (probability sample) report much higher levels of familiarity at 56% including 19% very familiar.

Familiarity with AVs

	2020 Total	2020 (Online)	2020 (Phone)	2019 (Online)
	А	В	С	D
Base: All respondents	2500	2000	500	3113
Weighted	2500	2000	500	3113
Very familiar	9%	7%	19%	6%
Somewhat familiar	31%	30%	37%	28%
Neither familiar nor unfamiliar	6%	7%	1%	-
Not very familiar	31%	32%	25%	38%
Not at all familiar	20%	22%	13%	25%
Not sure	2%	2%	4%	3%
Summary				
Very or somewhat	41%	37%	56%	34%
Not very or not at all	51%	54%	38%	63%

q15. How familiar would you say you are with automated vehicles?

In 2019, familiarity with AVs was fairly similar across the country although lower in Quebec. In 2020, there is again little difference across the country and familiarity in Quebec increased to be consistent with other parts of the country. Familiarity increased between 2019 and 2020 among men (from 41% to 50%). Consistent with 2019 data, familiarity is higher among younger Canadians (familiarity decreases with age).

Familiarity with AVs by gender and age

	TOTAL	Male	Female	16-24	25-34	35-49	50-64	65+
		А	В	С	D	Е	F	G
Base: All respondents	2500	1263	1213	190	556	593	638	523
Weighted	2500	1199	1277	202	532	564	646	556
Very familiar	9%	11%	7%	16%	11%	9%	7%	7%
Somewhat familiar	31%	39%	24%	32%	33%	33%	30%	30%
Neither familiar nor unfamiliar	6%	6%	6%	8%	7%	7%	5%	4%
Not very familiar	31%	28%	34%	26%	29%	31%	32%	32%
Not at all familiar	20%	15%	26%	15%	16%	17%	24%	25%
Not sure	2%	1%	3%	2%	3%	2%	2%	2%
DK/REF	0	-	0	-	-	-	-	0
Summary								
Very or somewhat	41%	50%	32%	48%	44%	42%	37%	37%
Not very or not at all	51%	43%	60%	42%	45%	48%	56%	57%

q15. How familiar would you say you are with automated vehicles?

Attitudes about AVs

Respondents were shown 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 about automated vehicles and how they will function on the nation's roads. In 2020 30% agree they would be comfortable riding in a fully automated car, 47% disagree, while 23% have a neutral opinion or don't know.

In order to compare to 2019, where a neutral option was not offered, the 29% agree from the online sample was rebased to exclude the percentage who chose neutral. This increased the 29% to 35% and disagree increased from 47% to 56%. The re-based data is comparable with 2019, meaning opinions have remained constant since 2019 when 33% agreed and 54% disagreed. Notably, phone respondents (probability sample) are as likely as online respondents to disagree, but more likely to agree, meaning there are fewer fence sitters in the neutral category. The level of agreement that automated vehicles will help keep the roads safer for everyone is also much higher among phone respondents than online respondents. The combined result is 41% agree and 26% disagree. Compared to 2019, when re-based data is used, we observe that 52% agree (online rebased) and 35% disagree (online rebased). Notably, this represents a 10 point increase in comfort from 2019.

Percentage who agree/disagree with AV statements

% agree	2020 Total	2020 (Online)	2020 (Phone)	2020 (Online rebased*)	2019 (Online)
Base: All respondents	2500	2000	500		
I would be comfortable riding in a fully automated vehicle.	30%	29%	37%	35%	33%
Automated vehicles will help keep the roads safer for everyone.	41%	39%	48%	52%	42%
Automated vehicles are cyber secure (e.g. secure from hackers, terrorists, fraud or unwanted access).	17%	16%	21%	n/a	n/a

q16_t2b. [Agree Summary] Please indicate your level of agreement or disagreement with the following statements about automated vehicles

^{*}re-based to exclude neutral neither agree nor disagree used in 2020, so the scale matches the 2019 scale.

% disagree	2020 Total	2020 (Online)	2020 (Phone)	2019 (Online)*	2019 (Online)
Base: All respondents	2500	2000	500		
I would be comfortable riding in a fully automated vehicle.	47%	46%	49%	54%	54%
Automated vehicles will help keep the roads safer for everyone.	26%	26%	29%	35%	38%
Automated vehicles are cyber secure (e.g. secure from hackers, terrorists, fraud or unwanted access).	42%	42%	39%	n/a	n/a

q16_t2b. [Disagree Summary] Please indicate your level of agreement or disagreement with the following statements about automated vehicles

When it comes to security, relatively few Canadians (17%) agree that automated vehicles are cyber secure (e.g. secure from hackers, terrorists, fraud or unwanted access). While a substantial minority (42%) disagree, all others offer a neutral rating or don't know. Concerns about the cyber security of automated vehicles are correlated with comfort in riding in an automated vehicle. Therefore, it may be useful to include cyber security in activities aimed at raising public awareness of automated vehicles. While security concerns are more prevalent among older Canadians, at 25% and 30% respectively, there is also room to increase confidence among those ages 16-24 and 25-34.

Percentage who agree/disagree with AV statements by gender and age

	TOTAL	Male	Female	16-24	25-34	35-49	50-64	65+
Base: All respondents	2500	1199	1277	202	532	564	646	556
I would be comfortable riding in a fully automated vehicle.	30%	38%	23%	44%	43%	33%	22%	20%
Automated vehicles will help keep the roads safer for everyone.	41%	49%	33%	53%	50%	41%	34%	34%
Automated vehicles are cyber secure (e.g. secure from hackers, terrorists, fraud or unwanted access).	17%	21%	13%	30%	25%	17%	11%	12%

q16_t2b. [Agree Summary] Please indicate your level of agreement or disagreement with the following statements about automated vehicles

^{*}re-based to exclude neutral neither agree nor disagree used in 2020, so the scale matches the 2019 scale.

Interestingly, when it comes to concerns or confidence in security of AVs there does not appear to be much correlation with awareness of ADAS technologies, but it is to some extent is correlated familiarity. The scores are very similar regardless of whether the respondent is aware of ADAS or not (17% of those aware of the top 6, or in fact of any, ADAS technologies vs. 12% of those not aware of any). However, those familiar with ADAS are twice as likely as to say that they believe AVs are secure as those who are unfamiliar (22% vs. 11%). Interestingly, there is no difference of opinion when it comes to those with a valid driver's license and those who do not, and no differences by regions across Canada.

Perceived advantages or disadvantages of AVs

Given the 2020 survey was conducted via mixed methodology, there was an opportunity to measure Canadians' predisposed notions of the advantages and disadvantages of AVs in two different ways. In 2019, the online survey utilized a prompted list of potential advantages and disadvantages from which respondents selected the ones that apply to their view of AVs. In 2020, we mirrored this approach to the questions -- using a prompted list in order to track changes in opinions year over year, but also utilized an unprompted approach. The unprompted approach was to keep the question open-ended and allow respondents to state the advantages and disadvantages without putting a notion in their mind. This could be argued to be a more useful approach as it requires the respondent to think of the factors that they associate with AVs top of mind, rather than reacting to ideas given to them. Reacting to possible ideas is a more rationale or possibly suggestive type of thinking, while top of mind better reflects level of knowledge and independent beliefs.

The dual approach shows interesting findings. Notably, safety/reduction of driver error was mentioned equally as often unprompted and promoted and in both approaches as the most frequent advantage of AVs (50% of online and 55% of phone respondents identified safety. This validates that safety is the top advantage. Beyond safety, Canadians come up with fewer advantages unprompted, suggesting that most Canadians do not have a good sense of any other advantages. The second most frequent mention unprompted is convenience, but even though mentioned second most frequently, 11% offered this response unprompted. In comparison, among those answering online with prompting, several other advantages are identified including some that were identified up to 20 times as often than through the unprompted approach. A stand-out is the frequency with which respondents prompted with "easier for elderly or persons with disabilities" – selected by 50% of respondents online vs. 7% unprompted over the phone. This suggests that this is a compelling, but not obviously an advantage of AVs. It would be effective to inform the public of this advantage as it clearly resonates once informed.

Other major differences between prompted and unprompted responses, that are reasonably compelling as advantages, but not obvious to most Canadians include:

- Less stressful/don't have to worry as much about driving
- Better traffic flow/reduces congestion
- Reduced travel times
- Better for the environment/reduced emissions
- Better fuel economy/cheaper to run
- Lower insurance premiums

When comparing back to 2019, we observe that the top advantages of AVs identified by Canadians remained the same: safety/reduction in driver error, and easier vehicle operation for elderly or disabled persons (prompted). The latter did increase in year over year in the frequency with which it was mentioned which may speak to some increased awareness

or education or that there is more focus on elderly persons and persons with disability in the past year, making it be selected more often. The other advantage that increased in frequency year over year is lower insurance premiums.

Perceived advantages of AVs

	2020 Total	2020 (Online)	2020 (Phone)	2019 (Online)
Base: All respondents	2500	2000	500	3113
Safer/reduces driver error/fewer bad or impaired drivers	51%	50%	55%	51%
Convenience/can do other things while driving	22%	24%	11%	29%
Less stressful/don't have to worry as much about driving	26%	30%	9%	31%
Better traffic flow/reduces congestion	26%	31%	8%	27%
Reduced travel times	9%	11%	2%	12%
Better for the environment/reduced emissions	18%	21%	3%	21%
Better fuel economy/cheaper to run	18%	23%	1%	21%
Lower insurance premiums	21%	26%	3%	18%
Easier for elderly/persons with (a) disability(ies)	41%	50%	7%	40%
Better for the economy e.g. improved productivity	11%	13%	2%	11%
Anyone can drive/don't need a driving license	14%	17%	3%	14%
No advantages	11%	11%	12%	13%
Not sure	12%	12%	12%	11%

q17. What do you think are the advantages, if any, of automated vehicles?

When it comes to differences by gender and age, it is noteworthy that a greater percentage of men are able to identify several advantages compared with women. As well, a greater percentage of those under age 50 are able to identify advantages compared with those over age 50.

Perceived advantages of AVs by gender and age

	TOTAL	Male	Female	16-24	25-34	35-49	50-64	65+
Base: All respondents	2500	1199	1277	202	532	564	646	556
Safer/reduces driver error/fewer bad or impaired drivers	51%	54%	46%	54%	54%	49%	50%	49%
Convenience/can do other things while driving	22%	26%	17%	26%	34%	22%	20%	11%
Less stressful/don't have to worry as much about driving	26%	28%	24%	30%	35%	25%	22%	21%
Better traffic flow/reduces congestion	26%	34%	19%	29%	32%	27%	21%	25%
Reduced travel times	9%	12%	6%	11%	18%	9%	6%	5%
Better for the environment/reduced emissions	18%	20%	15%	20%	22%	17%	14%	18%
Better fuel economy/cheaper to run	18%	22%	16%	18%	22%	19%	15%	18%
Lower insurance premiums	21%	24%	19%	16%	28%	22%	19%	19%
Easier for elderly/persons with (a) disability(ies)	41%	43%	40%	38%	45%	37%	43%	41%
Better for the economy e.g. improved productivity	11%	14%	8%	13%	18%	10%	8%	8%
Anyone can drive/don't need a driving license	14%	16%	13%	19%	22%	14%	12%	7%

No advantages	11%	10%	12%	4%	6%	9%	15%	17%
Not sure	12%	9%	15%	11%	9%	13%	11%	16%

q17. What do you think are the advantages, if any, of automated vehicles?

In general, higher income households are able to identify more advantages than lower income households.

Perceived advantages of AVs by household income

	<\$40K	\$40K - <\$80K	\$80K - <\$150K	\$150K+
Base: All respondents	348	554	589	195
Safer/reduces driver error/fewer bad or impaired drivers	46%	53%	51%	56%
Convenience/can do other things while driving	21%	22%	29%	32%
Less stressful/don't have to worry as much about driving	28%	30%	34%	33%
Better traffic flow/reduces congestion	24%	29%	34%	41%
Reduced travel times	9%	10%	13%	15%
Better for the environment/reduced emissions	21%	20%	22%	26%
Better fuel economy/cheaper to run	21%	24%	24%	28%
Lower insurance premiums	24%	24%	31%	29%
Easier for elderly/persons with (a) disability(ies)	48%	48%	52%	57%
Better for the economy e.g. improved productivity	14%	11%	16%	13%
Anyone can drive/don't need a driving license	18%	17%	16%	21%
No advantages	11%	12%	11%	7%
Not sure	13%	11%	9%	8%

q17. What do you think are the advantages, if any, of automated vehicles?

The dual approach shows interesting findings when it comes to perceived disadvantages as well. Notably, equipment/system failure was mentioned most frequently both unprompted and promoted but was identified twice as often prompted than unprompted (66% of online and 32% of phone respondents identified safety). Several other aspects were identified online as frequently or thereabouts. In other words, Canadians find many of the prompted disadvantages as compelling. These include:

- Vehicle fails to react to unexpected situations
- Drivers will become lazy/pay less attention
- Drivers will become less skillful
- Concerns about operation in winter/Canadian weather
- Concerns about cyber security threats (e.g. hackers, terrorists, fraud)
- Legal liability/knowing who is at fault
- Loss of driver control.

When comparing back to 2019, we observe that the top disadvantages of AVs identified by Canadians remained the same, although fewer identify Interacting with other human drivers. And, more Canadians year over year see the disadvantages as:

- Drivers will become lazy/pay less attention
- Drivers will become less skillful

- Loss of driver control
- Legal liability/knowing who is at fault
- Concerns about cyber security threats (e.g. hackers, terrorists, fraud)
- Data privacy (e.g., location tracking)
- Concerns about operation in winter/Canadian weather

Perceived disadvantages of AVs

	2020 Total	2020 (Online)	2020 (Phone)	2019 (Online)
Equipment/system failure	59%	66%	32%	65%
Vehicle fails to react to unexpected situations	53%	63%	10%	64%
Interacting with other human drivers	22%	27%	2%	37%
Interacting with pedestrians/cyclists	33%	40%	3%	41%
Drivers will become lazy/pay less attention	60%	68%	24%	62%
Drivers will become less skillful	51%	61%	9%	54%
Loss of driver control	42%	50%	10%	43%
Legal liability/knowing who is at fault	42%	52%	5%	44%
Concerns about cyber security threats (e.g. hackers, terrorists, fraud)	48%	57%	15%	45%
Data privacy (e.g., location tracking)	34%	42%	2%	33%
Concerns about operation in winter/Canadian weather	48%	59%	3%	50%
Impact on jobs/drivers losing jobs	22%	28%	2%	24%
Driving becomes less fun/enjoyable	23%	29%	2%	25%
No disadvantages	2%	1%	3%	2%
Not sure	6%	6%	8%	6%

q18. What do you think are the disadvantages, if any, of automated vehicles?

When it comes to differences by gender and age, it is noteworthy that a greater percentage of men are able to identify several disadvantages compared with women. As well, a greater percentage of those under age 50 are able to identify advantages compared with those over age 50.

Perceived disadvantages of AVs by gender and age

	TOTAL	Male	Female	16-24	25-34	35-49	50-64	65+
Base: All respondents	2500	1199	1277	202	532	564	646	556
Equipment/system failure	59%	57%	62%	51%	51%	54%	66%	68%
Vehicle fails to react to unexpected situations	53%	49%	56%	44%	50%	49%	57%	57%
Interacting with other human drivers	22%	22%	22%	17%	18%	20%	25%	26%
Interacting with pedestrians/cyclists	33%	32%	34%	26%	29%	30%	35%	38%
Drivers will become lazy/pay less attention	60%	55%	64%	47%	50%	57%	64%	70%
Drivers will become less skillful	51%	48%	54%	40%	43%	47%	57%	60%
Loss of driver control	42%	38%	46%	33%	35%	39%	48%	50%
Legal liability/knowing who is at fault	42%	41%	44%	39%	42%	38%	45%	45%

Concerns about cyber security threats (e.g. hackers, terrorists, fraud)	48%	48%	49%	41%	46%	46%	51%	53%
Data privacy (e.g., location tracking)	34%	32%	36%	29%	30%	35%	40%	32%
Concerns about operation in winter/Canadian weather	48%	47%	49%	34%	43%	43%	51%	58%
Impact on jobs/drivers losing jobs	22%	22%	23%	27%	26%	21%	23%	18%
Driving becomes less fun/enjoyable	23%	27%	21%	22%	17%	23%	27%	27%
No disadvantages	2%	2%	1%	2%	2%	2%	2%	1%
Not sure	6%	6%	7%	10%	7%	7%	6%	5%

q18. What do you think are the disadvantages, if any, of automated vehicles?

Community Members Views on Automated Vehicles

Community members, for the most part, are skeptical of automated vehicles. In large part, this skepticism is fueled by a lack of knowledge and general understanding of how automated vehicles operate. Some simply dismiss automated vehicles out of hand, while others raise a variety of concerns they feel would need to be addressed before they would consider the purchase of an automated vehicle. These community members state that they cannot imagine not being in control of their vehicle. Others raise several issues that would need to be addressed or further clarified before they would consider operating or riding in an automated vehicle. These issues can generally be grouped into 5 broad categories.

- **Cyber security** more specifically, concerns related to potential cyber vulnerabilities in automated vehicle systems that may result in hacking.
- **Driving conditions** several members question this technology's ability to adapt to constantly changing driving environments which is most often framed in the context of varying weather conditions. Having said this community members also offer up other examples such as children playing on/by the roadside, animals crossing roads etc. This last point appears to be of particular concern for several members who speak of our northern climate and consequently of the potential for less than ideal road and driving conditions these members are largely unconvinced that automated vehicles could safely and effectively negotiate snow covered or icy roads.
- System malfunctions according to members, the potential for system malfunctions in automated vehicles is real. Several mention that they would need to know that AV operators could quickly and easily override the system in order to retake control of driving functions if needed.
- **Data** as is the case for ADAS, members suggest that in order to convince them of the safety of automated vehicles they would need to have access to or be presented with trusted and vetted longitudinal data that underscores the safety of these vehicles.
- **Training** some members suggest that eventual AV drivers/operators should have to receive special training in operating procedures (in-vehicle training, videos, websites, printed training materials) prior to operating an automated vehicle.

"I would need to know that they can't be used where/when they shouldn't be used. That the conditions for which they are designed are the only conditions that they will engage. If they aren't designed for snow, then they won't turn on in snowy conditions and the human driver will need to be fully engaged. Can't be forced into unsafe or unpredictable scenarios."

« Il faudrait que les véhicules autonomes soient parfaitement adaptés pour la conduite hivernale au Canada et passent avec succès plusieurs évaluations auprès d'organisations gouvernementales pour assurer leur niveau de sécurité. »

"DATA – there needs to be extensive data showing they do not get into collisions and protect occupants and pedestrians."

8. Conclusions

Reader's note

This survey provides an update on level of public awareness and confidence in ADAS technologies and automated vehicles from the baseline survey conducted in 2019. It also provides some direction on the most impactful factors that influence confidence. It is important to note that surveys are a snap-shot in time, and therefore reflect public opinion at the time the survey is conducted. As well, every survey has limitations such as the size and representativeness of the sample. The 2019 survey was conducted online using a non-probability panel of respondents. The Government of Canada standards state that the results of surveys using non-probability samples, particularly large samples such as the 2019 survey (>n=3000), can be relied upon to provide an accurate and reliable reflection of public opinion, but should not be generalized to reflect the wider Canadian population. For this reason, Government of Canada standards for reporting public opinion research precludes the publishing margins of error and credibility intervals for non-probability based sample methods. In 2020, to improve the survey coverage and allow for the results to be generalizable to the wider population, the methodology was shifted to a mixed online and phone sample frame with the latter using a probability-based dual-cell/landline sampling method. The 2020 survey was also large at n=2500 and thus is reliable.

Key Findings

The 2020 survey found that half of Canadians are familiar with ADAS technologies, with most of these Canadians being somewhat familiar. Therefore, there is a large opportunity to increase the public's familiarity with ADAS technologies. Additionally, the survey found a correlation between familiarity with these technologies and confidence in them to make our roads safer. Confidence in ADAS increases the more familiar Canadians are with them.

In terms of the type of information that would be beneficial to highlight in communications aimed at increasing familiarity with ADAS, the survey identified that educating Canadians about how ADAS assist the driver with unexpected events is an effective way to increase confidence in these technologies. Education efforts may be more effective if they target women, younger and less affluent Canadians as they are least familiar and less supportive in general. In terms of the technologies themselves, Canadians are least aware of lane keeping assistance, adaptive cruise control, automatic emergency braking and forward collision warning. Therefore, it may be most effective to focus on how these specific technologies mitigate or reduce the risk of unexpected events. Further to this, more research could provide additional insight into a) understanding if there are other, more impactful advantages of ADAS that were not covered in the survey in a manner that can be statistically correlated with perceptions of improved road safety, and b) understanding the types of unexpected events that are most compelling or worrisome to Canadians and would resonate strongly in communications.

ADAS technologies are important to future vehicle purchase decisions among those who have used them, but the pool of Canadians who have used them is similar in size to last year. Feeling safer driving in a vehicle with ADAS strengthens the belief that these technologies make roads safer for drivers and others on the road. At present half of users feel safer driving a vehicle with ADAS. To build greater support for the value proposition of ADAS and grow uptake, the findings suggest that it would be useful to better understand why many drivers do not feel safer when using the technology and

what might strengthen their feelings of safety. Building greater confidence that the technology works well and is enjoyable to use also promotes support for these technologies and in turn increases interest. Future research opportunities could include these areas as well.

In terms of future research methodologies that might be used to address these objectives, there are a few well-suited options. The first is an IBN driver analysis that undercovers the structure of the relationship between factors contributing to feeling safer on the road when using ADAS. This will help inform communications aimed at building confidence and interest in ADAS. The second is a behavioural science study to better understand how a driver's usage (or misusage) of ADAS influences feelings of safety. Note: each individual ADAS technology should be studied separately as the type and/or magnitude of the factors that influence usage behaviour may vary from one technology to another. Several types of behavioural science projects can be useful in this regard ranging from a qualitative or observational client journey exercise, quantitative predictive analytics modelling exercise or longitudinal behaviour experiment.

When it comes to fully automated vehicles, many Canadians remain skeptical, largely due to a lack of knowledge about these vehicles. They are not convinced they make roads safer (i.e. fear of failure, increased drive laziness etc.) and many have concerns regarding the cyber security of these vehicles. These factors can impact the comfort with considering riding in a fully automated vehicle. More research could provide additional insight into how Canadians form their opinions about the impact on road safety and cyber security of automated vehicles. As well, greater analysis of the degree to which understanding the advantages related to convenience, particularly for elderly and persons with disabilities, influences opinions of automated vehicles may be useful.

Appendix A: Methodology

This research consisted of two phases. Phase 1 was a mixed-methodology survey of n=2500 Canadians age 16-80 (n=2000 online and n=500 telephone). Phase 2 consisted of a 2-day online community to gather qualitative insights to help flesh out the key learning for the survey.

Phase 1: Survey of Canadians

Sample frame and mode

A mixed-methodology survey was conducted with a total of n=2500 Canadians age 16-80 where 90% of the sample has a valid driver's licence and 10% do not. A total of n=2000 sample was conducted online to mimic the methodology used in 2019. The online sample was drawn from Ipsos' online and partner panels (non-probability sample, no margin of sampling error is reported). Online 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.

A total of n=500 sample was conducted by telephone using a dual frame landline and cell phone households (70% cell phone primary and 30% landline). This is a probability-based sample. The addition of the probability-based telephone sample was a valuable addition as it provides greater coverage and inclusive of perspective of those not part of an online panel.

Quotas were set by age, gender, and region on each sample separately, to make each sample closely reflects the composition of the population. The samples were statistically weighted independently to ensure each sample matches this population according to the most recently available Census information (region, age, gender) prior to be merged. Where tracking the data was intended to track against the 2019 data, only the online sample of n=2,000 has been used in order to promote comparability by matching the methodology of the 2019 survey (n=3,113 online sample of Canadians), otherwise the data reported reflects the combined n=2500 sample.

The following distribution of interviews was achieved:

Target Audience	2019 Online Unweighted	2019 Online Weighted	2020 Online Unweighted	2020 Online Weighted	2020 Telephone Unweighted	2020 Telephone Weighted	2020 Combined Unweighted	2020 Combined Weighted	%
Licensed drivers	2789	2805	1803	1803	451	443	2254	2246	90%
Unlicensed drivers	324	308	197	197	49	57	246	254	10%
Total	3113	3113	2000	2000	500	500	2500	2500	100%

The survey obtained the following regional distribution:

Target Audience	2019 Online Unweighted	2019 Online Weighted	2020 Online Unweighted	2020 Online Weighted	2020 Telephone Unweighted	2020 Telephone Weighted	2020 Combined Unweighted	2020 Combined Unweighted	%
British Columbia	474	416	268	262	62	62	330	323	13%
Alberta	432	311	237	225	56	56	293	281	11%
Saskatchewan	174	124	50	48	16	16	66	64	3%
Manitoba	175	125	85	83	17	17	102	99	4%
Ontario	700	1183	773	769	192	192	965	961	38%
Quebec	680	716	449	468	117	117	566	585	23%
New Brunswick	124	57	35	37	11	11	46	48	2%
Nova Scotia	141	64	66	70	13	13	79	83	3%
Prince Edward Island	78	37	5	5	2	2	7	7	<0%
Newfoundland and	121	60	23	24	8	8	31	32	1%
Yukon	5	5	2	2	2	2	4	4	<0%
Northwest	7	11	7	7	2	2	9	9	<0%
Nunavut	2	4	0	2000	2	2	2	2	<0%
CANADA	3113	3113	2000	262	500	500	2500	2500	100%

Questionnaire design

Transport Canada provided Ipsos with the 2019 survey questionnaire and material on ADAS technology. Ipsos then designed a questionnaire in consultation with Transport Canada to ensure its research objectives were met. Upon approval of the English questionnaire, Ipsos arranged for the questionnaire to be translated into French by professional translators. The survey was programmed and tested online and telephone. Prior to finalizing the survey for field, a pretest (soft launch) was conducted in English and French via both methodologies. As no changes were required following the pre-test, these responses have been included in the final data set. The final survey questionnaire is included in Appendix B.

Fieldwork

The survey was conducted using a secure, fully featured web-based survey environment. The interviews took place from December 9 to 21, 2020. The average interview length was 11 minutes by telephone and 8 minutes online. 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 online

Disposition	N
Total invitations (c)	5500
Total completes (d)	2000

Qualified break-offs (e)	303
Disqualified (f)	8
Not responded (g)	
Quota filled (h)	585
Contact rate = (d+e+f+h)/c	53%
Participation rate = (d+f+h)/c	47%

Contact disposition – Telephone

The telephone response rate is calculated as follows: Response Rate/Participation Rate = R/(U + IS + R)

Disposition	N
Total Numbers Attempted	32020
Out-of-scope - Invalid	19475
Unresolved (U)	7114
No answer/Answering machine	7114
In-scope - Non-responding (IS)	4784
Language barrier	104
Incapable of completing (ill/deceased)	13
Callback (Respondent not available)	574
Refusal	4031
Termination	62
In-Scope - Responding Units (R)	625
Completed Interview	500
DQ - Disqualify	106
Partial Completes	19
Response Rate (%) R/(U + IS + R)	5%

Respondent Profile

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

Variable	2019 %	2020 %
Age		
16-24	4	8
25-34	25	21
35-49	24	23
50-64	26	26
65+	21	22
Gender		
Male	51	51
Female	49	48
Other / Prefer not to say	0	1
Education		
High school or less	23	22
Apprentice/college/some university	37	34
University graduate/post-graduate	39	42
Prefer not to say	0	1

Total annual household income				
Under \$20,000	6	5		
\$20,000 - <\$40,000	13	12		
\$40,000 - <\$60,000	16	14		
\$60,000 - <\$80,000	15	14		
\$80,000 - <\$100,000	14	14		
\$100,000 - <\$150,000	17	15		
\$150,000 +	8	10		
Prefer not to say	11	16		
Community size (self-reported)				
Rural <30K	29	24		
Medium 30k -500K	37	35		
Large urban 500K	34	40		
Language spoken at home				
English	79	82		
French	22	18		
Other	3	0		

^{*}The % are the same for online as for telephone since they were weighted independently.

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	Online Sample*	Telephone Sample *	Canada (2016) Census)
Gender			
Male	50%	52%	49%
Female	49%	46%	51%
Other	1%	2%	0%
Age			
16-34	32%	22%	29%
35-49	24%	23%	24%
50-64	24%	29%	26%
65+	21%	21%	21%
Refused	0%	5%	
Education level			
High school diploma or less	22%	21%	35%
Trades/college/post sec no degree	34%	37%	36%
University degree	43%	39%	29%
Prefer not to day	1%	3%	0%

^{*} Data are unweighted and percentages based on those giving a response to each demographic question

^{*}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

Phase 2: Online Community

Qualitative Results are based on a series of questions posed on Ipsos Conversations - an omnibus online qualitative community designed to provide clients with qualitative insights. Findings flowing from the qualitative component of the research are not drawn from a representative sample of the Canadian population, they should be considered directional and thematic in nature, they should not and cannot be extrapolated to the wider research audience

159 Ipsos Conversations community members shared their thoughts on topics related to advanced driver assistance systems (ADAS) as well as automated vehicle (AV) technologies between January 28th and January 30th, 2021. The table below provides additional context related to the volume and nature of interactions within the Ipsos Conversations Community environment.

Total number of participants	159
Total number of Posts	1775
Total number of Likes	540
Average number of contributions per participant	11.16

Community members took part in online bulletin board style activities – they were invited to answer a series of openended questions individually *before* being exposed to the answers of other community members and were encouraged to interact with each other.

Appendix B: Quantitative research instrument

[ASK ALL]

2020 Public Opinion Research on Automated Vehicles and ADAS Technologies Questionnaire NOTE 2: DUE TO LENGTH CONCERNS, THE FOLLOWING QUESTIONS <u>WILL NOT</u> BE INCLUDED IN THE TELEPHONE VERSION OF THE SURVEY: Q10-Q14

TELEPHONE INTRODUCTION	
Hello, this is calling from Ipsos, a professional public opinion research company on behalf Transport Canada. Today we're talking to Canadians about new features in vehicles. We are not trying to sell you anything - this is strictly a brief survey and your responses will be kept confidential.	of
Would you prefer that I continue in English or French?	
The survey takes about 10 minutes to complete. Should you have any questions about the survey, I can give you a contact person within the Government of Canada / Department name.	
carol.lau@tc.gc.ca	
Your participation is voluntary and confidential. Your answers will remain anonymous, and the information you prowill be administered according to the requirements of the Privacy Act, the Access to Information Act, and any other pertinent legislation. Is this a safe and convenient time for you? May I continue?	
SCREENING QUESTIONS	
[ASK IF SAMPLE=LANDLINE] S1a. May I please speak with the person in your household who is 16 years of age or older and who has had the mo recent birthday? Would that be you? (IF NOT, ASK TO SPEAK WITH MEMBER 16+ WITH THE LAST BIRTHDAY AND START AGAIN)	st
Yes (CONTINUE)	
No (ASK TO SPEAK TO 'ELIGIBLE' PERSON AND START AGAIN)	
REFUSED (THANK AND TERMINATE)	
[ASK IF SAMPLE=CELLPHONE] S1b. Are you 16 years of age or older?	
Yes (CONTINUE)	
No (THANK AND TERMINATE)	
DK/REF (THANK AND TERMINATE)	

1a. In what year were you born?

Record year: [RANGE: 1920-2004]

[If 81 or older THANKS AND TERMINATE]

[ASK IF QAGE = DON'T KNOW/NO RESPONSE]

1b. Would you be willing to tell me in which of the following age categories you belong? (READ LIST)

16 to 17

18 to 24

25 to 34

35 to 44

45 to 54

55 to 64

65 to 74

75 to 80

81 or older

[If 81 or older /DK/REF THANKS AND TERMINATE]

2. In what province or territory do you live? (do not read)

British Columbia

Alberta

Saskatchewan

Manitoba

Ontario

Quebec

New Brunswick

Nova Scotia

Prince Edward Island

Newfoundland and Labrador

Yukon

Northwest Territories

Nunavut

3. How do you identify yourself? (Select one only)

Female

Male

Other gender identity

(Do not read) Prefer not to answer

4. Do you currently have a valid driver's license? (Select one only)

Yes, I have a valid driver's license

No, I do not have a valid driver's license

[Quota instruction- if DK/REF move to No]

[INFO SCREEN.] There are driver assistance technologies on many new vehicles today. These are called Advanced Driver Assistance Systems (ADAS). Some driver assistance technologies like blind spot warning, are designed to warn you if you are at risk of an accident, while others, like automatic emergency braking, are designed to take action to help avoid a crash. Note that manufacturers may use different names for these technologies.

5. How familiar would you say you are with Advanced Driver Assistance Systems (ADAS)? (read list)

Very familiar Somewhat familiar Not very familiar Not at all familiar Not sure

6. Please indicate your level of agreement or disagreement with the following statements about Advanced Driver Assistance Systems (ADAS). [INSERT ITEM] (READ LIST). (How about) [INSERT NEXT ITEM] (READ LIST IF NECESSARY)

[RANDOMIZE]

When used properly, ADAS features help make roads safer. Information about the proper use of ADAS technologies is not easily accessible. ADAS technologies make drivers over-confident. ADAS technologies assist the driver with unexpected events.

Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree
Not sure

7. Please select which of these ADAS technologies you have heard of (including those you have interacted with, experienced as a passenger, seen on a commercial or heard about elsewhere). Please note that you may know these technologies by other names. [Multi -punch](Select all that apply, read list)

Very familiar
Somewhat familiar
Not very familiar
Neither familiar nor unfamiliar
Not at all familiar
Not sure

[SHOW TO ALL]

I am now going to read you a description of some of the technologies we have been talking about?

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.

Fully automated vehicles will be capable of doing all of the driving themselves, without the need of a human driver. It is important to note that these types of vehicles are not currently available to the general public on the Canadian market.

15. Please indicate your level of agreement or disagreement with the following statements about automated vehicles [INSERT ITEM] (READ LIST). (How about) [INSERT NEXT ITEM] (READ LIST IF NECESSARY)

[RANDOMIZE]

I would be comfortable riding in a fully automated vehicle.

Automated vehicles will help keep the roads safer for everyone.

Automated vehicles are cyber secure (e.g. secure from hackers, terrorists, fraud or unwanted access).

Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree
Not sure

16. What do you think are the advantages, if any, of automated vehicles? [Multi-punch](select all that apply)

(DO NOT READ accept all responses, probe up to 3 times)

Safer/reduces driver error/fewer bad or impaired drivers
Convenience/can do other things while driving
Less stressful/don't have to worry as much about driving
Better traffic flow/reduces congestion
Reduced travel times
Better for the environment/reduced emissions
Better fuel economy/cheaper to run
Lower insurance premiums
Easier for elderly/persons with (a) disability(ies)
Better for the economy e.g. improved productivity
Anyone can drive/don't need a driving license
Other (Please specify)
No advantages
Not sure

17. What do you think are the disadvantages, if any, of automated vehicles? (select all that apply) **[DO NOT READ accept all responses, probe up to 3 times]**

Equipment/system failure

Vehicle fails to react to unexpected situations

Interacting with other human drivers

Interacting with pedestrians/cyclists

Drivers will become lazy/pay less attention

Drivers will become less skillful

Loss of driver control

Legal liability/knowing who is at fault

Concerns about cyber security threats (e.g. hackers, terrorists, fraud)

Data privacy (e.g., location tracking)

Concerns about operation in winter/Canadian weather

Driving becomes less fun/enjoyable

Other (Please specify)

No disadvantages

Not sure

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.

18. What is the highest level of formal education you have completed? (READ LIST UNTIL RESPONSE GIVEN) (Select one only)

Up to high school Some high school

High school diploma or equivalent

Registered Apprenticeship or other trades certificate or diploma

College, CEGEP or other non-university certificate or diploma

University certificate or diploma below bachelor's level

Bachelor's degree

Post graduate degree above bachelor's level

Prefer not to answer

19. How big is the community in which you live? Would you say it is: (Read list, Select one only)

A rural or small community (with a population below 30,000)

A medium-sized community or city (with a population of at least 30,000 but under 500,000)

A large urban centre (with a population of 500,000 or more)

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.

2020 Public Opinion Research on Automated Vehicles and ADAS Technologies Questionnaire NOTE 1: QUESTIONS TRACKED FROM THE 2019 SURVEY ARE: Q1-Q4, Q7, Q9, Q12-13 (slightly altered), Q15, 16 (ITEM 1&2), Q17-Q21

ONLINE LANDING PAGE

Please select your preferred language for completing the survey.

English

French

Welcome to this survey about new vehicle technologies. The survey is being conducted by Ipsos, an independent research company, on behalf of Transport Canada, and will take about 10 minutes of your time.

Your participation is entirely voluntary and all of your answers will be kept completely confidential and anonymous.

Thank you in advance for your participation.

Once the online survey is approved, the survey will be formatted for telephone.

The following represents the online scripting format.

SCREENING QUESTIONS

1. In what year were you born? - DROP DOWN LIST

IF UNDER 16 THANK AND TERMINATE

IF AGE 81+ THANK AND TERMINATE

2. In what province or territory do you live? - DROP DOWN LIST

British Columbia

Alberta

Saskatchewan

Manitoba

Ontario

Quebec

New Brunswick

Nova Scotia

Prince Edward Island

Newfoundland and Labrador

Yukon

Northwest Territories

Nunavut

3. How do you identify yourself? (Select one only)

Female Male Other gender identity Prefer not to answer

4. Do you currently have a valid driver's license? (Select one only)

Yes, I have a valid driver's license No, I do not have a valid driver's license

INFO SCREEN. There are driver assistance technologies on many new vehicles today. These are called Advanced Driver Assistance Systems (ADAS). Some driver assistance technologies like blind spot warning, are designed to warn you if you are at risk of an accident, while others, like automatic emergency braking, are designed to take action to help avoid a crash. Note that manufacturers may use different names for these technologies.

6. How familiar would you say you are with Advanced Driver Assistance Systems (ADAS)?

Very familiar Somewhat familiar Not very familiar Not at all familiar Not sure

8. Please indicate your level of agreement or disagreement with the following statements about Advanced Driver Assistance Systems (ADAS).

GRID ROWS

[RANDOMIZE]

When used properly, ADAS features help make roads safer.
Information about the proper use of ADAS technologies is not easily accessible.
ADAS technologies make drivers over-confident.

ADAS technologies assist the driver with unexpected events.

GRID COLUMNS

Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree
Not sure

9. Please select which of these ADAS technologies you have heard of (including those you have interacted with, experienced as a passenger, seen on a commercial or heard about elsewhere). Please note that you may know these technologies by other names. (Select all that apply)

[RANDOMIZE]

Automatic emergency braking
Forward collision warning
Adaptive cruise control
Lane departure warning
Lane keeping assistance
Blind spot warning
Back—up camera
Parking collision warning
Automatic emergency steering
Active Parking Assistance
None of the above [EXCLUSIVE DO NOT RANDOMIZE]
Not sure [EXCLUSIVE DO NOT RANDOMIZE]

Please read the following description of these technologies.

NAME	DESCRIPTION
Automatic emergency	This technology detects a potential collision with obstacles ahead, provides
braking (AEB)	forward collision warning, and automatically applies the brakes to avoid or
	lessen the severity of the impact. Some systems send an alert if a
	pedestrian or other object is detected.
Forward collision	This technology detects and warns the driver of a potential collision with a
warning (FCW)	vehicle ahead. Some systems include pedestrian or other object detection.
Adaptive cruise	This technology assists with acceleration and/or braking to
control (ACC)	maintain a prescribed distance between it and a vehicle in front.
	Some systems can come to a stop and continue.
Lane departure	This technology monitors the vehicle's position within the driving
warning (LDW)	lane and alerts the driver as the vehicle is drifting over the lane
	markings.
Lane keeping	This technology assists with steering to maintain the vehicle within the
assistance (LKA)	driving lane.
Blind spot warning	This technology warns drivers of a vehicle in their blind spot while
(BSW)	driving. Some systems provide an alert when the driver activates
	the turn system and there is a vehicle in that blind spot.

[IF AWARE OF AT LEAST ONE TECHNOLOGY IN Q7 CONTINUE, OTHERWISE SKIP TO Q13]

10. Do you think these features should be on all new vehicles?

GRID ROWS

[PIPE-IN TECHNOLOGY NAME IF HEARD OF IN Q7] [PIPE-IN IF HEARD OF IN Q7]

Automatic emergency braking (AEB) Forward collision warning (FCW) Adaptive cruise control (ACC) Lane departure warning (LDW) Lane keeping assistance (LKA) Blind spot warning (BSW)

GRID COLUMNS

Yes

No

Not sure

11. Have you ever driven, or been a passenger in, a vehicle equipped with these features?

GRID ROWS

[PIPE-IN IF HEARD OF IN Q7]

Automatic emergency braking (AEB) Forward collision warning (FCW) Adaptive cruise control (ACC) Lane departure warning (LDW) Lane keeping assistance (LKA) Blind spot warning (BSW)

GRID COLUMNS

(Select all that apply)
Driver
Passenger
No [EXCLUSIVE]
Unsure [EXCLUSIVE]

[IF NO OR UNSURE TO ALL IN Q9 SKIP TO 13]

[IF YES AT Q4 AND (DRIVER OR PASSENGER TO AT A LEAST ONE AT Q9) DEFINE AS DRIVER OWNER/USER AND CONTINUE TO Q10-Q12. ALL OTHERS SKIP TO Q13]

[ASK Q10-Q12 FOR ONE TECHNOLOGY THE RESPONDENT HAS SELECTED 'DRIVER' OR 'PASSENGER' IN Q9 -- PRIORITIZE THE TECHNOLOGY FOR WHICH THE RESPONDENT IS A DRIVER (PER Q9) AND THEN USE LEAST FILL ALLOCATION IF RESPONDENT IS DRIVER ON MORE THAN ONE TECHNOLOGY. IF THE RESPONDENT DID NOT ANSWER DRIVER TO ANY TECHNOLOGY IN Q9, USE LEAST FILL ALLOCATION TO ASSIGN TECHNOLOGY]

12. Please indicate your level of agreement or disagreement with the following statements about your experience using [PIPE-IN BASED ON ALLOCATION].

GRID ROWS

[RANDOMIZE]

I think it works well

I worry about my driving data being captured/privacy

I feel safer when using it

I feel less stressed when using it

I know how to use it properly

I feel comfortable using it

My driving is good enough so this feature is not needed

I find it annoying

It is difficult to use

I don't know how to use it properly

I had a bad experience with it

It impresses passengers

I enjoy using it

It's distracting

GRID COLUMNS

Strongly agree

Somewhat agree

Neither agree nor disagree

Somewhat disagree

Strongly disagree

Not sure

[IF THE RESPONDENT DID NOT ANSWER DRIVER TO ANY TECHNOLOGY IN Q9, SKIP TO Q12]

13. Have you ever turned off [PIPE-IN BASED ON ALLOCATION] ? (Select one only)

Yes [specific reason]

No. I prefer to keep it on.

No. I want to turn it off but don't know how.

Not sure

[ASK Q12 IF AWARE OF AT LEAST ONE TECHNOLOGY IN Q7 CONTINUE, OTHERWISE SKIP TO Q13]

14. How important a factor do you think each of these ADAS technologies will be in your decision to purchase or lease a vehicle in the future?

GRID ROWS

[PIPE-IN IF HEARD OF IN Q7]

Automatic emergency braking (AEB)

Forward collision warning (FCW)

Adaptive cruise control (ACC)

Lane departure warning (LDW)

Lane keeping assistance (LKA)

Blind spot warning (BSW)

GRID COLUMNS

Very important
Somewhat important
Neutral / Neither important nor unimportant
Not very important
Not at all important
Not applicable
Not sure

[ASK TO ALL]

15. What sources do you/would you use if you want to learn about an ADAS feature, for example, about what they do or how they work?

[OPEN-END TEXT BOX]

[IF YES AT Q4 AND (DRIVER TO AT A LEAST ONE AT Q9) ASK Q14, OTHERWISE SKIP TO Q15]

16. Have you ever been offered information about any ADAS feature at a dealership?

Yes No Not sure Not applicable

[ASK TO ALL]

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

Very familiar Somewhat familiar Not very familiar Neither familiar nor unfamiliar Not at all familiar Not sure

[SHOW TO ALL]

Please read the following description of automated vehicles.

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.

Fully automated vehicles will be capable of doing all of the driving themselves, without the need of a human driver. It is important to note that these types of vehicles are not currently available to the general public on the Canadian market.

18. Please indicate your level of agreement or disagreement with the following statements about automated vehicles

GRID ROWS

[RANDOMIZE]

I would be comfortable riding in a fully automated vehicle.

Automated vehicles will help keep the roads safer for everyone.

Automated vehicles are cyber secure (e.g. secure from hackers, terrorists, fraud or unwanted access).

GRID COLUMNS

Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree
Not sure

19. What do you think are the advantages, if any, of automated vehicles? (select all that apply)

[ONLINE VERSION] [TELEPHONE VERSION] [DO NOT READ accept all responses, probe up to 3 times] [RANDOMIZE]

Safer/reduces driver error/fewer bad or impaired drivers

Convenience/can do other things while driving

Less stressful/don't have to worry as much about driving

Better traffic flow/reduces congestion

Reduced travel times

Better for the environment/reduced emissions

Better fuel economy/cheaper to run

Lower insurance premiums

Easier for elderly/persons with (a) disability(ies)

Better for the economy e.g. improved productivity

Anyone can drive/don't need a driving license

Other (Please specify)

No advantages [EXCLUSIVE NO RANDOMIZATION]

Not sure [EXCLUSIVE NO RANDOMIZATION]

20. What do you think are the disadvantages, if any, of automated vehicles? (select all that apply)

[ONLINE VERSION] [TELEPHONE VERSION] [DO NOT READ accept all responses, probe up to 3 times] **[RANDOMIZE]**

Equipment/system failure

Vehicle fails to react to unexpected situations

Interacting with other human drivers

Interacting with pedestrians/cyclists

Drivers will become lazy/pay less attention

Drivers will become less skillful

Loss of driver control

Legal liability/knowing who is at fault

Concerns about cyber security threats (e.g. hackers, terrorists, fraud)

Data privacy (e.g., location tracking)

Concerns about operation in winter/Canadian weather Impact on jobs/drivers losing jobs
Driving becomes less fun/enjoyable
Other (Please specify)
No disadvantages [EXCLUSIVE NO RANDOMIZATION]
Not sure [EXCLUSIVE NO RANDOMIZATION]

NOT SHOWN: FOR ANALYSIS NOT SHOWN: SAFETY-NET CODES 1-4

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.

21. What is the highest level of formal education you have completed? (Select one only)

Up to high school
Some high school
High school diploma or equivalent
Registered Apprenticeship or other trades certificate or diploma
College, CEGEP or other non-university certificate or diploma
University certificate or diploma below bachelor's level
Bachelor's degree
Post graduate degree above bachelor's level
Prefer not to answer

- 22. How big is the community in which you live? Would you say it is: (Select one only)
 - A rural or small community (with a population below 30,000)
 - A medium-sized community or city (with a population of at least 30,000 but under 500,000)
 - A large urban centre (with a population of 500,000 or more)
- 23. 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)

Under \$20,000 \$20,000 to just under \$40,000 \$40,000 to just under \$60,000 \$60,000 to just under \$80,000 \$80,000 to just under \$100,000 \$100,000 to just under \$150,000 \$150,000 and above 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.

Appendix C: Qualitative Conversations community questions

Introduction to Short Term Community

This week we would like you to spend some time reflecting on driver assistance technologies that can now be found in many new vehicles nowadays. These technologies are often referred to as Advanced Driver Assistance Systems (ADAS). Some driver assistance technologies like blind spot warning, are designed to alert you if you are at risk of a collision, while others, like automatic emergency braking, are designed to take action to help avoid a crash.

It is important to note that different manufacturers may use different names for these technologies. We have provided a brief table below which is intended to provide you with a more detailed description of each of these technologies. We would ask that you take a few minutes to review and familiarize yourself with this information prior to contributing to the conversation.

NAME	DESCRIPTION
Automatic emergency	This technology detects a potential collision with obstacles ahead, provides forward
braking (AEB)	collision warning, and automatically applies the brakes to avoid or lessen the severity of the
	impact. Some systems send an alert if a pedestrian or other object is detected.
Forward collision	This technology detects and warns the driver of a potential collision with a vehicle ahead.
warning (FCW)	Some systems include pedestrian or other object detection.
Adaptive cruise	This technology assists with acceleration and/or braking to maintain a prescribed
control (ACC)	distance between it and a vehicle in front. Some systems can come to a stop and
	continue.
Lane departure	This technology monitors the vehicle's position within the driving lane and alerts
warning (LDW)	the driver as the vehicle is drifting over the lane markings.
Lane keeping	This technology assists with steering to maintain the vehicle within the driving lane.
assistance (LKA)	
Blind spot warning	This technology warns drivers of a vehicle in their blind spot while driving. Some
(BSW)	systems provide an alert when the driver activates the turn system and there is a
	vehicle in that blind spot.

DAY 1 Activity Questions

- 1. Do you currently hold a valid driver's license? [Single-select]
 - Yes
 - No
- 2. When you think of advanced driver assistance systems (ADAS), what are some of the advantages or benefits that come to mind? Please explain, in detail, why you think this is an advantage. [Text Response]
- 3. Do you think that some ADAS technologies can protect road users (pedestrians, cyclists, other drivers, etc.)? IF someone was trying to convince you that these technologies make driving safer, what information, arguments or messages would be most likely get your attention? [Text Response]

4. So far, we've asked you to focus on the positives and the benefits associated with ADAS technologies, but what about drawbacks, are there any? Can you share any stories about a time when the technology did not behave as expected when either you or someone you know was driving a vehicle equipped with ADAS technologies? How did you/they react? [Text Response]

Please go back and read through responses other community members have provided – just a selection, not all of them. Feel free to comment on what others have said by 'replying' to their posts. **[prompt]**

The hope is to start a conversation – so expand and elaborate on what others are saying. Help us understand WHY you also agree or perhaps have a different view. **[prompt]**

As always, disagreement is fine but let's keep the conversation respectful and civilized.

Once you have done that, you have reached the end of the activity. Please reach out to Nina.Wang01@ipsos.com if you have any questions.

Introduction to Short Term Community Day Two

As we continue to explore your views related to driver assistance technologies, we wanted to remind you of some technologies that are found in many new vehicles nowadays. These technologies are often referred to as Advanced Driver Assistance Systems (ADAS). Some driver assistance technologies, like blind spot warning, are designed to alert you if you are at risk of a collision, while others, like automatic emergency braking, are designed to take action to help avoid a crash.

We would also like to remind you that manufacturers may use different names for these technologies. The table below which is intended to provide you with a more detailed description of each of these technologies. We would ask that you take a moment to review and familiarize yourself with this information prior to contributing to the conversation.

NAME	DESCRIPTION
Automatic emergency	This technology detects a potential collision with obstacles ahead, provides forward
braking (AEB)	collision warning, and automatically applies the brakes to avoid or lessen the severity of the
	impact. Some systems send an alert if a pedestrian or other object is detected.
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warning (FCW)	Some systems include pedestrian or other object detection.
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Lane departure	This technology monitors the vehicle's position within the driving lane and alerts
warning (LDW)	the driver as the vehicle is drifting over the lane markings.
Lane keeping	This technology assists with steering to maintain the vehicle within the driving lane.
assistance (LKA)	
Blind spot warning	This technology warns drivers of a vehicle in their blind spot while driving. Some
(BSW)	systems provide an alert when the driver activates the turn system and there is a
	vehicle in that blind spot.

Day 2 Activity Questions

- 5. While some people say that certain ADAS technologies do in fact make their driving experience safer, others are quick to note that these technologies can, in some cases, make drivers over-confident. What are your thoughts on this? What about drivers who do not trust ADAS technologies? Is the driving experience is less safe when drivers have either too much or too little confidence in ADAS technologies? How so please explain. [Text Response]
- 6. When discussing ADAS technologies, some people have said that in certain cases these systems can be distracting or annoying for drivers. What are your thoughts on this, what specifically might be causing some drivers to see these technologies negatively? Are there certain types of ADAS technologies that you see as being potentially more distracting or annoying than others? What are these ADAS features and why do you say that? [Text Response]
- 7. Many of the new vehicles being manufactured these days are equipped with some form of ADAS technology. We also know from recent survey findings that roughly six in ten respondents say they know how to properly use these technologies. What kinds of things could be done to assist owners with learning how to use these technologies? Who or what organization should be primarily responsible for doing this? [Text Response]
- 8. One reason that people might be concerned about automated vehicles (AVs) is simply that highly automated vehicles aren't on the roads yet and people don't have first-hand experience with them. What specifically would you need to know about automated vehicles in order to feel safe when riding in one? [Text Response]

Please go back and read through responses other community members have provided – just a selection, not all of them. Feel free to comment on what others have said by 'replying' to their posts. **[prompt]**

The hope is to start a conversation – so expand and elaborate on what others are saying. Help us understand WHY you also agree or perhaps have a different view. No need to repeat the same point on multiple posts, we read everything. **[prompt]**

As always, disagreement is fine but let's keep the conversation respectful and civilized.

Once you have done that, you have reached the end of the activity. Please reach out to Nina.Wang01@ipsos.com if you have any questions.