Automated Vehicles in the Greater Toronto and Hamilton Area: Overview from a 2016 Consumer Survey

Part A: Summary and Discussion
Part B: Data Overview
Part C: Survey Instrument

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Automated Vehicles in the Greater Toronto and Hamilton Area: Overview from a 2016 Consumer Survey

Part A: Summary and Discussion

Acknowledgements

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1.0 Introduction

This report presents the discussion of findings from a consumer survey conducted in November 2016 on the topic of autonomous vehicles. These results are based on the descriptive findings in *Part B: Data Overview* and are further documented in *Part C: Survey Instrument*.

This report begins by highlighting the context of why understanding implications of automated vehicles (AVs) for cities is important, discussing the current state of knowledge on this topic, and identifying gaps in knowledge on AVs in the Greater Toronto and Hamilton context. Next, the study approach is introduced and major findings are summarized and discussed. This report component (Part A) is designed to provide an overview, whereas more detailed quantitative findings are documented in *Part B* and the detailed survey design is introduced in *Part C*.

1.1 Context

Automated vehicles may dramatically transform urban travel. There is much uncertainty in how this technology will be produced, purchased, used, and how it will affect urban environments.

Production - Different types of automated vehicles include *fully driverless cars* (autonomous vehicles) and *partially-automated vehicles* which still require driver control for many actions.

Purchasing – It remains unclear under what circumstances autonomous vehicle trips are likely to be purchased by consumers as a service (shared autonomous vehicles), like taxi trips, or through purchasing and using a privately owned vehicle (private automated vehicles), like conventional cars.

Use – It is not clear whether automated vehicles are likely to induce users to travel further, take more trips, abandon public transit and walking, or not substantially change their travel behavior. Alternately, transportation system users could forego vehicle ownership and instead use shared driverless cars to augment public transit use and active travel.

These sources of uncertainty have enormous implications for the transportation system and for what types of outcomes the public might begin to expect from public policymaking in the transportation domain. Automated vehicles could yield enormous benefits, from congestion reduction, fewer greenhouse gas emissions, safer streets, and more reliable travel conditions. But they likewise could erode the market share of public transit, threaten the long-term financial outlook of public transit operators, and lead to urban sprawl. Harnessing the positive elements of automated vehicles through policy action while limiting the negative consequences hinges on understanding how consumers are likely to adopt and use this new technology. Differences in how shared autonomous vehicles (SAVs) or privately-held automated vehicles (PAVs) are used

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have implications for who benefits from this technology and what the broader impacts will be.

1.2 State of Knowledge

Daily travel behaviour not only depends on travel opportunities and individual characteristics but also upon the services provided by new and evolving technologies. The rise in information technology has led to digital activity participation (Gaspar & Glaeser, 1998; Golob & Regan, 2001) and automated vehicles may represent a new disruptive technology which changes how humans engage in daily activities. Previous theoretical work beginning with Von Thuenen (1826), Christaller (1933), and Alonso (1964) has established the links between transportation technologies, urban function, and urban spatial structure. These expectations have been supported by empirical evidence on how transit has both shaped suburbanization (Warner Jr., 1962) and led to denser cities (Chatman & Noland, 2013), while urban freeways have led to regional growth (Duranton and Turner, 2012) and induced suburbanization (Baum-Snow, 2007). When adopted en masse, new technologies have often led to increased functional spaces - at least for the majority of the population - and reshaped land markets.

Automated vehicles have the potential to change travel behavior and household location decisions. Private-sector companies are investing in advances in automated vehicle technology, however the broader implications of this technology on society, cities, and the environment is poorly understood. To date, only a few studies have investigated how consumers may respond and the impacts of autonomous vehicles remain uncertain – providing limited clarity for public policy to maximize the collective benefits. The studies found that consumers who have high travel intensity or travel long distances (Kyriakidis et al., 2015; Krueger, Rashidi, & Rose, 2016; Robertson, Meister, & Vanlaar, 2016), who are familiar with automated vehicle technology (Shoettele & Sivak, 2014; Kyriakidis et al. 2015), live in urban areas (Bansal, Kockelman, and Singh, 2016; Lavieri et al., 2017), or are technologically-savvy (Bansal, Kockelman, & Singh, 2016; Zmud, Sener & Wagner, 2016; Lavieri et al., 2017) are more willing to adopt new technologies. Shoettele and Sivak (2014) found consumers generally perceive automated vehicles as positive. More specifically, Bansal, Kockelman, and Singh (2016) found that consumers view fewer car accidents as one of the largest benefits to automated vehicle technology. The effect of demographic features, such as age and income on automated vehicle adoption is not clearly understood and current studies disagree on whether a relationship exists (Zmud, Sener & Wagner, 2016; Bansal, Kockelman, & Singh, 2016; Krueger, Rashidi, & Rose, 2016; Lavieri et al., 2017; Deloitte, 2016).

1.3. Research Gaps and Opportunities

There is much speculation in the discourse about the future of automated vehicles. Policymakers must nevertheless grapple with the likelihood of alternate futures, their implications, and what policy actions are necessary to manage such a technology in a way to improve broader social and

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environmental objectives. There is a significant need for research to disentangle the hype to inform policy as to how actual people are likely to respond to the new technology. The need to identify and test alternate implications on travel behavior are particularly important when exploring the likely social outcomes of a new technology, which so dramatically changes the mobility landscape.

A consumer survey was deployed in November 2016 to estimate how Greater Toronto-Hamilton Area (GTHA) residents are likely to adopt, use, and respond to automated vehicles. This survey focuses each on the vehicle ownership, travel behavior, and location decision elements of consumer choice to explore the relative impact of automated vehicles and their attributes on future travel behaviour. Adoption, use, and implications of automated vehicles will be differentiated between the two different ownership models. *Private automated vehicles* (PAVs) are owned by individuals and could be either semi-autonomous (still needing a driver sometimes) to fully-autonomous (no driver needed). *Shared autonomous vehicles* (SAVs), function very similarly to taxis or technology-enabled mobility products (e.g. Uber or Lyft) – except there is no driver. The potential role of policy will be discussed in the context of harnessing positive opportunities of AVs while limiting potential negative consequences.

2.0 Approach

A survey was conducted in November, 2016, focusing on four core research questions:

1) Under what conditions are GTHA consumers likely to adopt either PAVs or SAVs?

2) If PAVs or SAVs are adopted, how are transportation system users likely to change their travel behaviour?

3) How are residents likely to change their choices regarding location and urban form?

4) What role could planning and policy play in managing automated vehicle adoption and use, to maximize benefits and minimize negative consequences?

The data was obtained through an online survey of 3,201 adults in the Greater Toronto and Hamilton Area, age 18 to 75. Survey participants were recruited from a panel managed by Research Now. To reasonably represent the regional population, the survey was administered with hard targets for respondents within each of the two cities (Hamilton and Toronto) and four

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regional governments (Durham, Halton, Peel and York Regions). Those targets were:

> Durham Region - 400
> Halton Region - 300
> Hamilton - 300
> Peel Region - 500
> Toronto - 1200 (300 in each of the four operational districts)
> York Region - 500

After data collection, results were adjusted based on the sample age groups, gender and region of residence to align with 2011 Statistics Canada estimates of the underlying population. The proportions of each of these groups was weighted to align with the observed proportions of the respective gender/age/region group based on Statistics Canada estimates. As the 2011 Statistics Canada data used as a reference only had female/male descriptors for gender, adjustments to this group reflect the mean gender-specific adjustments for each age group in each region.

Each individual in the survey represents, on average, 1,498 individuals, depending on the relative survey frequency of any given gender/age/region group combination.

3.0 Summary

Results in this report are descriptive in nature. Two other reports (one complete and one still pending as of March 9, 2018) from this project further explore causal and predictive interpretations based on both modeling and focus group research.

Findings from descriptive analyses provide guidance with regards to the four core issues: *consumer adoption*, *AV use and travel behaviour*, potential impacts on *location decisions and urban form*, and *policy implications*. Each of these is briefly discussed below.

Consumer Adoption (*Under what conditions are GTHA consumers likely to adopt either PAVs or SAVs?*)

- Most (84%) respondents have heard of AVs

- Half (52%) are at least somewhat interested in regularly using AVs

- Younger respondents are more interested in purchasing and using AVs

- Willingness to purchase AVs is affected by how much more expensive they are than conventional vehicles. For example, with a $15,000 premium, 8.0% indicate willingness to adopt fully driverless cars, while with only a $1,000 premium, 51.3% indicate willingness to adopt. One-quarter (25.2%) are completely uninterested in purchasing AVs, regardless of price.

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AV Use and Travel Behaviour (*If PAVs or SAVs are adopted, how are transportation system users likely to change their travel behaviour?*)

- Consumers respond to the cost of SAV trips. While one-third (31%) are unwilling to use SAVs even at a price of $0.50 per kilometer, at prices of $1.00 or $1.50 per kilometer, respectively, 56% and 70% of individuals indicate no interest in using SAVs for trips (excluding to access/egress transit).

- At a cost of $1.50 per kilometer, 2.6% of respondents indicate an interest in either selling or not replacing their current vehicle. One-quarter (28.0%) of respondents indicate an interest in either selling or not replacing their current vehicle should the price of an SAV be at most $0.50 per kilometer.

- A majority of respondents opt not to use shared driverless cars in their commute, with costs of operation of $1.00/km or more

- Approximately equal shares of respondents indicate interest in sharing a driverless car with another passenger at a reduced price (34.0%), uncertainty (27.4%), or unwillingness to do so (38.6%).

Location Decisions and Urban Form (*How are residents likely to change their choices regarding location and urban form?*)

- If AVs are faster than conventional vehicle travel
    - 58.6% of respondents are willing to travel further to work in a faster driverless car, especially in Hamilton, Toronto, and Peel

- AVs appear likely to change travel behavior and housing/work location decisions even if they are not faster than conventional vehicles
    - 47.5% of respondents willing to travel further to work in a driverless car even if it is not faster than a conventional car
    - Urban residents (Hamilton and Toronto) are most interested in travelling further with AVs even if they are not faster
    - Younger participants are more willing to travel further if AVs are available

- Approximately half of respondents indicate interest in locating to a neighbourhood with good shared AV services (on-demand technology-enabled mobility delivered by an autonomous car)
    - Toronto and Peel residents are most interested in neighborhoods with high-quality SAV services

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Policy (*What role could planning and policy play in managing automated vehicle adoption and use, to maximize benefits and minimize negative consequences?*)

- Strong public preference (47.9%) for monitoring the use of AVs and responding when necessary. One-quarter (24.5%) prefer active encouragement of AVs, while less than ten percent prefer discouragement of AVs (5.9%) or an uninvolved public sector which leaves AV management to market forces (9.4%).

- Approximately half of respondents support (47.1%) public investment to encourage, support, or regulate AVs, but 61.5% indicate that additional taxes should not be proposed towards this end.

- One-third of respondents indicate interest (35.5%) in the public sector acting as an innovator and taking the lead on AVs

- Little support (14.9%) for additional taxes to support AVs and lack of support increases with age

- Among those willing to fund public spending on AVs, respondents expect public sector funding to increase more for roads than for transit or demand management

4.0 Discussion

Overall findings indicate several themes:

Younger residents are persistently more interested in AVs – regardless of type of use or ownership model.

- Age is associated with several attitudes related to AVs, including:

    o Interest to adopt (younger residents are more interested)

    o Travel behavior (older residents are less interested in commuting further)

    o Government preferences (older residents are less interested in government action related to AVs)

However, it is unclear whether the links between AV interest and age are related to cohort differences (which are embedded in generations even as they age) or age group-related differences (which are related to general responsibilities and lifecycle change).

The most urban areas appear poised to experience both disconnects between jobs and housing and higher premiums for high-quality SAV neighborhoods.

- Urban residents of Hamilton, Toronto, and Peel appear to be more willing to commute further should they be able to multitask or travel faster in an AV

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- Likewise, urban residents of Toronto and Peel are also more interested in locating in neighborhoods with high-quality SAV services

Respondents expect a soft role for the public sector in preparing for autonomous vehicles.

- Currently there is an expectation for an observational, reactive stance from government

- There is some support for government investment in AVs, but strong opposition to increased taxes to do so

- Given the potential impacts of AVs, there is stronger support for increased government funding for roads than for public transit or demand management. But respondents indicate an expectation that AVs will have implications for public policy across modes

- There is strong support for government to play a regulatory role, but general uncertainty for a role as innovator and leader in overseeing AV use

Consumers are still learning about automated vehicles.

Respondents are still learning about automated vehicle technology, with just over 50% aware of the Google Car – indicating a potential public role in disseminating information to the public

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Part B: Data Overview

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1.0 Overview

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2.0 **AV Attitudes**

2.1 Awareness of Google Car

Figure 1. Responses to "I Have Heard of Google Car Before Today"
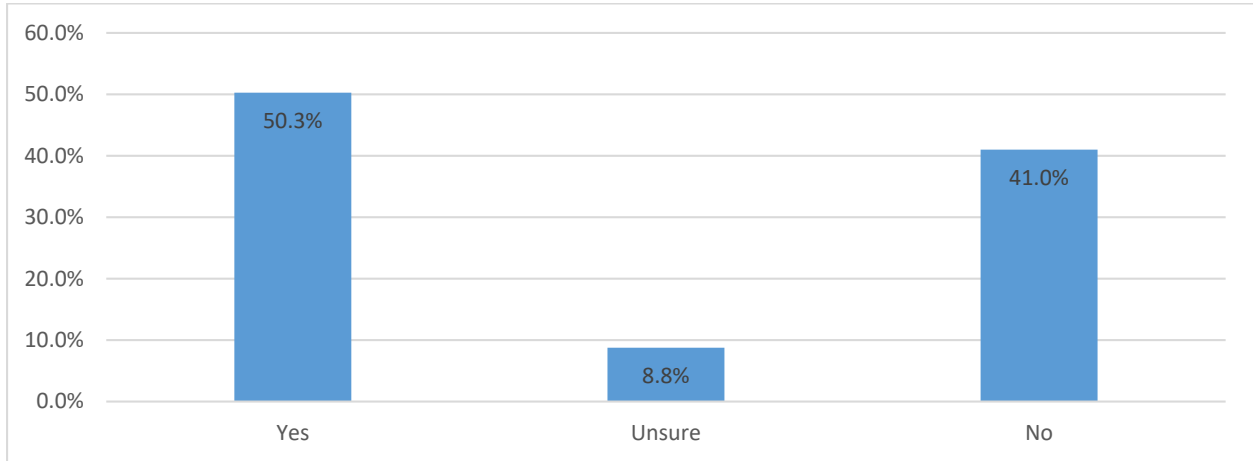
Figure 2. Responses to "I Have Heard of Google Car Before Today" (by Age)
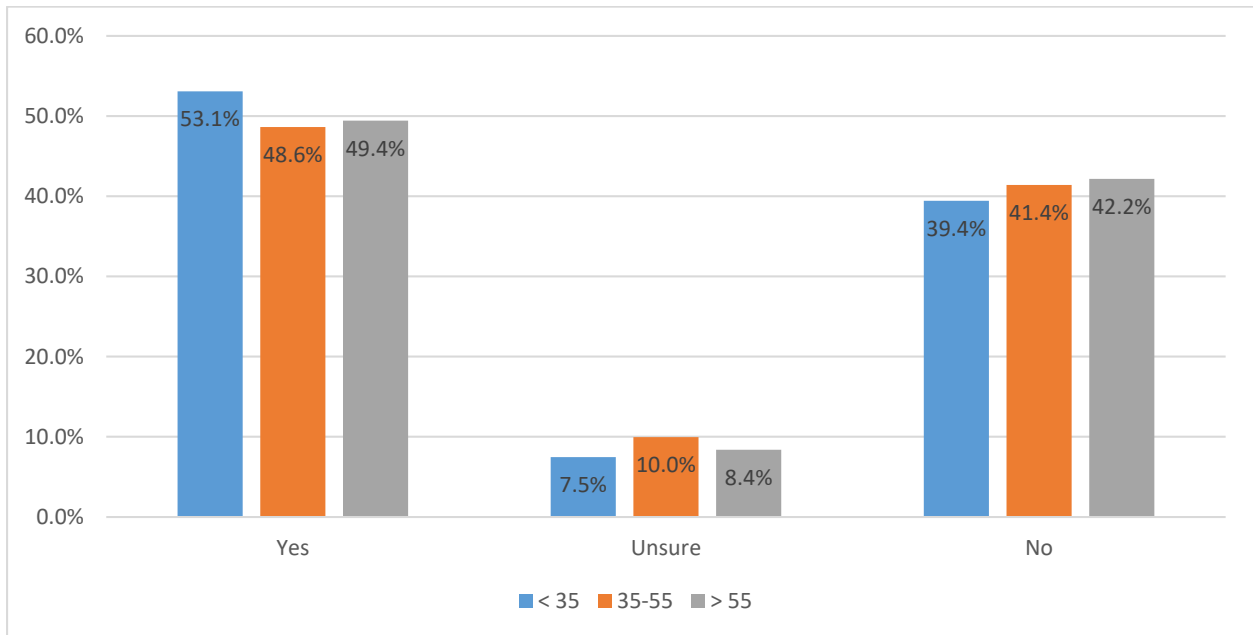
Key Takeaways:

- Half of respondents have heard of the Google car, a reasonable indicator of specific familiarity with driverless cars

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2.2 Awareness of Driverless Cars

Figure 3. Responses to "I Have Heard of Driverless Cars Before Today"
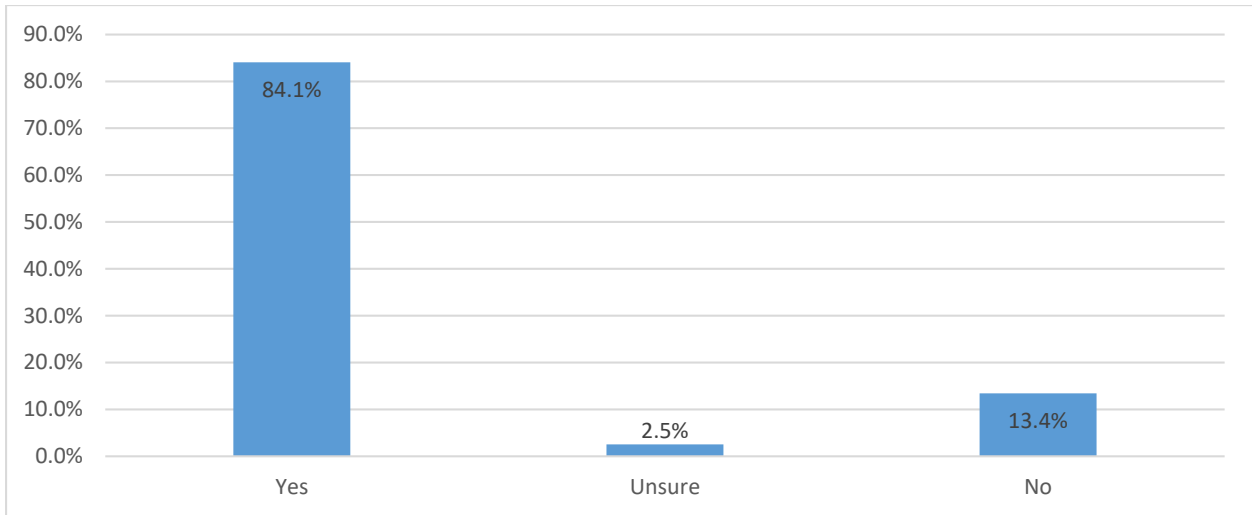
Figure 4. Responses to "I Have Heard of Driverless Cars Before Today" (by Age)
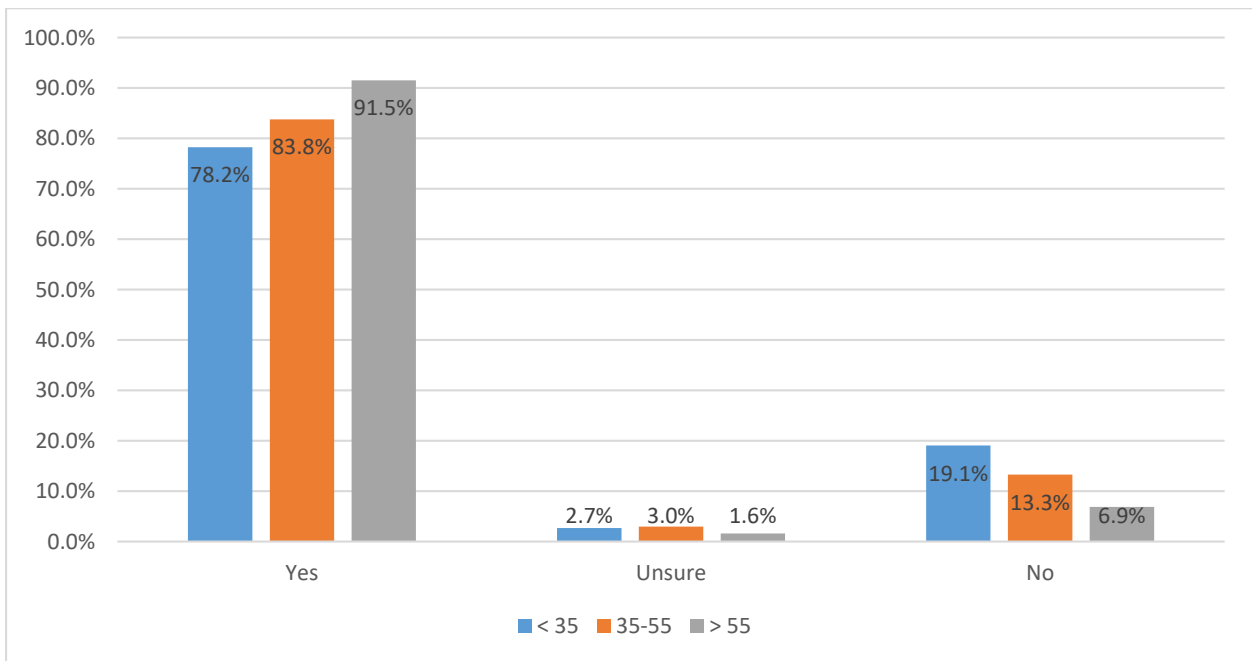
Key Takeaways:

- More than 80% of respondents have heard of AVs. Differences between knowledge of AVs and the Google Car suggest that even though individuals have heard of this technology, they may not be overly familiar

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2.3 Interest in Driverless Car Benefits

Figure 5. Driverless Car Benefits of Interest
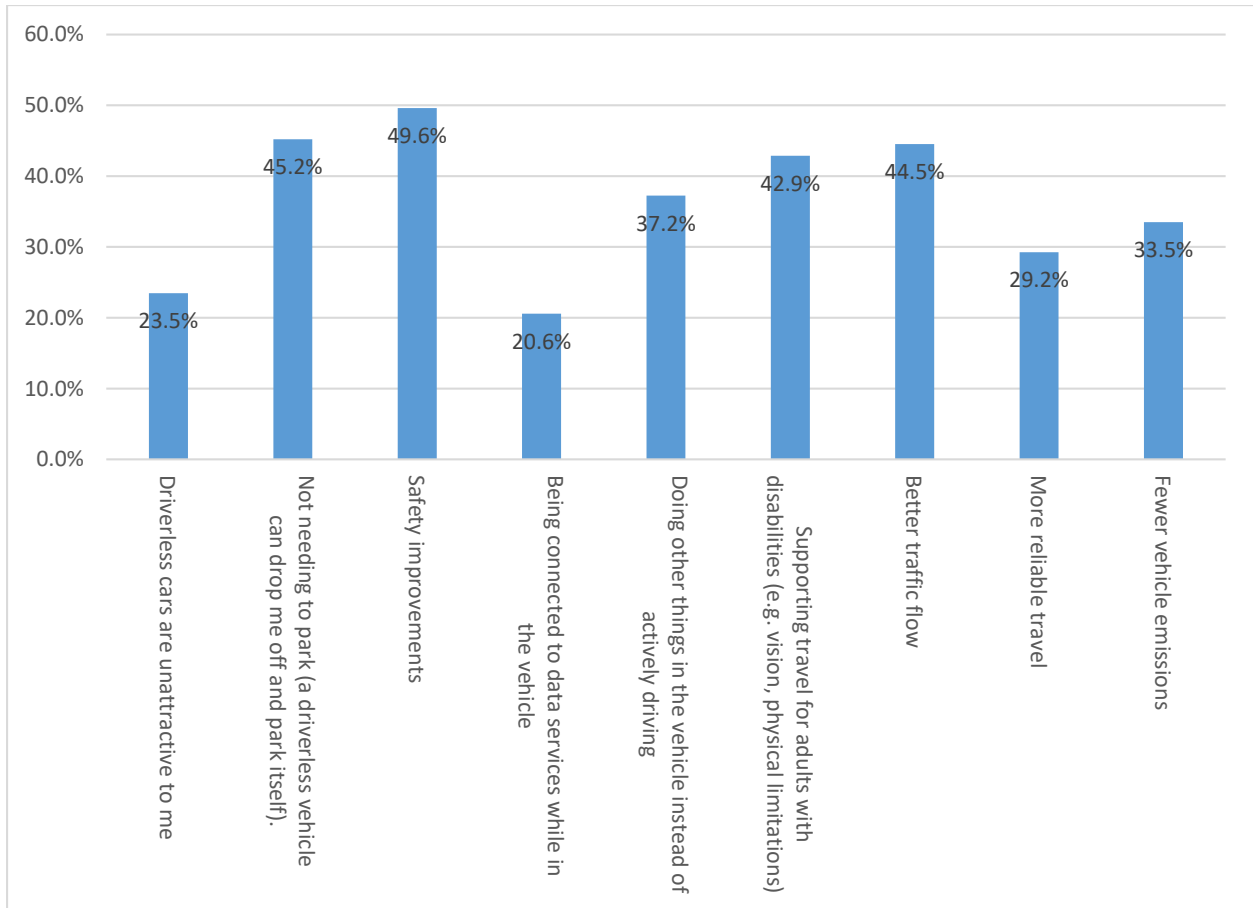
Key Takeaways:

- One-quarter (23.5%) of respondents indicate AVs are unattractive to them.
- Higher-frequency AV benefits of interest (40% to 50%) include:
    - Safety
    - Parking
    - Traffic
    - Disability Services
- Lower-frequency AV benefits of interest (20 to 40%) include:
    - Multitasking
    - Emissions reduction
    - Reliability
    - Data connectivity

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Figure 6. Driverless Car Benefits of Interest (by Age)
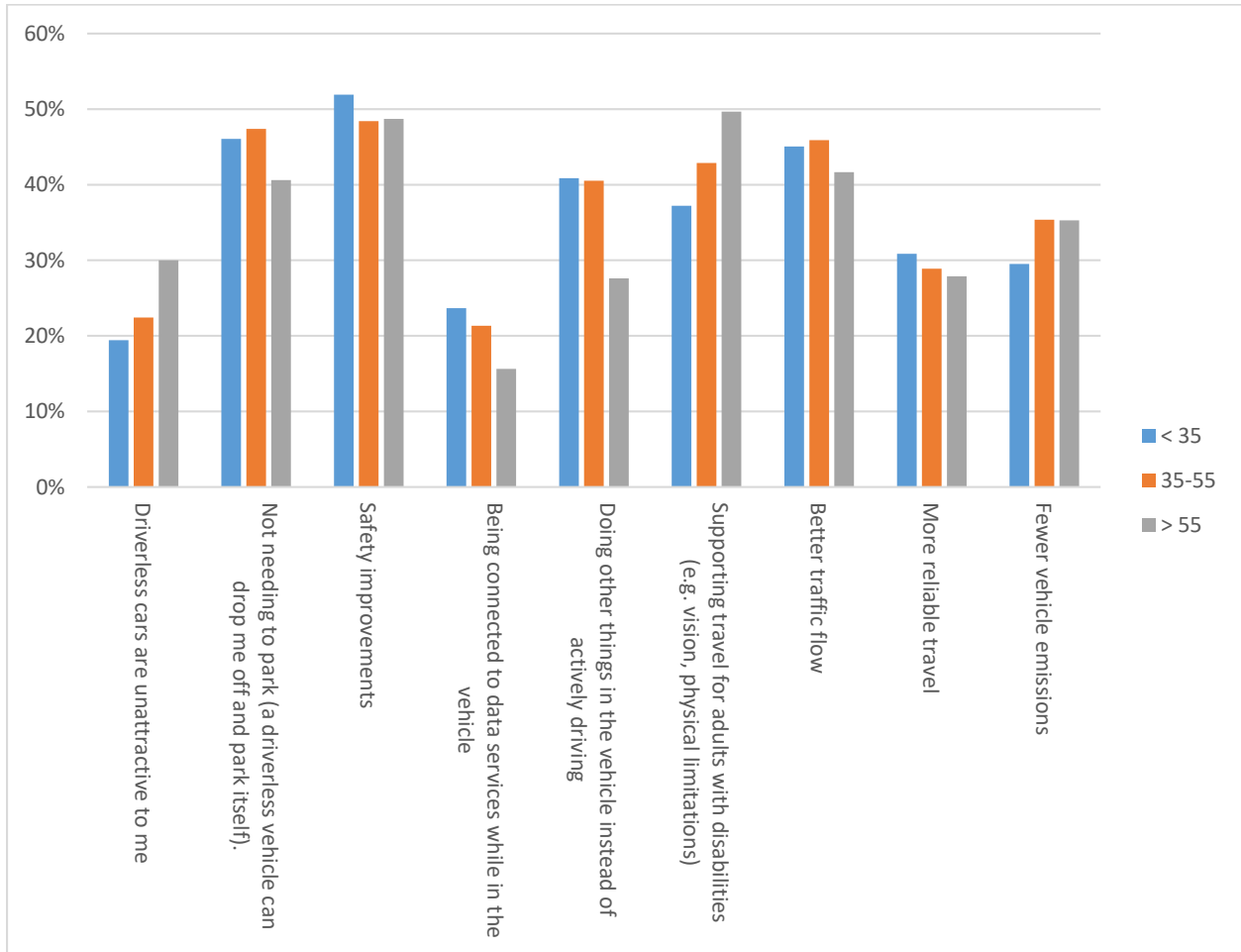
Key Takeaways:

- Strong age differences in
  - connection to data services,
  - support for disabilities,
  - multi-tasking, and
  - lack of interest entirely

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2.4 Interest in Regular Use of Driverless Cars

Figure 7. Interest in Regularly Using Driverless Cars
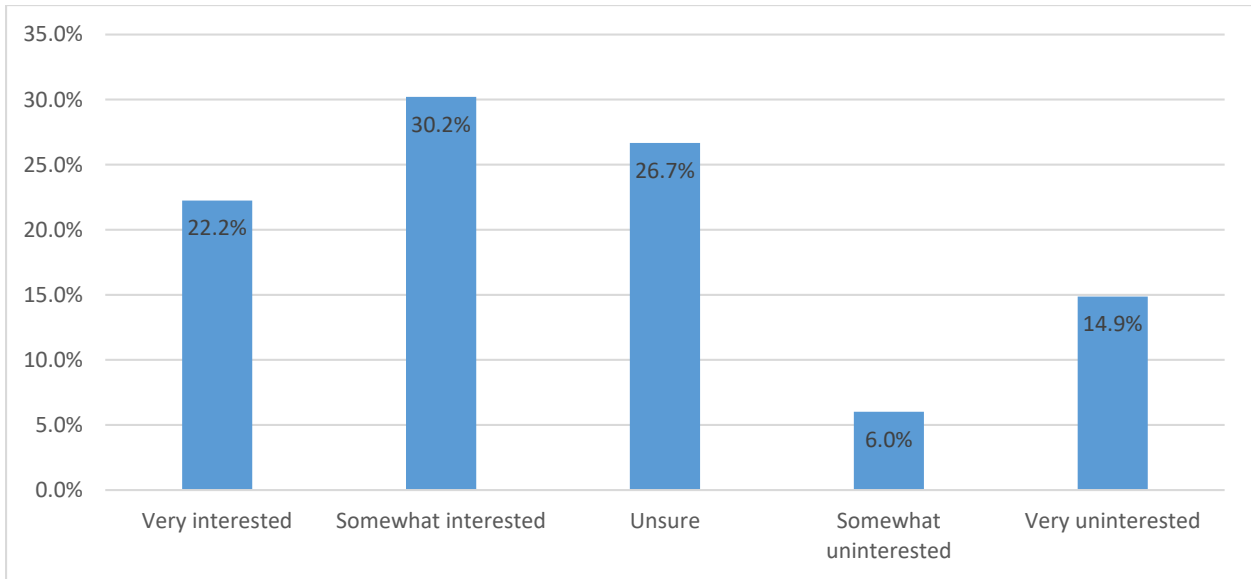
Figure 8. Interest in Regularly Using Driverless Cars (by Age)

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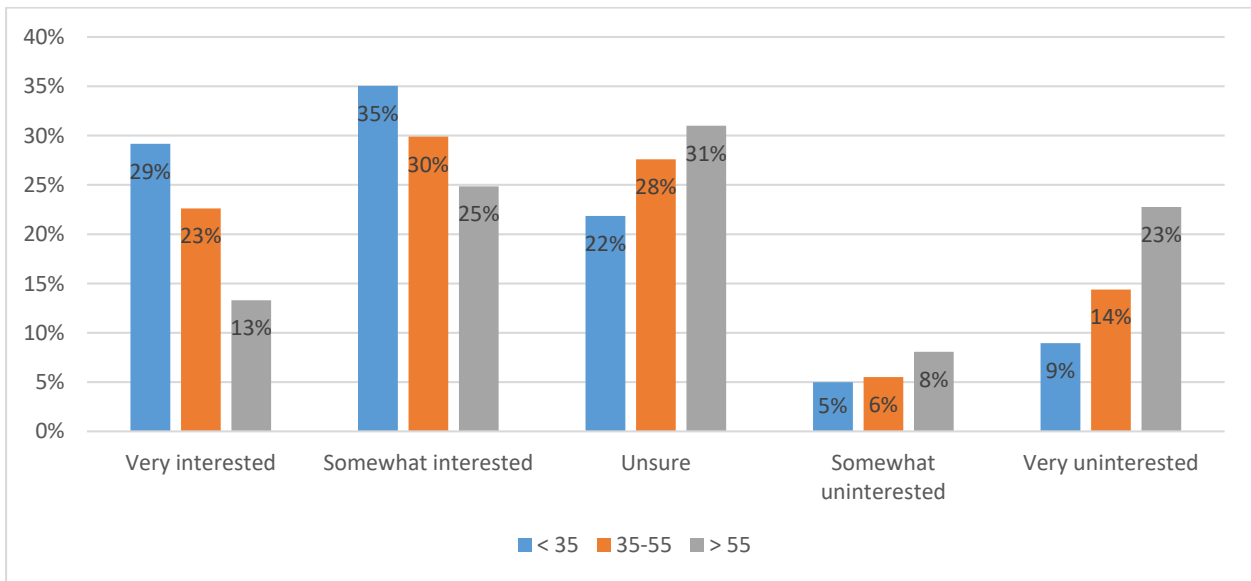
Figure 9. Interest in Regularly Using Driverless Cars (by Gender)
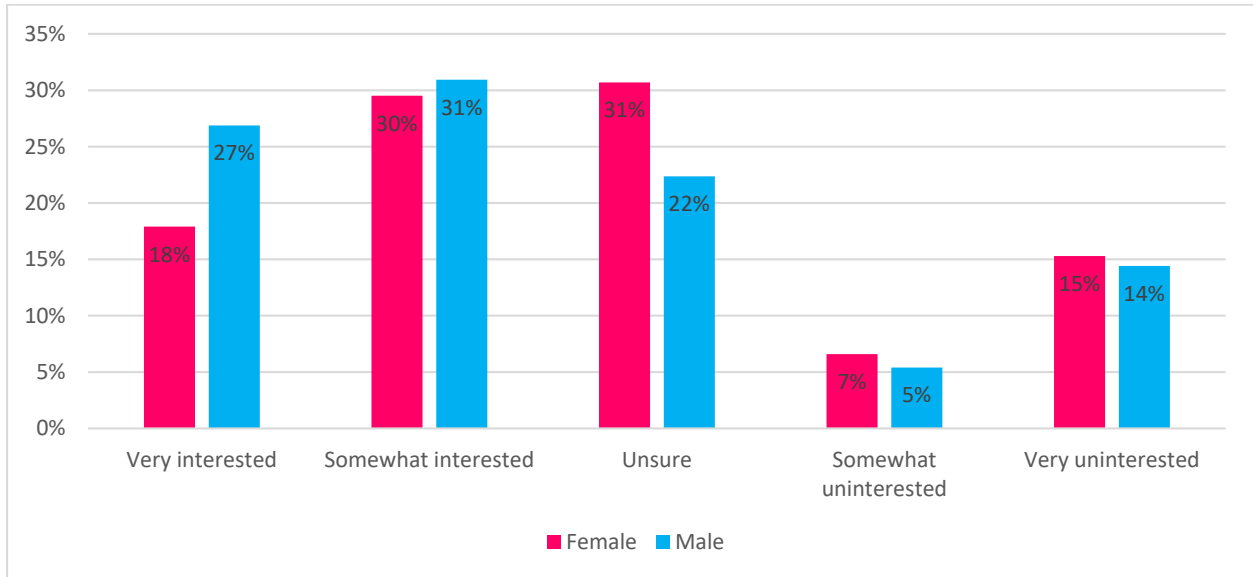
Key Takeaways:

- More than 50% of respondents were at least somewhat interested in regularly using a driverless car
- Declining interest and increasing disinterest in driverless car use with increasing age
- Males express more interest than females

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2.5 Purchasing a Driverless Car

Figure 10. Responses to "When Would You Consider Buying a Driverless Car?"

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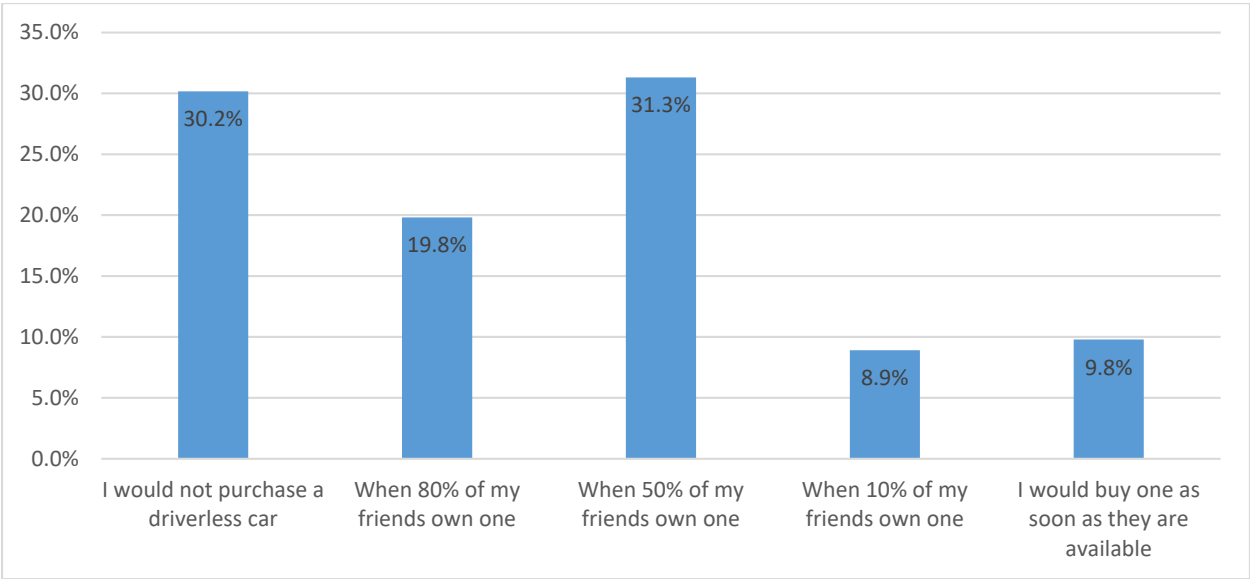
2.6 Paying for Additional Connected Capabilities

Figure 11. Interest in Paying Extra for Connected Vehicle Capability

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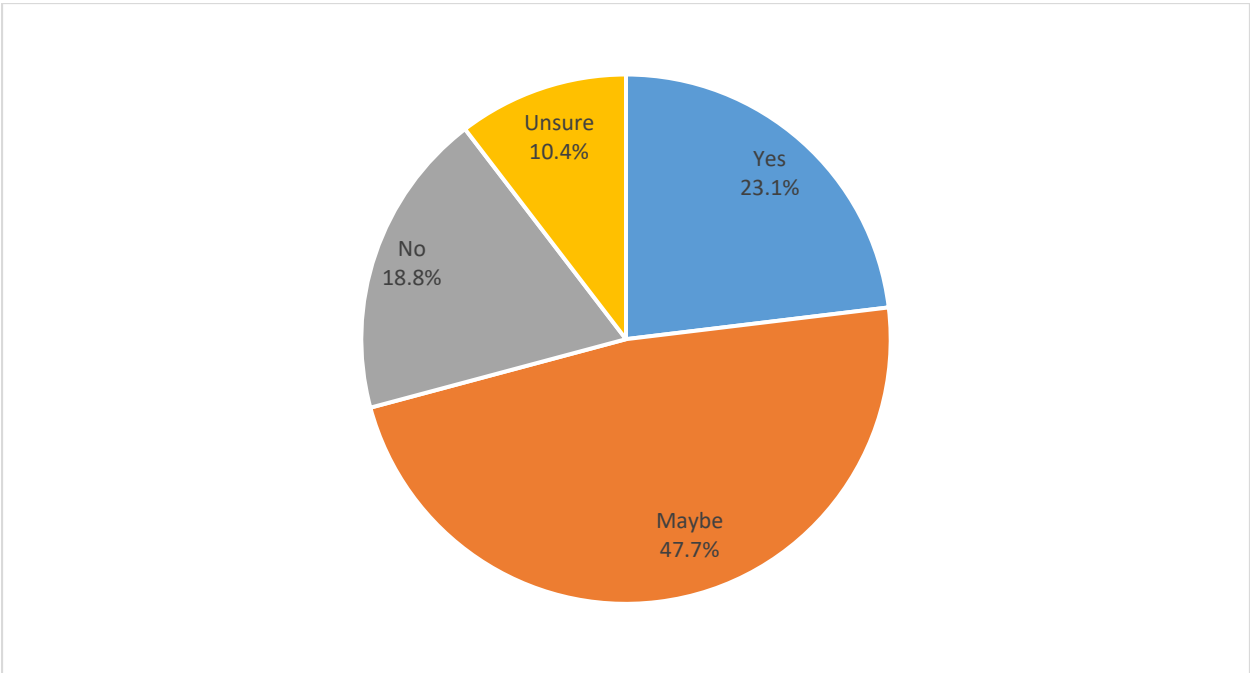
2.7 Willingness to Pay for Partially Driverless Capabilities

Figure 12. Willingness to Pay Extra for Partially Driverless Capabilities
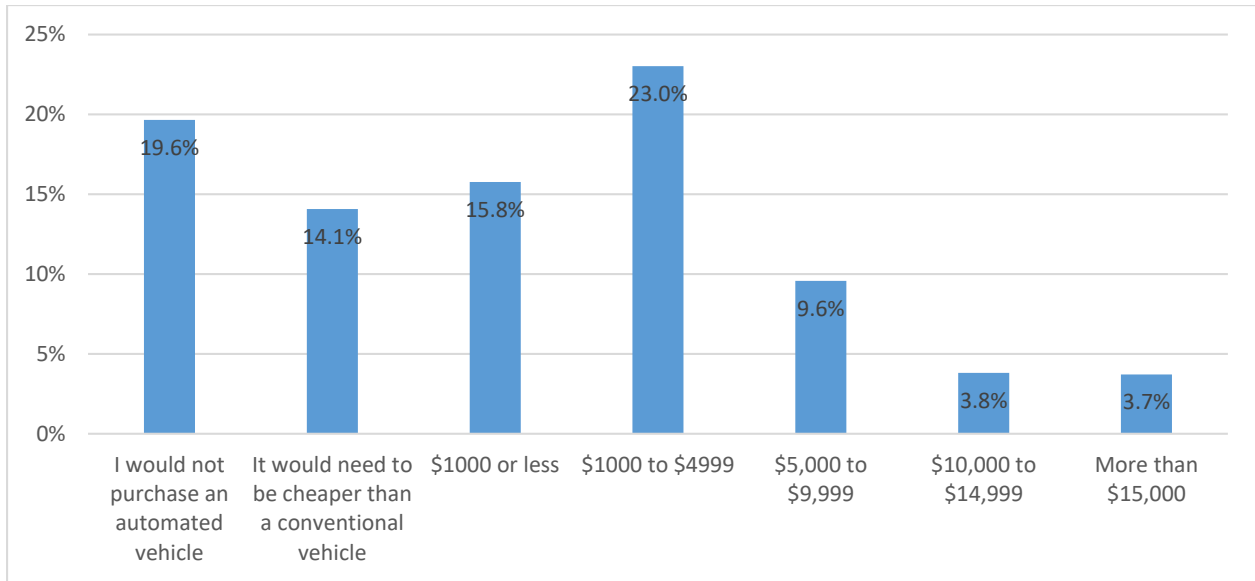
Figure 13. Willingness to Pay Extra for Partially Driverless Capabilities (by Age)
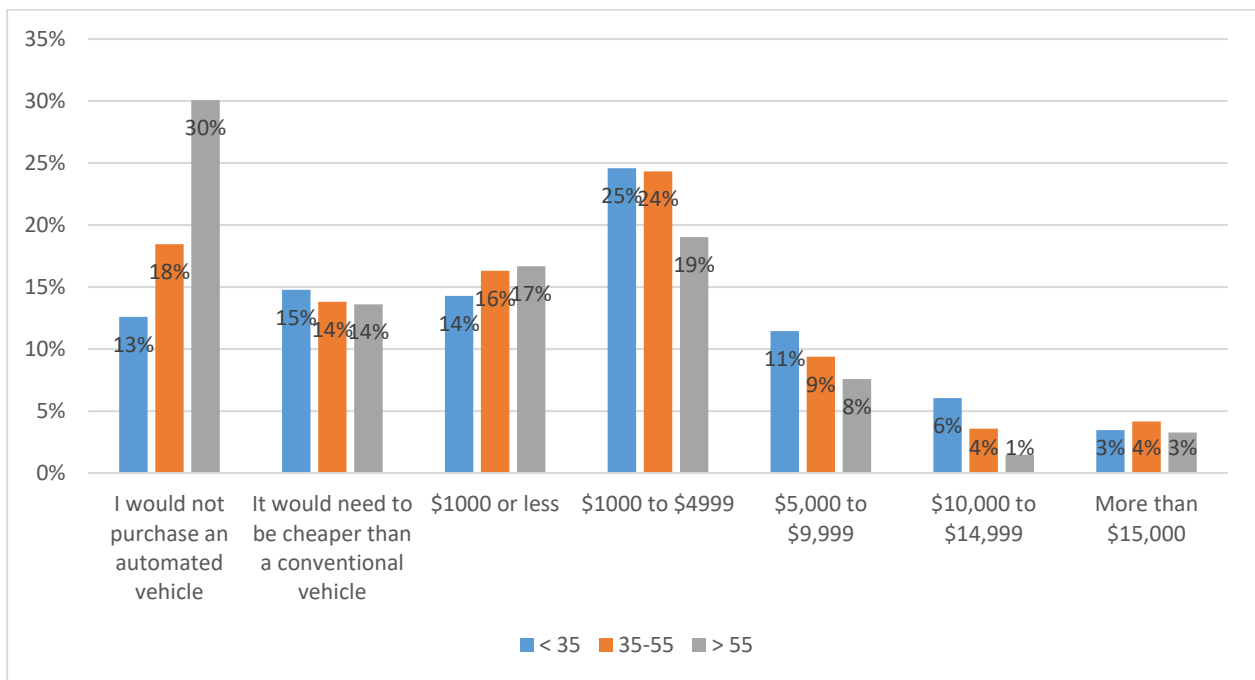
Key Takeaways:

- $1000-$4999 is dominant range for willingness to pay
- Nearly 20% unwilling to purchase driverless capabilities

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2.8 Willingness to Pay for Fully Driverless Capabilities

Figure 14. Willingness to Pay Extra for Fully Driverless Capabilities
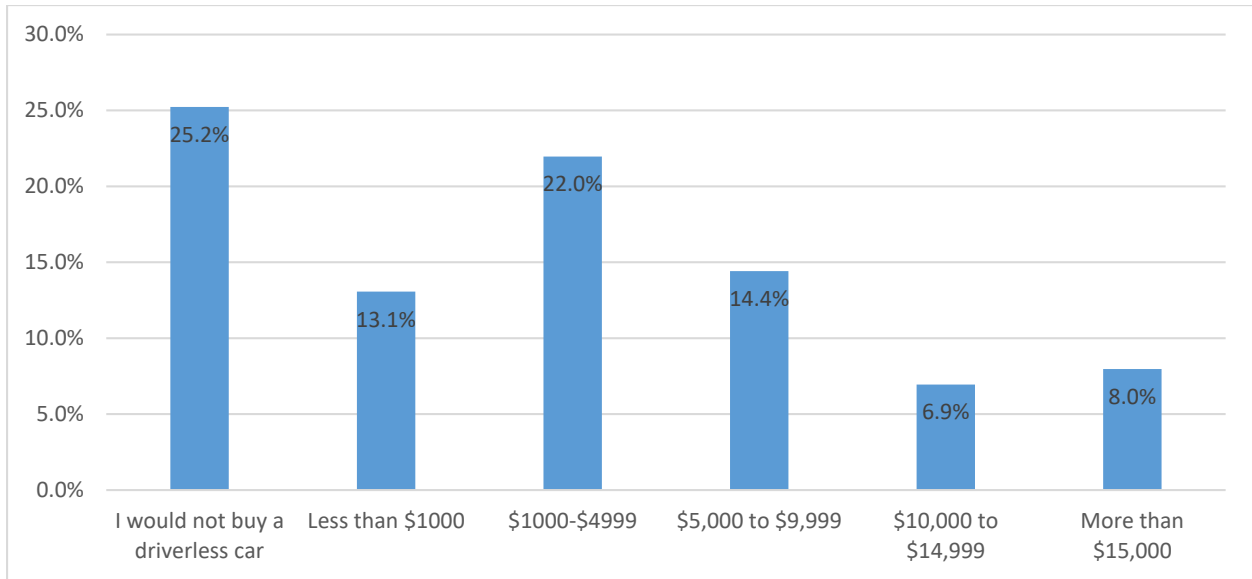
Figure 15. Willingness to Pay Extra for Fully Driverless Capabilities (by Age)
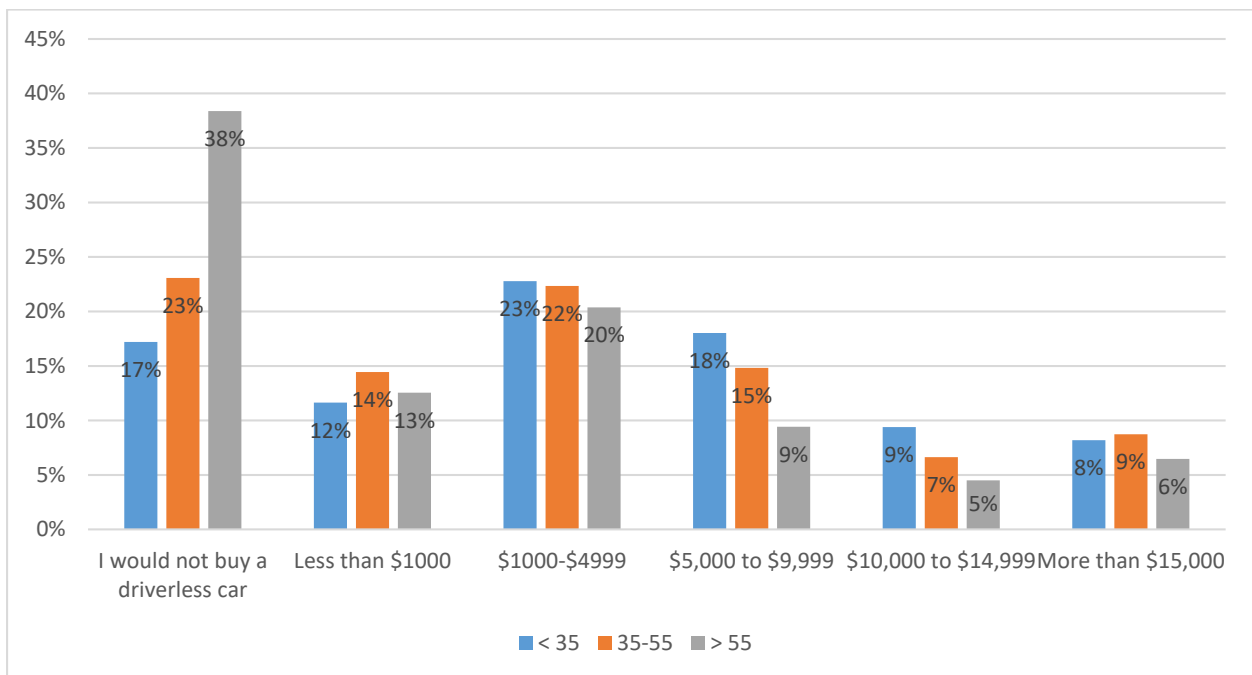
Key Takeaways:

- One-quarter of respondents (25%) and almost two-fifths (35%) of respondents over 55 state that they are unwilling to buy a fully driverless car, regardless of price

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3.0 Prospective Travel and Location Choices

3.1 Travel Further to Work with Driverless Car

Figure 16. Willingness to Travel Further to Work in Driverless Car
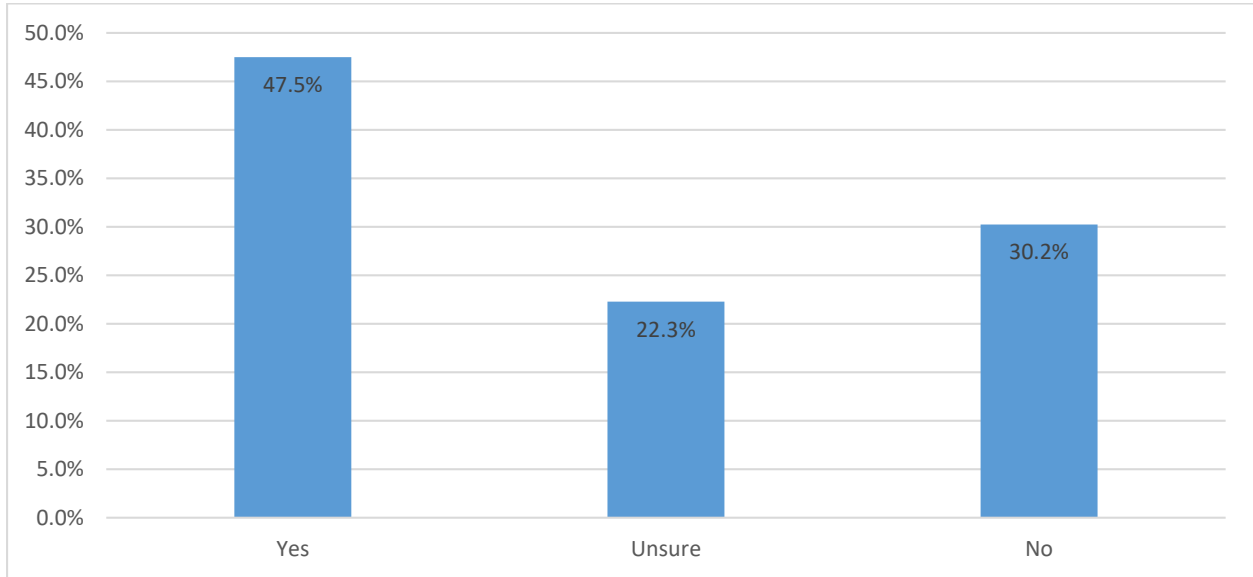
Figure 17. Willingness to Travel Further to Work in Driverless Car (by Region)

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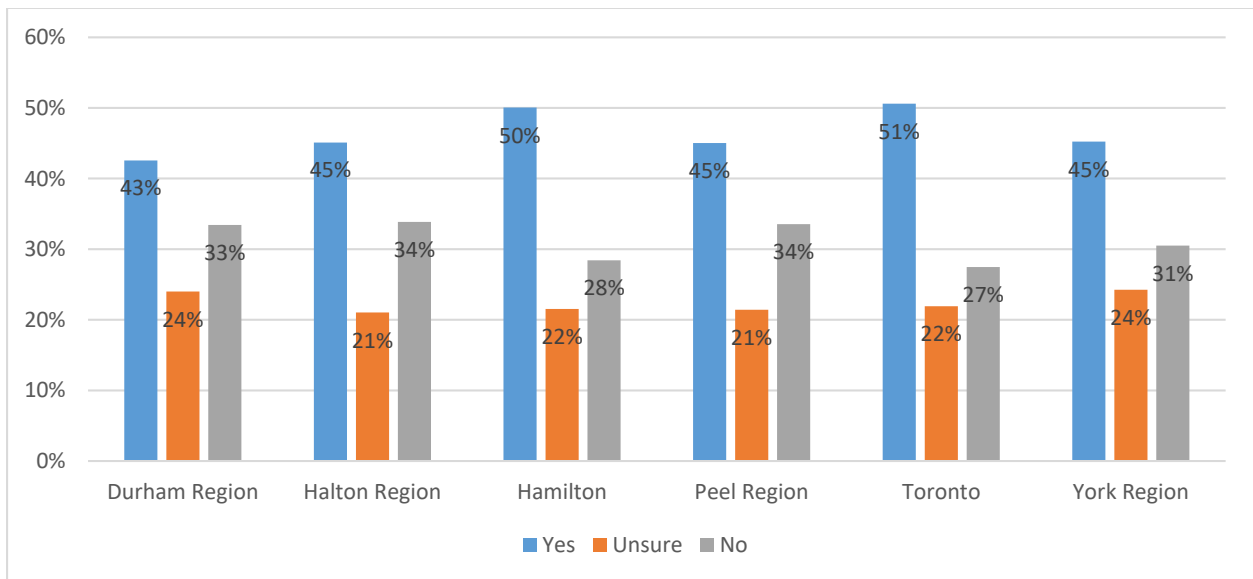
Figure 18. Willingness to Travel Further to Work in Driverless Car (by Age)
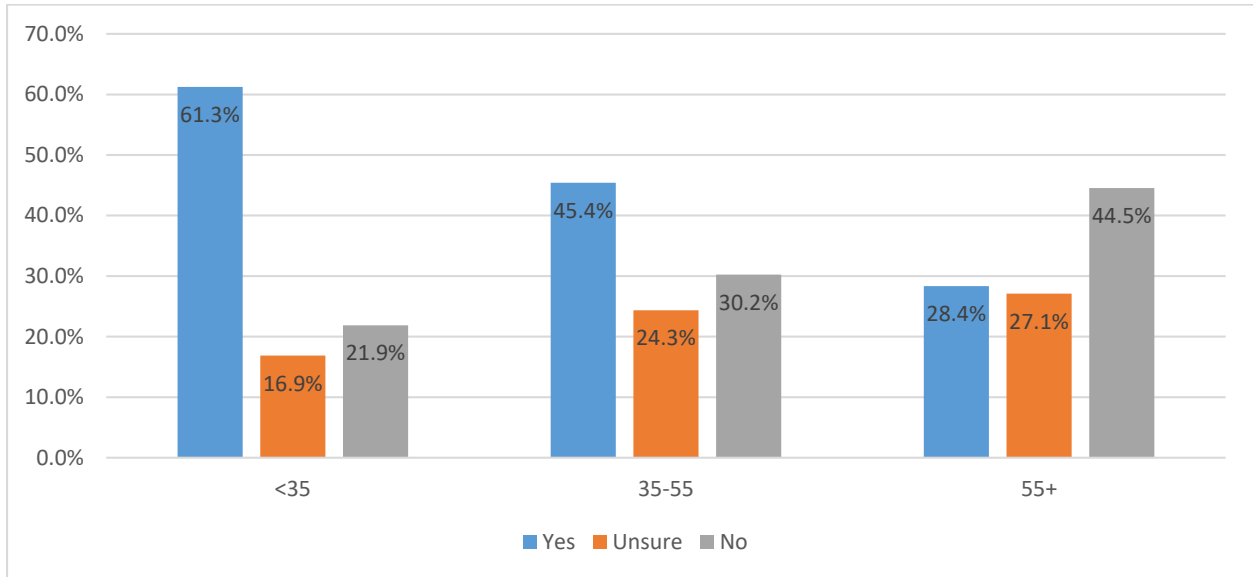
Key Takeaways:

- 47.5% of respondents willing to travel further to work in a driverless car
- The cities (Hamilton, Toronto) appear more willing to extend their commute distance
- Willingness to travel further declines as age increases

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3.2 Travel Further to Work with Faster Driverless Car

Figure 19. Willingness to Travel Further to Work in Driverless Car if Faster
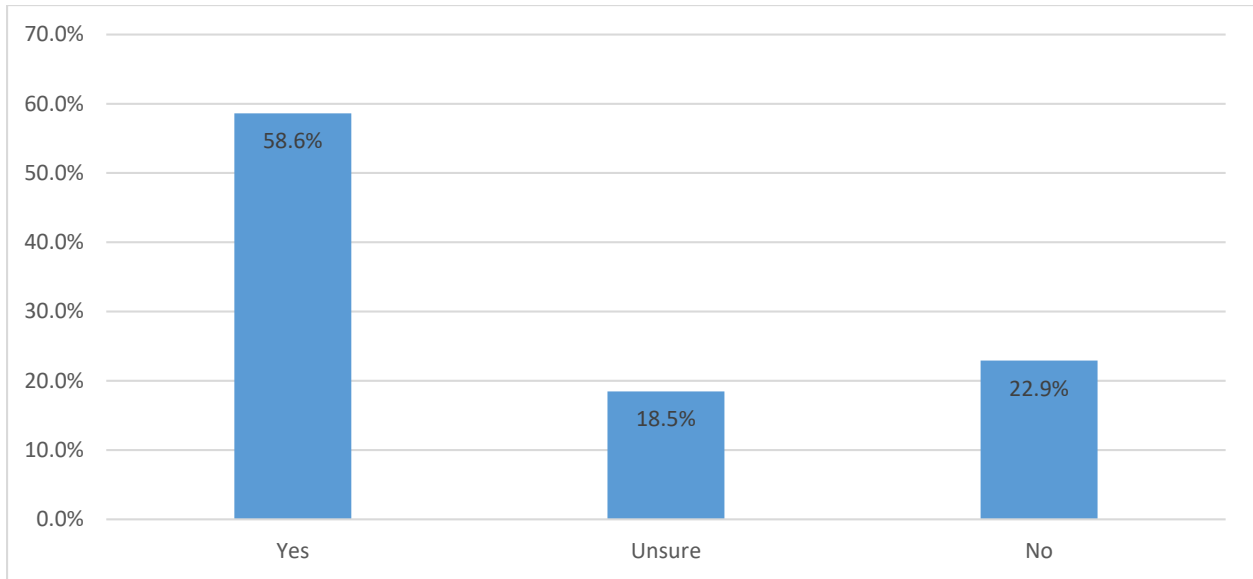
Figure 20. Willingness to Travel Further to Work in Driverless Car if Faster (by Region)

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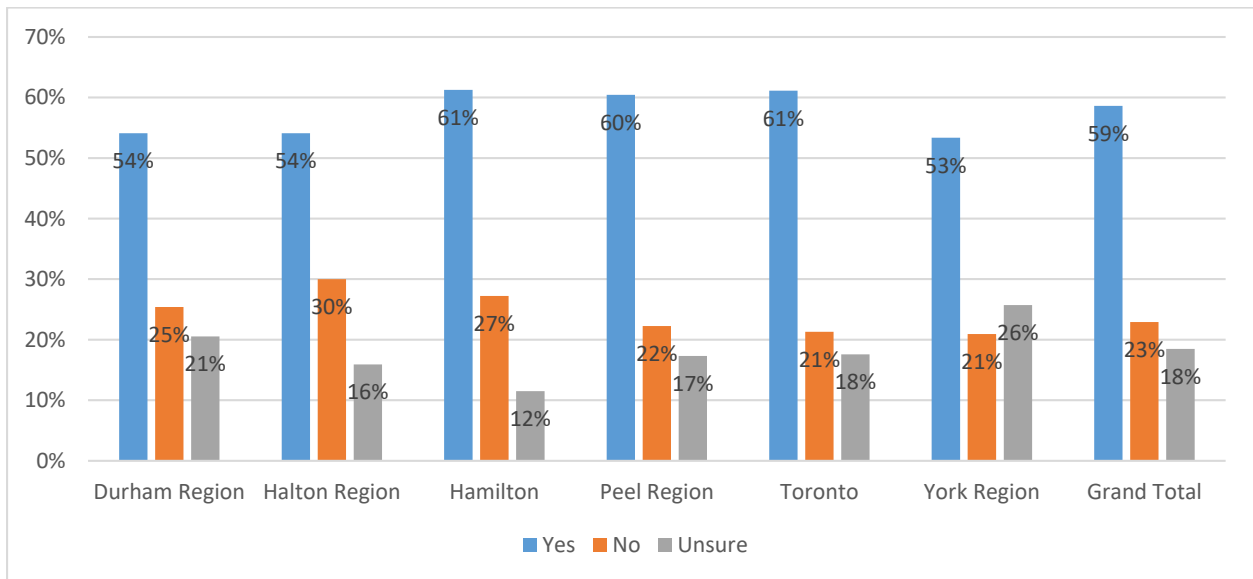
Figure 21. Willingness to Travel Further to Work in Driverless Car if Faster (by Age)
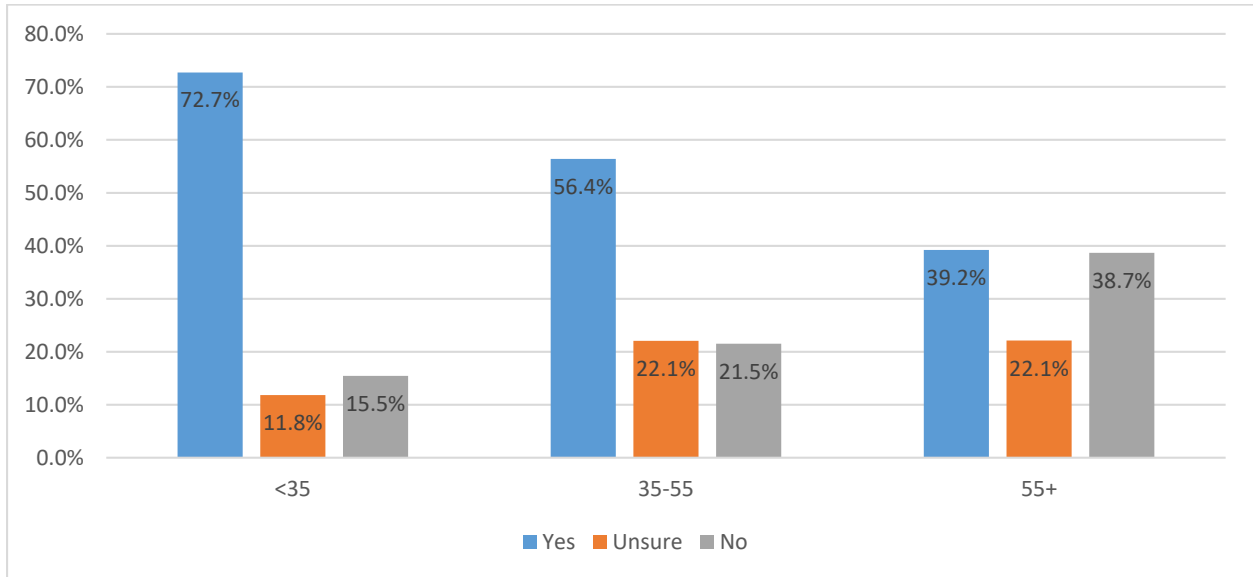
Key Takeaways:

- The prospect of faster travel by driverless cars motivates an even greater share (58.6%) to consider commuting further
- The cities and Peel Region show the greatest willingness to extend their commutes
- The decline in willingness to use with age still appears to hold

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TRANSFORM   18

3.3 Frequency of Use at Price per KM

Figure 22. Stated Frequency of Use of Shared Driverless Cars at Different Prices, Not Including Accessing Public Transit ($ per KM)
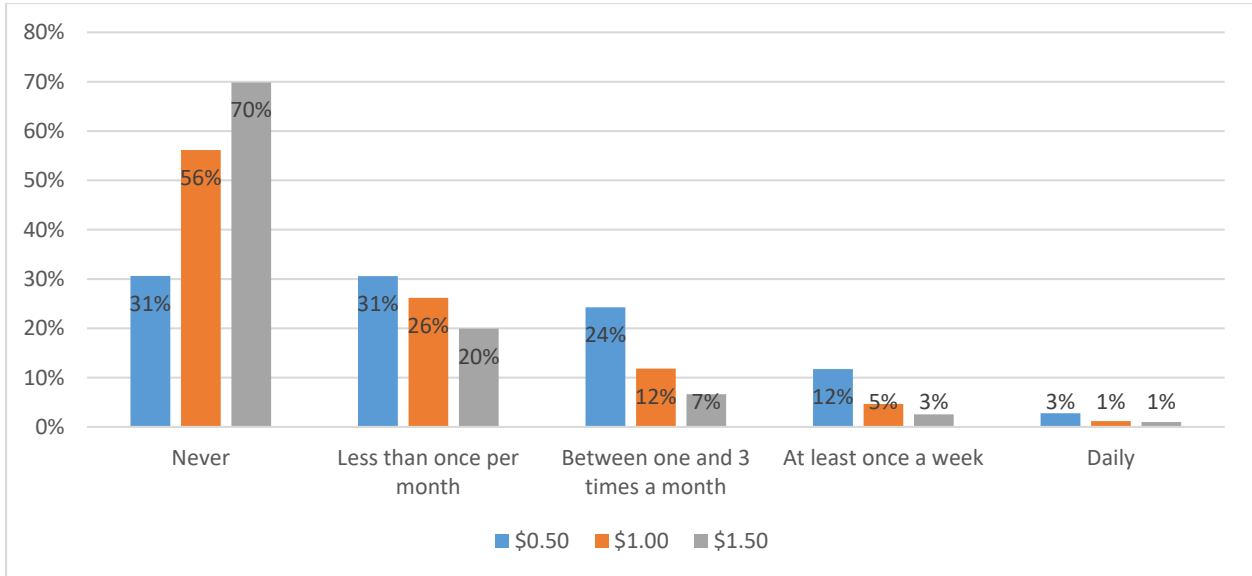
Key Takeaways:

- A majority of respondents choose not to use shared driverless cars at all with costs of operation of $1.00/km or more
- At any of the price thresholds given, regular use (once a week or more) is limited to a very small share of respondents

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3.4 Price to Switch for All Commuting

Figure 23. Highest Price for Driverless Car Travel While Still Willing to Switch to Shared Driverless Cars for All Commuting
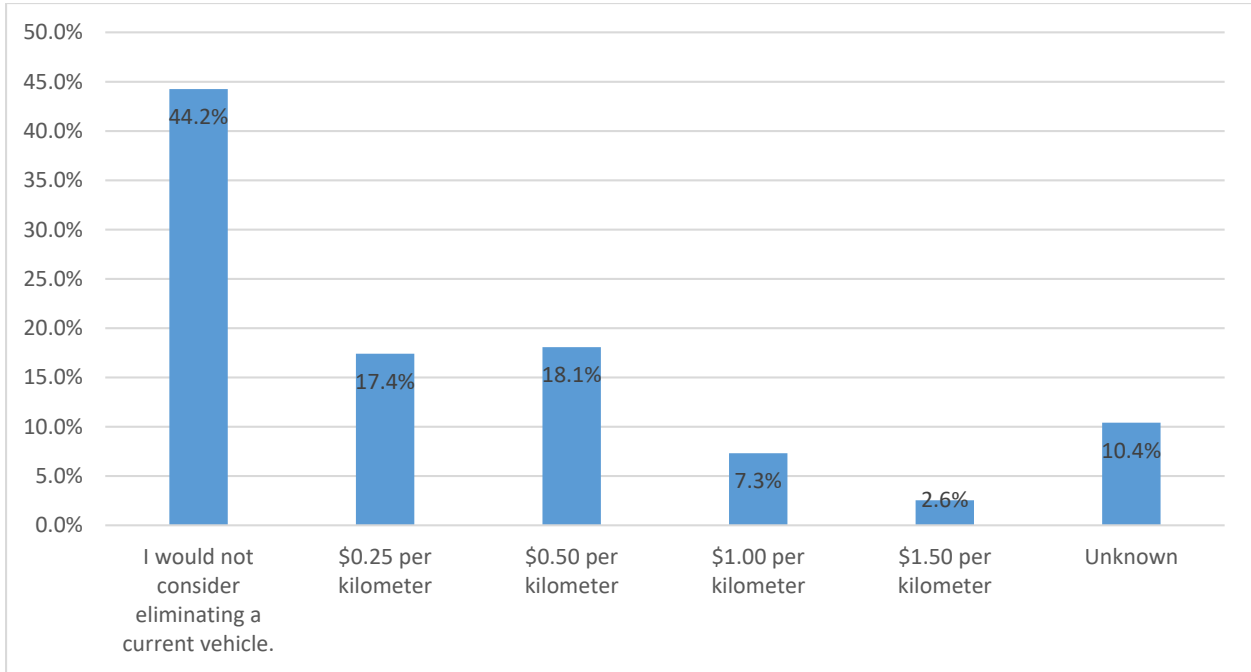
Key Takeaways:

- A price of less than $1.00 per kilometer would be necessary to expect a regular commuting mode share higher than ten percent.
- Cumulative total respondents willing to switch at different price thresholds:

$0.25/km	$0.50/km	$1.00/km	$1.50/km
45.4%	28.0%	9.9%	2.6%

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3.5 Frequency of Use to Access Transit

Figure 24. Shared Driverless Car Trips to Transit at Different Prices (per KM)
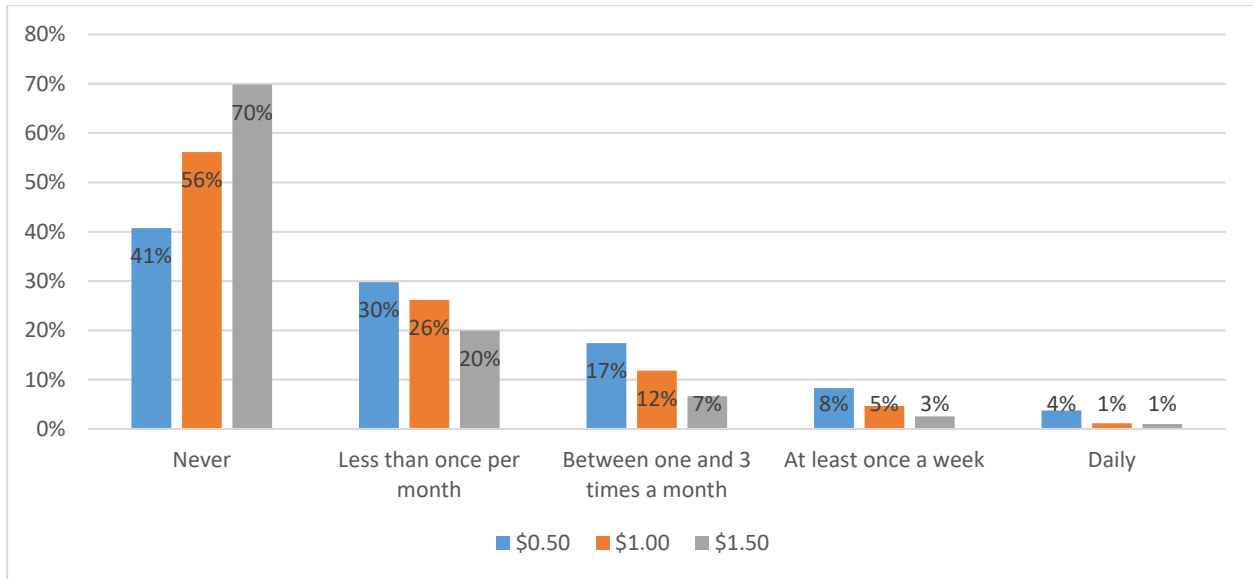
Key Takeaways:

- A majority of respondents choose not to use shared driverless cars to get to transit at all with costs of operation of $1.00/km or more

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3.6 Willingness to Share Driverless Car

Figure 25. Willingness to Travel in a Shared Driverless Car with Others
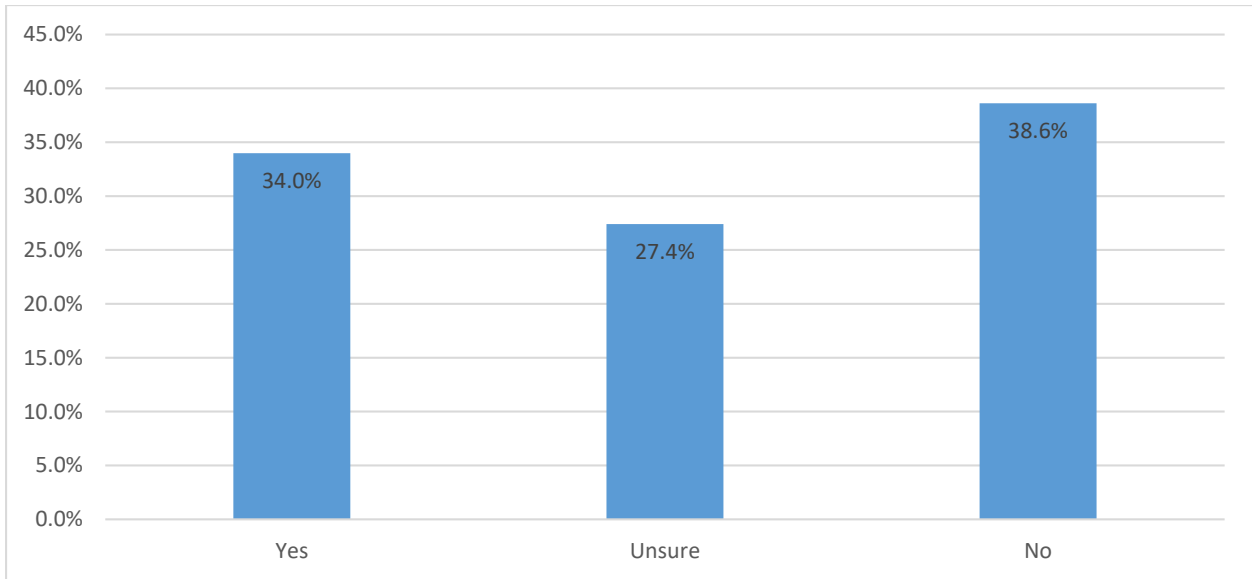
Figure 26. Willingness to Travel in a Shared Driverless Car with Others (by Age)

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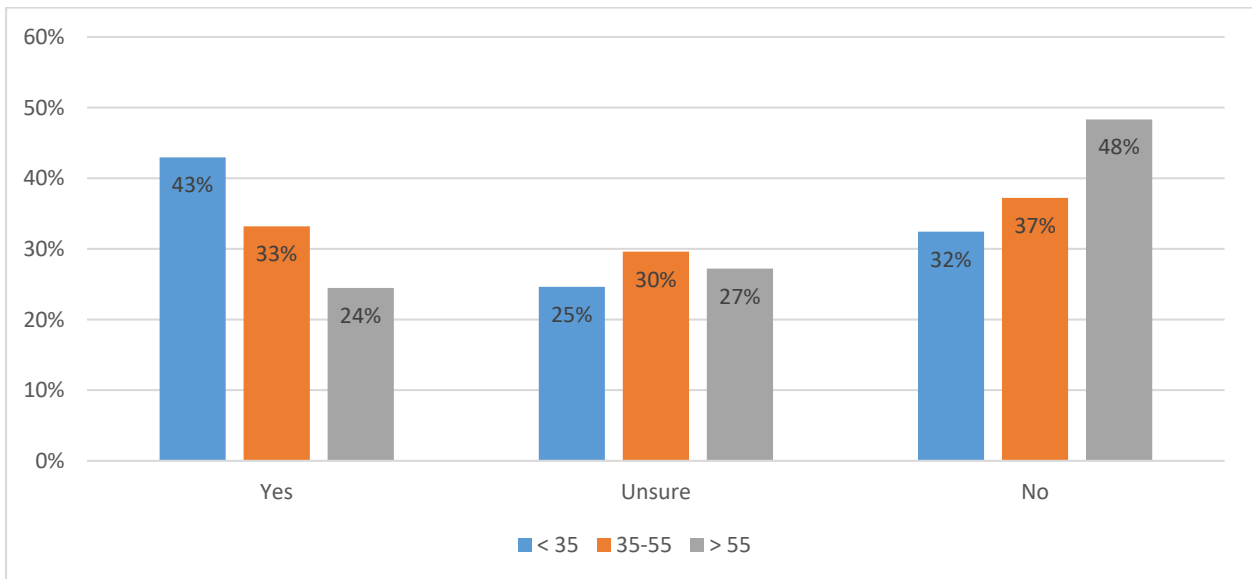
Figure 27. Willingness to Travel in a Shared Driverless Car with Others (by Gender)
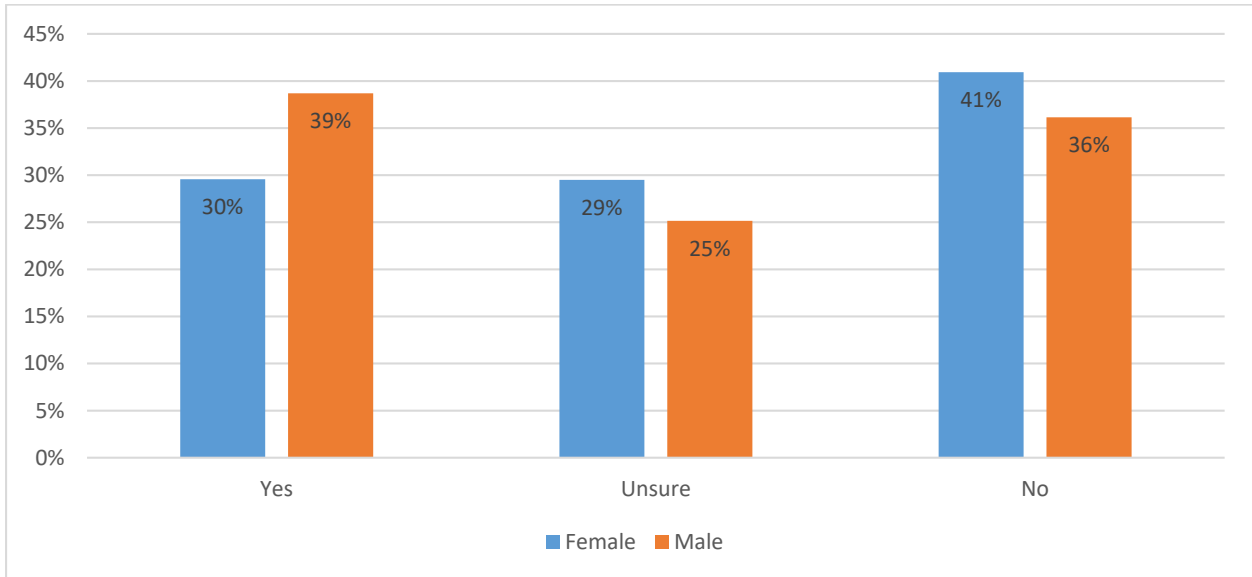
Key Takeaways:

- Males are more willing to utilize shared autonomous vehicles
- Interest in using SAVs declines with age

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3.7 Shared Driverless Car Access on Neighbourhood Attractiveness

Figure 28. Interest in High Shared Driverless Car Service Neighbourhoods
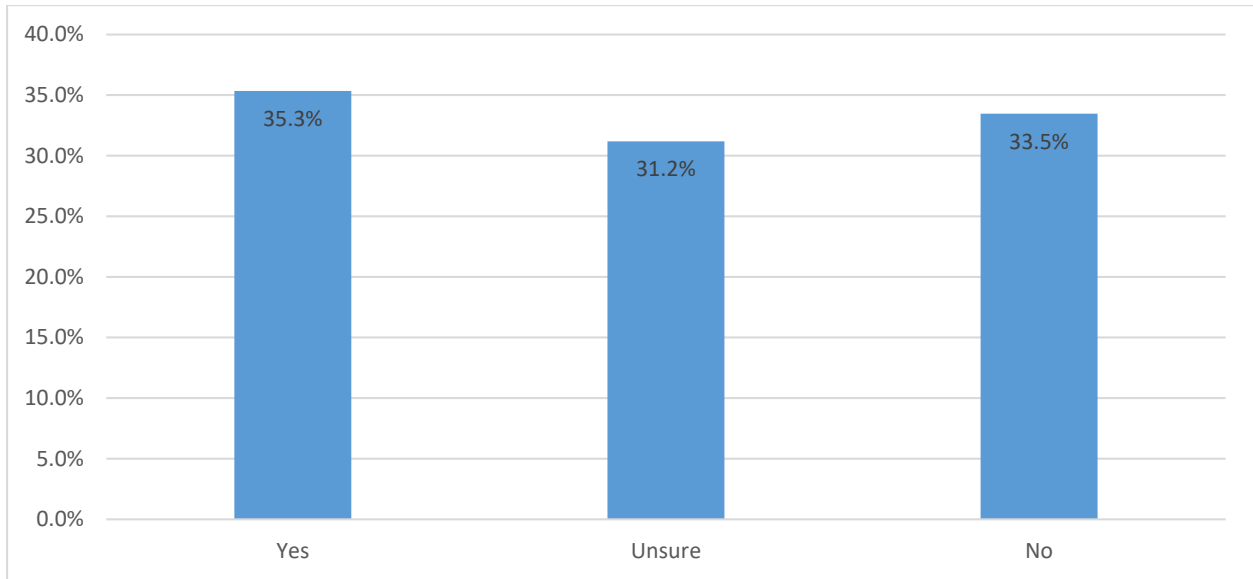
Figure 29. Interest in High Shared Driverless Car Service Neighbourhoods (By Region)
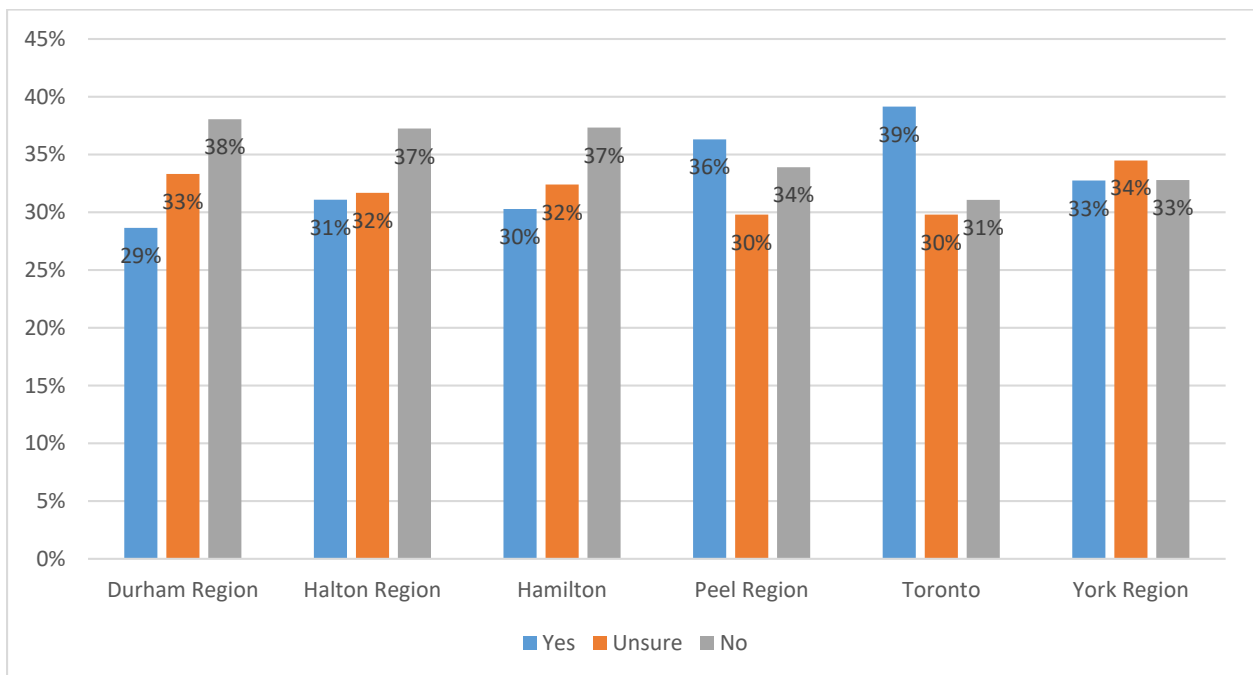
Key Takeaways:

- Close to even split on respondents' interest to locate in a neighbourhood with good shared AV services
- Toronto and Peel Region residents show higher levels of interest

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TRANSFORM   24

4.0 **AVs and Public Policy**

4.1 Government Response

Figure 30. Responses to "Automated and Driverless Vehicles are Likely to Become More Common in the Future. How Should Governments Respond?"
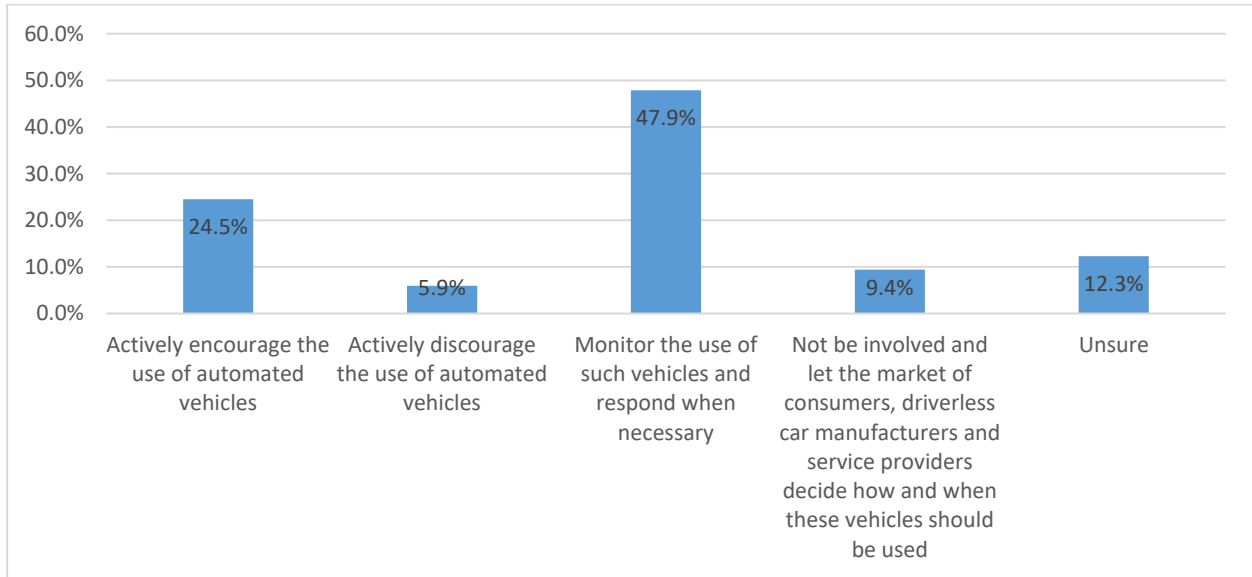
Figure 31. Responses to "Automated and Driverless Vehicles are Likely to Become More Common in the Future. How Should Governments Respond?" (by Age)

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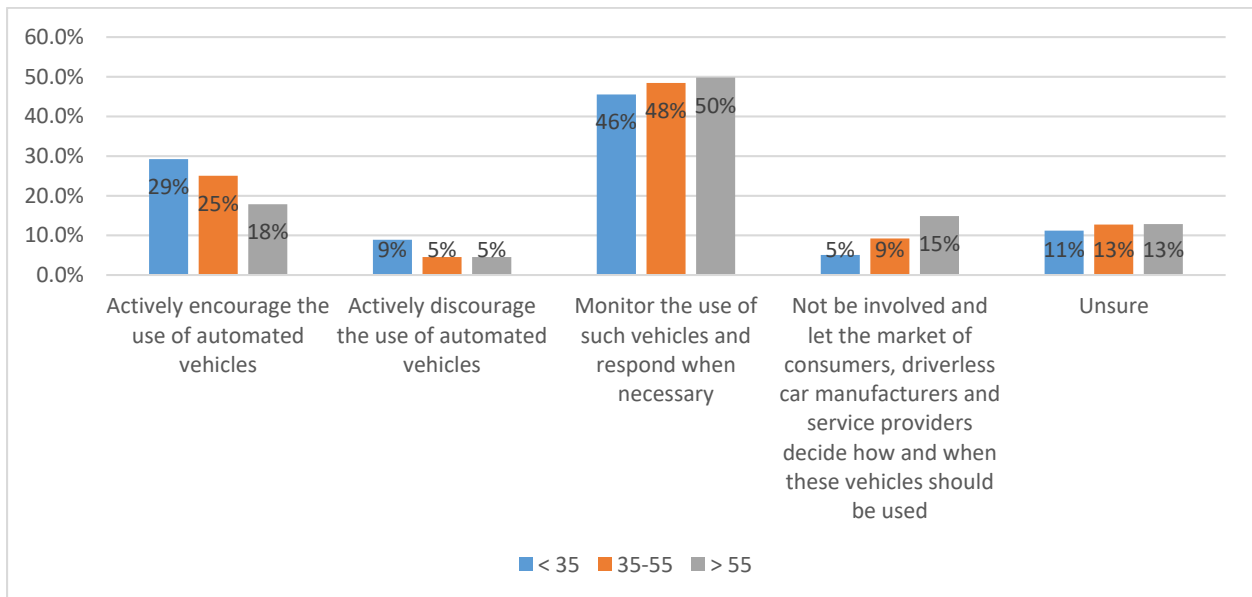
Figure 32. Responses to "Automated and Driverless Vehicles are Likely to Become More Common in the Future. How Should Governments Respond?" (by Gender)
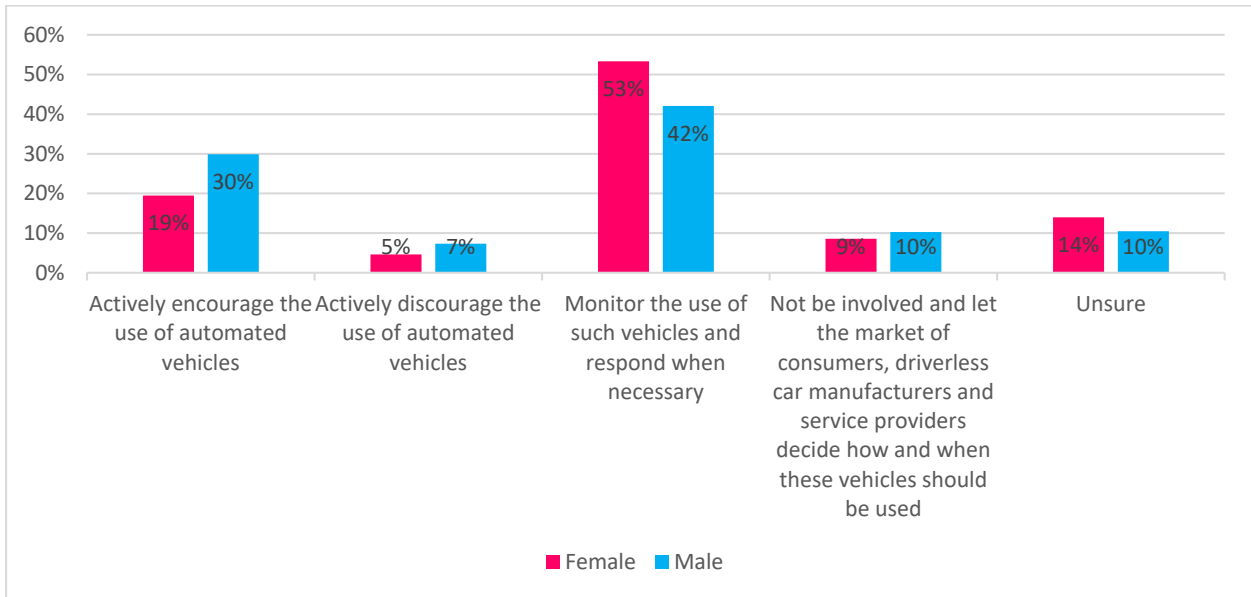
Key Takeaways:

- Strong preference for wait-and-see approach from government

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4.2 Public Investment

Figure 33. Responses to "Would You Support Investment to Encourage, Support, or Regulate Automated Vehicles?"
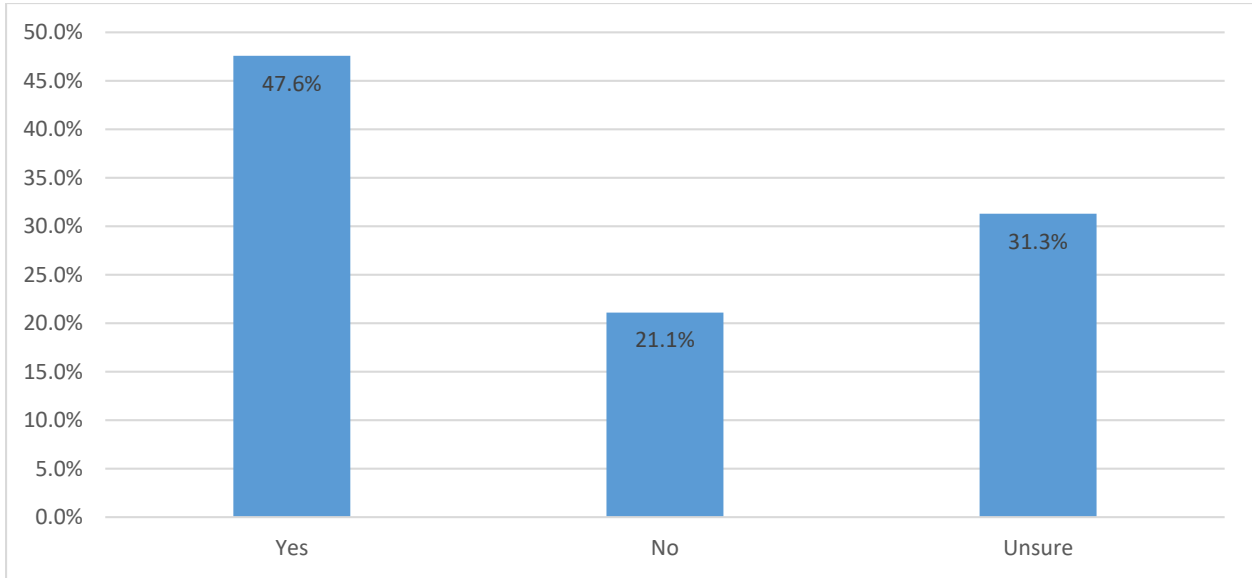
Figure 34. Responses to "Would You Support Investment to Encourage, Support, or Regulate Automated Vehicles?" (by Age)

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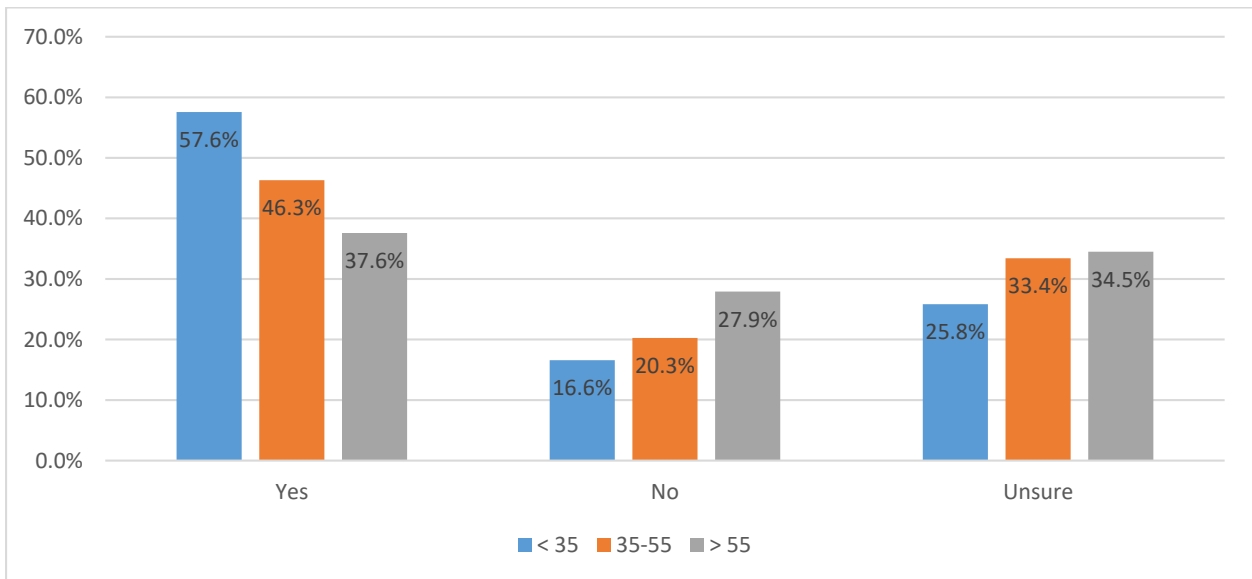
Figure 35. Responses to "Would You Support Investment to Encourage, Support, or Regulate Automated Vehicles?" (by Gender)
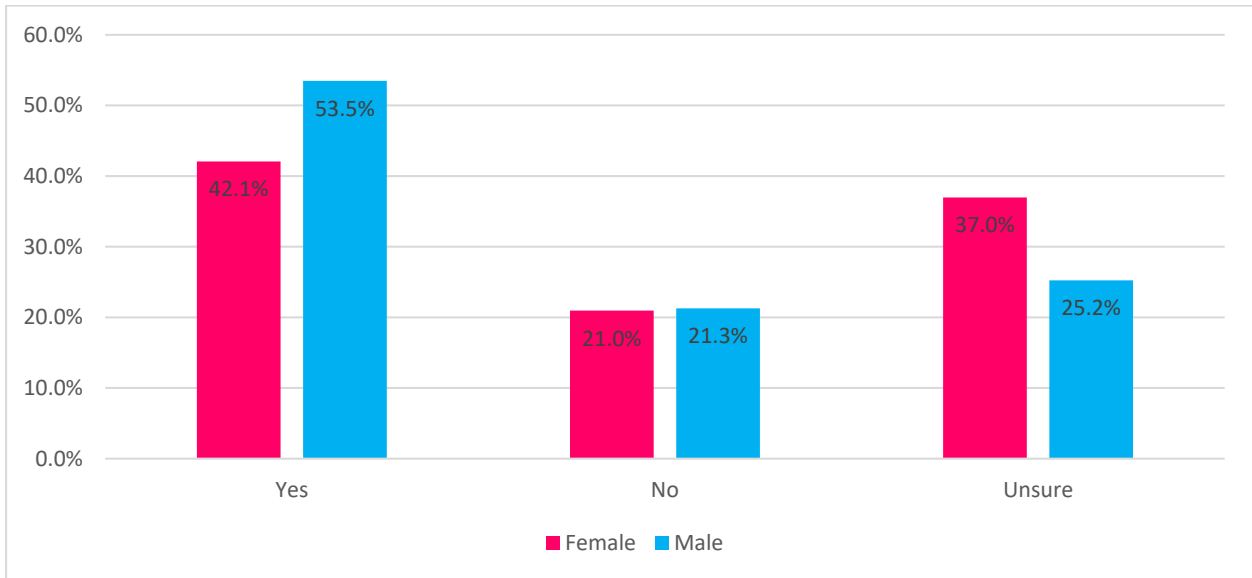
Key Takeaways:

- Approximately half (47.6%) of respondents support government investment to support AVs

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4.3 Additional Taxes for Public Investment

Figure 36. Responses to "Should Investment to Support, Encourage, or Regulate Automated Vehicles be Funded through Additional Taxes?"
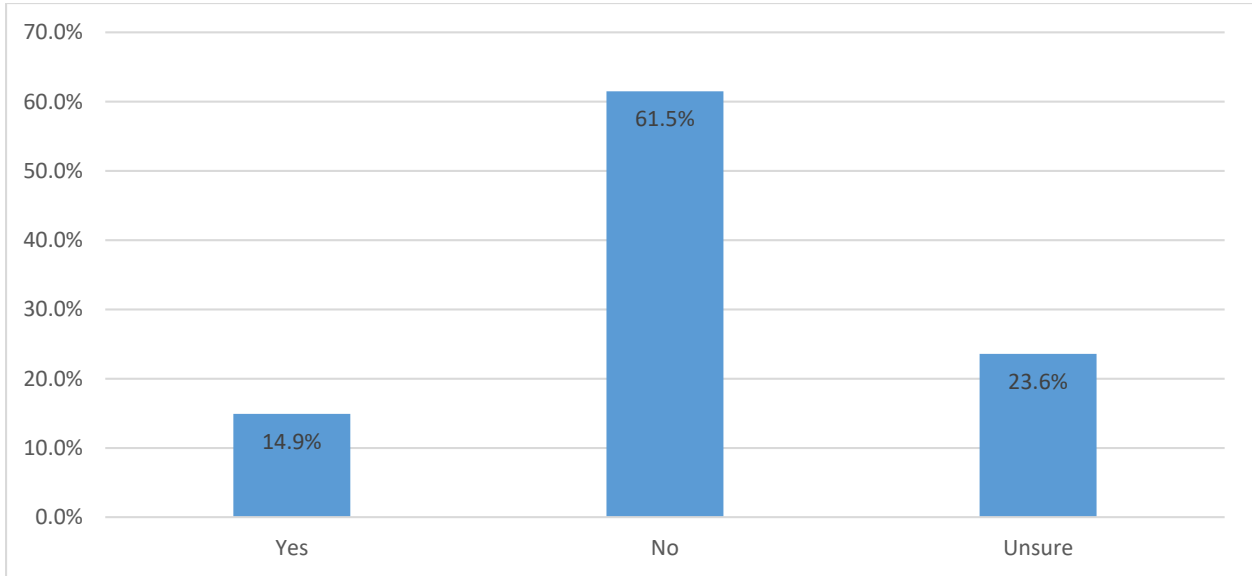
Figure 37. Responses to "Should Investment to Support, Encourage, or Regulate Automated Vehicles be Funded through Additional Taxes?" (by Age)
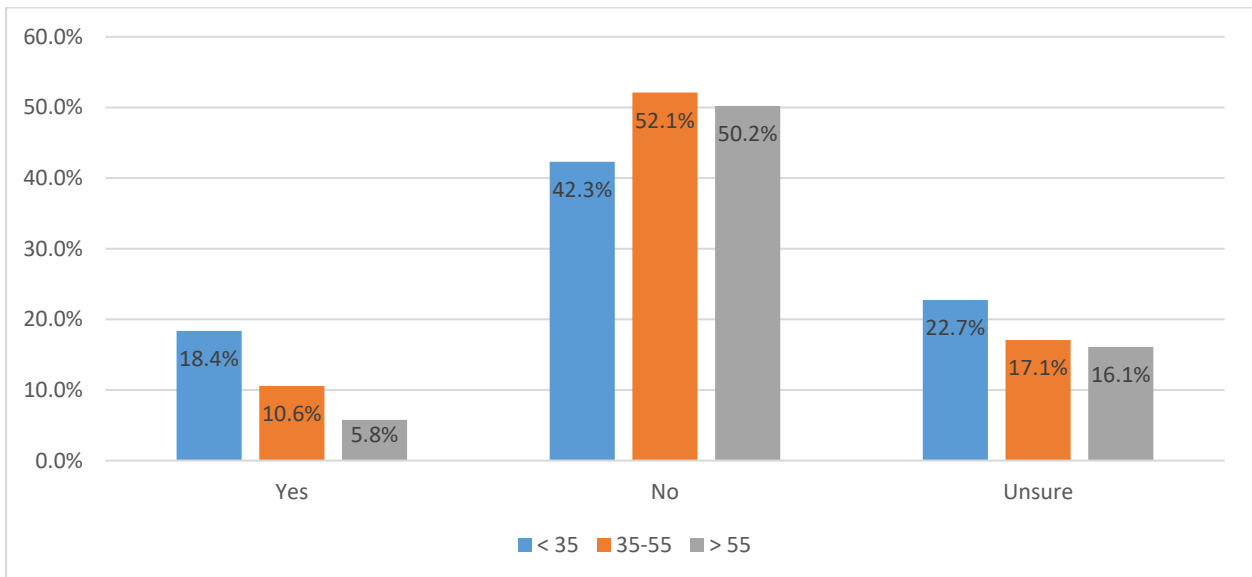
Key Takeaways:

- 61.5% opposed to additional taxes to fund public support of AVs

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4.4 Use of Transportation Funding

Figure 38. Responses to "How Should Automated and Driverless Vehicles Impact Public Sector Transportation Spending in the GTHA?"
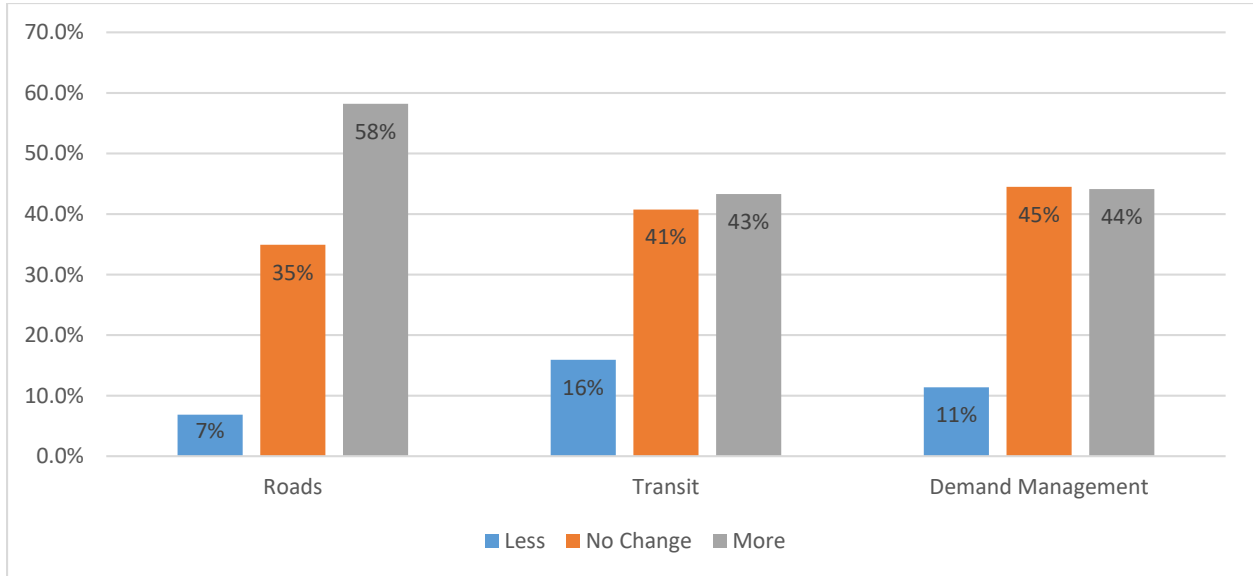
Key Takeaways:

- There is only majority support for increased spending on roads, given respondents' expectations of AVs' impacts

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4.5 Government Regulation

Figure 39. Responses to "Do You Expect Governments to Regulate How Automated and Driverless Vehicles are Used?"
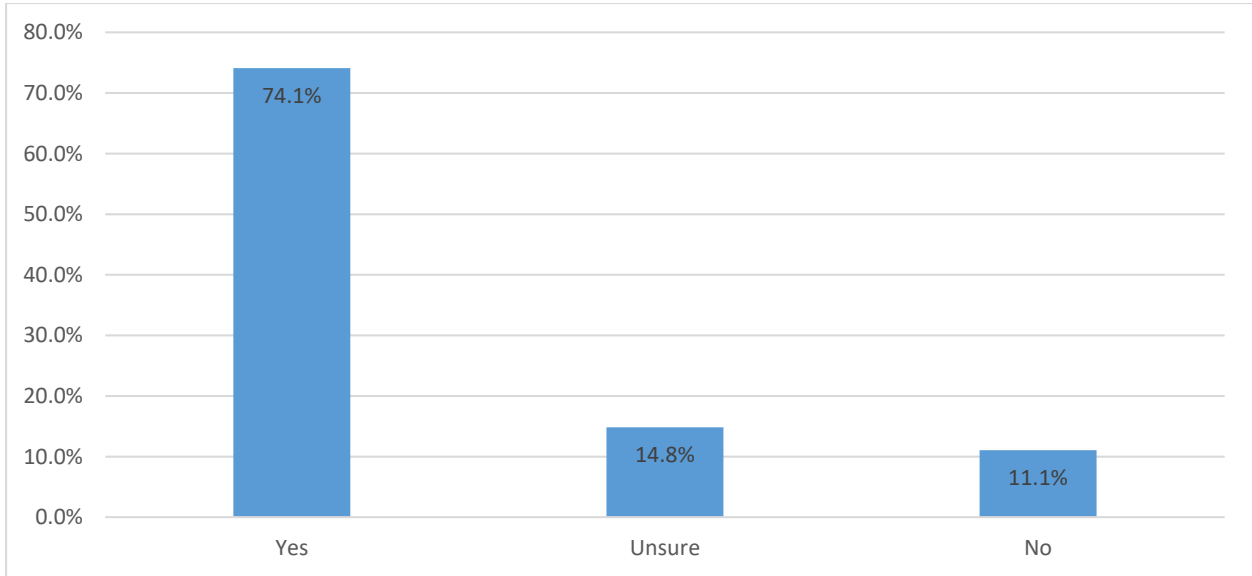
Figure 40. Responses to "Do You Expect Governments to Regulate How Automated and Driverless Vehicles are Used?" (by Age)

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TRANSFORM   31
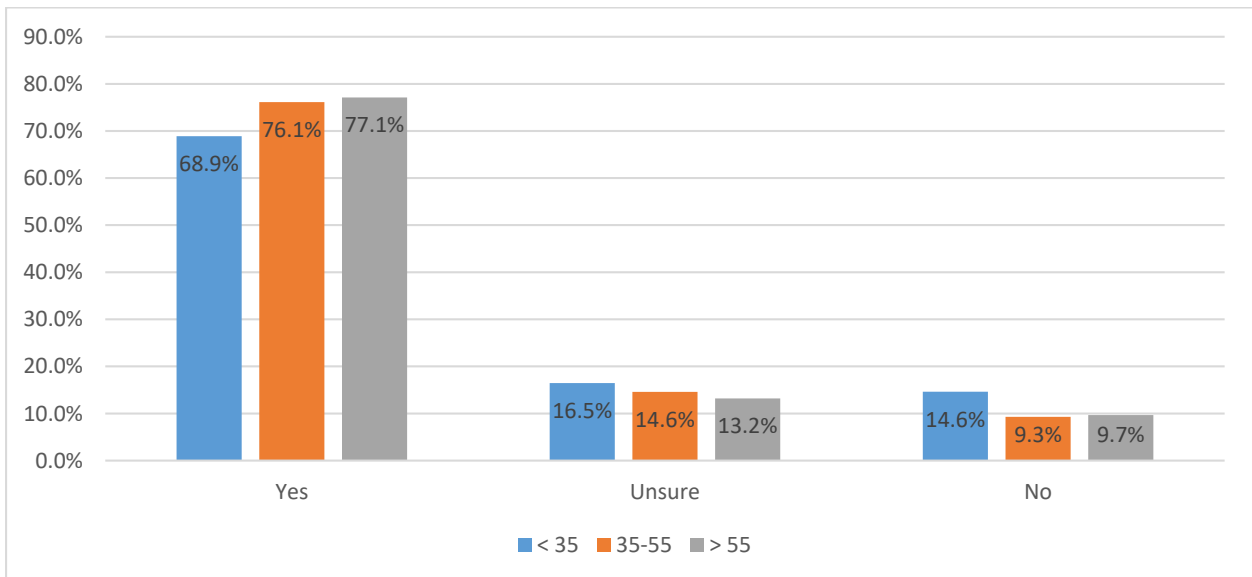
Figure 41. Responses to "Do You Expect Government to Regulate How Automated and Driverless Vehicles are Used?" (by Gender)
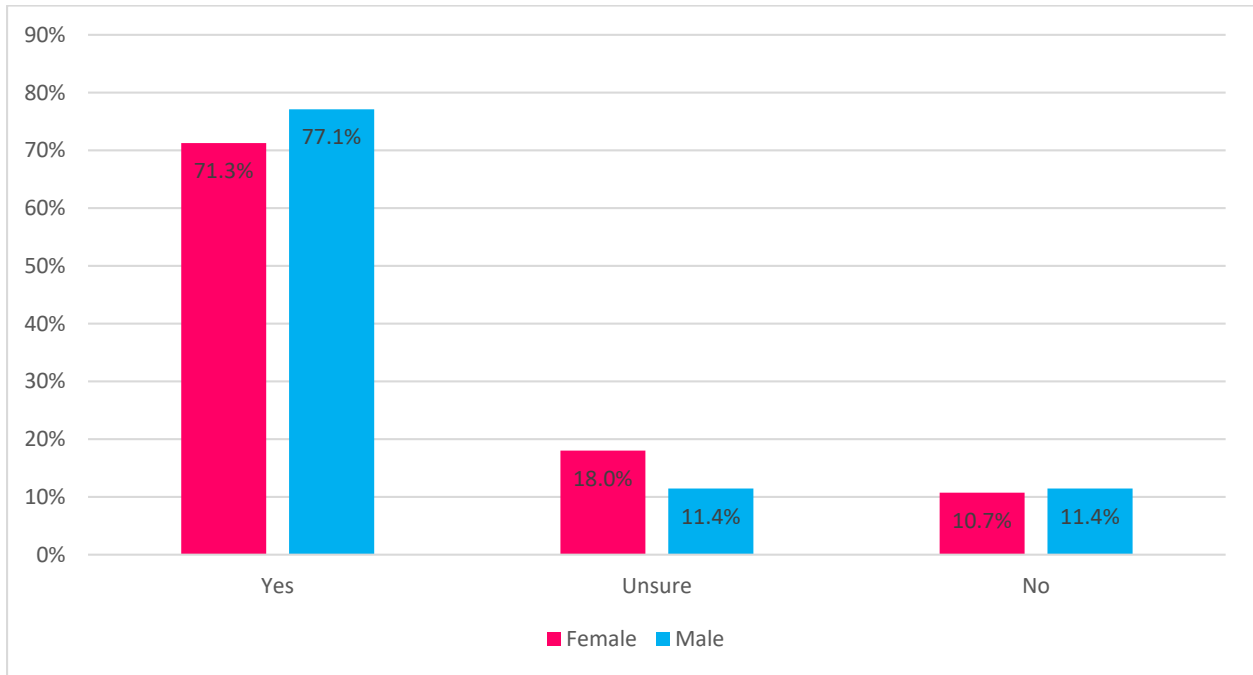
Key Takeaways:

- 74.1% support government efforts to regulate and encourage automated vehicle use

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4.6 Government Innovation

Figure 42. Responses to "Should Governments Become 'Innovators' and Take the Lead on Using Driverless Cars?"
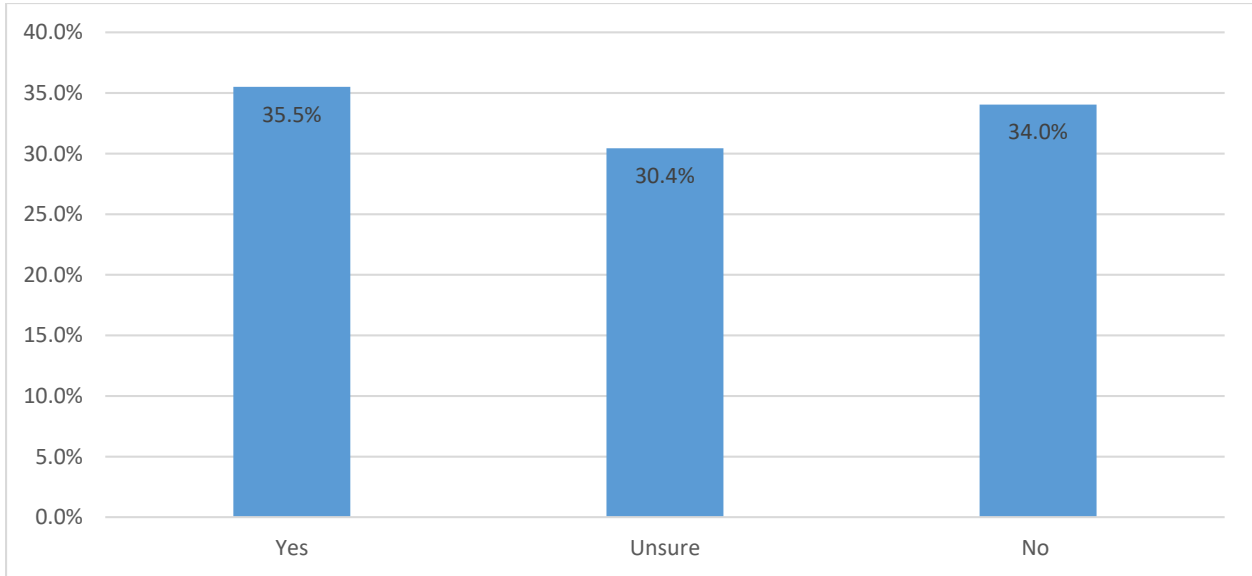
Figure 43. Responses to "Should Governments Become 'Innovators' and Take the Lead on Using Driverless Cars?" (by Age)

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TRANSFORM   33
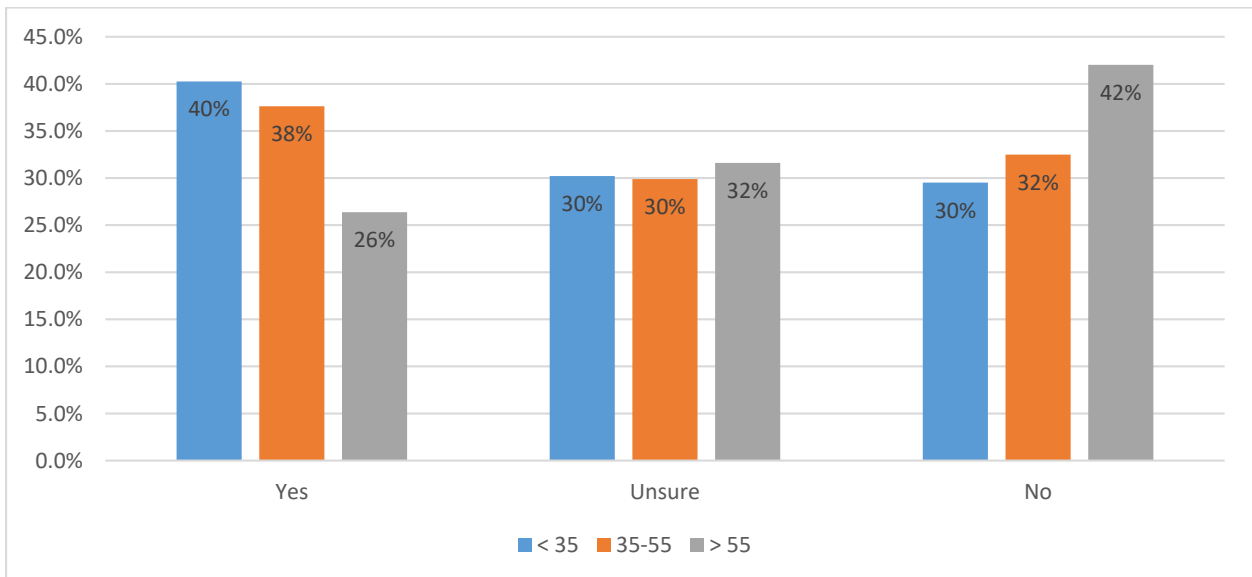
Figure 44. Responses to "Should Governments become 'Innovators' and Take the Lead on Using Driverless Cars?" (by Gender)

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TRANSFORM   34
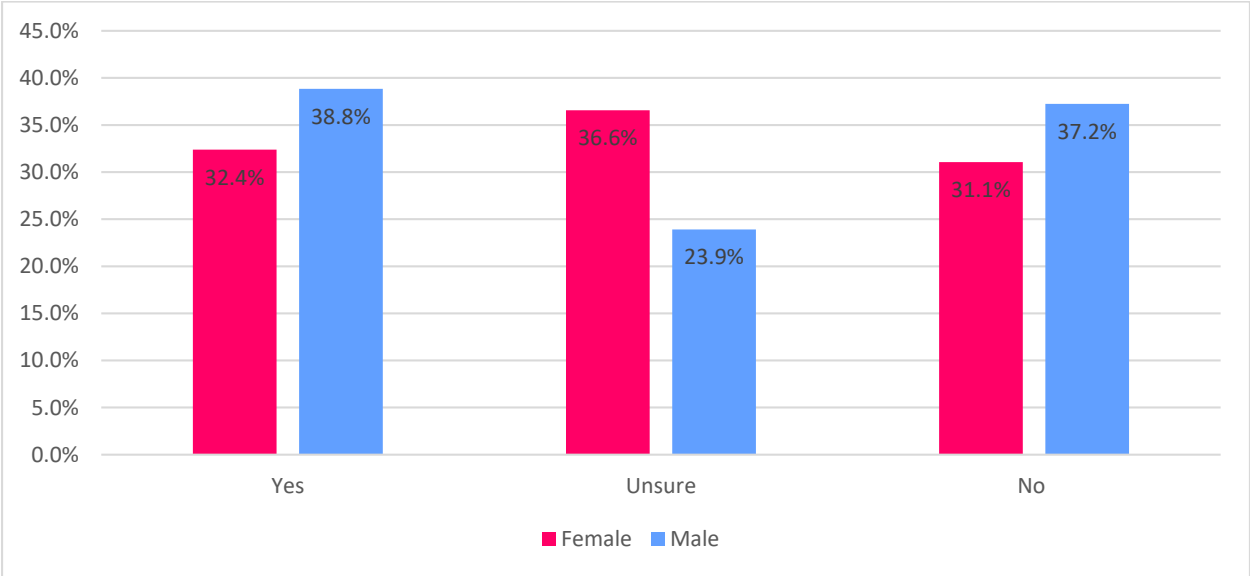
5.0 Demographics

5.1 Age

Figure 45. Age of Respondents
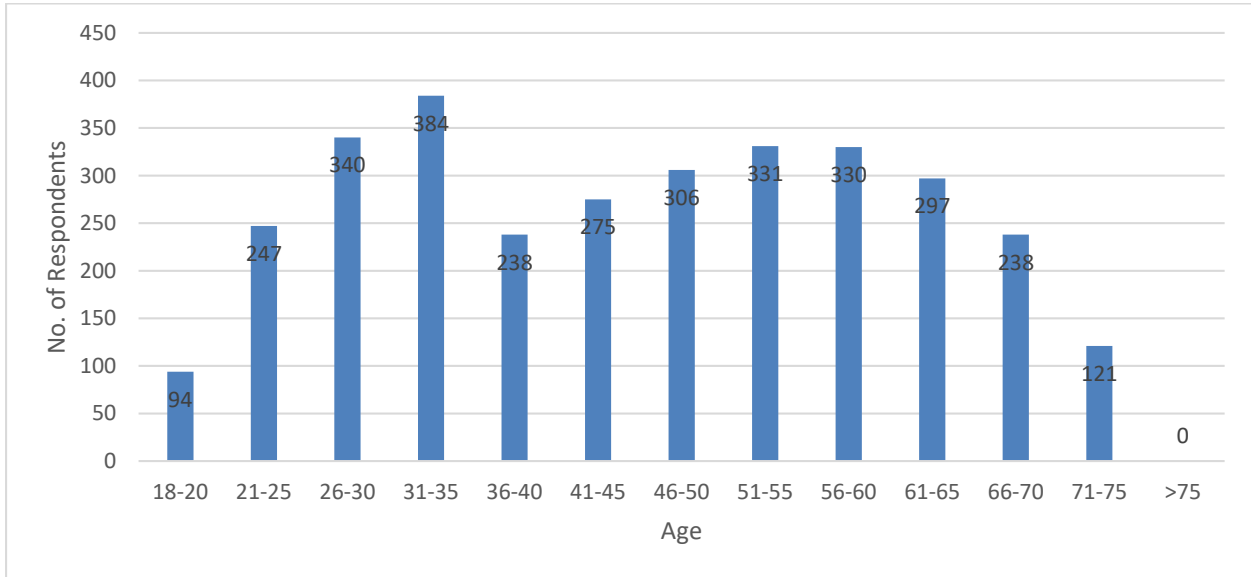
Figure 46. Age of Weighted Responses

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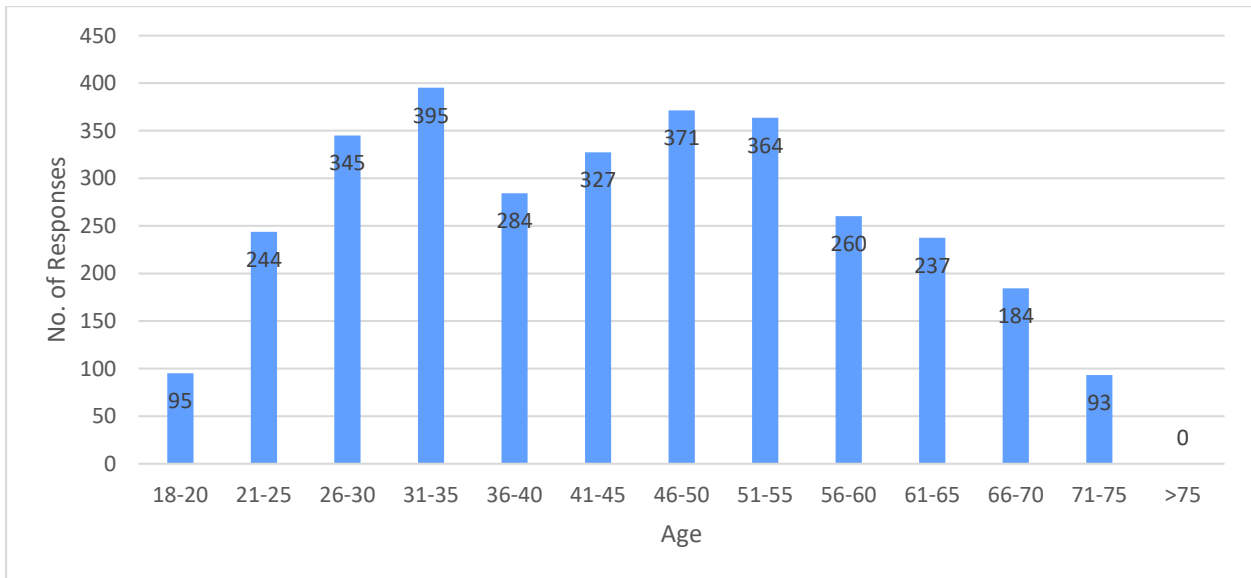
5.2 Gender

Figure 47. Gender of Responses
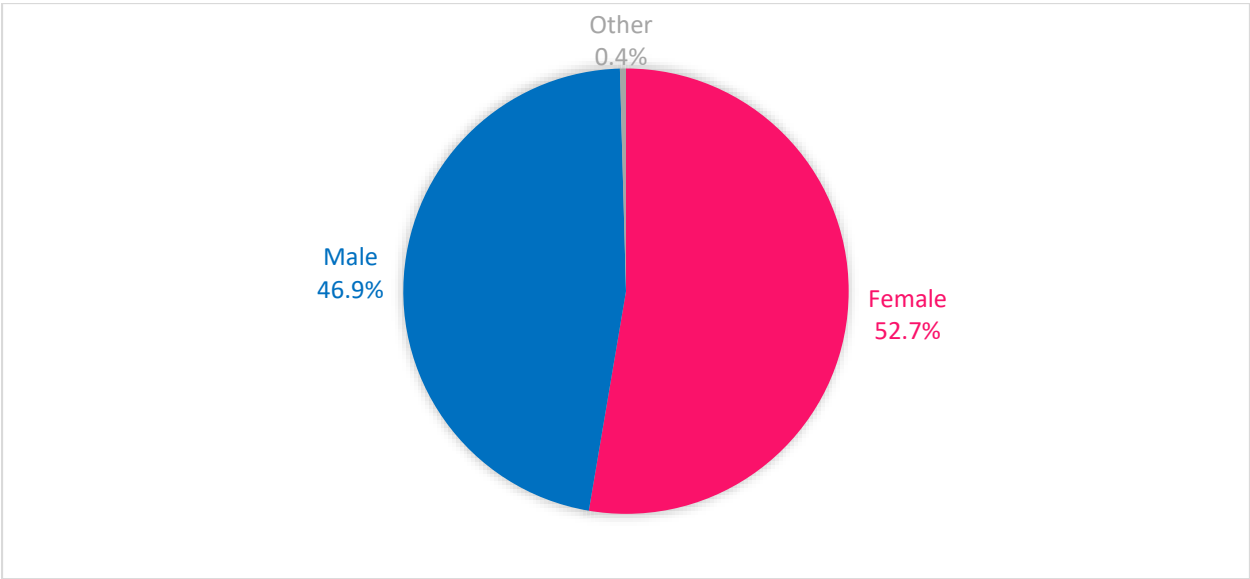
Figure 48. Gender of Weighted Responses

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TRANSFORM   36
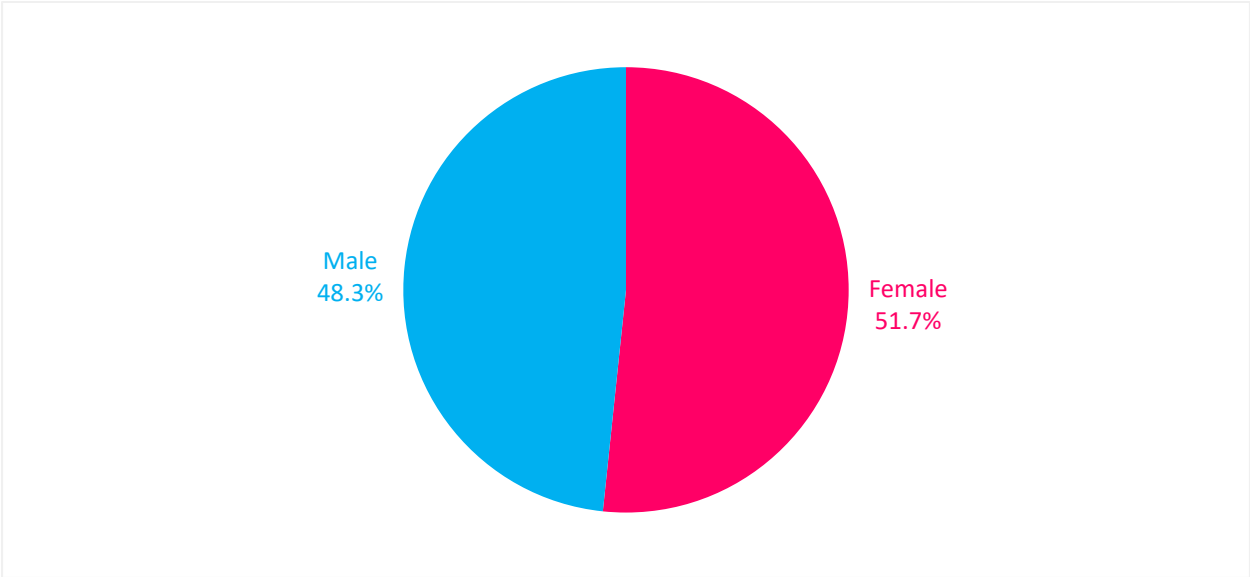
5.3 Age and Gender

Figure 49. Respondents by Age and Gender
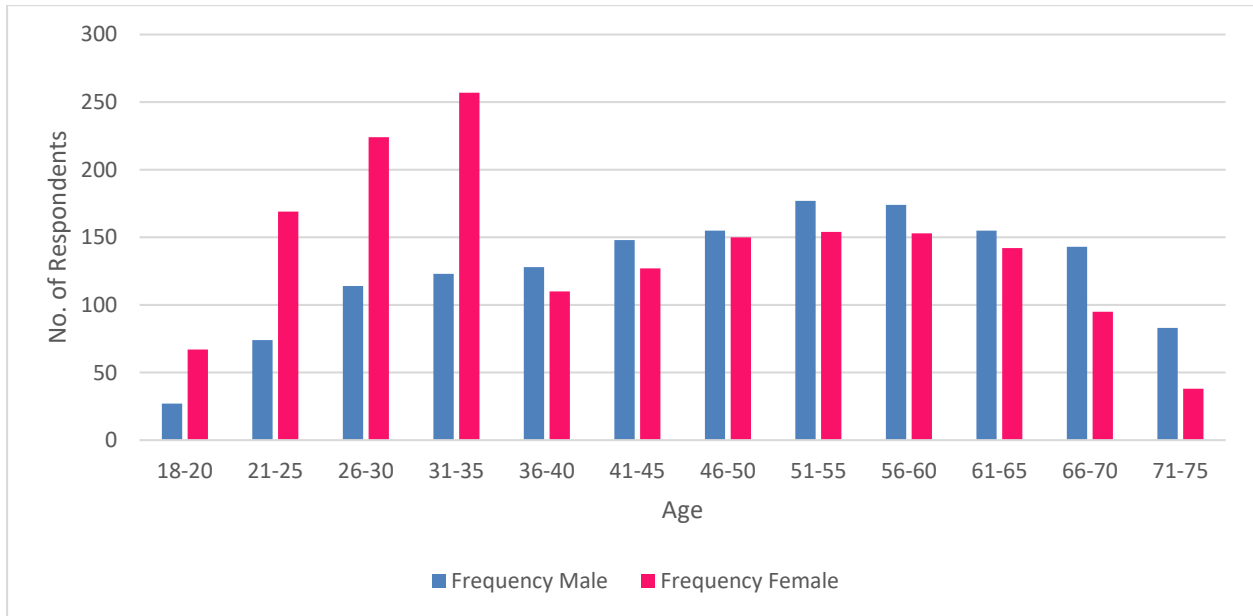
Figure 50. Weighted Responses by Age and Gender
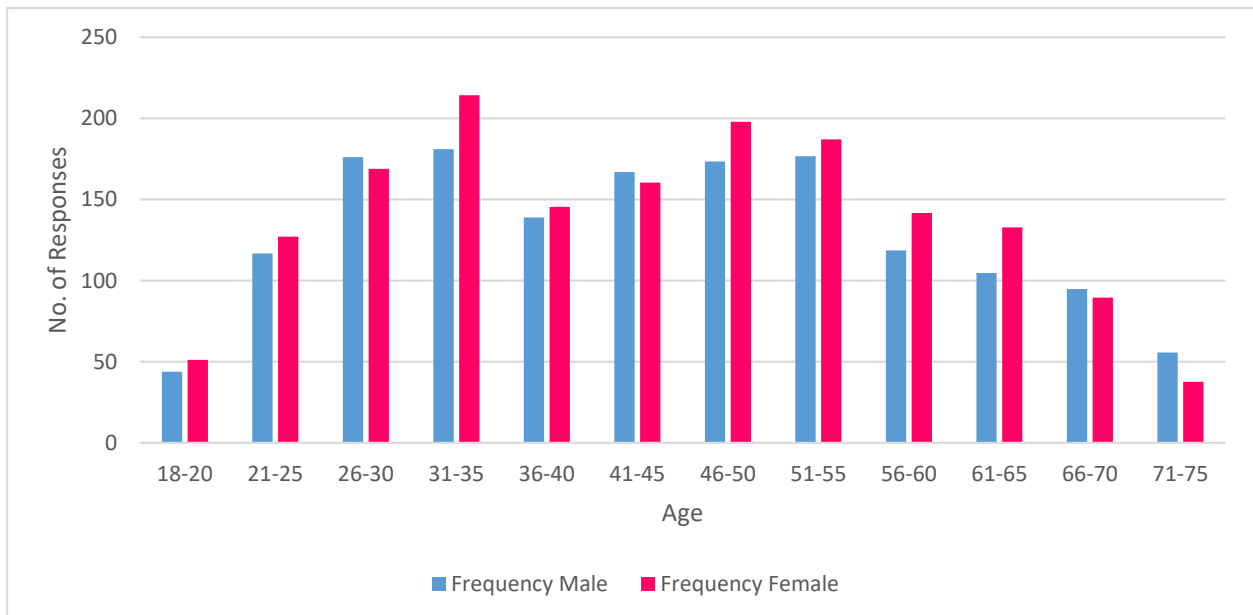
Our raw sample had rather low proportions of young (< 35) male respondents. However, these proportions were weighted to be in line with those of the GTHA based on 2011 Statistics Canada data.

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5.4 Region

Table 1. Regional Proportions of Samples

Region	No. of Respondents	% of Respondents	% of Weighted Responses	% of Census Population
Durham Region	400	12.5%	9.1%	9.2%
Halton Region	300	9.4%	7.4%	7.6%
Hamilton	300	9.4%	7.8%	7.9%
Peel Region	500	15.6%	19.5%	19.7%
Toronto	1200	37.5%	40.7%	39.8%
York Region	501	15.7%	15.6%	15.7%
Total	**3201**	**100.0%**	**100.1%***	**99.9%***

*Discrepancies in totals due to rounding error

Differences between each region's share of weighted responses and census population are due to the fact that the survey was restricted to individuals age 18-75. The weights were calculated in reference to each region's population share for that age range. Accordingly, the weighted proportions are equal to regional shares of the actual GTHA population, within ages 18-75. The overall census population, however, includes individuals outside of this age range, which, to differing extents, changes each region's share of that overall all-ages population.

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5.5 Driver's License

Figure 51. Individuals with Driver's License
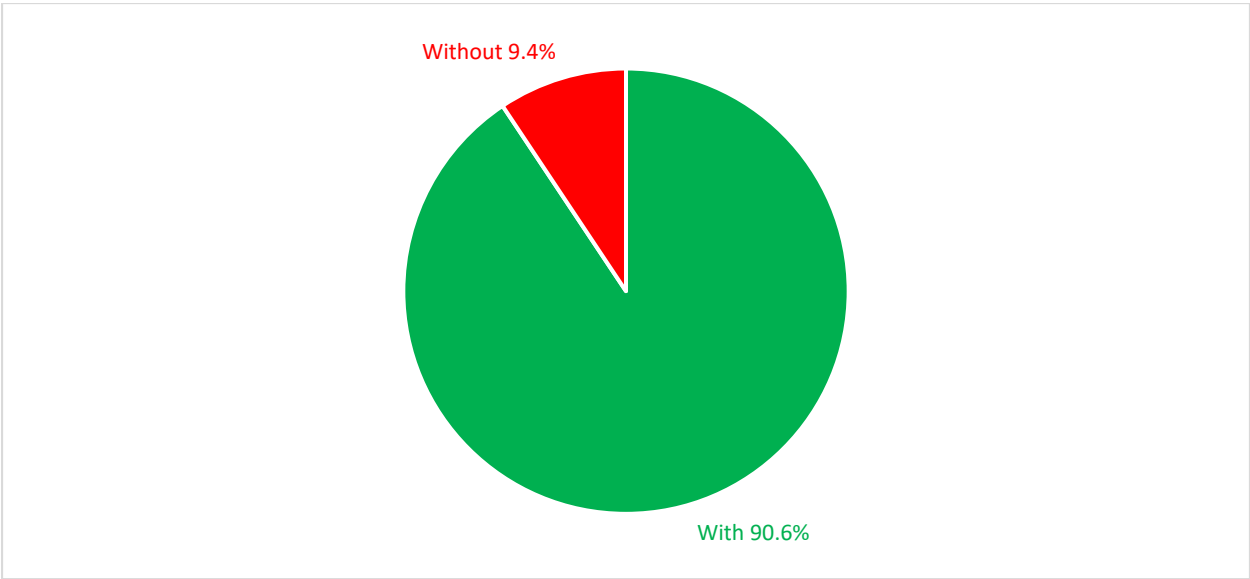
Average Licenses Reported per Household: 2.1

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5.6 Smartphone

Figure 52. Individuals Regularly Carrying a Smartphone

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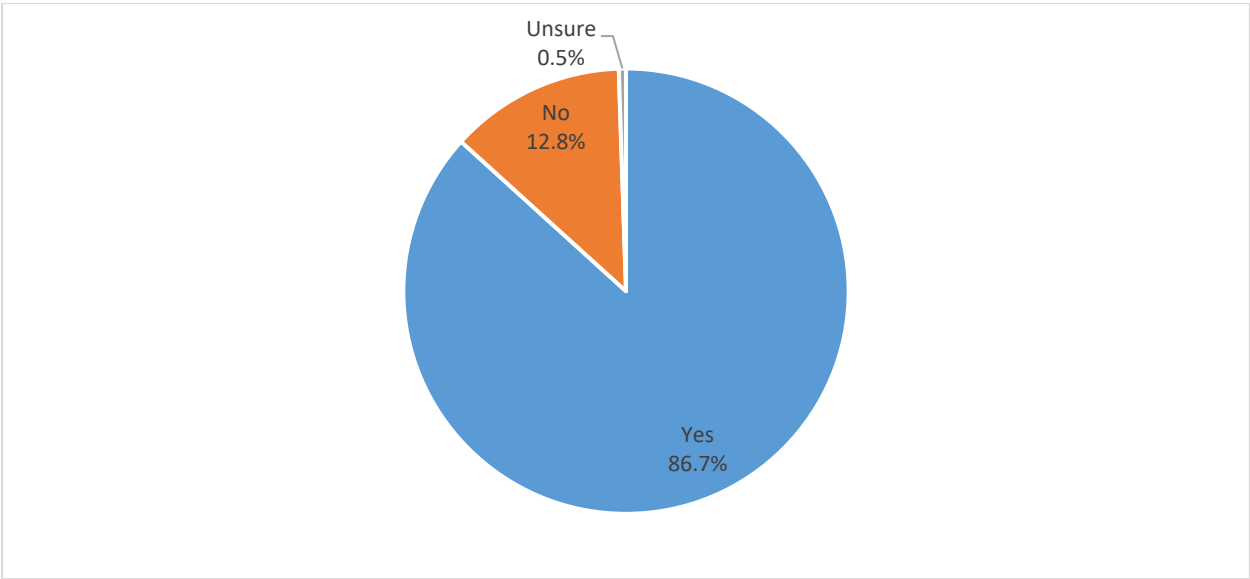
5.7 Physical Disability

Figure 53. Responses to "I Have a Physical Disability Which Influences My Ability to Go Places"

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TRANSFORM   41
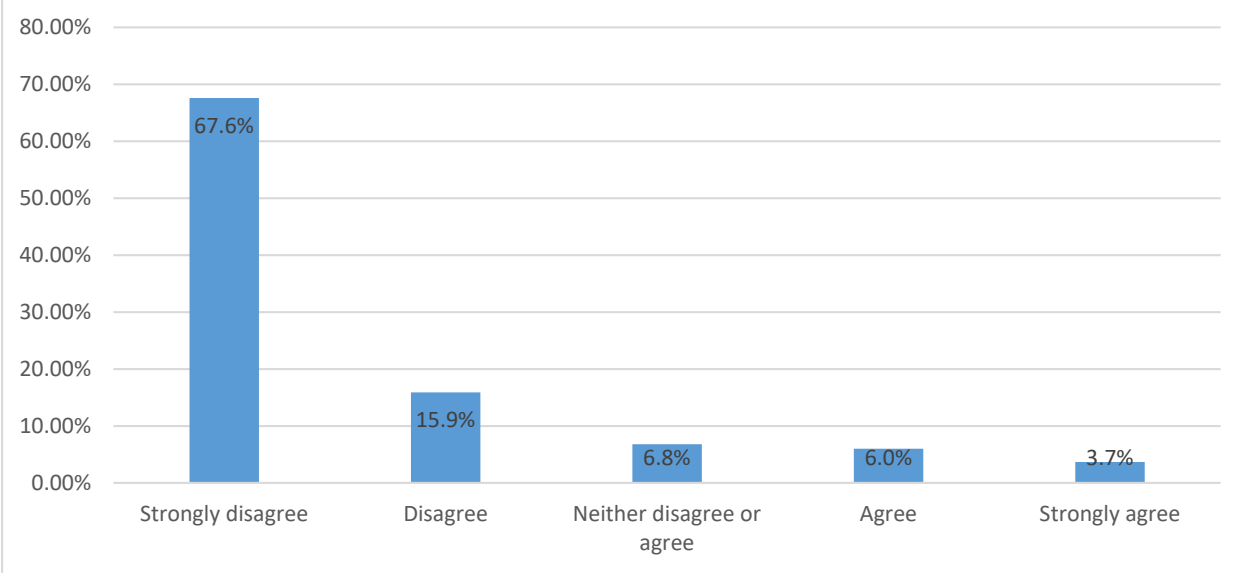
5.8 Educational Attainment

Figure 54. Educational Attainment
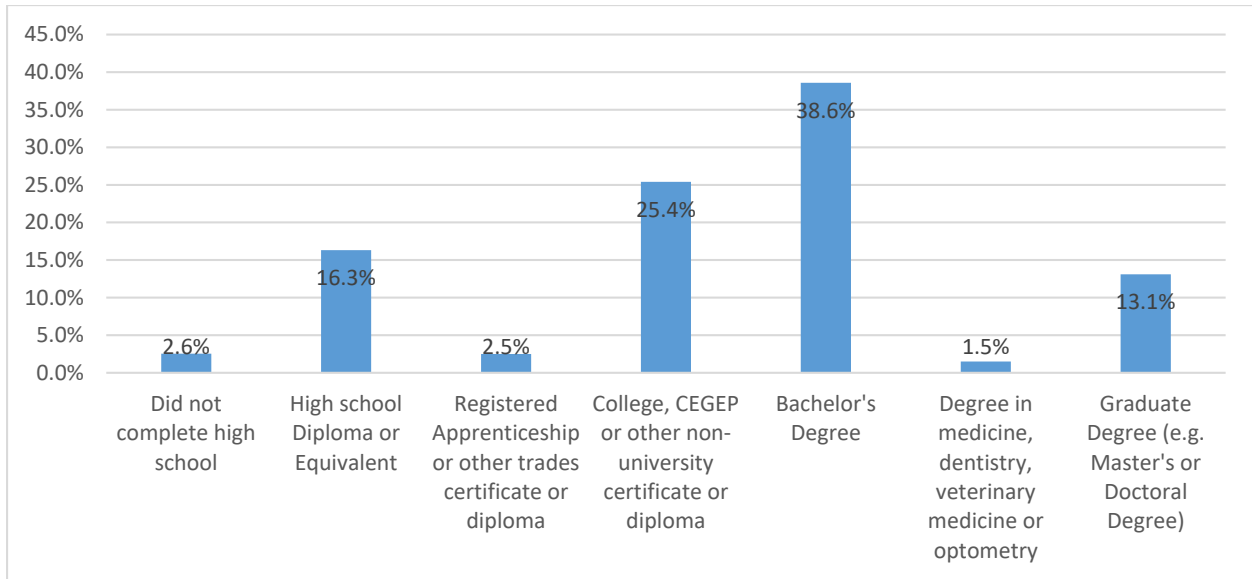
Figure 55. GTHA Educational Attainment in 2011 Census
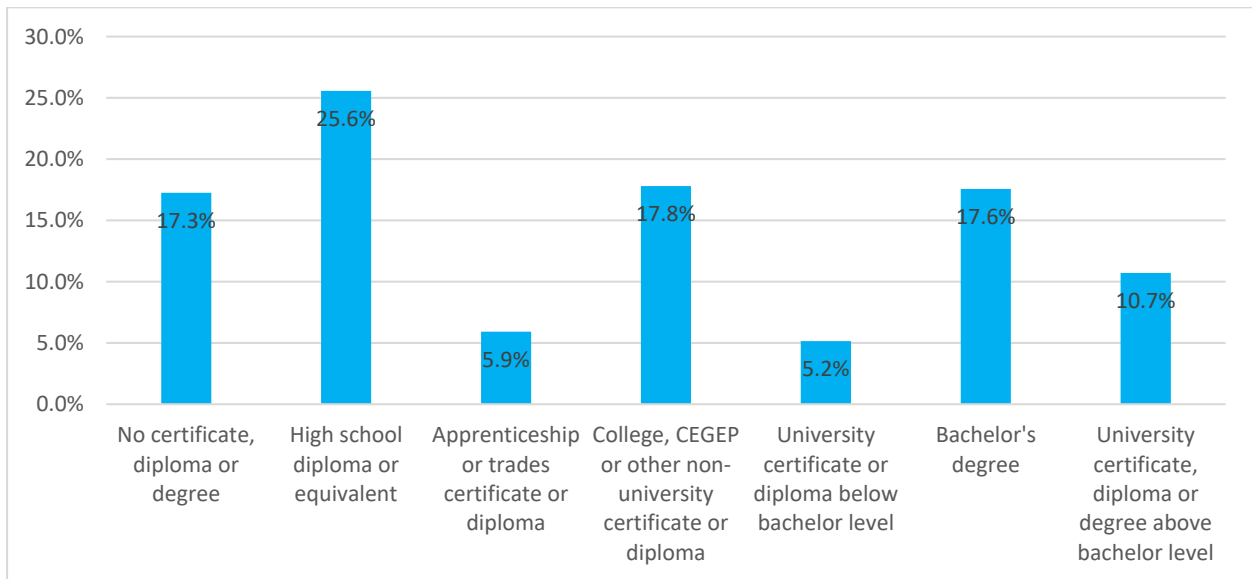
Even after weighting for gender, age and region, it appears that our sample's educational attainment is substantially higher than the actual underlying population of the GTHA (at least according to 2011 Statistics Canada data).

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6.0 **Employment and Commuting**

6.1 Employment Status

Figure 56. Employment Status

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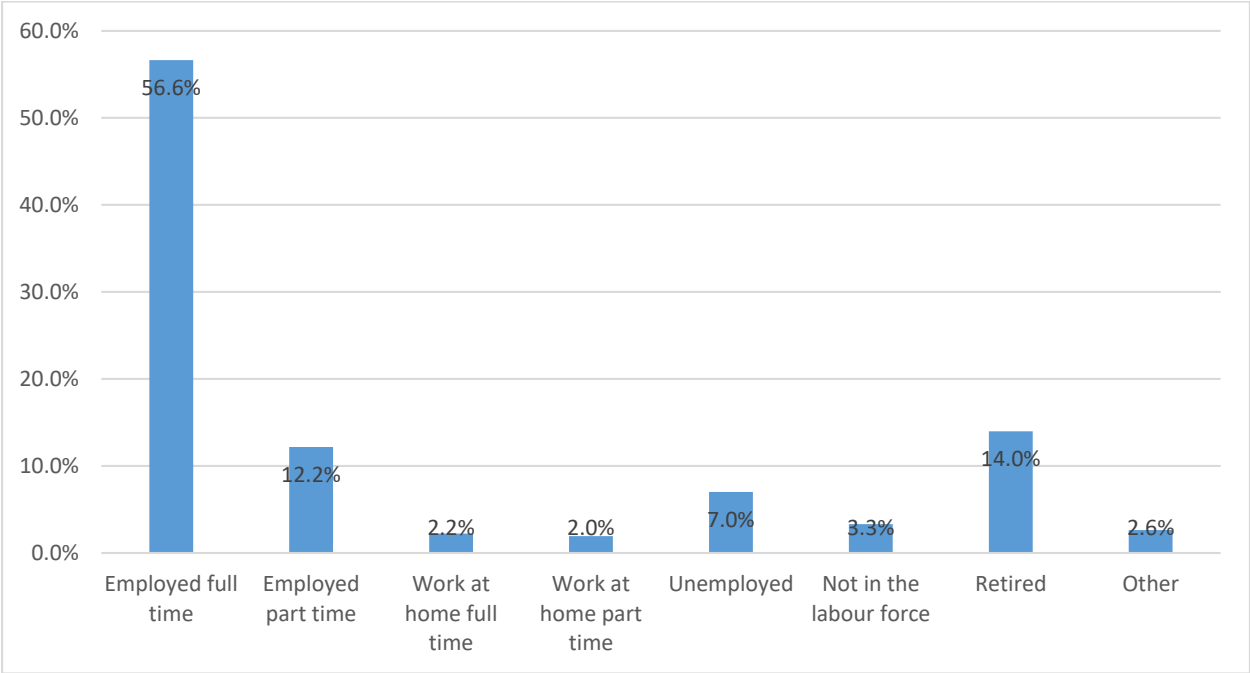
6.2 Student Status

Figure 57. Student Status

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TRANSFORM   44
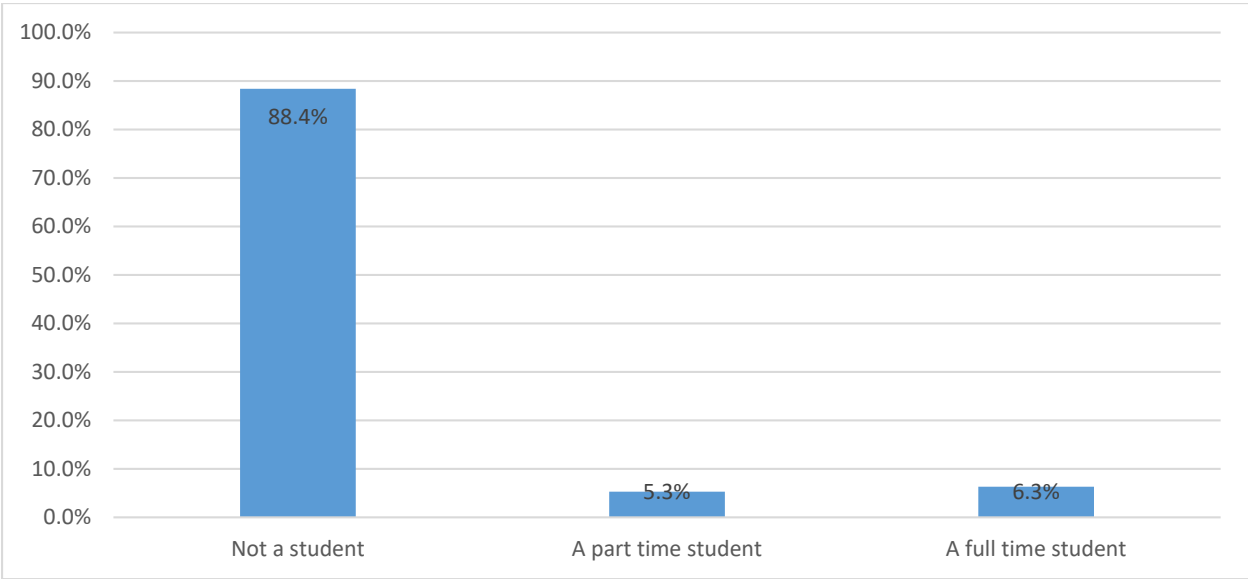
6.3 Weekly Hours by Employment Status

Figure 58. Weekly Hours Worked, Sorted by Employment Status

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TRANSFORM   45
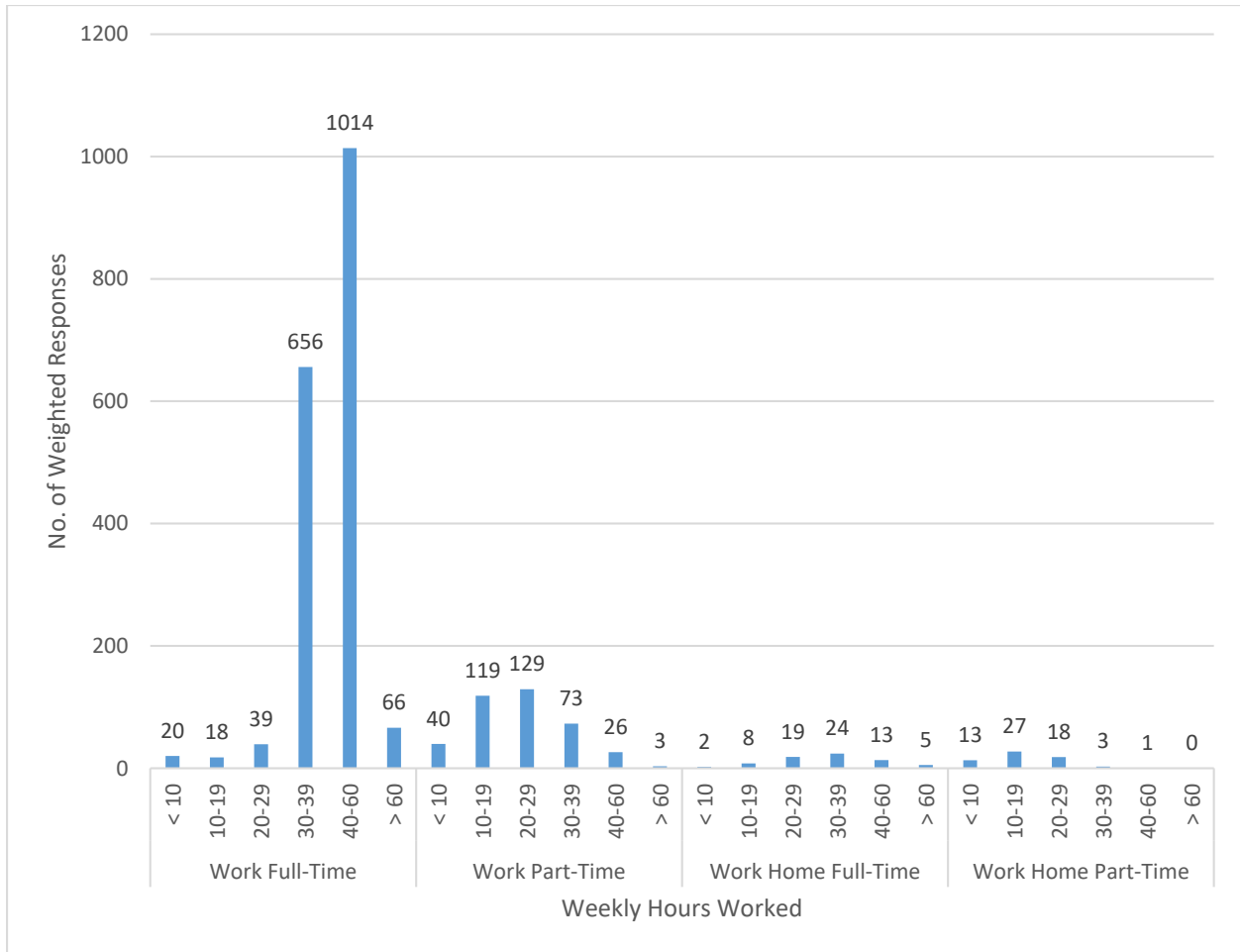
6.4 Weekly Hours by Student Status

Figure 59. Weekly Hours Worked, Sorted by Student Status

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TRANSFORM   46
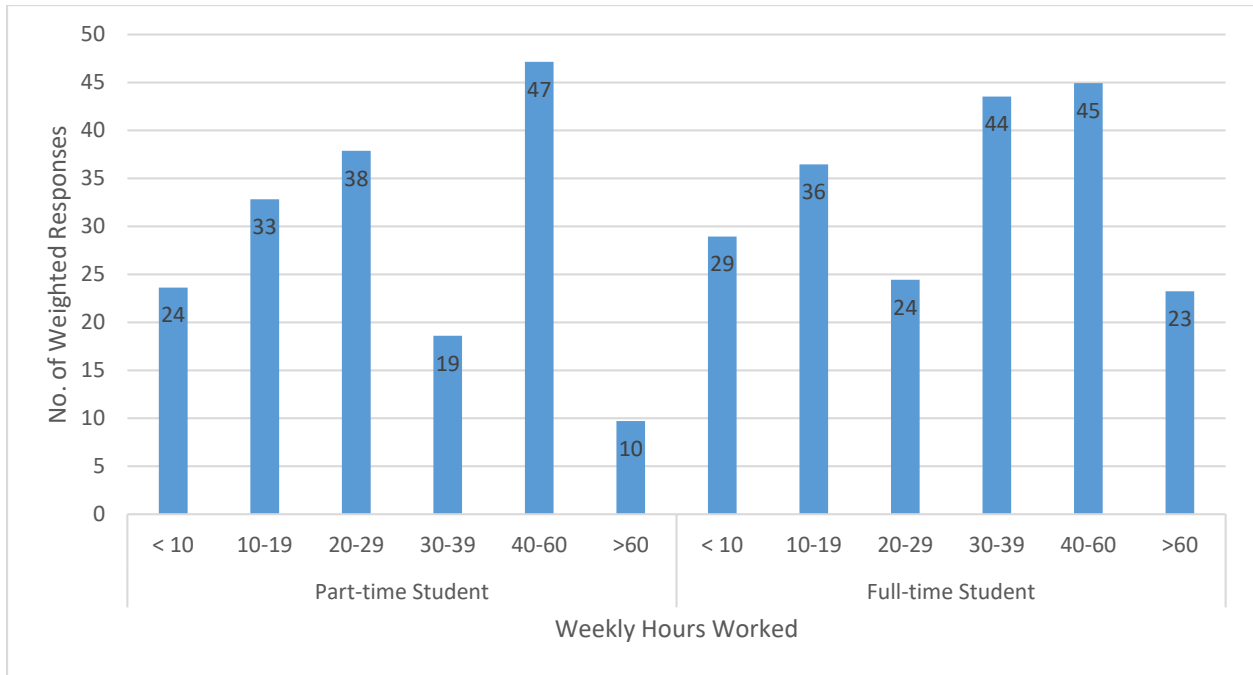
6.5 Occupation

Figure 60. Occupation

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TRANSFORM   47
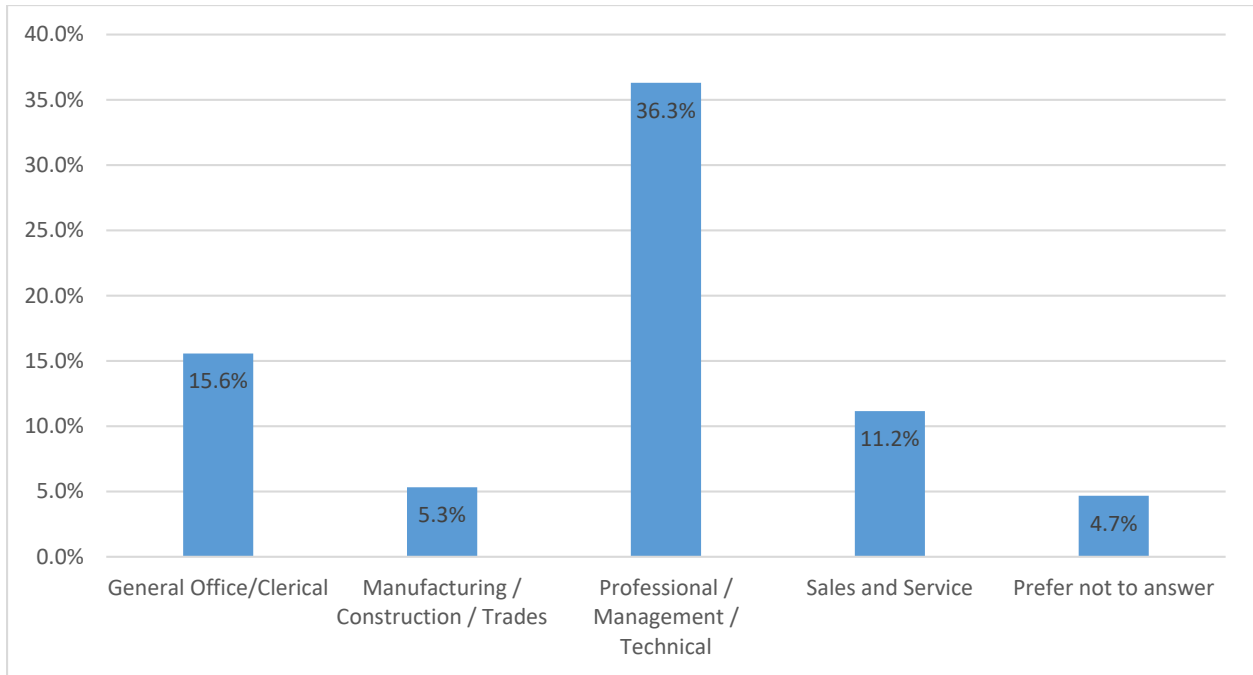
6.6 Travel Mode

Figure 61. Mode Used on Last Day of Work/School
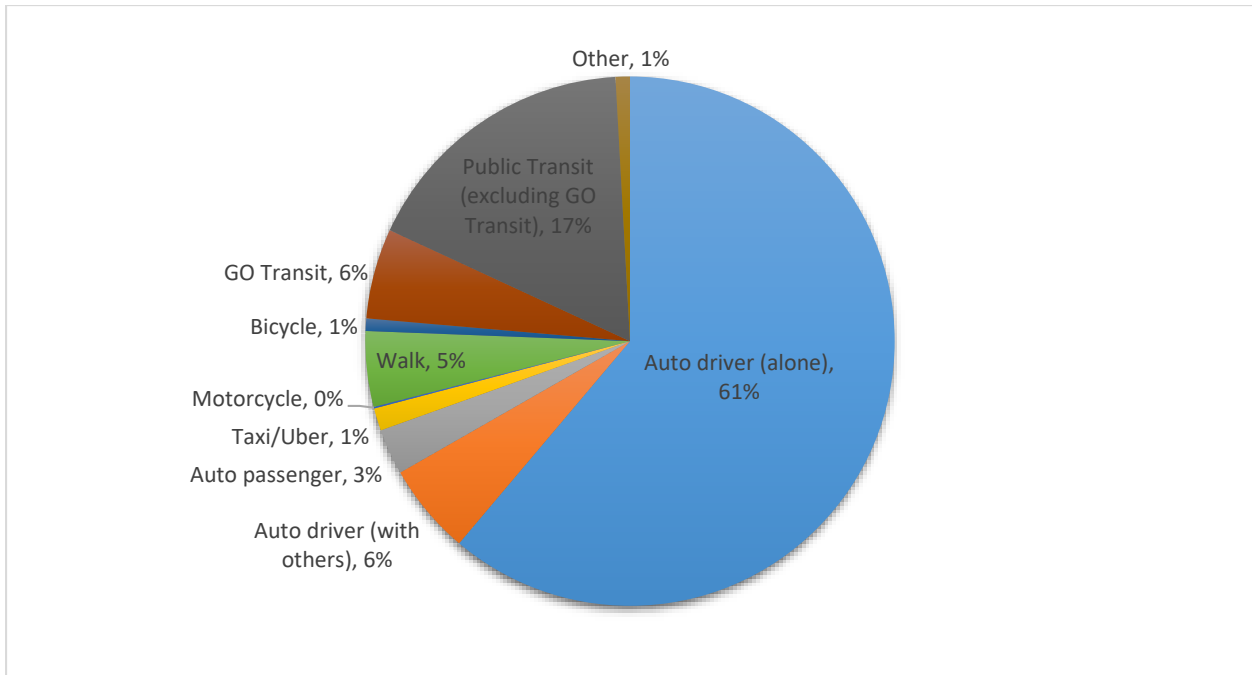
Table 2. Mode Used on Last Day of Work/School

Mode	< 35	35-55	> 55	Total
Auto driver (alone)	54.9%	63.9%	69.6%	61.2%
Auto driver (with others)	6.8%	5.0%	4.0%	5.6%
Auto passenger	2.8%	2.5%	3.9%	2.8%
Taxi/Uber	1.8%	1.0%	1.2%	1.4%
Motorcycle	0.2%	0.0%	0.3%	0.1%
Walk	5.8%	4.2%	2.7%	4.6%
Bicycle	1.0%	0.4%	1.5%	0.8%
GO Transit	4.8%	6.6%	3.6%	5.5%
Public Transit (excluding GO Transit)	21.0%	15.6%	12.2%	17.2%
Other	0.9%	0.8%	1.0%	0.9%

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6.7 Car Parking

Figure 62. Individuals with Access to Free Work Parking

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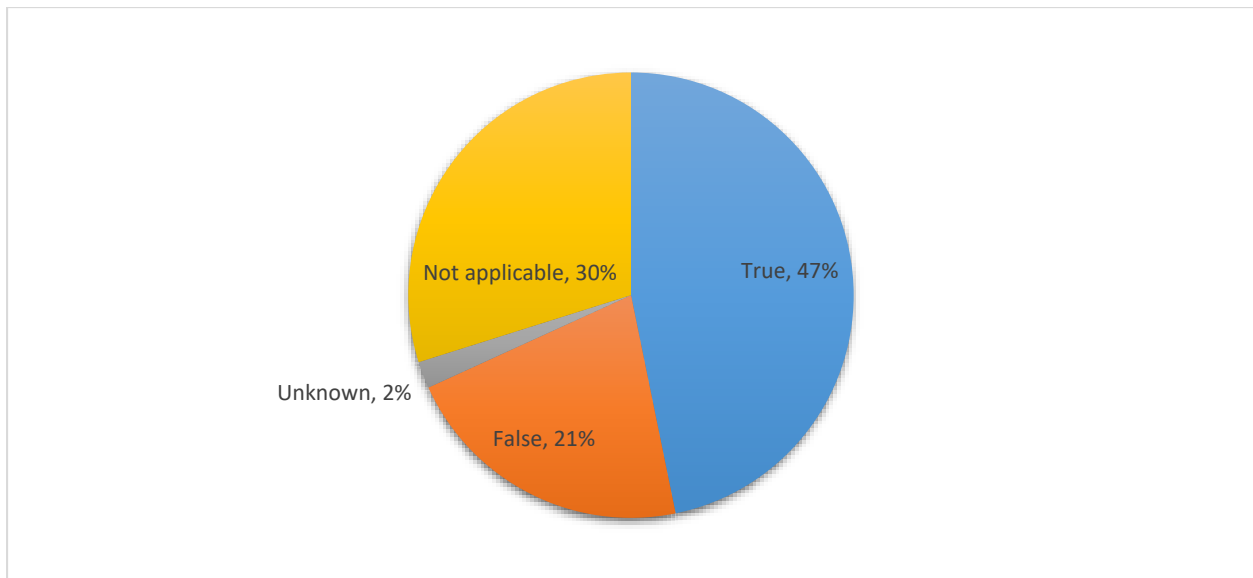
6.8 Travel Time

Figure 63. Mode Average Travel Time (in Minutes)

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TRANSFORM   50
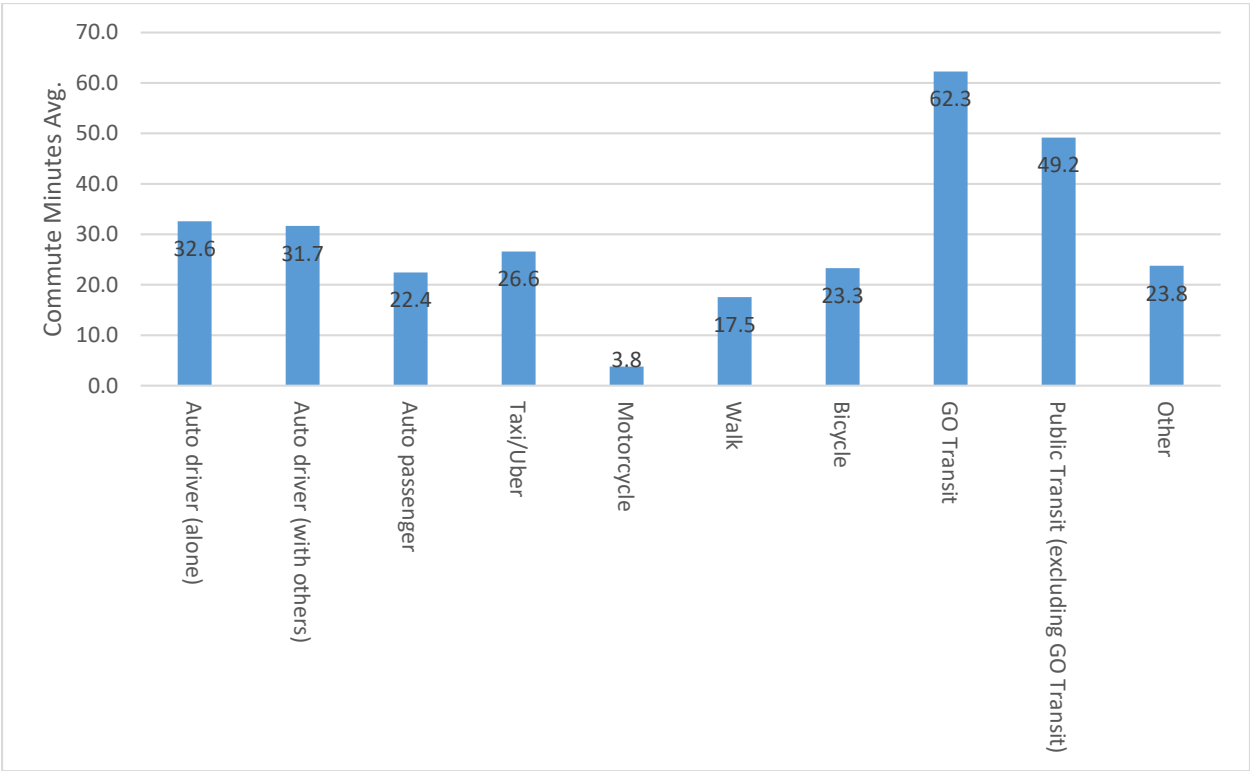
6.9 Teleworking

Figure 64. Frequency of Teleworking

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TRANSFORM   51
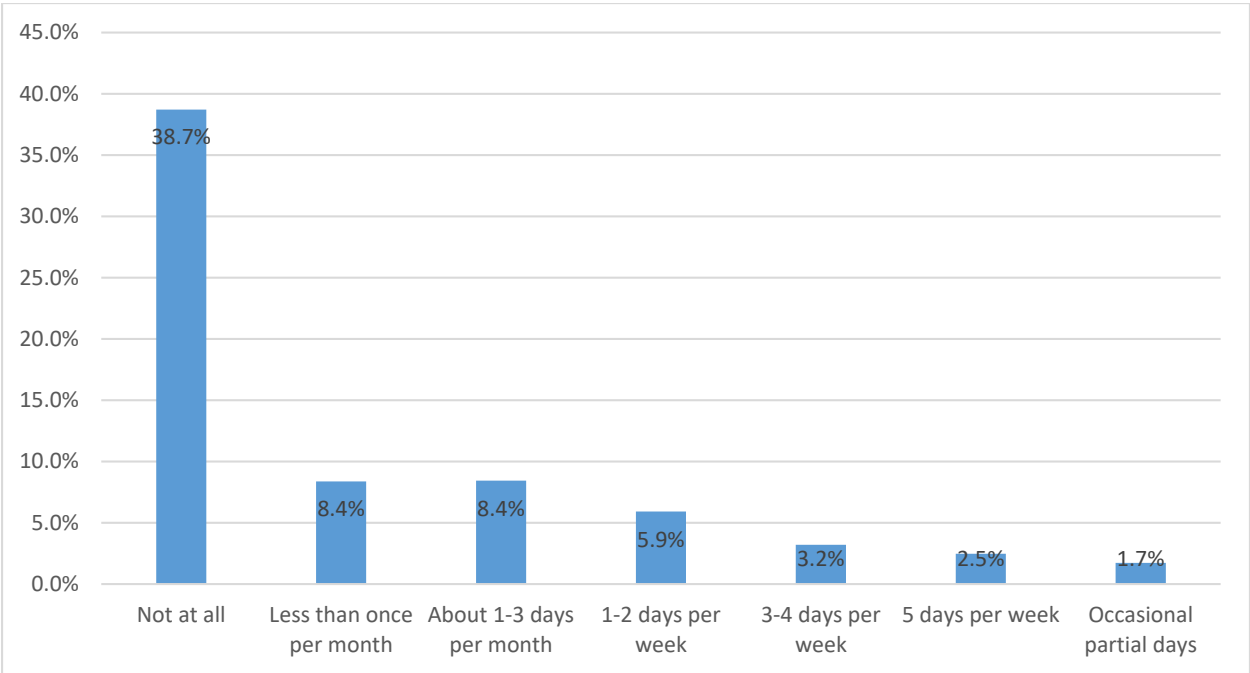
7.0 Residence and Household

7.1 Dwelling Type

Figure 65. Dwelling Type

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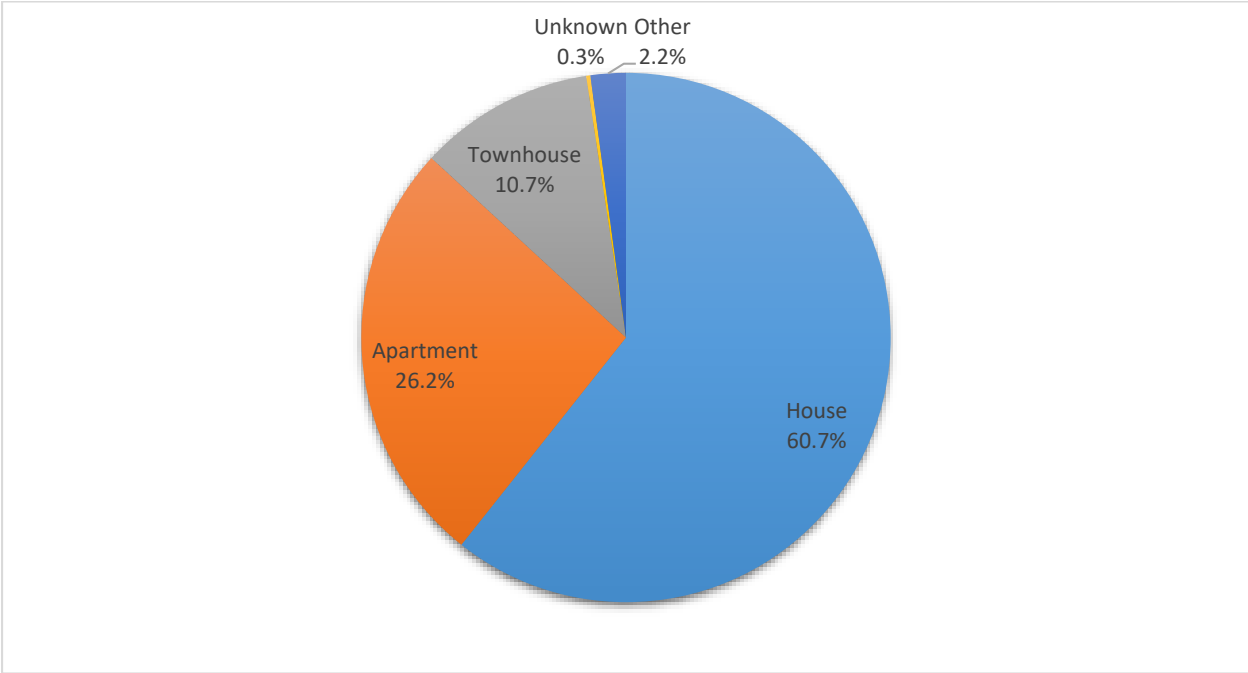
7.2 Household Size

Figure 66. Household Size

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53
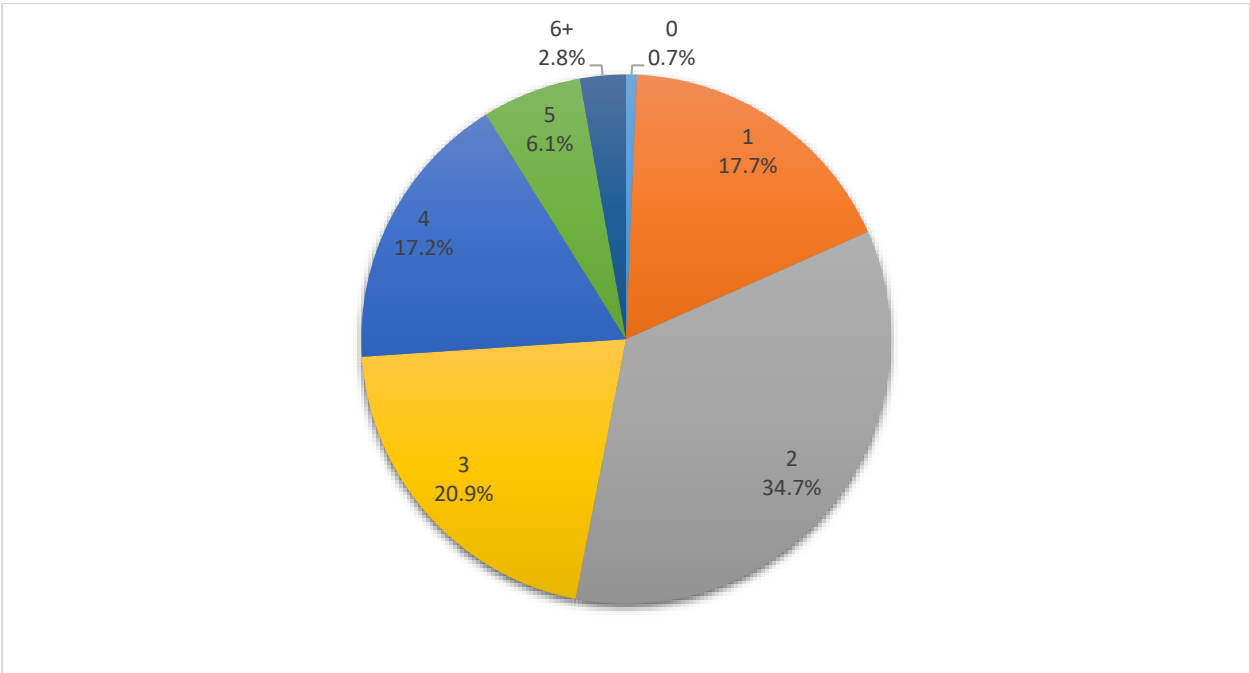
7.3 Household Members Under Age 15

Figure 67. Number of Household Members Under Age 15

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TRANSFORM   54
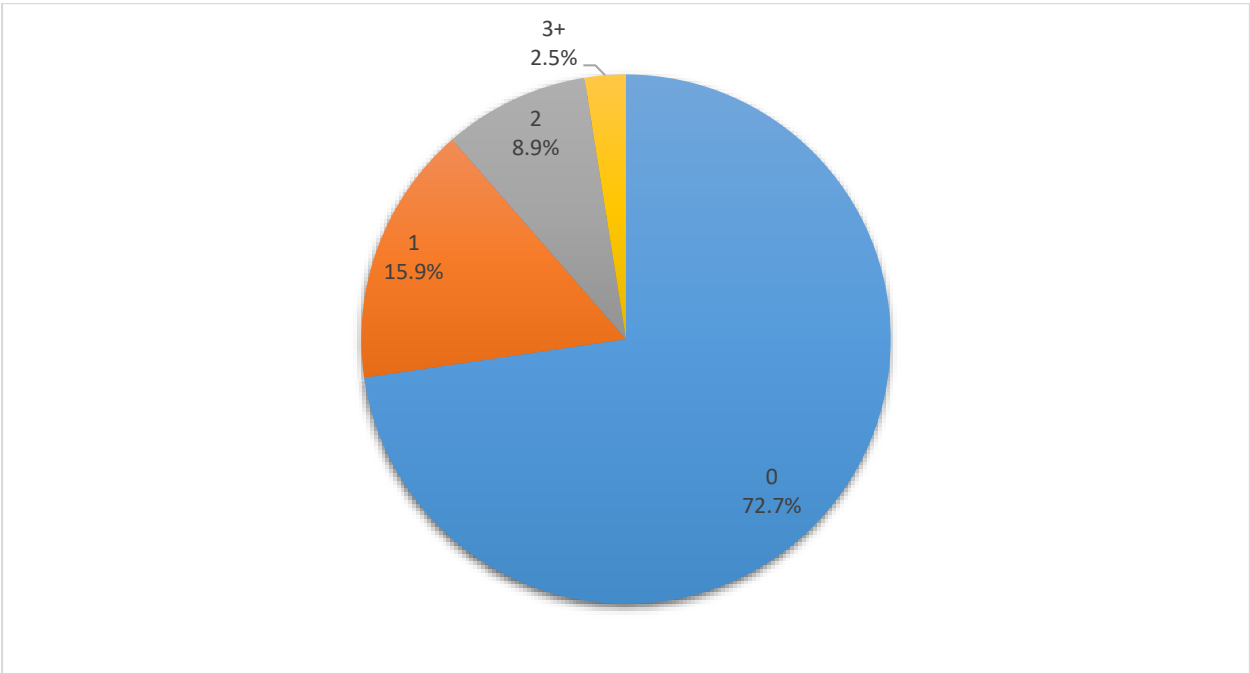
7.4 Chauffeuring Frequency

Figure 68. Chauffeuring Frequency

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TRANSFORM   55
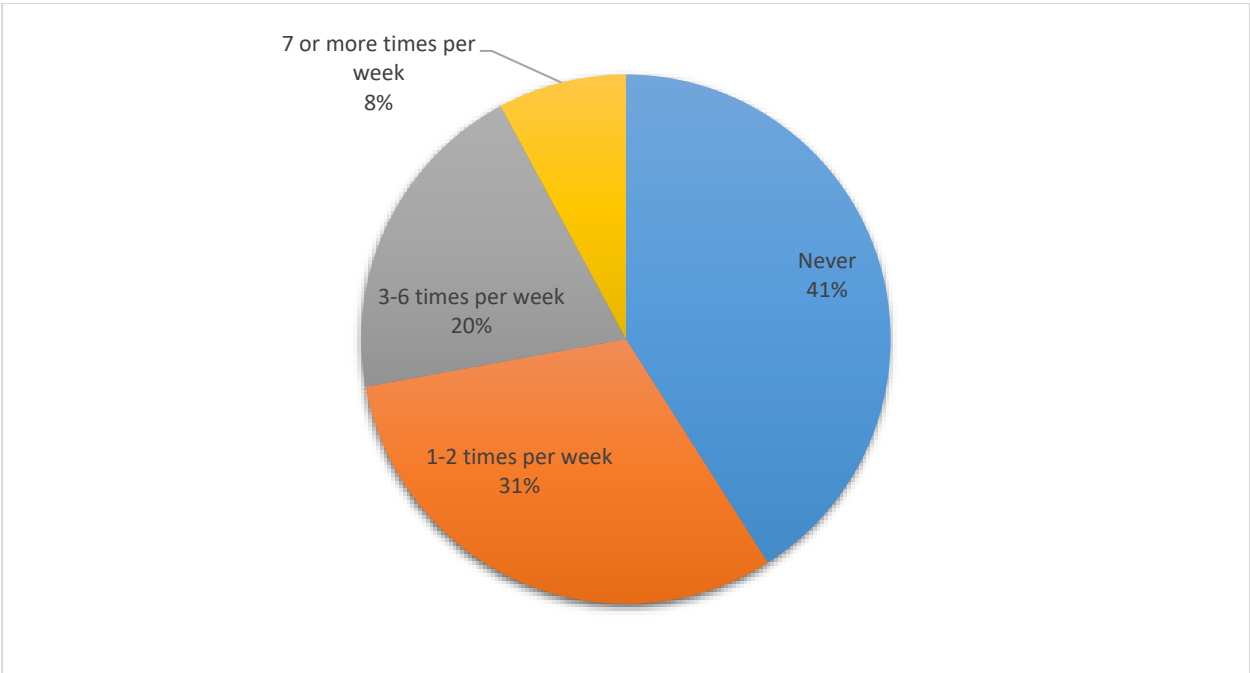
7.5 Number of Employed Persons

Figure 69. Number of Employed Persons in Household

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TRANSFORM

56
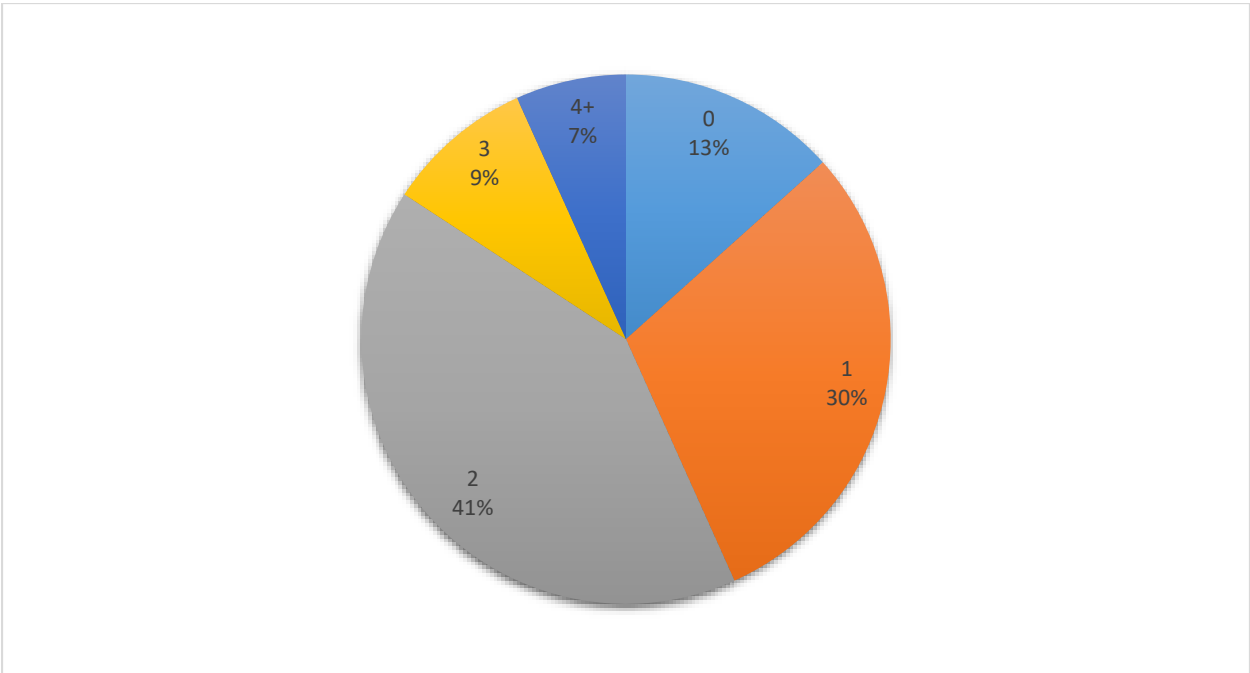
7.6 Number of Post-Secondary Students

Figure 70. Number of Post-Secondary Students in Household

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TRANSFORM   57
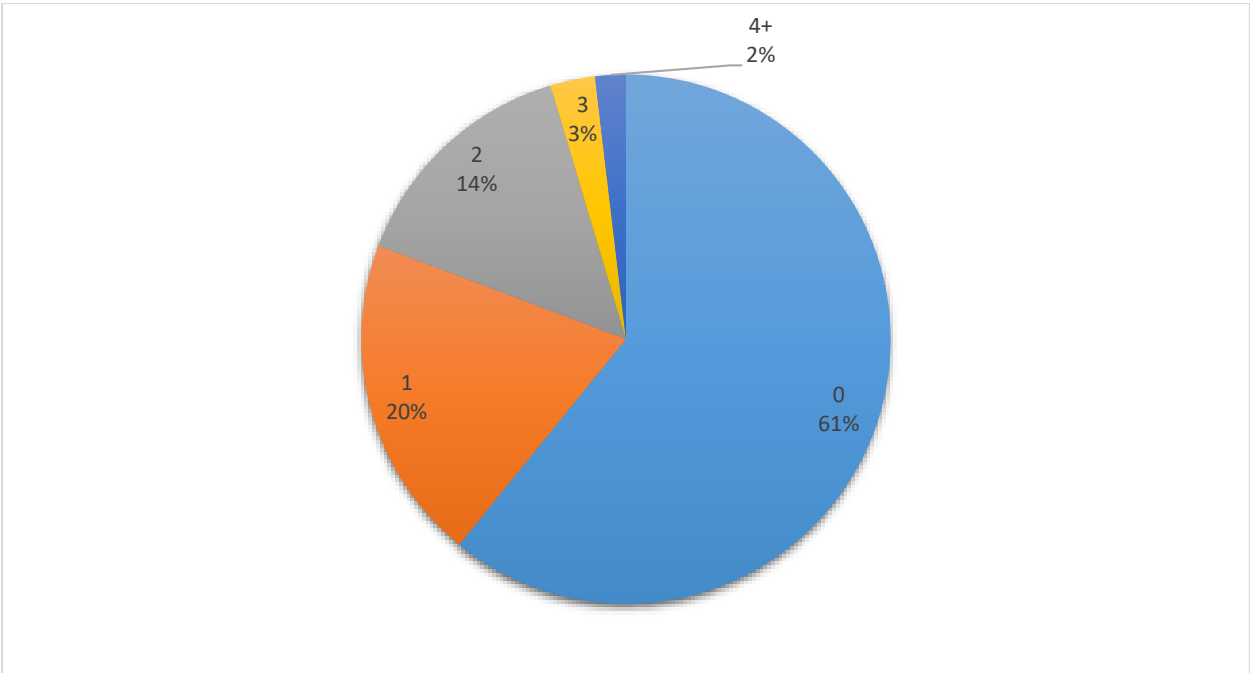
7.7 Household Income

Figure 71. Household Income
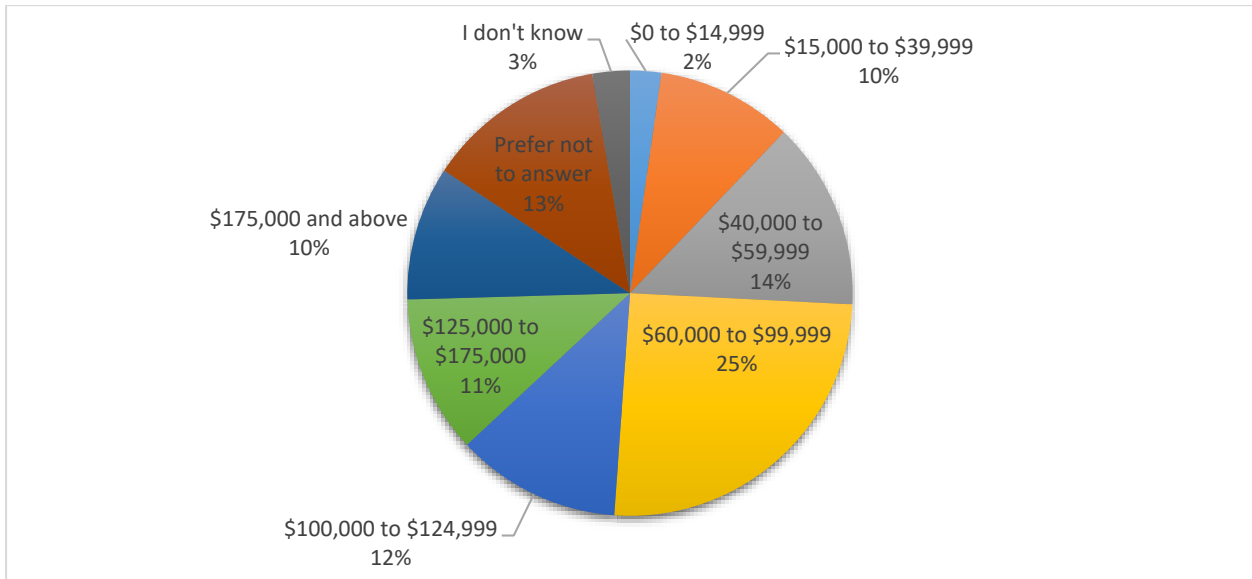
Figure 72. GTHA Household Income in 2011 Census
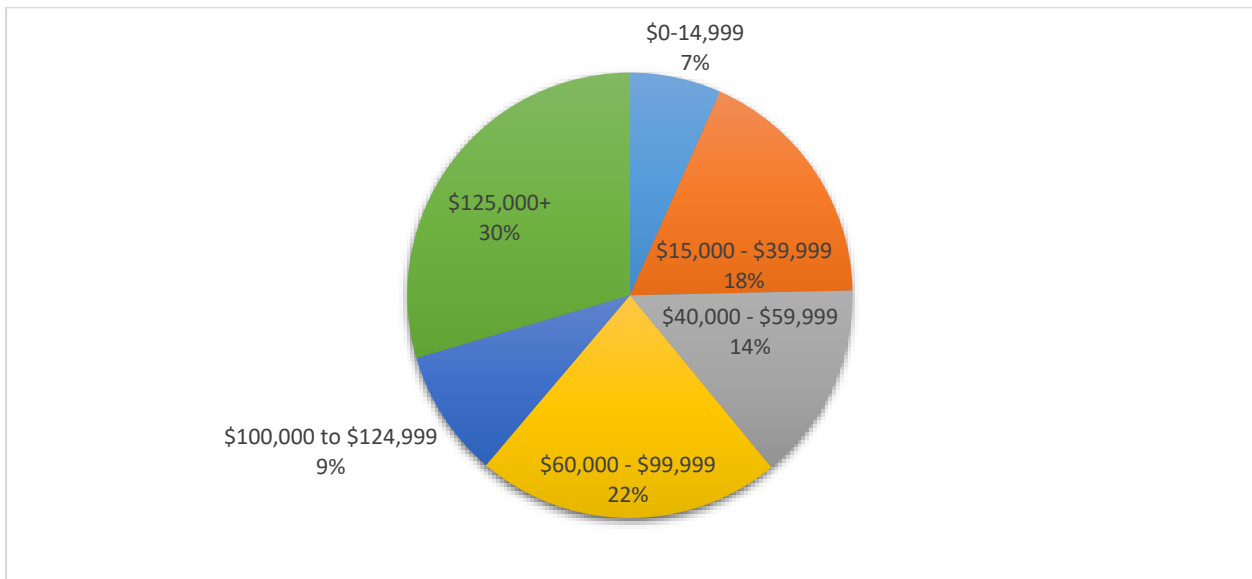
Our sample appears to be somewhat under-representative of the lower end ($0-39, 999) and higher end ($125, 000+) of household incomes in the GTHA, although there could be an effect of the "prefer not to answer" and "I don't know" survey responses masking a disproportionate share of responses from these extremes.

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7.8 Vehicles per Household

Figure 73. Number of Vehicles Per Household

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TRANSFORM   59
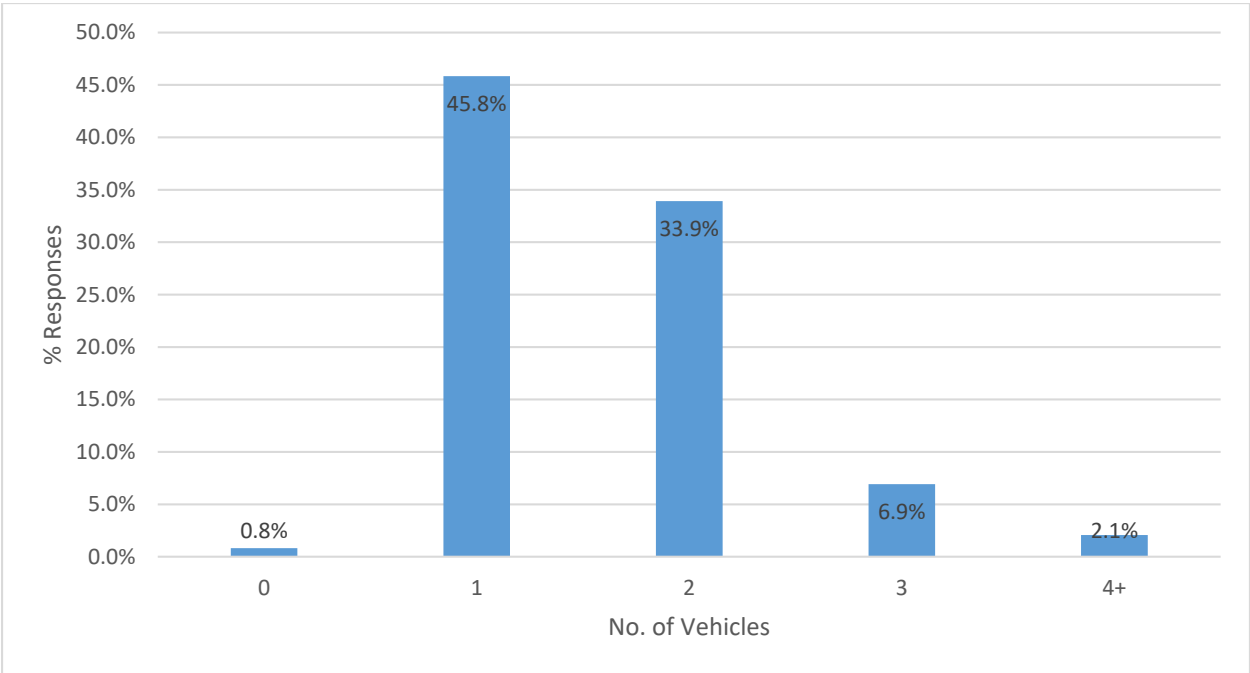
8.0 Vehicle and Daily Travel

8.1 Primary Vehicle Type

Figure 74. Primary Vehicle Type

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TRANSFORM   60
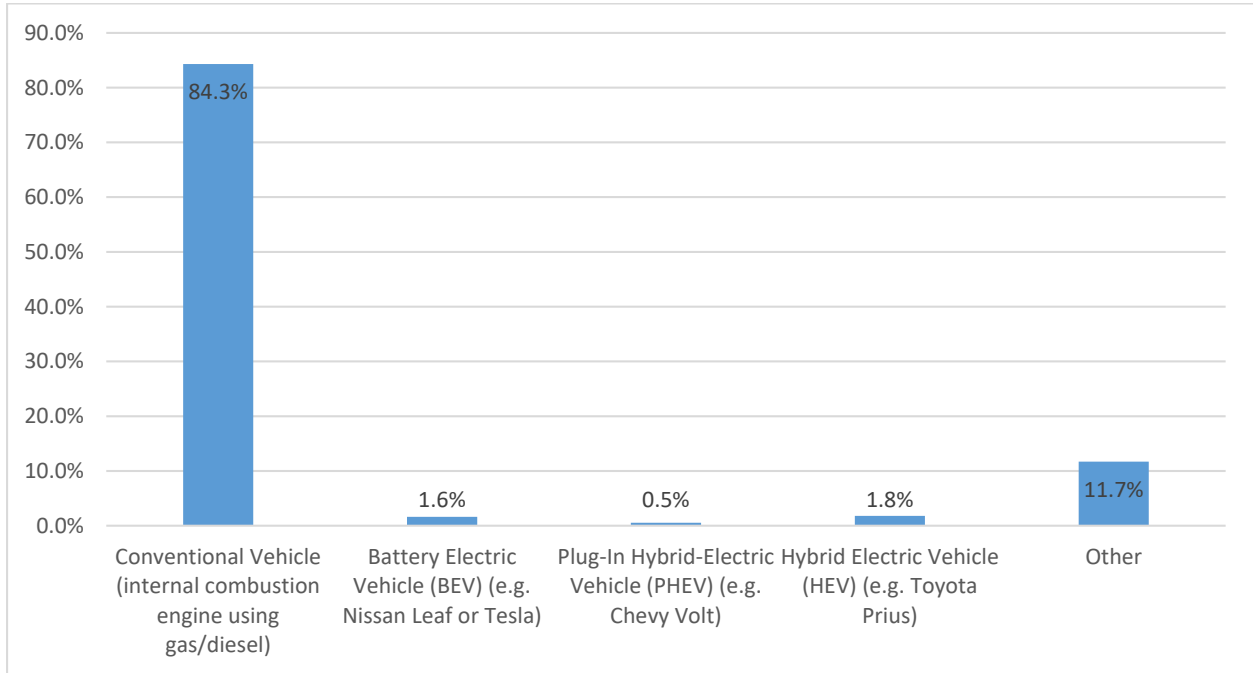
8.2 Number of Collisions

Figure 75. Number of Collisions as Driver

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TRANSFORM   61
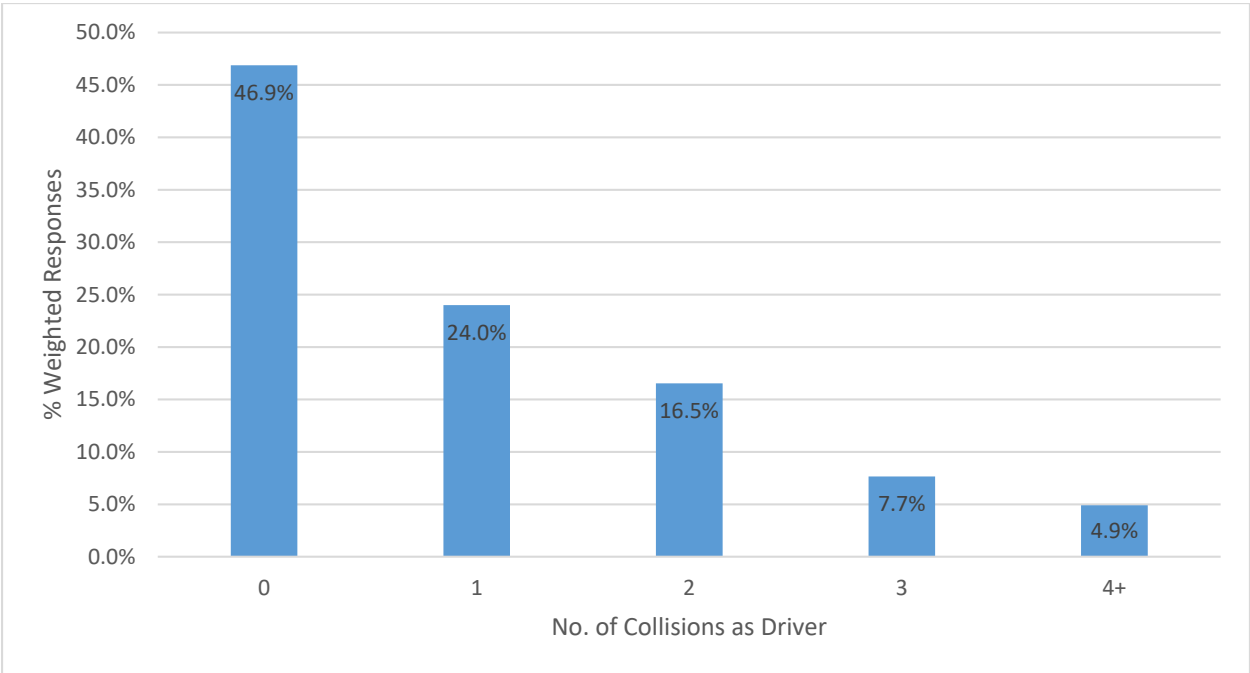
8.3 Distance Travelled

Figure 76. Daily Vehicle KM Travelled

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TRANSFORM   62
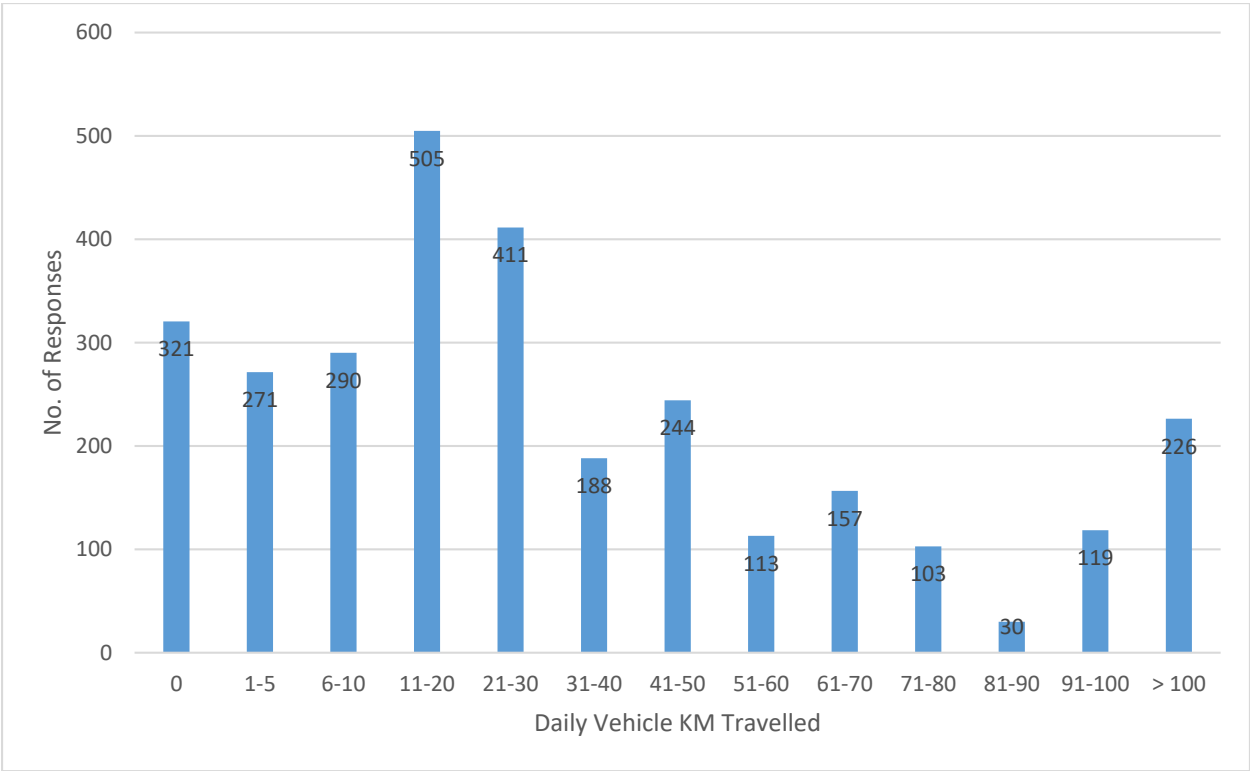
9.0 General Attitudes

9.1 Individual Preferences

Table 3. Individual Preferences

Attitude	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
I always plan things in advance.	22.8%	57.4%	14.8%	4.5%	0.5%
I'm very protective of my personal space.	25.9%	56.1%	14.6%	3.0%	0.5%
I like to be in control.	19.1%	55.3%	21.3%	3.9%	0.4%
If I'm traveling to a meeting, I allow extra time in case my trip is delayed	35.2%	51.1%	10.2%	3.2%	0.3%
Driving a car gives me a sense of control	21.1%	47.3%	24.0%	5.7%	1.9%
Having a car gives me a great sense of freedom	33.9%	48.3%	13.2%	2.9%	1.7%
I'm often one of the first people to try out a new product	9.1%	26.4%	36.0%	24.5%	4.0%
I like to work hard and play hard	14.3%	44.4%	31.8%	8.7%	0.8%
I live a hectic life	10.1%	30.2%	31.9%	24.6%	3.2%

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Automated Vehicles in the Greater Toronto and Hamilton Area:
Overview from a 2016 Consumer Survey

Part C: Survey Instrument

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TRANSFORM

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1.0 Survey Instrument Overview

This report presents the survey instrument conducted in November 2016 on the topic of autonomous vehicles. This survey produced the results for the discussion in *Part A: Summary and Discussion* and *Part B: Data Overview.*

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2.0 Survey and Consent Forms

[SCREEN #1 UPON RECEIVING SOLICITATION EMAIL AND SELECTING LINK INDICATING INTEREST IN PARTICIPATING IN A GENERIC SURVEY]

Professor Matthias Sweet, and graduate student, Kailey Laidlaw, of the School of Urban and Regional Planning, are conducting a survey on residents' perceptions of automated vehicles (driverless cars) and what this new technology may mean for how our cities function. This travel survey is jointly funded by Metrolinx and the City of Toronto and it informs ongoing transportation planning efforts.

[SCREEN 2]
What will happen during the study?
You will be asked a series of questions which are either multiple choice or with a fixed numerical answer. Questions cover the following broad topics:
* *commuting experiences and auto ownership,*
* *characteristics of your household,*
* *attitudes towards travel,*
* *your living arrangements, and*
* *attitudes towards automated vehicles.*

[SCREEN 3]
This survey will take approximately 20 minutes. We hope that you answer all questions, as this survey plays a key role in preparing the Greater Toronto-Hamilton Area for automated vehicles. Upon finishing the survey, you will be given the option of contacting us should you be interested in participating in possible future in-person focus groups on the topic of automated vehicles. The survey is administered by Research Now (www.researchnow.com) who does not have legal rights to retain this data; all data processing or storage will occur in Canada.

[SCREEN 4]
Are there any risks to doing this study?
It is not likely that there will be any harm or discomforts from participating in this survey. The survey will not ask you to provide personal identifiers (e.g. your name, your social insurance number) and we do not have a master list of potential survey participants. However, the survey will ask you to respond to several demographic questions, which taken together, may be a unique combination of answers. Nevertheless, as the study team has no master list of potential survey participants and their detailed characteristics, we cannot identify you even if your combination of survey answers is unique.

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[SCREEN 5]
Are there any benefits to doing this study?
This research will provide valuable information for transportation planning researchers to better understand how automated vehicles are likely to influence society.
This research will inform the City of Toronto and Metrolinx, the project funders, in better anticipating and preparing for automated vehicles in the region.

[SCREEN 6]
Who will know what I said or did in the study?
Questions we are asking you do not contain uniquely-identifiable information and we are not collecting computer IP addresses, so we cannot track you individually in the dataset and this survey is confidential. The survey results will be managed by the Principal Investigator, Professor Matthias Sweet, and his research team and the data will only be available to the study team and the funders. Data will be stored indefinitely on secured computers in Professor Sweet's research lab (www.transformlab.ryerson.ca).

[SCREEN 7]
How do I find out what was learned in this study?
For updates and information about the study findings, please visit (www.transformlab.ryerson.ca/projects/). Findings are expected to be made public in the Summer of 2017.

Questions about the Study:
If you have questions or need more information about the study itself, please contact the Principal Investigator, Matthias Sweet of Ryerson University, at:

> *Matthias Sweet, Assistant Professor*
> *Ryerson University School of Urban and Regional Planning*
> *matthiassweet@ryerson.ca*
> 416-979-5000 ext. 6774

[SCREEN 8]
This study has been reviewed by the Ryerson University Research Ethics Board and received ethics clearance. If you have any questions about your rights or treatment as a research participant in this study, please contact the Ryerson University Research Ethics Board at rebchair@ryerson.ca (416) 979-5042.

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[SCREEN 9]

CONSENT
• I have read the information presented above about a study being conducted by Ryerson University's School of Urban and Regional Planning and funded by Metrolinx and the City of Toronto.
• I have had the opportunity to ask questions about my involvement in this study and to receive additional details I requested.
• I understand that if I agree to participate in this study, I may withdraw from the study at any time by exiting the online survey. Participation in this research is completely voluntary. However, because the survey is anonymous, once you click the submit button at the end of the survey the researchers will not be able to determine which survey answers belong to you so your information cannot be withdrawn after that point. By consenting to participate you are not waiving any of your legal rights as a research participant.
• By selecting the survey link below, I agree to participate in the study.
• If you are interested in participating, the following link will take you to the survey: **[INSERT SURVEY LINK HERE]**

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0%

Professor Matthias Sweet, and graduate student, Kailey Laidlaw, of the School of Urban and Regional Planning, are conducting a survey on residents' perceptions of automated vehicles (driverless cars) and what this new technology may mean for how our cities function. This travel survey is jointly funded by Metrolinx and the City of Toronto and it informs ongoing transportation planning efforts.

Continue »

0%

What will happen during the study?

You will be asked a series of questions which are either multiple choice or with a fixed numerical answer. Questions cover the following broad topics:

- *commuting experiences and auto ownership,*
- *characteristics of your household,*
- *attitudes towards travel,*
- *your living arrangements, and*
- *attitudes towards automated vehicles.*

Continue »

12%

This survey will take approximately 20-25 minutes. We hope that you answer all questions, as this survey plays a key role in preparing the Greater Toronto-Hamilton Area for automated vehicles. Upon finishing the survey, you will be given the option of contacting us should you be interested in participating in possible future in-person focus groups on the topic of automated vehicles. The survey is administered by Research Now (www.researchnow.com) who does not have legal rights to retain this data; all data processing or storage will occur in Canada.

Continue »

25%

Are there any risks to doing this study?

It is not likely that there will be any harm or discomforts from participating in this survey. The survey will not ask you to provide personal identifiers (e.g. your name, your social insurance number) and we do not have a master list of potential survey participants. However, the survey will ask you to respond to several demographic questions, which taken together, may be a unique combination of answers. Nevertheless, as the study team has no master list of potential survey participants and their detailed characteristics, we cannot identify you even if your combination of survey answers is unique.

Continue »

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37%

Are there any benefits to doing this study?

This research will provide valuable information for transportation planning researchers to better understand how automated vehicles are likely to influence society.

This research will inform the City of Toronto and Metrolinx, the project funders, in better anticipating and preparing for automated vehicles in the region.

Continue »

50%

Who will know what I said or did in the study?

Questions we are asking you do not contain uniquely-identifiable information and we are not collecting computer IP addresses, so we cannot track you individually in the dataset and this survey is confidential. The survey results will be managed by the Principal Investigator, Professor Matthias Sweet, and his research team and the data will only be available to the study team and the funders. Data will be stored indefinitely on secured computers in Professor Sweet's research lab (www.transformlab.ryerson.ca).

Continue »

62%

How do I find out what was learned in this study?

For updates and information about the study findings, please visit (www.transformlab.ryerson.ca/projects/). Findings are expected to be made public in the Summer of 2017.

Questions about the Study:

If you have questions or need more information about the study itself, please contact the Principal Investigator, Matthias Sweet of Ryerson University, at:

> *Matthias Sweet, Assistant Professor*
> *Ryerson University School of Urban and Regional Planning*
> *matthiassweet@ryerson.ca*
> *416-979-5000 ext. 6774*

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75%

This study has been reviewed by the Ryerson University Research Ethics Board and received ethics clearance. If you have any questions about your rights or treatment as a research participant in this study, please contact the Ryerson University Research Ethics Board at rebchair@ryerson.ca (416) 979-5042.

Continue »

99%

CONSENT

- *I have read the information presented above about a study being conducted by Ryerson University's School of Urban and Regional Planning and funded by Metrolinx and the City of Toronto.*

- *I have had the opportunity to ask questions about my involvement in this study and to receive additional details I requested.*

- *I understand that if I agree to participate in this study, I may withdraw from the study at any time by exiting the online survey. Participation in this research is completely voluntary. However, because the survey is anonymous, once you click the submit button at the end of the survey the researchers will not be able to determine which survey answers belong to you so your information cannot be withdrawn after that point. By consenting to participate you are not waiving any of your legal rights as a research participant.*

- *By selecting the survey link below, I agree to participate in the study.*

- *If you are interested in participating, the following link will take you to the survey: Survey Link*

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3.0 Background Information

3.1 Individual Information

1. My age is (in years): _____[RN: termination point: only include 18-75]

```
                                                              [_____] 0%
```

Please login to see additional testing features

My age is (in years):
Please enter a whole number

[_____]

Continue »

2. My current place of residence is:

The first three digits of your postal code are (i.e. A#A - no spaces in between) _____
[RN: The FSA question is asked alone and in isolation without the other two below. Upon entering the three digits of the FSA, two actions are possible:

a. If an FSA is in Table Q (also attached in excel), then the participant is prompted with either:]

Your response indicates that you reside in _____ [from m:m table]
      Or
Your response indicates that you reside in either _____ or _____
      Or
Your response indicates that you reside in either _____ or _____ or _____
c. [Then the respondent is prompted with:]
   Is this true?   Yes   No

d. [If they select no, they are terminated.

e. If they respond "yes", and only one region is identified in the table (Q), then the respondent is done with the location questions and is eligible based on the locational requirement. >**NON-TERMINATION LOGIC.**

f. If they respond "yes," and two or three regions are identified in table (Q), then the 2 or 3 regions are highlighted and clickable and the participant is further prompted with:]
   Please   select   in   which   region/city   you   reside   from   above.

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g. [Then the names of the regions (the underlined component above) are highlighted and additional text reads below]

Please select the city or region in which you reside.

ii.   [Upon selecting the city/region in which they reside, the respondent is done with the location questions and is eligible for the survey based on locational requirements > **NON-TERMINATION LOGIC.**]

My current place of residence is:
Please be as specific as possible

The first three digits of your postal code are (i.e. A#A - no spaces in between)	[ ]

Continue »

2%

Your response indicates that you reside in Toronto

Is this true?
Please select one

◯ Yes
◯ No

Continue »

3.   I self-identify as:
     Female
     Male
     Other

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4. I currently hold a driver's license
   Yes
   No

5. The number of people in my household who hold a license, including me:
   __ [fill in, numerical 0:99]

10%

The number of people in my household who hold a license, including me:
Please enter a whole number

Continue »

6. I regularly carry a smartphone (e.g. an iPhone, Blackberry, Android, etc.)
   Yes
   No
   Unsure

7. I have a physical disability which influences my ability to go places.
   * Strongly disagree   *Disagree   * Neither disagree or agree   * Agree
   *Strongly   agree

11%

I have a physical disability which influences my ability to go places.
Please select one

Strongly disagree	Disagree	Neither disagree or agree	Agree	Strongly agree
○	○	●	○	○

Continue »

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8. The highest level of education I have attained is:

Did not complete high school

High school Diploma or Equivalent

Registered Apprenticeship or other trades certificate or diploma

College, CEGEP or other non-university certificate or diploma

Bachelor's Degree

Degree in medicine, dentistry, veterinary medicine or optometry

Graduate Degree (e.g. Master's or Doctoral Degree)

12%

The highest level of education I have attained is:
Please select one

○ Did not complete high school

○ High school Diploma or Equivalent

○ Registered Apprenticeship or other trades certificate or diploma

○ College, CEGEP or other non-university certificate or diploma

○ Bachelor's Degree

○ Degree in medicine, dentistry, veterinary medicine or optometry

○ Graduate Degree (e.g. Master's or Doctoral Degree)

Continue »

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3.2 Individual Preferences

Please indicate the degree to which you agree or disagree with the following statements.

9.   I always plan things in advance.
   * Strongly Agree * Agree * Neither agree or disagree *Disagree * Strongly Disagree

10. I'm very protective of my personal space.
   * Strongly Agree * Agree * Neither agree or disagree *Disagree * Strongly Disagree

11. I like to be in control.
   * Strongly Agree * Agree * Neither agree or disagree *Disagree * Strongly Disagree

12. If I'm traveling to a meeting, I allow extra time in case my trip is delayed
   * Strongly Agree * Agree * Neither agree or disagree *Disagree * Strongly Disagree

13. Driving a car gives me a sense of control
   * Strongly Agree * Agree * Neither agree or disagree *Disagree * Strongly Disagree

14. Having a car gives me a great sense of freedom
   * Strongly Agree * Agree * Neither agree or disagree *Disagree * Strongly Disagree

15. I'm often one of the first people to try out a new product
   * Strongly Agree * Agree * Neither agree or disagree *Disagree * Strongly Disagree

16. I like to work hard and play hard
   * Strongly Agree * Agree * Neither agree or disagree *Disagree * Strongly Disagree

17. I live a hectic life*
   *Strongly Agree * Agree * Neither agree or disagree *Disagree * Strongly   Disagree

12%

Please indicate the degree to which you agree or disagree with the following statements.
Please select a button for each card.

< | I always plan things in advance. | >

| Strongly Agree | Agree | Neither agree or disagree | Disagree | Strongly Disagree |

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4.0 Employment and Commuting

[NOTE TO RESEARCH NOW: SEVERAL SUBSEQUENT QUESTIONS PIVOT OFF OF THE NEXT TWO]

18. Currently, I am:
    Not a student
    A part time student
    A full time student

19. Currently, I am:
    Employed full time
    Employed part time
    Work at home full time
    Work at home part time
    Unemployed
    Not in the labour force
    Retired
    Other

[Note, for survey programming, the following terms above need to be defined when the participant hovers over the terms: is it possible for this be defined when participant hovers over the dot not just the category?]

Full time: *This category includes employed persons who usually worked 30 hours or more per week, at their main or only job.*
Part time: This category includes employed persons who usually worked less than 30 hours per week, at their main or only job.
Unemployed: Were without work and had looked for work within the past four weeks
Not in the labour force: Unavailable for work or unable to work. It also includes persons who were without work and who had neither actively looked for work in the past four weeks.]

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19a. Typically, I work and/or study ＿＿＿ hours per week. [To be asked of those who work or are a student in Q19]

        a. less than 10 hours per week
        b. 10-19 hours per week
        c. 20-29 hours per week
        d. 30-39 hours per week
        e. 40-60 hours per week
        f. 60 or more hours per week

[Research Now: at this point, we need to categorize the survey participants into the following bins based on Q18 and Q19 which are relevant for future questions:

<u>Non-workers</u> (Those who answered {"unemployed" "not in the labour force" or "other" or "retired"} and "not a student" based on the previous three questions.)

<u>Non-commuters</u>: those who did one of the following:

    Answered "employed at home full-time" or

    Answered "employed at home part-time."

<u>Dominant Worker Commuters</u> (Those who meet any of the following criteria):

    Selected "employed full-time"

    Selected "employed part-time" and {"A part-time student" or "non-student"}

<u>Dominant Student Commuters</u>: those who meet any of the following criteria):

    Selected "student full-time"

    Selected "a part-time student," not "employed full-time," and not "employed part-time."]

13%

Currently, I am:
Please select one

◯ Not a student

◯ A part time student

◯ A full time student

Continue »

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13%

Currently, I am:
Please select one

○ Employed full time
○ Employed part time
○ Work at home full time
○ Work at home part time
○ Unemployed
○ Not in the labour force
○ Retired
○ Other

Continue »

14%

Typically, I work and study _____ hours per week.
Please select one

○ less than 10 hours per week
○ 10-19 hours per week
○ 20-29 hours per week
○ 30-39 hours per week
○ 40-60 hours per week
○ 60 or more hours per week

Continue »

[following questions in this sub-section are only asked if "employed full-time" or "employed part-time" or "Work at home full time" or "Work at home part time" are selected in Q18]

4.1 Employment

[THE FOLLOWING CATEGORIES HAVE DESCRIPTIONS WHICH APPEAR WHEN YOU PUT THE CURSOR ON THE TEXT. THE DESCRIPTIONS ARE NOTED BELOW.]

20. My occupation is best characterized as[1]:
      General Office/Clerical
      Manufacturing / Construction / Trades
      Professional / Management / Technical
      Sales and Service
      Prefer not to answer

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[Definitions for Research Now for purposes of programming cursor hover definitions:
General Office/Clerical. Persons who work in an office environment but do not have a specialized post-secondary education and are not managers.
Manufacturing/Construction/Trades. Jobs outside of the office which often require physical work.
Professional/Technical/Management. Jobs needing a specialized post-secondary education or management responsibility.
Sales and Service. People involved in the selling of goods or services at either the wholesale or retail level.]

[FOR THE PURPOSES OF THE FOLLOWING QUESTIONS, THE FOLLOWING CATEGORIES DICTATE WHICH QUESTIONS ARE ASKED OF DIFFERENT PARTICIPANTS: "NON-WORKER," "DOMINANT COMMUTING WORKER," AND "NON-COMMUTER," AND "DOMINANT STUDENT"]
[Following questions are only asked of DOMINANT COMMUTING WORKERS or DOMINANT STUDENTS.]

4.2 Commuting to Work/School

[RN: THE TEXT "work/school" IS ASSIGNED AS "work" IF DOMINANT COMMUTING WORKER, but "school" if DOMINANT STUDENT. NOTE THE WORK/SCHOOL DISTINCTION SHOULD BE PROGRAMMED BASED ON IDENTITY AS EITHER "DOMINANT COMMUTING WORKER" OR "DOMINANT STUDENT

21. In a typical work/school week, I travel to work/school _____ [ranging from 0 to 7] days per week.

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In a typical school week, I travel to school
Please enter a whole number

[   ] days per week.

Continue »

22. On the last work/school day traveled to work/school, my primary mode of transportation was:

Auto driver (alone)
Auto driver (with others)
Auto passenger
Taxi/Uber
Motorcycle
Walk
Bicycle
GO Transit
Public Transit (excluding GO Transit)
Other _____[enable text write-in]

18%

On the last work day traveled to work, my primary mode of transportation was:
Please select one

○ Auto driver (alone)
○ Auto driver (with others)
○ Auto passenger
○ Taxi/Uber
○ Motorcycle
○ Walk
○ Bicycle
○ GO Transit
○ Public Transit (excluding GO Transit)
○ Other [   ]

Continue »

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23. Car parking is available for free where I usually go to work/school
    True
    False
    Unknown
    Not applicable

    [if DOMINANT COMMUTING WORKER OR DOMINANT STUDENT COMMUTER then]

24. My typical travel time to work/school:
    My travel time door-to-door (from my place of residence to my place of work/school)
    (in min) _____ [INPUT FROM 0 TO 999]

<div align="right">■■■□□□□□□□□□□□□ 19%</div>

My typical travel time to school:
Please enter a whole number

My travel time door-to-door (from my place of residence to my place of school) was(in min) [_____]

<div align="right">Continue »</div>

4.3 Transit Commuting

[NEW HEADER, APPLICABLE TO TRANSIT COMMUTERS ONLY]
[APPLIES ONLY TO THOSE WHO INDICATE THAT THEY ARE EMPLOYED OR STUDENTS & COMMUTE BY PUBLIC TRANSIT IN]
[IF CATEGORIZED AS DOMINANT WORKERS, THIS SHOULD BE IDENTIFIED AS "work", EVEN IF IDENTIFYING AS PART WORKER/PART STUDENT]

25. Which of the following ways of accessing transit did you use in your commute?
    Another type of transit (e.g. taking bus service to the GO train) [multi-select]
    Walking
    Cycling
    Driving
    Someone dropped me off
    Taxi/Uber
    Other _____ [ENABLE WRITE-IN]

26. Number of transfers when using public transit
    The number of trip transfers (e.g. switching from train to bus or switching from bus to bus) in my commute to work/school was: ___

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TRANSFORM▶   19

21%

Number of transfers when using public transit
Please enter a whole number

The number of trip transfers (e.g. switching from train to bus or switching from bus to bus) in my commute to work was: [____]

Continue »

4.4 Auto Commuting

[APPLIES ONLY TO THOSE WHO INDICATE THAT THEY COMMUTE BY CAR in Q26 and indicated "false" in Q23]

27. I typically pay $_____ [enable 0 to 99.99] per day to park at work/school.

[IF NOT THE VEHICLE DRIVER, select from rows 3,4,8,9 in Q22]

4.5 Telework

[NEW HEADER APPLICABLE TO EMPLOYED PERSONS WHO WORK OUT OF THE HOME FULL OR PART-TIME IN Q18]
Telework is a flexible form of workplace arrangement that allows people to work from home part of the time instead of commuting to an out-of-home work location.

28. The amount of time I currently spend teleworking is:
    Not at all
    Less than once per month
    About 1-3 days per month
    1-2 days per week
    3-4 days per week
    5 days per week
    Occasional partial days

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TRANSFORM   20

Telework is a flexible form of workplace arrangement that allows people to work from home part of the time instead of commuting to an out-of-home work location.

The amount of time I currently spend teleworking is:
Please select one

○ Not at all
◉ Less than once per month
○ About 1-3 days per month
○ 1-2 days per week
○ 3-4 days per week
○ 5 days per week
○ Occasional partial days

Continue »

5.0 Residence and Household

29. The dwelling unit in which I reside is best characterized as:
    House
    Apartment
    Townhouse
    Unknown
    Other   [write-in]

30. Number of members in my family living at this location, including me: ___

31. Number of people under the age of 15 in my household _____

32. How frequently are you responsible for chauffeuring, dropping off, or accompanying members of your household to places or activities?

    *Never   * 1-2 times per week   * 3-6 times per week   * 7 or more times per week

33. There are a total of _____ [between 0 and 99] employed persons in my household (including me).

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TRANSFORM ▶   21

34. There are a total of _____ [between 0 and 99] post-secondary students in my household (including me).

[note to Research Now: provide a hover box over "post-secondary" which defines post-secondary as "any education beyond High School, including college, university, technical schools, etc." Also emphasize the font such that individuals know that by highlighting the term they can identify the definition.]

35. My usual place of work is located in: [ASKED IF INDIVIDUAL IS BOTH EMPLOYED AND WORKED OUT OF HOME FROM Q18]
City/Town _____

The first three digits of your work's postal code are (i.e. A#A - no spaces in between) _____

Q35. [RN: Add the following text and a live clickable link which is populated with a link to the url "maps.google.ca"].

36. For help remembering your three-digit work postal code, this [link] to Google Maps is provided for your convenience.

37. My primary place of school is located in: [ASKED IF INDIVIDUAL IS A FULL OR PART-TIME STUDENT IN Q19]

City/Town _____
The first three digits of your school's postal code is (i.e. A#A - no spaces in between) _____

Q37. [RN: Add the following text and a live clickable link which is populated with a link to the url "maps.google.ca"].

For help remembering your three-digit work postal code, this [link] to Google Maps is provided for your convenience.

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TRANSFORM▶   22

30%

My usual place of work is located in:

For help remembering your three-digit work postal code, this link to Google Maps is provided for your convenience.
Please be as specific as possible

City/Town	
The first three digits of your work's postal code are (i.e. A#A - no spaces in between)	

Continue »

38. What was the combined income of all members of your household in 2015? Please include
    all wages, dividends, business income, rent, and pensions.
    $0 to $14,999
    $15,000 to $39,999
    $40,000 to $59,999
    $60,000 to $99,999
    $100,000 to $124,999
    $125,000 to $175,000
    $175,000 and above
    Prefer not to answer
    I don't know

31%

What was the combined income of all members of your household in 2015? Please include all wages, dividends, business income, rent, and pensions.
Please select one

○ $0 to $14,999
○ $15,000 to $39,999
○ $40,000 to $59,999
○ $60,000 to $99,999
○ $100,000 to $124,999
○ $125,000 to $175,000
○ $175,000 and above
○ Prefer not to answer
○ I don't know

Continue »

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TRANSFORM ▶   23

6.0 Vehicle Ownership

39. I, or a member of my household own(s) a vehicle where I live
    Yes
    No

40. The number of vehicles available for me to use in my household is _____. [0 to 9]
    [ASKED OF THOSE WHO HAVE ONE OR MORE VEHICLES IN HOUSEHOLD ("Yes") in Q46]

41. Approximately how far did you travel yesterday in a personal vehicle as either an auto passenger or driver?
    _____ (in kilometers) [ENABLE INTEGER BETWEEN 0 AND 999]

[FOLLOWING SECTION QUESTION ARE ASKED OF AUTO OWNERS BASED ON Q47]

42. My primary vehicle would best be described as
    Conventional Vehicle (internal combustion engine using gas/diesel)
    Battery Electric Vehicle (BEV) (e.g. Nissan Leaf or Tesla)
    Plug-In Hybrid-Electric Vehicle (PHEV) (e.g. Chevy Volt)
    Hybrid Electric Vehicle (HEV) (e.g. Toyota Prius)
    Other _____

31%

My primary vehicle would best be described as
Please select one

○ Conventional Vehicle (internal combustion engine using gas/diesel)

○ Battery Electric Vehicle (BEV) (e.g. Nissan Leaf or Tesla)

○ Plug-In Hybrid-Electric Vehicle (PHEV) (e.g. Chevy Volt)

○ Hybrid Electric Vehicle (HEV) (e.g. Toyota Prius)

○ Other [   ]

Continue »

43. Type of vehicles I, or members of my household own (enter the number of vehicles in each class; leave blank if zero) [integer 0 to >5; 0 should be the default]
    Small (i.e. Toyota Yaris, Chevrolet Cobalt) _____
    Medium (i.e. Pontiac G6 or Ford Taurus) _____
    Large (pick-up truck, minivan, or sports utility vehicle) _____
    Other

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TRANSFORM▶   24

[IF ONLY ONE VEHICLE IS CHOSEN IN Q53]

44. How much did this vehicle cost you when you or your household purchased it?
     less than $15,000
     $15,000 - $30,000
     $30,000 - $45,000
     $45,000-$60,000
     more than $60,000
     Move question 53a directly after Q49.

     [IF MORE THAN ONE VEHICLE IS CHOSEN IN Q53]

45. How much did you pay for the most recent of these vehicles when you purchased it?
     less than $15,000
     $15,000 - $30,000
     $30,000 - $45,000
     $45,000-$60,000
     more than $60,000

[NEXT QUESTION IF RESPONDENT'S HOUSEHOLD DOES HAVE A CAR in Q53]

46. I am proud of my car.
     * Strongly Agree * Agree * Neither agree or disagree *Disagree * Strongly Disagree

47. In my lifetime, I have been in approximately _____ [numerical between 0 and 99] vehicle collisions while driving and _____ [numerical between 0 and 99] vehicle collisions as a passenger.

48. Are you a member of any of the following car share programs? Please select all that apply.

Car sharing is a type of self-service car rental where designated cars are available to be rented by members on an as-needed basis, typically for a short period of time.

     ___ I'm not a member of any car share program
     ___ I'm a member of ZipCar
     ___ I'm a member of car2go
     ___ I'm a member of Autoshare
     ___ I'm a member of another car share program: _____ [enable write-in]

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TRANSFORM▶   25

7.0 Recent Daily Travel

The following section asks you questions about your travel yesterday.

49. Yesterday I took approximately _____ [ALLOW CONTINUOUS INTEGER INPUT from 0 to 99] distinct trips (e.g. from home to work, from work to lunch, etc.).

50. Yesterday, I used public transit (e.g. bus, subway, train, or streetcar)
    Yes
    No

51. Yesterday, I walked or used a bicycle
    Yes
    No

    [ask only if individual indicates >1 in Q.47]

52. Yesterday, I used a personal vehicle (e.g. car, van, truck, SUV)
    Yes
    No

53. In the past 30 days, how often have you used each of the following car share or ride share services? [INSERT A TABLE WITH BUTTONS WHICH THE PARTICIPANTS CAN CLICK.]

	I never do this.	I do this, but not in the past 30 days	1-3 times in the last 30 days	1 day / week	2-4 days / week	5 days / week	6-7 days / week
Used car2go car share							
Used other car share							
Used Uber ride share							
Used taxi							
Used a bike share program (e.g. *Bike Share Toronto*)							

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TRANSFORM▶   26

[Note to Research Now: when hovering over "Uber" the participant should see the text: Uber refers to either Uber X or Uber Pool, but does not refer to Uber Eats."
[FOLLOWING QUESTION ONLY ASKED IF PARTICIPANT INDICATES THAT THEY HAVE USED UBER or TAXIS FROM ABOVE. If both Q64r3 and Q64r4 are 1, then Q64a should not be asked]

35%

In the past 30 days, how often have you used each of the following car share or ride share services?
Please select one in each row

	I never do this.	I do this, but not in the past 30 days	1-3 times in the last 30 days	1 day / week	2-4 days / week	5 days / week	6-7 days / week
Used car2go car share	○	○	○	○	○	○	○
Used other car share	○	○	○	○	○	○	○
Used **Uber** ride share	○	○	○	○	○	○	○
Used taxi	○	○	○	○	○	○	○
Used a bike share program (*e.g. Bike Share Toronto*)	○	○	○	○	○	○	○

Continue »

54. I primarily use Uber or taxis for the following trip types [MULTI-SELECT]:
Entertainment or recreation
Facilitating a passenger (e.g. giving somebody else a ride)
Shopping or errands
Work   [paid employment] /School [university, college, or trade program]
Other _____ [ENABLE WRITE-IN].

[RN:FOLLOWING QUESTION ONLY ASKED IF PARTICIPANT INDICATES THAT THEY HAVE USED ONE OF THE FOUR CAR SHARE OPTIONS IN **Q64 Columns 2-7**. If Q58r1, Q64r1, and Q64r2 are all 1, then Q64b should not be asked.

55. I primarily use car share services for the following trip types [MULTI-SELECT]:
Entertainment or recreation
Facilitating a passenger (e.g. giving somebody else a ride)
Shopping or errands
Work   [paid employment] /School [university, college, or trade program]
Other _____ [ENABLE WRITE-IN].

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8.0 General Information and Views

[INSTRUCTIONS]
In this section, we would like to ask about your views regarding your travel and housing

56. I have heard of the Google car before today
    Yes
    No
    Unsure

57. I have heard of driverless cars before today
    Yes
    No
    Unsure

9.0 Automated Vehicle Opinions and Choices

In this survey, we are interested in your preferences and opinions related to <u>automated vehicles</u>. Automated vehicles are cars which are equipped with technologies which reduce or eliminate the need for a human driver.

Some automated cars can make driving easier or safer but would still require a human driver. These vehicles include driver assistance technologies, such as:
automatic parallel parking,
vehicle communications to identify upcoming road conditions,
adaptive cruise control, and
automatic braking.

Other automated vehicles are <u>driverless cars</u> which can navigate the streets with no need for a human driver.
These vehicles currently look like conventional cars.
http://cogeng.cafe24.com/wp/wp-content/uploads/2016/01/google.jpg
[SHOW PICTURE]

Some driverless buses have also been designed and developed.
https://i.ytimg.com/vi/fEOT2sEps6Y/hqdefault.jpg
[SHOW PICTURE]

[next screen. Each of the following lines should be one click.]
Automated vehicles may improve the safety of travel.
Car collisions resulted in almost 2,000 fatalities and more than 10,000 serious injuries in Canada in 2013 (Transport Canada, 2013[2]).

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TRANSFORM   28

Over 90% of car collisions can be attributed to human error, such as drunk or distracted driving [3].

Google reported its first car collision caused by one of their driverless vehicles in February 2016. At that time Google's driverless vehicles had traveled more than 1.5 million kilometers with no human at the wheel[4].

[next screen]

Driverless and automated cars could play several possible roles in passenger travel in the future. [Each of the following possibilities should be prompted on the same screen but on separate clicks.]

Possibility A. <u>Private ownership</u>

Privately-owned driverless and automated cars may primarily be purchased by individuals and used as they wish.

Possibility B. <u>Shared use</u>

Shared driverless cars may primarily be used as fleets of roaming taxis which can be hailed or scheduled electronically. "Shared," means anybody can use them for a fare, not that you must share a ride with someone else.

Possibility C. <u>Private and shared use</u>

Both privately-owned and shared driverless cars could become common.

Possibility D. <u>No future for driverless cars</u>

Both privately-owned and shared driverless cars could play a very small or non-existent roles in the future of transportation.

[next screen]

The next questions are designed to explore

  a) your general interest in automated or driverless vehicles and

  b) your interest based specifically on the shared or privately-held ownership models.

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TRANSFORM▶   29

42%

In this survey, we are interested in your preferences and opinions related to automated vehicles. Automated vehicles are cars which are equipped with technologies which reduce or eliminate the need for a human driver.

Some automated cars can make driving easier or safer but would still require a human driver. These vehicles include driver assistance technologies, such as:

automatic parallel parking,
vehicle communications to identify upcoming road conditions,
adaptive cruise control, and
automatic braking.

Other automated vehicles are driverless cars which can navigate the streets with no need for a human driver.

These vehicles currently look like conventional cars.

http://cogeng.cafe24.com/wp/wp-content/uploads/2016/01/google.jpg

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TRANSFORM   30

Some driverless buses have also been designed and developed.

https://i.ytimg.com/vi/fEOT2sEps6Y/hqdefault.jpg

Continue »

43%

Automated vehicles may improve the safety of travel.

Car collisions resulted in almost 2,000 fatalities and more than 10,000 serious injuries in Canada in 2013 (Transport Canada, 2013).

Over 90% of car collisions can be attributed to human error, such as drunk or distracted driving.

Google reported its first car collision caused by one of their driverless vehicles in February 2016. At that time Google's driverless vehicles had traveled more than 1.5 million kilometers with no human at the wheel.

Continue »

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TRANSFORM›

31

49%

Driverless and automated cars could play several possible roles in passenger travel in the future.

Possibility A. Private ownership
Privately-owned driverless and automated cars may primarily be purchased by individuals and used as they wish.

Possibility B. Shared use
Shared driverless cars may primarily be used as fleets of roaming taxis which can be hailed or scheduled electronically. "Shared," means anybody can use them for a fare, not that you must share a ride with someone else.

Possibility C. Private and shared use
Both privately-owned and shared driverless cars could become common.

Possibility D. No future for driverless cars
Both privately-owned and shared driverless cars could play a very small or non-existent roles in the future of transportation.

Continue »

58. Which of the following potential benefits of <u>driverless cars</u> are most attractive to you? Select all that apply. [please make this multi-select]

Driverless cars are unattractive to me
Not needing to park (a driverless vehicle can drop me off and park itself).
Safety improvements
Being connected to data services while in the vehicle
Doing other things in the vehicle instead of actively driving
Supporting travel for adults with disabilities (e.g. vision, physical limitations)
Better traffic flow
More reliable travel
Fewer vehicle emissions

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TRANSFORM▶   32

Which of the following potential benefits of driverless cars are most attractive to you?
Please select all that apply.

☐ Driverless cars are unattractive to me

☐ Not needing to park (a driverless vehicle can drop me off and park itself).

☐ Safety improvements

☐ Being connected to data services while in the vehicle

☐ Doing other things in the vehicle instead of actively driving

☐ Supporting travel for adults with disabilities (e.g. vision, physical limitations)

☐ Better traffic flow

☐ More reliable travel

☐ Fewer vehicle emissions

Continue »

59. Would you be interested in using a driverless car on a regular basis?
Very interested
Somewhat interested
Unsure
Somewhat uninterested
Very uninterested

60. When would you consider purchasing a driverless car?
I would not purchase a driverless car
When 80% of my friends own one
When 50% of my friends own one
When 10% of my friends own one
I would buy one as soon as they are available

61. If you are purchasing a new vehicle, how much more would you be willing to pay for it to be available as a fully driverless car as opposed to a conventional car ? [ASKED IF EXISTING VEHICLE OWNERS IN Q46]

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TRANSFORM▶   33

62. I would not buy a driverless car
    Less than $1000
    $1000-$4999
    $5,000 to $9,999
    $10,000 to $14,999
    More than $15,000

63. Vehicles with *connected* capabilities can communicate with each other or with traffic signals about routing or safety issues. Connected capabilities can be added to a conventional vehicle. Would you consider paying more for a vehicle with connected capabilities?

    Yes
    Maybe
    No
    Unsure

                                                                    59%

Vehicles with *connected* capabilities can communicate with each other or with traffic signals about routing or safety issues. Connected capabilities can be added to a conventional vehicle. Would you consider paying more for a vehicle with connected capabilities?
Please select one.

○ Yes

○ Maybe

○ No

○ Unsure

[Continue »]

[Provide instructions.]

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TRANSFORM ▶   34

64. *Some automated vehicles require a driver behind the wheel, but can fully control the vehicle in many (e.g. on freeways) but not all circumstances. When these vehicles need human drivers to take control, they provide an alert.*

If you are purchasing a new vehicle, how much more would you be willing to pay for such a vehicle compared to a conventional vehicle? [ASKED OF EXISTING VEHICLE OWNERS]

I would not purchase an automated vehicle
It would need to be cheaper than a conventional vehicle
$1000 or less
$1000 to $4999
$5,000 to $9,999
$10,000 to $14,999
More than $15,000

60%

Some automated vehicles require a driver behind the wheel, but can fully control the vehicle in many (e.g. on freeways) but not all circumstances. When these vehicles need human drivers to take control, they provide an alert.

If you are purchasing a new vehicle, how much more would you be willing to pay for such a vehicle compared to a conventional vehicle?
Please select one.

○ I would not purchase an automated vehicle

○ It would need to be cheaper than a conventional vehicle

○ $1000 or less

○ $1000 to $4999

○ $5,000 to $9,999

○ $10,000 to $14,999

○ More than $15,000

Continue »

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TRANSFORM▶   35

10.0 Prospective Travel and Location Choices

[INSTRUCT THE SURVEY PARTICIPANTS]
Please respond to the following scenarios based on the most likely changes to your own circumstances if you owned a driverless car.

Please respond to the following scenarios based on the most likely changes to your own circumstances if you owned a driverless car.

65. Suppose using a driverless vehicle does not enable you to go faster but enables you to now use that travel time for other activities while traveling. Would you be likely to travel further to work (e.g. for a better job or less expensive housing)?
    Yes
    No
    Unsure

66. Suppose using a driverless vehicle increases your commuting speed by 25% and also enables you to now use that time commuting for other activities while traveling. Would you be likely to travel further to work (e.g. for a better job or less expensive housing)?
    Yes
    No
    Unsure

Shared driverless cars may operate very similarly to Uber, which already operates in the Greater Toronto-Hamilton Area.
Uber has emerged as a technology-enabled mobility service which is like a taxi service, except it reduces the cost for users to find potential ride services to their destinations. Uber drivers are matched with customers using the Uber smartphone app.

Shared Driverless Vehicles
Imagine a future in which Uber-style shared (meaning, anybody can use them) driverless cars are available in the Greater Toronto-Hamilton Area. These cars would constantly be in circulation or be parked waiting for individual customers (just like taxis) and they would not have any human driver. The following questions ask how you might use such services and change how you travel.

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TRANSFORM ▶   36

64%

Shared driverless cars may operate very similarly to Uber, which already operates in the Greater Toronto-Hamilton Area.

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Shared Driverless Vehicles

Imagine a future in which Uber-style shared (meaning, anybody can use them) driverless cars are available in the Greater Toronto-Hamilton Area. These cars would constantly be in circulation or be parked waiting for individual customers (just like taxis) and they would not have any human driver. The following questions ask how you might use such services and change how you travel.

Continue »

[NEXT SCREEN]
The total cost of driving a conventional car typically ranges between $0.37 and $0.88 per kilometer, depending on what type of car you have, how expensive your fuel is, and how much you drive (Canadian Automobile Association, 2013[5]). This does not include the cost of parking. These costs can be divided into two types:

> *[After participant clicks next, both of these types appear on the same screen]*
> *Operating Costs (one-third of total costs): fuel and maintenance costs. You pay more of these for each trip you make.*
>
> *Ownership Costs (two-thirds of total costs): insurance, registration fees, taxes, etc. You have already paid for these costs simply by purchasing, registering, and insuring your vehicle. They do not change when you travel more or less.*

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TRANSFORM ▶   37

69%

Operating Costs (one-third of total costs): fuel and maintenance costs. You pay more of these for each trip you make.

Ownership Costs (two-thirds of total costs): insurance, registration fees, taxes, etc. You have already paid for these costs simply by purchasing, registering, and insuring your vehicle. They do not change when you travel more or less.

Continue »

67%

The total cost of driving a conventional car typically ranges between $0.37 and $0.88 per kilometer, depending on what type of car you have, how expensive your fuel is, and how much you drive (Canadian Automobile Association, 2013). This does not include the cost of parking. These costs can be divided into two types:

Continue »

[FOLLOWING QUESTIONS ASKED OF ALL]

67. If Uber-style shared driverless cars can pick you up and drive you anywhere in the Greater Toronto Area for a price of **$0.50/km, how often would you use this service for commuting or other trip purposes (not including accessing public transit)?**

[if survey participant hovers over the parenthesis section here, the text should explain, "Here we are simply asking about door-to-door trips directly to your destination that could occur by driverless car, not (for example) trips in which you might take a driverless car to access a public transit station."]

Never
Less than once per month
Between one and 3 times a month
At least once a week
Daily

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TRANSFORM

38

If Uber-style shared driverless cars can pick you up and drive you anywhere in the Greater Toronto Area for a price of **$0.50/km, how often would you use this service for commuting or other trip purposes (not including accessing public transit)?**
Please select one.

⦿ Never

⦿ Less than once per month

⦿ Between one and 3 times a month

⦿ At least once a week

⦿ Daily

Continue »

68. If Uber-style shared driverless cars can pick you up and drive you anywhere in the Greater Toronto Area for a price of **$1/km, how often would you use this service for commuting or other trip purposes (not including using accessing public transit)?**
Never

Less than once per month
Between one and 3 times a month
At least once a week
Daily
[RN: If Q78== Row 1 (Never), skip Q79]

69. If Uber-style shared driverless cars can pick you up and drive you anywhere in the Greater Toronto Area for a price of **$1.50/km, how often would you use this service for commuting or other trip purposes (not including accessing public transit)?**
Never
Less than once per month
Between one and 3 times a month
At least once a week
Daily

[RN: If Q78== Row 1 (Never) or Q79 == Row 1 (Never), skip Q80]

70. What is the highest price of using an Uber-style shared driverless car at which you would consider either selling one of your current vehicles or not replacing one as it ages?
I would not consider eliminating a current vehicle.
$0.25 per kilometer
$0.50 per kilometer
$1.00 per kilometer
$1.50 per kilometer

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TRANSFORM ▶   39

71. For what type of trips do you imagine using Uber-style shared driverless cars (independent of accessing public transit)? Select any that apply.
    Entertainment or recreation
    Facilitating a passenger (e.g. giving somebody else a ride)
    Shopping or errands
    School
    Work
    Other _____ [ENABLE WRITE-IN].
    I would not travel in an Uber-style shared driverless car

The following questions are about how you might use Uber-style shared driverless cars to access public   transit.

76%

The following questions are about how you might use Uber-style shared driverless cars to access public transit.

Continue »

72. If Uber-style shared driverless cars can pick you up and drive you anywhere in the Greater Toronto Area for a price of **$0.50/km**, how often would you use this service as a means of **getting to/from a public transit station (for example, a GO or TTC station)**?
    Never
    Less than once per month
    Between one and 3 times a month
    At least once a week
    Daily

73. If Uber-style shared driverless cars can pick you up and drive you anywhere in the Greater Toronto Area for a price of **$1/km**, how often would you use this service as a means of **getting to/from a public transit station (e.g. a GO or TTC station)**?
    Never

    Less than once per month
    Between one and 3 times a month
    At least once a week
    Daily

[RN: If Q83== Row 1 (Never) , skip Q84]

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74. If Uber-style shared driverless cars can pick you up and drive you anywhere in the Greater Toronto Area for a price of **$1.50/km**, how often would you use this service as a means of **getting to/from a public transit station (e.g. a GO or TTC station)**?
    Never
    Less than once per month
    Between one and 3 times a month
    At least once a week
    Daily

[RN: If Q83== Row 1 (Never) or Q85 == Row 1 (Never), skip Q85]

75. Would you be willing to share a ride in an Uber-style shared driverless car with another person?
    Yes
    No
    Unsure

76. For what type of trips do you imagine using Uber-style shared driverless cars as a means of getting to/from a public transit station (e.g. a GO or TTC station)? Select any that apply.
    Entertainment or recreation
    Facilitating a passenger (e.g. giving somebody else a ride)
    Shopping or errands
    Work   [paid employment] /School [university, college, or trade program]
    Other _____ [ENABLE WRITE-IN].
    I would not travel in an Uber-style shared driverless car

76%

For what type of trips do you imagine using Uber-style shared driverless cars (independent of accessing public transit)?
Please select any that apply.

☐ Entertainment or recreation

☐ Facilitating a passenger (e.g. giving somebody else a ride)

☐ Shopping or errands

☐ School

☐ Work

☐ Other [_____]

☐ I would not travel in an Uber-style shared driverless car

Continue »

[RN: Do not ask Q77 if individual indicates "I would not buy a driverless ca]

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77. If you owned a driverless car, how interested would you be in "leasing" that vehicle for a cost to others for individual trips when you do not need it?
   Very interested
   Somewhat interested
   Uninterested

78. If some of the GTA's neighborhoods had access to low-cost, near-immediate, and reliable Uber-style shared driverless vehicle services (like taxis), would such a service make a neighborhood more attractive to you?
   Yes
   No
   Unsure

85%

If some of the GTA's neighborhoods had access to low-cost, near-immediate, and reliable Uber-style shared driverless vehicle services (like taxis), would such a service make a neighborhood more attractive to you?
Please select one.

◯ Yes

◯ No

◯ Unsure

Continue »

79. Would you be willing to use Uber-style shared driverless cars at a reduced price in exchange for sharing the vehicle for part of your trip with another customer?
   Yes
   Sometimes
   No
   Don't know.

80. How inexpensive would Uber-styled shared driverless cars need to be for you to exclusively commute using this mode (instead of how you currently commute to work/school)?

   less than 25 cents per kilometer
   less than 50 cents per kilometer
   less than 75 cents per kilometer
   less than $1.00 per kilometer
   less than $1.50 per kilometer
   Other _____ [ENABLE WRITE-IN]
   I would never travel by driverless car

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89%

How inexpensive would Uber-styled shared driverless cars need to be for you to exclusively commute using this mode (instead of how you currently commute to work)?
Please select one.

○ less than 25 cents per kilometer

○ less than 50 cents per kilometer

○ less than 75 cents per kilomter

○ less than $1.00 per kilometer

○ less than $1.50 per kilometer

○ Other [   ]

○ I would never travel by driverless car

Continue »

11.0 Automated Vehicles and Public Policy

81. Automated and driverless vehicles are likely to become more common in the future. How should governments respond?

Actively encourage the use of automated vehicles

Actively discourage the use of automated vehicles

Monitor the use of such vehicles and respond when necessary

Not be involved and let the market of consumers, driverless car manufacturers and service providers decide how and when these vehicles should be used

Unsure

82. Would you support investment to encourage, support, or regulate automated vehicles?

Yes [then Q97]

No (skip Q97)

Unsure (skip then Q97) [this should now be "then"]

83. Should this investment be funded through additional taxes?

Yes

No

Unsure

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84. How should automated and driverless vehicles impact public sector transportation spending in the Greater Toronto and Hamilton Area?

Type of Investment	Less Investment	More Investment	No Change
Public transit			
Roads and Infrastructure			
System Operations and Demand Management			

85. Do you expect governments to regulate how automated and driverless vehicles are used?
    Yes
    No
    Unsure

86. Should governments become "innovators" and take the lead on using driverless cars?
    Yes
    No
    Unsure

89%

Automated and driverless vehicles are likely to become more common in the future. How should governments respond?
Please select one.

○ Actively encourage the use of automated vehicles

○ Actively discourage the use of automated vehicles

○ Monitor the use of such vehicles and respond when necessary

○ Not be involved and let the market of consumers, driverless car manufacturers and service providers decide how and when these vehicles should be used

○ Unsure

Continue »

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93%

How should automated and driverless vehicles impact public sector transportation spending in the Greater Toronto and Hamilton Area?

Please select one in each row.

Type of Investment	Less Investment	More Investment	No Change
Public transit	○	○	○
Roads and Infrastructure	○	○	○
System Operations and Demand Management	○	○	○

Continue »

99%

Thank you for having taken the time to complete this survey. Your time and input will play a critical role in supporting this study and informing policymaking.

The study team may conduct focus groups to further explore consumer attitudes towards automated vehicles. If you are interested in being considered for future focus groups on this topic, please send an email to driverlesscars@ryerson.ca .

To exit the survey please click on Finish

Finish

To exit the survey please click [HERE].

[final screen]

Thank you for having taken the time to complete this survey. Your time and input will play a critical role in supporting this study and informing policymaking.

The study team may conduct focus groups to further explore consumer attitudes towards automated vehicles. If you are interested in being considered for future focus groups on this topic, please send an email to driverlesscars@ryerson.ca .

[1] Question based on Transportation Tomorrow Survey (2011)

[2] *https://www.tc.gc.ca/media/documents/roadsafety/cmvtcs2013_eng.pdf*

[3] https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/811059

[4] https://www.wired.com/2016/02/googles-self-driving-car-may-caused-first-crash/

[5]http://www.caa.ca/wp-content/uploads/2012/06/CAA_Driving_Cost_English_2013_web.pd

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