Myth-busting for Anxious Older Drivers

Stage 2: Driver Perceptions Survey



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Contents

Disclaimer

This report ('**Report**') has been prepared by WSP exclusively for the Automobile Association Research Foundation of New Zealand ('**Client**') in relation to a survey to better understand senior driver perceptions, anxiety, and behaviours ('**Purpose**') and in accordance with the contract for Myth-busting for anxious older drivers (signed 14-07-2021). The findings in this Report are based on and are subject to the assumptions specified in the Report. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

1 Purpose

There is evidence that older New Zealand drivers are more anxious around their driving safety, and consequently are limiting their journeys more than other older driver groups, including those in Australia. Driving anxiety even impacts "young older drivers", with about 3 in 10 drivers aged 55-72 being impacted. This may be related to the manner in which "self-regulation" messages have been presented to them.

In an aging population, it is important to understand the actual risks by delivering easily accessible evidence around actual safety in different driving conditions, as well as busting myths around journeys where older drivers may be limiting themselves unnecessarily.

2 Approach

The following 5-staged approach was used to deliver this project. This report covers the Stage 2 Perception Survey.

2.1 Stage 1 – Develop fact-based single point of truth

The Researcher will utilise existing data from a variety of sources to develop a Single Point of Truth around older driver safety and mobility. Planned sources include the Ministry of Transport Household Travel Survey, Police Crash reporting data, the Driver Licensing Database, ACC data, hospital discharge data, the NZ General Social Survey, and Statistics NZ Demographic Projections. The existing situation will be addressed along with the future projected impact of demographic change on safety and mobility.

2.2 Stage 2 – Perception survey

The Researcher will undertake a survey of AA members around the trips the older cohorts of drivers make, their quantum of driving, and specific conditions they perceive as safer or to be avoided (and how that may have changed over time). The AA will deliver the survey to its members via its survey system to facilitate this survey.

These perceptions will be compared with actual safety. The Researcher will also examine two sub-groups: 1) those that have been through the AA Senior Driver Programme to see if this group has different driver behaviours or risk perceptions, and 2) non-driving AA members would also be invited to participate to find out why they are not driving, how they are travelling, and how that fits their aspirations.

The Researcher will incorporate any relevant previous AA members' surveys (especially the "Safe Driving for a Lifetime" 2014 report) that will inform changing perceptions and behaviours over time.

2.3 Stage 3 – The role of infrastructure

A best practice review of infrastructure improvements which would be advantageous for an older driving population in New Zealand (e.g., lighting, delineation, sight distances, reflection). Existing

information already uncovered is in the footnoted publications. Most existing standards are based on the needs of relatively young cohorts.

2.4 Stage 4 – Infographic-based report

The Researcher will prepare an infographics-based report, integrating the information gathered in the previous stages in an easily digestible, visually appealing form. The report will include:

a) Current information on older driver safety and mobility
b) Future projected impact of demographic change on safety and mobility
c) Gaps between AA member perceptions of safety and actual safety
d) Advice to assist older drivers more effectively tailor their driving to the safety strengths of the road network
e) Infrastructure improvements which would be advantageous to the safety and mobility of older drivers and their passengers.

2.5 Stage 5 – Insights for the AA Senior Driver Programme coordinators

New insights from Steps 1-4 will be collated to inform possible new content for the AA Senior Driver Programme and presented to the appropriate AA personnel.

3 Method

3.1 Participants

Drivers of 55 years or older who were members of the Automobile Association of New Zealand were sent an email by the AA Research Foundation containing a Survey Monkey link. The email was sent to:

1) A random sample of 40,000 AA members 55 years and older (of which a sub-group of those no longer driving were asked a series of specific questions about why they stopped driving and any impacts this change)

2) All members who were recorded as completing the AA Senior Driving Course (who were also asked a series of questions about the course)

3.2 Survey structure, analysis plan, and rationale

The survey was structured to include the topic areas outlined in Table 3-1 below. See Appendix A to see a copy of the survey.

Table 3-1: Survey topic areas, example analyses and example rationale / insights

Survey topic	Question area / example analyses	Rationale / insights
Perception gaps	Examine gap between perception of unsafe locations (e.g., motorway) / behaviours (e.g., right turn movements) against actual risk for older drivers.	Reveal areas that are safer or less safe than is currently perceived by older drivers to reduce any gaps. Key to the myth-busting

Survey topic	Question area / example analyses	Rationale / insights
Confidence / anxiety and self-limiting	Analyse anxiety against behavioural restrictions (avoid driving at night etc) vs self-reported safety indicators (reported crashes, other driver interactions, difficulty of manoeuvres)	Understand the influence of anxiety on self-limiting behaviour Understand the relationship between anxiety, self-limiting and reported safety indicators
Anxiety trend	Comparison with prior survey data (any trend in level of anxiety)?	Understand any trend in anxiety (i.e., are there external influences – safety changes being implemented effective for older drivers?)
Anxiety and age thresholds	At what age(s) does confidence become more of an issue? Percentage cumulative anxiety with driving (could compare against risk of crashes by age to look at any gap) Cumulative percentage engaging in self-limiting behaviours by age	Understand the optimal age where confidence interventions like training may be most effective
Gender and anxiety vs actual risk	Examine anxiety differences between genders and then against actual risk by gender and age group	Understand any gender-based interventions
Location analysis	Are there areas where drivers are more reliant on the car? What are the consequences of this on driver perceptions and risk?	Understand any targeted interventions that may need to be considered in urban vs rural locations
AA Senior Driver Cohort vs Others	What is the effect of the senior training programme on anxiety and self-limiting driving behaviours? Is the course reaching those that need it most?	Identify any success in improved confidence in trained drivers Provide insights / tips for the driving programme to focus on.
Impacts of no longer driving	Why are they no longer driving (international comparison of rates of reasons OR within NZ have the rates of reasons altered in last 5 years)? How are they moving around now? How has this impacted them? (better / worse etc)	Understanding any variation in our older driving group – any specific barriers to continue where we are over-represented. How has this impacted on their activeness / wellbeing?

3.3 Participant demographics

A sample of 4164 drivers from the New Zealand Automobile Association responded to the survey. After removing those that did not ever drive (n = 2) or did not state their age as 55 or over (n = 18), the final sample was 4144. The sample also had sub-groups that had or had not attended an AA Senior Driver Offer (intended to support senior drivers, from vehicle setups through to safer driving tips; see Table 3-2). Those that had attended were asked some specific questions. Finally, a group that were no longer drivers that were also asked about why they stopped driving and questions about how this has impacted them.

Table 3-2 Sample groups and sizes (including relevant section)

Three key sample groups	Relevant section	Sample sizes	
General sample AA drivers	See Sections 4.1-0		4108
Sub-group that used the AA Senior Driver Offer	See Section 4.3	811	
Sub-group that did not use the AA Senior Driver Offer	Some comparisons in Section 4.3	3,297	
Non-drivers	See Section 4.4		36
Total respondents			4144

Respondents in the survey ranged from 55 to 95 years, with a mean on 72.51 years and a median age of 73 years. Only a small number of respondents were aged over 90 years and were therefore grouped into aged 85+. For the purposes of the simpler age analyses an Old, Middle, and Young classification of age group was used for some analyses (see Figure 3-1).

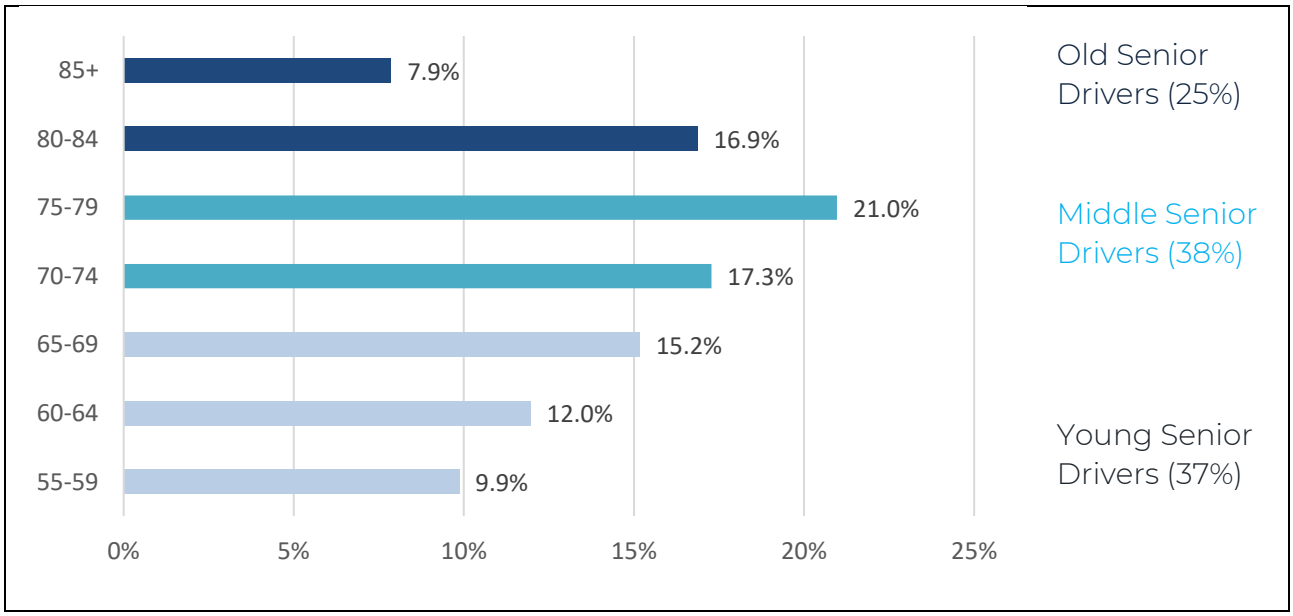

Figure 3-1 Proportion of survey respondents by age bands (in years) and Senior Driver Age Grouping

Table 3-3 shows the breakdown of respondent demographics by age, gender, area, impairment, and how the driving was shared (if at all).

Table 3-3 Demographics and driver characteristics

Variable		n	%
Age	55-59	409	9.9%
	60-64	496	12.0%
	65-69	629	15.2%
	70-74	716	17.3%
	75-79	869	21.0%
	80-84	699	16.9%
	85-89	246	5.9%
	90-94	75	1.8%
	95-99	5	0.1%
	Total	**4144**	
Gender	Male	1734	54.2%
	Female	2071	45.3%
	Total	**3823**	
Area	Urban	938	24.7%
	Suburban	2125	55.9%
	Rural	740	19.5%
	Total	**3803**	
Impairments (Note that some drivers had multiple impairments)	No Impairments	2753	74.7%
	Vision	534	14.5%
	Physical	291	7.9%
	Hearing	285	7.7%
	Mental or cognitive	35	0.9%
	Speech	4	0.1%
Main Driver	Only one who drives	1263	33.3%
	Main driver	1096	28.9%
	Evenly share	1208	31.8%
	Not the main driver	227	6.0%
	Total	**3794**	

4 Results

The results have been looked at focussing on driver anxiety and understanding when that is occurring as well as any effects of anxiety. This includes any relationship to self-pacing behaviours (i.e., where drivers avoid less comfortable driving situations, such as night or rain driving) and any crash involvement. Two further sections examine those who engaged in the Senior Driver Offer and those who are no longer driving.

4.1 Driver anxiety

A zero-to-ten-point scale was adopted from Taylor (2011) to measure driving anxiety. The 11-point Driver anxiety scale rated from 0 = Not at all anxious to 10 = Extremely anxious). This score was then grouped into three levels of anxiety following Taylor (2011); with those who reported a score of zero were considered to have no anxiety; those who reported 1 –4 on the

scale were categories as mild anxiety, and scores 5 or higher were considered to be moderate to extreme anxiety (see Table 4-1).

Table 4-1 Anxiety level of our total sample, with percentages.

Anxiety Level (0-10 scale)	n	%
No anxiety (0)	1510	39.4%
Mild anxiety (1-4)	1965	51.2%
Moderate to Extreme (5-10)	362	9.4%
Total	3837	

When asked to report how they believed their quality of driving was now compared to 5 years ago, there was a significant difference between anxiety levels (X^2 (4, 3817) = 185.243, p<.001). Respondents who reported driving anxiety (mild and moderate to extreme anxiety) were more likely to report that their driving was 'Not as Good' than those who reported no driving anxiety. So, those with anxiety perceived their driving ability had become worse over recent years (see Figure 4-1). People who report driving anxiety (both Mild and Moderate to extreme) were more likely to have made changes to their driving in the last 5 years to increase safety (X^2 (4, N=3837) = 263.458, p < .001).

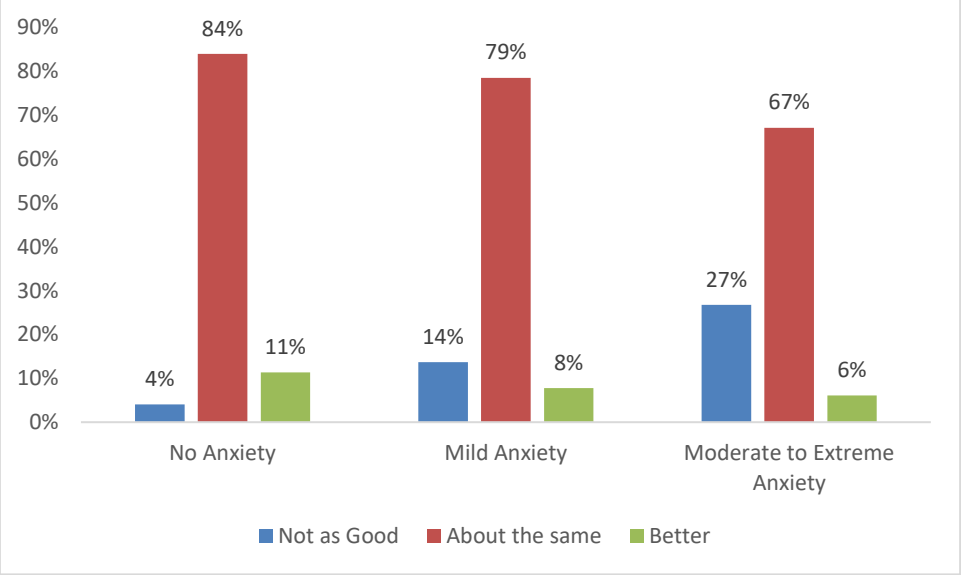

Figure 4-1 Self-rating of driving quality by anxiety group

4.1.1 Driver anxiety in different driving conditions

To examine driver comfort, discomfort, and avoidance, 18 different driving conditions were rated as either: "I avoid this (where I can)", "I do this, but I am uncomfortable", or "I do this comfortably" or "N/A".

Reliability analysis was run on these items for the purposes of gaining some overall use of them as a summary scale. The reliability of the 18-item scale was improved by the removal

of “Being a sober driver for others” (likely as many placed N/A next to this).[1] Once this item was removed the 17-item scale examined and indicates the scale reaches a good level of internal reliably/consistency (α = .837). Sub-scales were also created for Driving Condition Discomfort and Driving Condition Avoidance, where drivers could score from 0-17 representing the number of driving conditions where they rated either discomfort or avoidance.

Correlation analysis showed there was a stronger relationship between Driving Condition Avoidance behaviour and Anxiety Score ($r = .360$, $p < .01$) than between Driving Condition Avoidance behaviour and Age ($r = .156$, $p < .01$). This suggests that anxiety was a more sensitive indicator of self-pacing or avoiding road conditions than age.

There was a significant difference between Anxiety groups for both avoidance behaviour and discomfort under the different driving conditions, such that avoidance and discomfort of conditions significantly increased with greater group anxiety (see Figure 4-2). So, for the Moderate to extreme anxiety group drivers on average reported avoiding 3.51 driving conditions (SD = 3.10) and reported on average discomfort in a further 4.58 driving conditions (SD = 2.78) out of a possible 17 conditions.

A univariate ANOVA revealed that Driving Condition Avoidance differed significantly between all Anxiety groups ($F(2, 3834) = 254.938$, $p < .001$; all Bonferroni post-hoc tests were significant; see Figure 4-2). Significant differences were also observed with Driving Condition Discomfort between all Anxiety groups ($F(2,3834) = 548.633$, $p<.001$; where all Bonferroni post-hoc tests were also significant; see Figure 4-2).

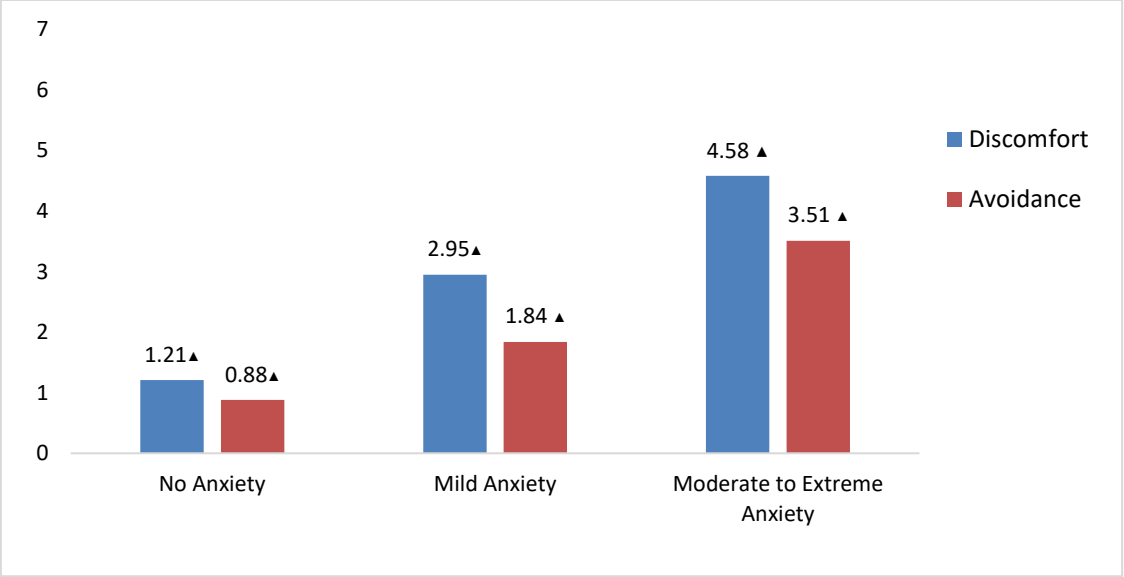

Figure 4-2 Average Driving Condition Avoidance and Discomfort score (indicating number of driving conditions avoided or driven with discomfort) by Anxiety group (▲indicates a significant increase across Anxiety group)

Figure 4-3 shows the change in proportion of older drivers that report discomfort and avoidance for the Mild and Moderate anxiety groups (subtracting baseline discomfort and avoidance in the No anxiety group) for different driving conditions. Chi-square test results

[1] This item still appears in overall tables, it is just removed from analyses when using this as a scale.

reveal a pattern in the significant increases in discomfort and avoidance under different driving conditions.

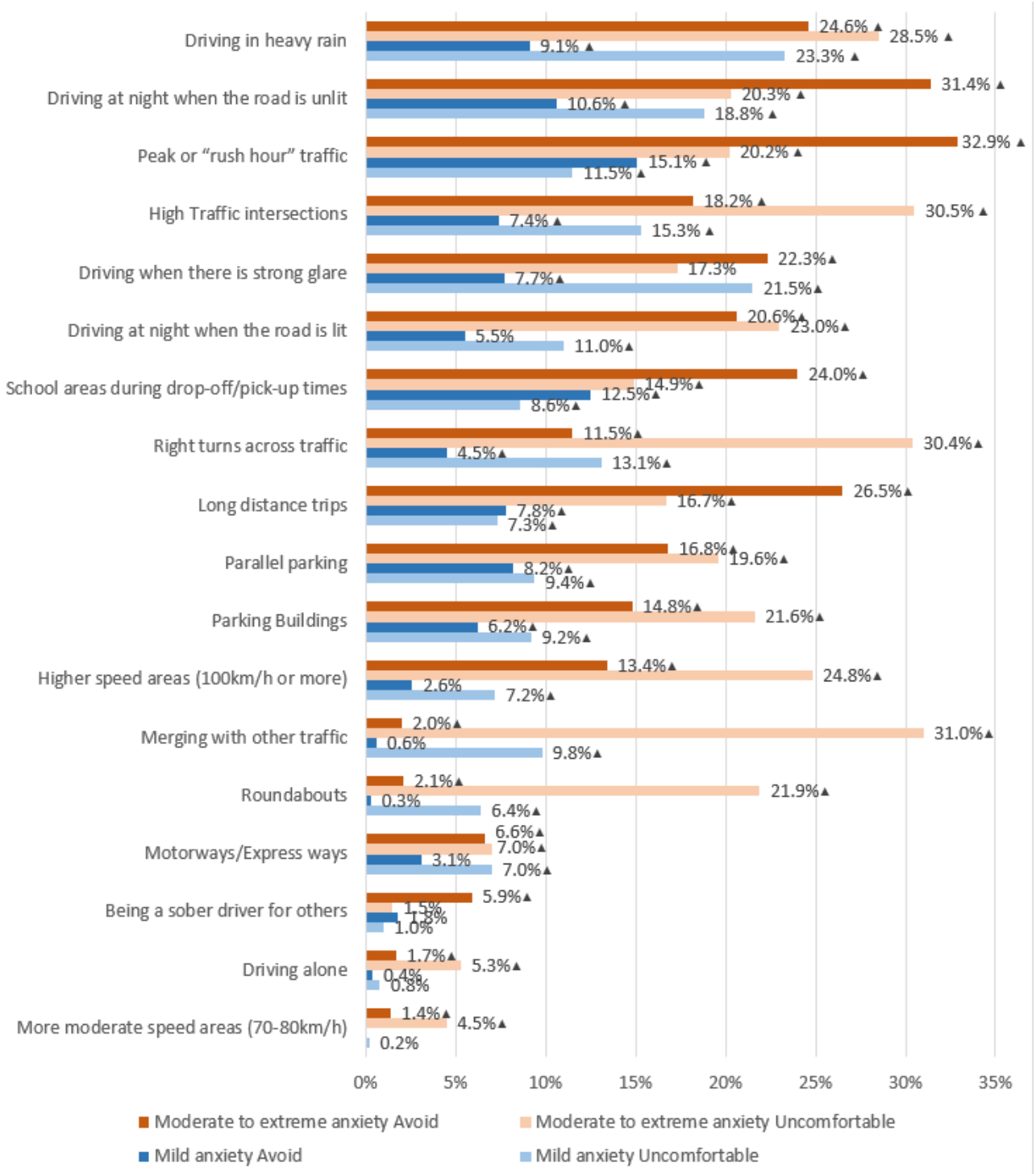

Figure 4-3 Change in proportion of older drivers reporting discomfort and avoidance from baseline (No Anxiety Group) for the Mild and Moderate to extreme anxiety groups (by driving condition; ▲indicates a significant higher likelihood of discomfort or avoidance)

This shows a few differences:

- Driver anxiety has a significant relationship with discomfort / avoidance behaviours across all driving conditions

- Significantly higher discomfort and avoidance in Mild Anxiety and Moderate to extreme anxiety groups includes Driving in difficult conditions:
- The Mild anxiety group drivers had a higher likelihood of discomfort only (i.e., not significantly higher avoidance) across several driving conditions, including Motorways/Expressways, Roundabouts, Higher speed areas (100km/h or more), and Driving at night when the road is lit.
- There were several conditions where the likelihood of discomfort was higher than the likelihood of avoidance for the moderate to extreme anxiety group (potentially because avoidance is difficult): High traffic intersections, roundabouts, right turns across traffic, merging, parking buildings, high speed areas. This indicates key areas where infrastructure or education interventions could support anxious drivers (as self-pacing may be more difficult).

4.1.2 Driver anxiety and crashes

Drivers were asked if they had been in a collision in the last 5 years that involved either serious injury (0.6%, n=24), a minor injury (1.3%, n=48), or no injury but did involve only vehicle damage (19.6%, n=746). They were also asked whether they were at fault or not.

When looked at by anxiety-level group, there was a significant difference between each anxiety group and those involved in an at-fault non-injury collision (X^2 (4, N=3811) = 10.902, p < .05). People with moderate to extreme anxiety were significantly more likely to report that they had been in a crash involving no injury than those who reported no anxiety. There were no significant differences between anxiety level and serious collisions (X^2 (4, N=3748) = 6.562, p = .161) or minor collisions (X^2 (4, N=3728) = 7.284, p =.122).

A key limitation to the significant anxiety-crash finding above was that one cannot determine whether being anxious may have contributed to a non-injury crash or whether a non-injury crash has contributed to driver anxiety. To look at the anxiety-crash relationship more directly, drivers who had some anxiety were also asked about the reason for it, including crash involvement (i.e., having witnessed or been in a crash). When drivers who stated their anxiety was due to crash involvement are not included in the significant anxiety group by non-injury collision analysis (above), the analysis is no longer significant (X^2 (4, N= 3681) = 5.555, p =.235). This indicates that the crash may have contributed to the anxiety (as opposed to anxiety causing the crash).

Finally, the anxiety-crash relationship also appeared to be linked only to at-fault crashes. Drivers who reported being in a crash in the last 5 years (including at-fault or not) were no more likely to report increased levels of anxiety in the last 5 years (X^2 (1, N=3681) = 3.584, p = .058). Whereas those drivers who did report being at-fault in a crash in the last 5 years were 1.4 times more likely to report increased levels of anxiety (X^2 (1, N=3718) = 5.319, p < .05).

4.1.3 Reasons for driver anxiety

For the 60% of older drivers that did report some level of anxiety, they were asked about the reasons (they could select multiple) for their anxiety when driving. The key reasons included the options provided in Figure 4-4. There was also an open-ended text box around “Other: Please Specify” which provided respondents an opportunity to expand further (which explains the high 31% reported in Other).

The reason reported by most of the anxious drivers was that the behaviour of other drivers made them nervous (52%). The next most common reasons were due to physical or mental

changes experienced (e.g., reduced eyesight or difficulty concentrating; 20%), and generally being an anxious person (8%). Some anxiety was not always perceived to be negative, with people equating this with caution or alertness, and some discussion was had around the impacts of Covid-19 in recent years.

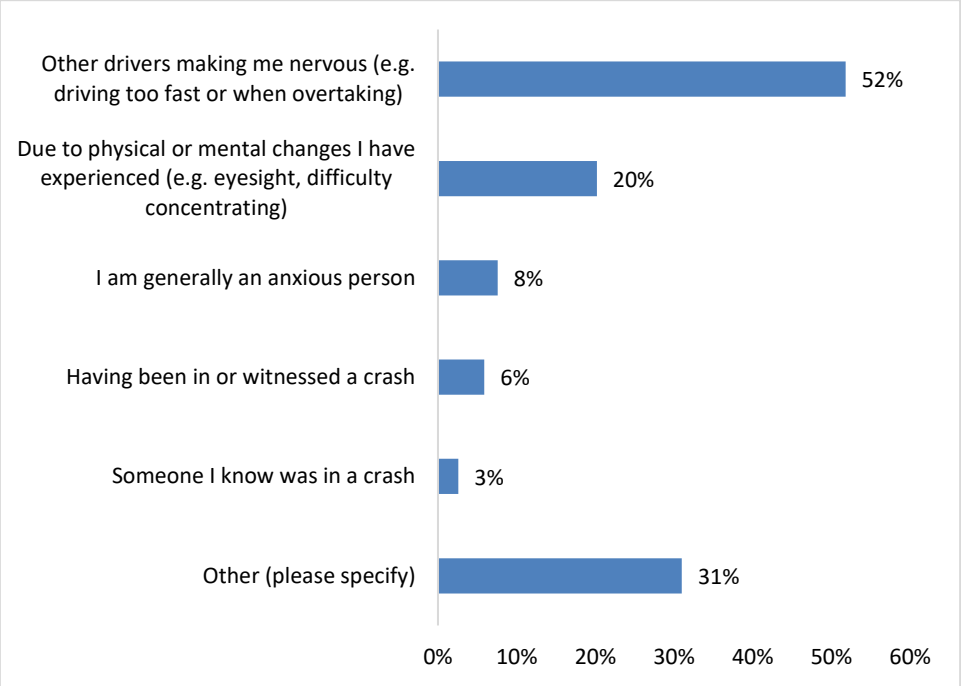

Figure 4-4 Percentage of anxious drivers that rate these reasons (N = 2327)

In relation to other drivers' behaviour making them nervous (52%), anxious older drivers stated that other drivers had become impatient (which could relate to the trend around increased anxiety in Section 4.1.5) as well as experiencing an anxiety around a perceived lack of control:

> *"I think drivers have become impatient and discourteous to others."*
>
> *"I am very aware of how fast things can change on the road and that other drivers are as much in control of my destiny as I am."*
>
> *"It's the unpredictability of other drivers that makes me nervous."*

Many drivers were aware of the changes in their ability as they aged (20%):

> *"I am generally more cautious as I age and keep in mind that my reactions aren't as quick as they used to be. I am perfectly comfortable keeping to the slow low lane instead of trying to overtake in the passing lane."*
>
> *"In the last 2 years, my stamina to drive long distances has decreased (need to ensure I am not tired otherwise can get sleepy, and have regular breaks due to lower back discomfort)"*
>
> *"I am more conscious of the fact of my age and how many elderly persons drive for more years than they should. I am always aware of the fact that a moving car can be a lethal machine."*

"I realise that as I grow older my reaction times, eyesight are not as sharp. I am more cautious about my driving speed, keeping a safe distance behind the car in front, tend to stop (or long pause) at 'Giveway" signs to double check traffic. On the open road I tend to drive 90-100kms per hour rather than 100kms (maybe even +) as when I was younger. I am more patient than I used to be!"

There were some drivers that were simply anxious (8%):

"I have never felt comfortable driving long distances on the open road, I am more anxious thinking about it rather than doing it but I rarely make long distance trips and would never do it at night or in driving rain. There is no reason for me to be like this - I have never had an accident on the open road or even a near miss but I get nervous about overtaking, especially large vehicles. I do drive to work and return on a motorway every day for about 5km and have no anxiety with this"

A number of responses reported that they believed being anxious was not the right term and preferred terms such as 'cautious':

"You have to be anxious when driving, it keeps you alert, aware and responsive. There are a lot of idiots on the road."

"I would prefer the word cautious instead of anxious."

"I probably mean more that I am alert rather than anxious"

"The very low level of anxiety I indicated has resulted in me driving more effectively (ie defensively)"

There were also comments that during the times there had been travel restrictions due to Covid-19, drivers had stayed local and home a lot more, such that less regular and shorter drives may have increased driver anxiety (potentially another reason for the trend in Section 4.1.5):

"During the Covid years I have stayed local/home a lot more and driven a lot less so confidence levels have dropped."

There are also some that may be using Covid-19 restrictions as an opportunity to shift away from reliance on the car:

Have driven less due to covid and now repaired hip, so just became less used to much driving. Got out of the way of it - especially long distance or busy traffic

4.1.4 Driver anxiety and age thresholds

To understand if there was an age at which driving related anxiety became more prominent, the cumulative percentages for anxiety were examined in relation to age (see Figure 4-5). The data showed that by age 71, 25% of the respondents indicated at least some anxiety, with 3.4% reporting moderate to extreme anxiety. By 81 years, 50% of the sample reported at least some level of driving related anxiety, with 7.4% experiencing moderate anxiety. Overall, in the decade between 71 and 81 years old, cumulative driver anxiety has doubled (with moderate anxiety increasing by 220%).

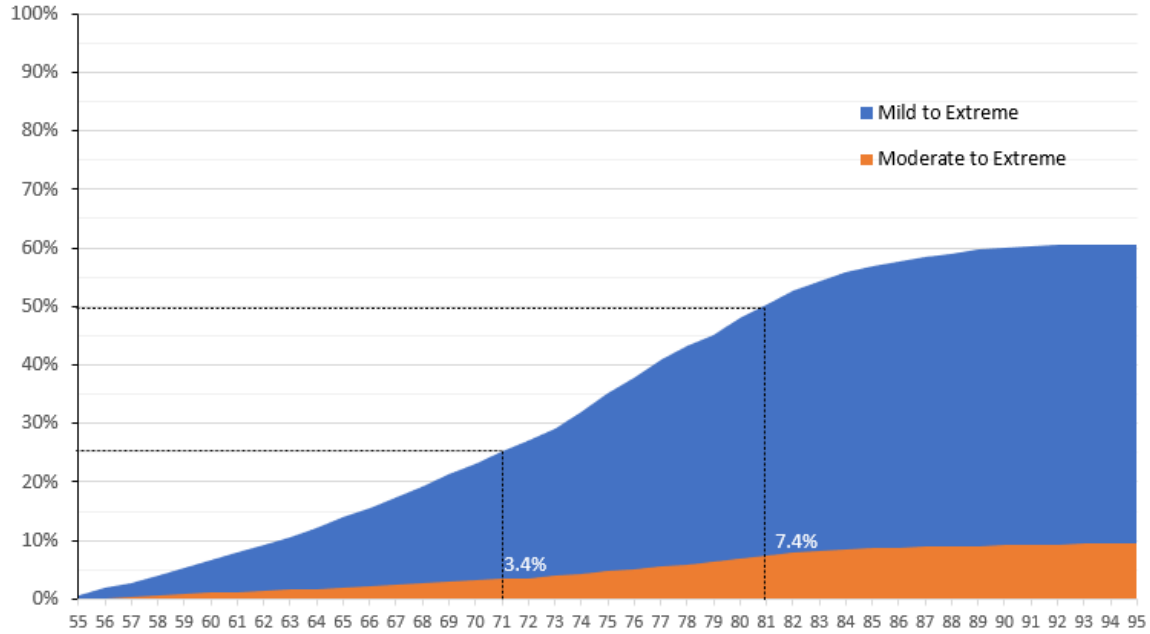

Figure 4-5 Cumulative anxiety by age for moderate to extreme and overall mild to extreme anxiety

A one-way ANOVA also revealed a significant effect of age group on driving anxiety (F (2, 3836) = 21.768, p < .001). Post-hoc analysis (Bonferroni adjusted) confirmed that Old Senior Drivers (80 or more years) had significantly higher anxiety than both other age groups (p < .05; M = 1.90; SD = 2.18), and that Middle Senior Drivers had significantly higher anxiety (M = 1.56; SD = 1.89) than Young Senior Drivers (p < .05; M = 1.36; SD = 1.83).

4.1.5 Driver anxiety trend over time

Approximately 60% of respondents reported at least some driving related anxiety, 51.2% reported mild anxiety and almost 10% (9.4%) of our sample reporting moderate to extreme levels of anxiety.

To examine a potential trend in driver anxiety, some comparisons were run against a sample of senior drivers by Taylor (2011). Our sample had a much higher percentage of respondents reporting at least some level of driving related anxiety than Taylor's (2011) sample, even when we match our age range (55-72 years) (see Figure 4-6). Mild anxiety is particularly high in the 2022 sample, with about 5 in 10 drivers reporting mild anxiety compared with 2 in 10 in 2011.

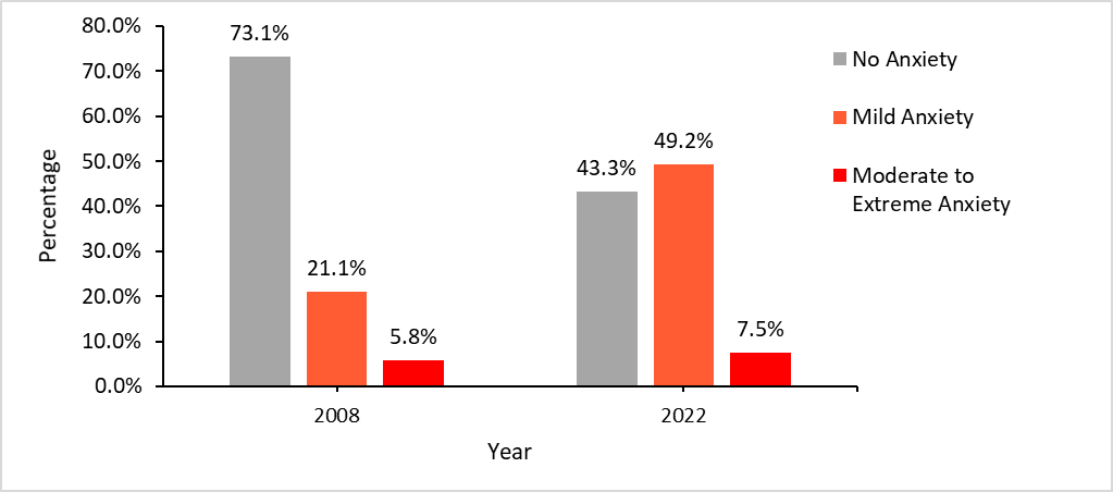

Figure 4-6 Percentage of respondents aged 55-72 reported level of driving related anxiety for Taylor's (2011) 2008 sample and WSP's 2022 sample.

4.1.6 Gender and driver anxiety

Our findings show that women reported significantly higher scores on average related to driving anxiety ($t(3373.83) = 10.78$, $p < .001$). Women reported a mean driver anxiety of 1.93 (SD = 2.087) compared to men with an average of 1.25 (SD = 1.763) and had about twice as many drivers in the moderate to extreme anxiety group (see Figure 4-7). This supports Taylor's (2011) findings around gender and driver anxiety in New Zealand.

Anxiety was more sensitive to change with age for males than for females, however this is a marginal difference. Both males ($r(2042) = .115$, $p < .001$) and females ($r(1699) = .071$, $p = .003$) had significant, weak correlations with level of driving related anxiety and age.

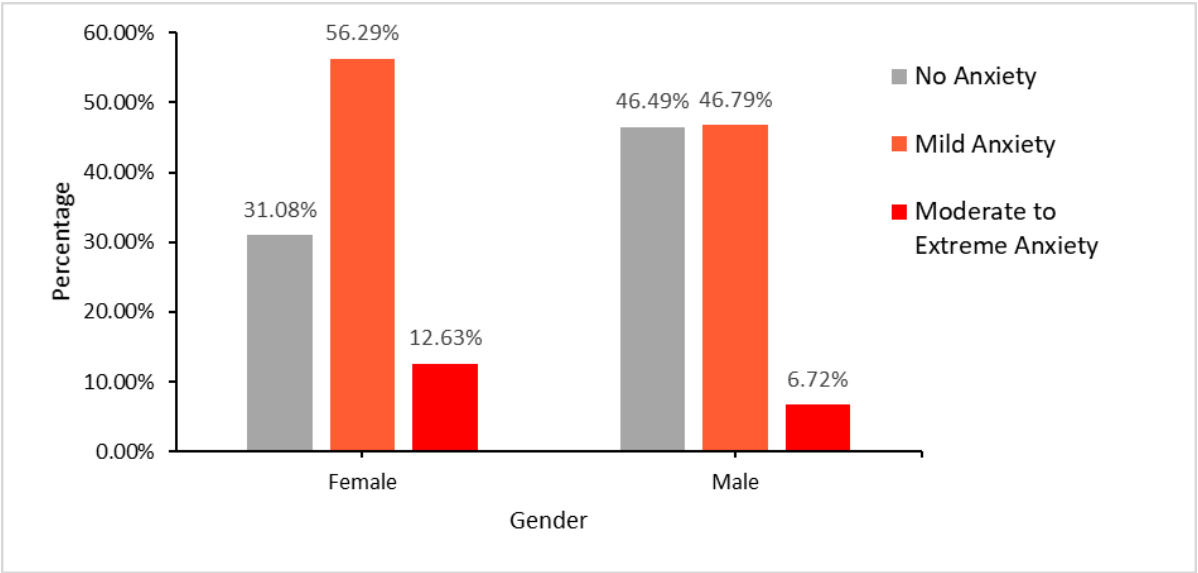

Figure 4-7 Proportion of drivers in different anxiety group by gender

4.1.7 Location, car reliance and anxiety

People living in rural areas were more likely to report needing to use a car to meet their transport needs than respondents living in suburb and urban areas. When asked about travel options across different trip purposes options included: I sometimes walk, cycle, or take public transport to do this; I could easily walk, cycle, or take public transport to do this; It would be difficult for me to walk, cycle, or take public transport to do this; I have to do this by car.

When compared with urban and suburban, those located rurally were significantly more likely to report having to do this trip by car across 8 of the 9 travel purposes (see Figure 4-8). This rural reliance on the car includes for operational and social purposes:

- Operational trips: Shopping, Personal business, Work, Education, Transporting others
- Social trips: Visiting friends and family, Recreational activities (e.g., yoga, nature walks), Social visits (e.g., restaurants, picnics, movies)

For religious trips rural drivers were more reliant on the car than urban drivers, but not suburban drivers (perhaps as church locations were farther apart for suburban drivers).

In relation to whether location has any impact on driver anxiety, the rural sample of drivers were not significantly higher in anxiety than the urban or suburban drivers (once age had been accounted for, as the older driver group were more likely to be under 70 years of age). If the age was not controlled for, then rural drivers were significantly less anxious than either urban or suburban drivers ($F(2, 3769) = 4.589$, $p < 0.05$). This is also reflected by anecdotal comments which link anxiety more to other driver interactions in high traffic locations:

> *"10 years ago my husband did all the driving, plus we lived in an smaller area. Now I live in a city and was out of practice with driving and the volume of traffic worried me."*

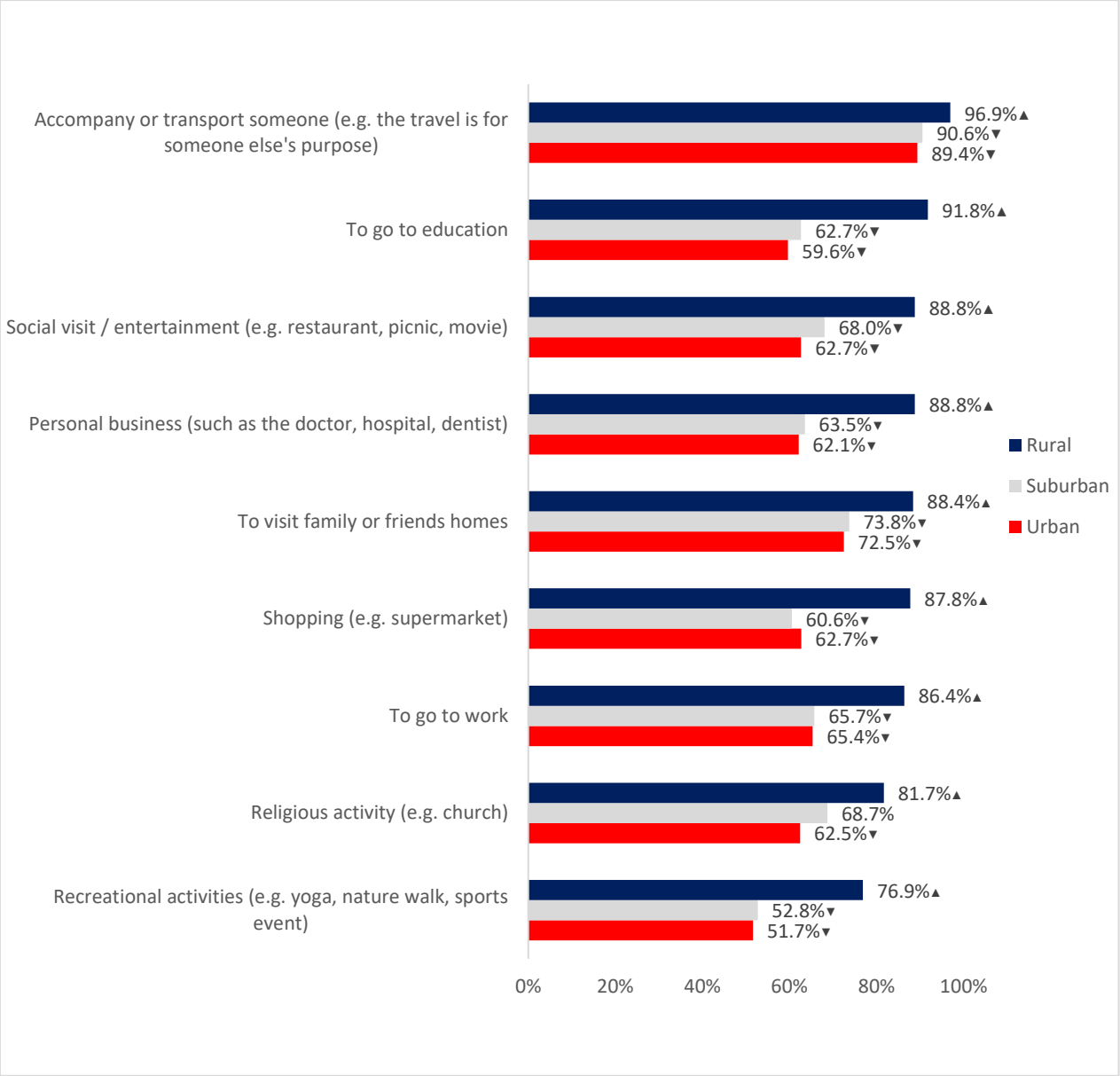

Figure 4-8 Those that report they have to make this trip by car, by trip purpose and location type (note that the ▲ / ▼ symbols represents a significant increase / decrease in avoidance)[2]

[2] Based on Chi-square tests with significance levels of $p < .05$ and adjusted residuals over 1.96.

4.2 Self-pacing or "limiting" behaviours

Overall, about 4 in 10 drivers (42.5%) reported making changes to their driving over the last 5 years to accommodate changes they have experienced (such as aching joints, changes to eyesight or hearing, headaches, difficulty concentrating, fatigue; see Table 4-1). About 3 in 10 drivers (31.8%) make these changes for safety reasons, like avoiding certain driving conditions to improve their road safety.

Table 4-1 Any alteration to driving over the last 5 years to accommodate changes

Have you found that you have altered your driving over the last five years to accommodate for changes you've experienced?	n	%
Yes, I have made changes to make driving safer (e.g., avoiding certain driving conditions)	1224	31.8%
Yes, I have made changes but for other reasons (e.g., comfort, or prefer to take other modes)	414	10.7%
No, I have not altered my driving	2215	57.5%
Total	3853	100%

When examining alterations to driving over the last 5 years to accommodate changes by age group there was a trend between age groups and making safety related changes to driving; a Chi-square test revealed respondents aged over 80 were significantly more likely to report having changed their driving behaviour to make their driving safer than those under 70 ($X^2(4, N = 3853) = 98.760$, $p < .001$). Figure 4-9 shows a breakdown by age group, including showing that about 1 in 10 drivers are making changes for non-safety reasons, regardless of age.

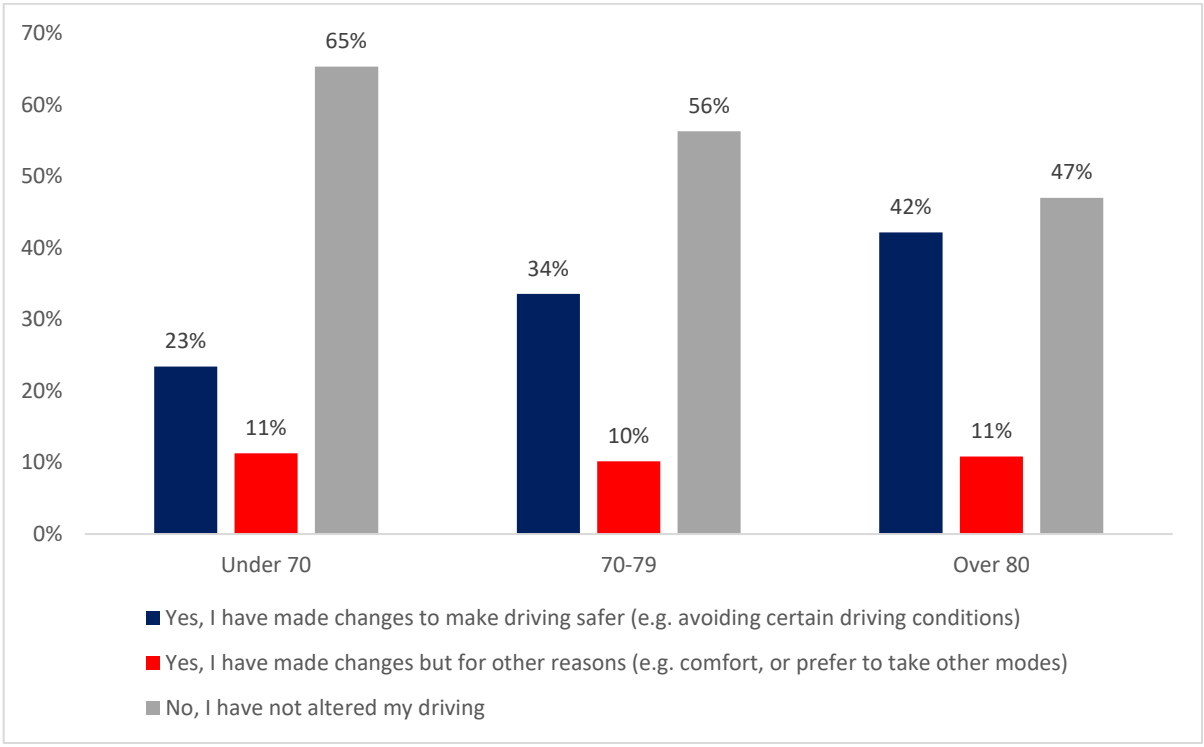

Figure 4-9 Any changes made to driving over last 5 years by age group

4.2.1 *Self-pacing by driving condition*

In relation to self-pacing (avoiding specific conditions), peak traffic conditions have the highest avoidance, arguably due to the ability to plan, including peak traffic conditions (28%), and school areas during pick-up and drop-off times (22%; see Figure 4-10).

The environmental conditions where there is most discomfort, but drivers are still driving (including where avoidance may be limited) includes strong glare (53%), heavy rain (40%), and driving at night 26%). This indicates areas where supporting infrastructure or technology solutions may be most useful to more senior drivers.

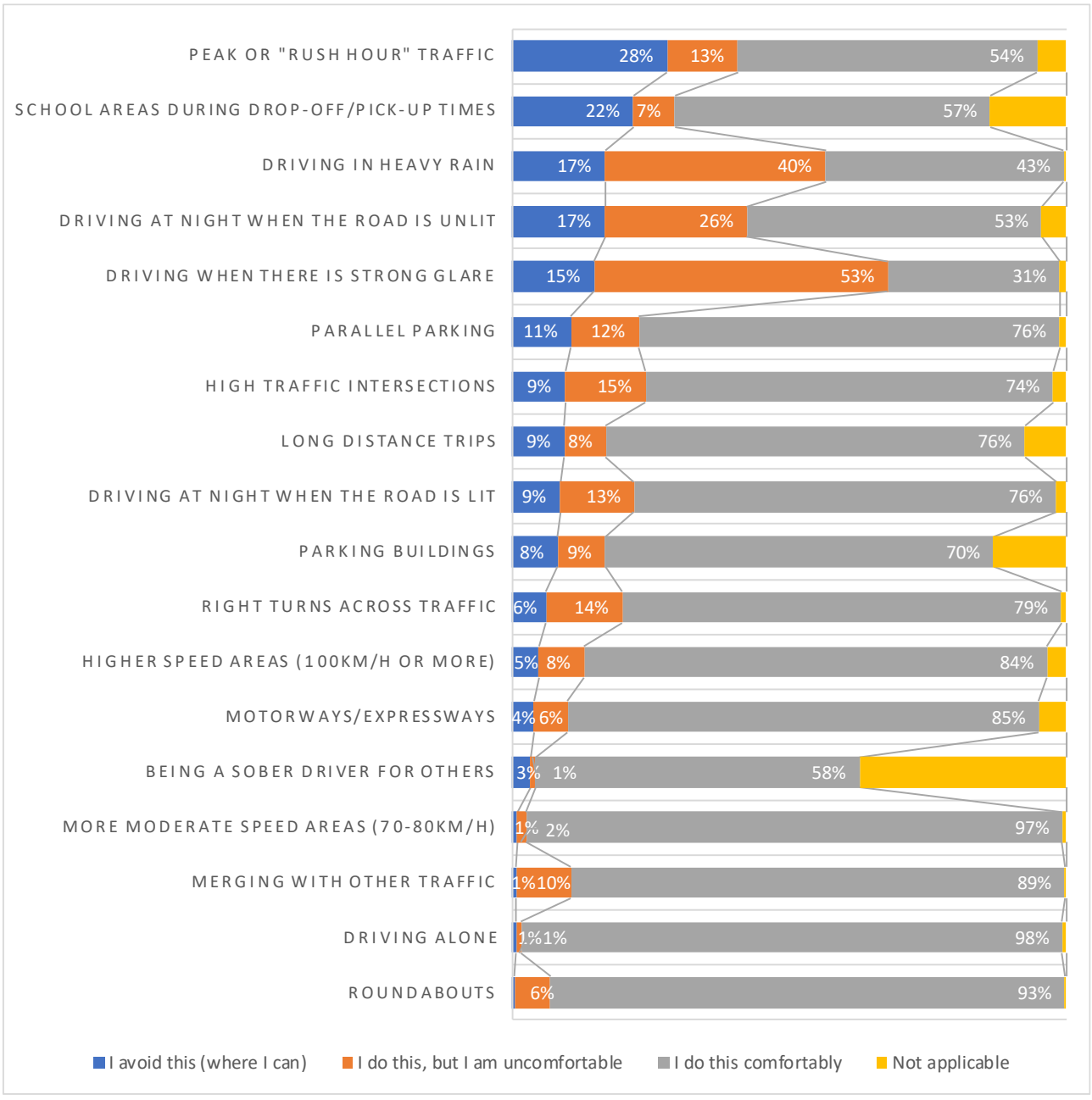

Figure 4-10 Driving condition by reported avoidance, discomfort, and comfort (ranked by avoidance (from highest to lowest)

4.2.2 Choice to self-pace by age group

To look more closely at the choice to self-pace (avoid) certain driving conditions, avoidance was recoded into either avoidant or I do this comfortably (with not applicable and uncomfortable removed). Uncomfortable was removed as the primary interest in this analysis is to look at those who had the choice to avoid the behaviour (as opposed to those that were uncomfortable but drove in this condition anyway). This was then examined across age group to determine whether avoidance altered with age.

An ANOVA revealed that Driving Condition Avoidance (scale score) was significant, with post-hoc (Bonferroni) tests showing a significant increase in avoidance with each Age group (F (2, 4143) = 57.710, p < .001). On average Young Senior Drivers (55-69 years) avoided 1.14 conditions (SD = 1.83), Middle Senior Drivers (70-79 years) avoiding 1.49 conditions (SD = 2.12) and Older Senior Drivers (80 or more years) avoiding 2.07 conditions (SD = 2.6).

When examining each driving condition separately, the Older Senior Driver age group was significantly more likely to avoid 7 of the 18 driving conditions when compared with the Young Senior Driver age group, which includes the following conditions (with the potential relevance to driver risk in brackets; see also Figure 4-11):

- Traffic conditions: Peak hour traffic (relevant to exposure to risk, and complexity of tracking multiple users i.e., cognitive workload)
- Higher speed areas (relevant to reaction times and crash severity)
- Long distance trips (relevant to fatigue and attention)
- Weather conditions: Heavy rain (relevant to visibility and reaction times)
- Light conditions: Strong glare, driving at night (lit and unlit locations)

Insights around these conditions are useful as it demonstrates how Old Senior Drivers have adapted. So, for example, raising awareness in Young and Middle Senior Driver groups that these are conditions they may want to start to consider and develop planning around. The Old Senior Drivers were also more likely to avoid motorways / expressways compared with the Middle Senior Drivers. The only area the Young Senior Drivers were more avoidant in was around parallel parking (which could indicate a training opportunity).

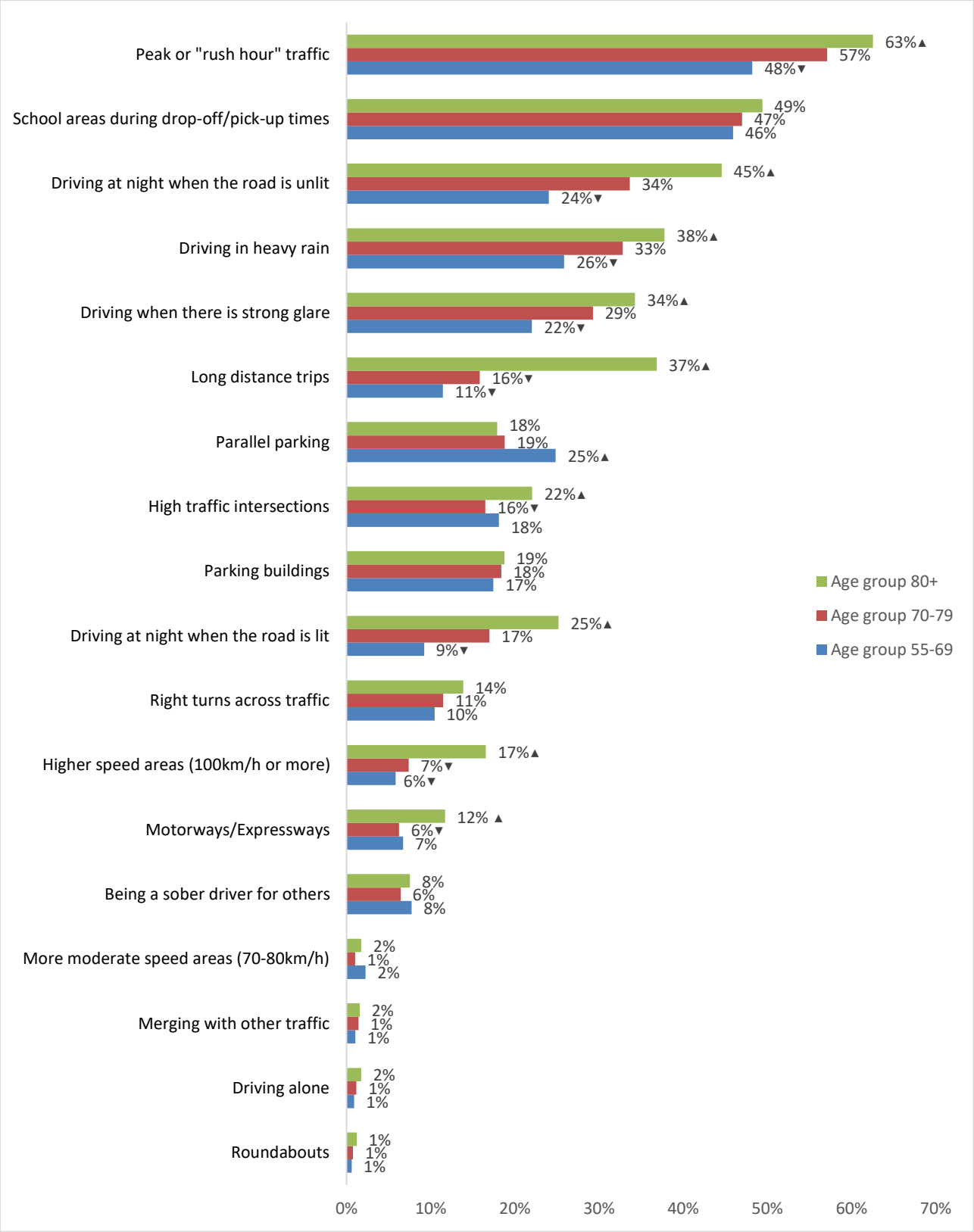

Figure 4-11 Driving condition by percent driver avoidance compared with comfortable by age group (from highest to lowest; note that the ▲/▼ symbols represents a significant increase / decrease in avoidance)[3]

[3] Based on Chi-square tests with significance levels of $p < .05$ and adjusted residuals over 1.96.

4.2.3 *Choice to self-pace and discomfort by gender*

Females had significantly higher Driving Condition Discomfort than Males (t (3550) = 12.005, p < .001), as well as significantly higher Driving Condition Avoidance than Males (t (2949) = 15.395, p < .001; see Figure 4-12). Similarly, in relation to self-pacing, overall exposure to driving was lower for female drivers. Duration of driving was more likely to be less than 1 hour per week and less likely to be more than 6 hours per week for Females compared with Males (X^2(4, N = 3668) = 25.251, p <.001). This was in line with previous research which reported women tend to self-pace their driving behaviour more than men (e.g., Dykstra et al., 2020).

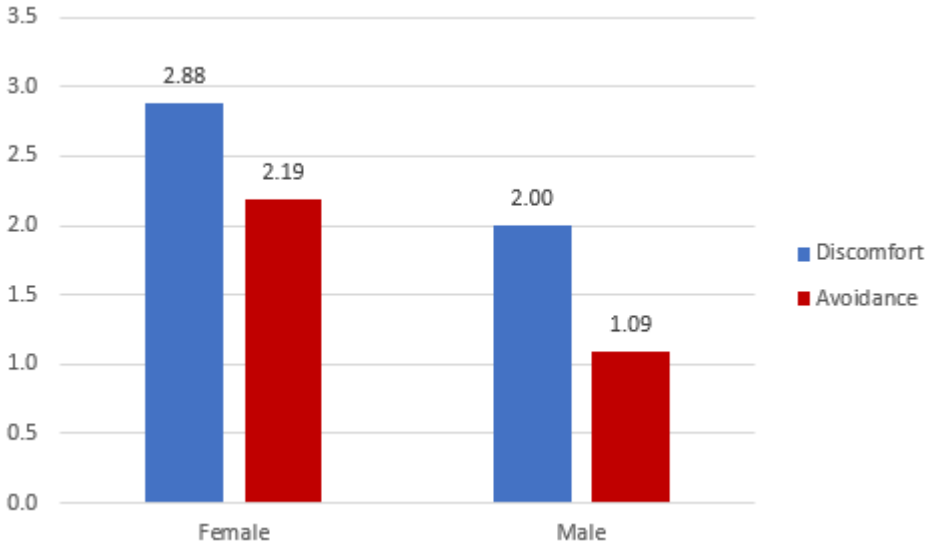

Figure 4-12 Average driving condition discomfort and avoidance scale score by gender.

4.3 AA Senior Driver Offer Cohort vs Others

4.3.1 *Is the course reaching those that need it?*

A total of 1,852 drivers over the age of 74 responded to the survey. Of these, 811 (43.8%) indicated they had completed the AA Senior driver course. To examine if gender was an influencing factor is attendance rate, a chi square analysis was conducted. There were no significant differences observed between gender and participation in the AA senior driver course (p=.080). So, both females and males found benefit in the Senior Driver Offer.

In relation to age, a larger proportion of drivers over the age of 80 reported having attended the AA senior driver course than respondents aged 74-79 (X^2(1) = 101.9, p<.001; see Figure 4-13). So, the older driver group perceived greater benefit in the Senior Driver Offer, perhaps as they wanted a check-up on how they were driving.

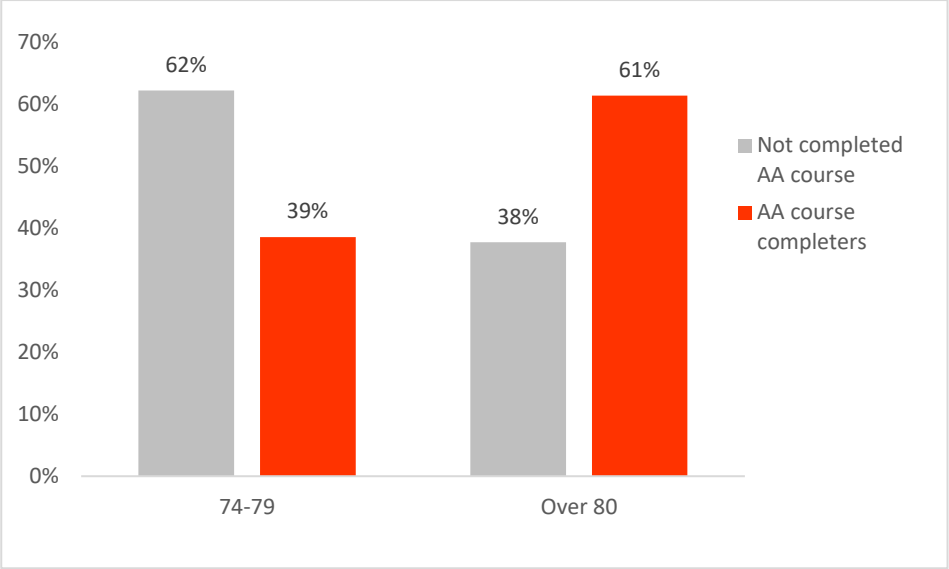

Figure 4-13 AA Offer completion by age group

Those who had completed the course were more likely to report that they were the only driver in the household, compared with those that share the driving responsibilities ($X^2(3) = 13.295$, p=.004; see Figure 4-14). Based on our sample of over 74-year-old drivers, this could indicate benefit in offering an incentive, discount or targeted approach to attract the 24% of drivers that shared driving responsibilities and were eligible.

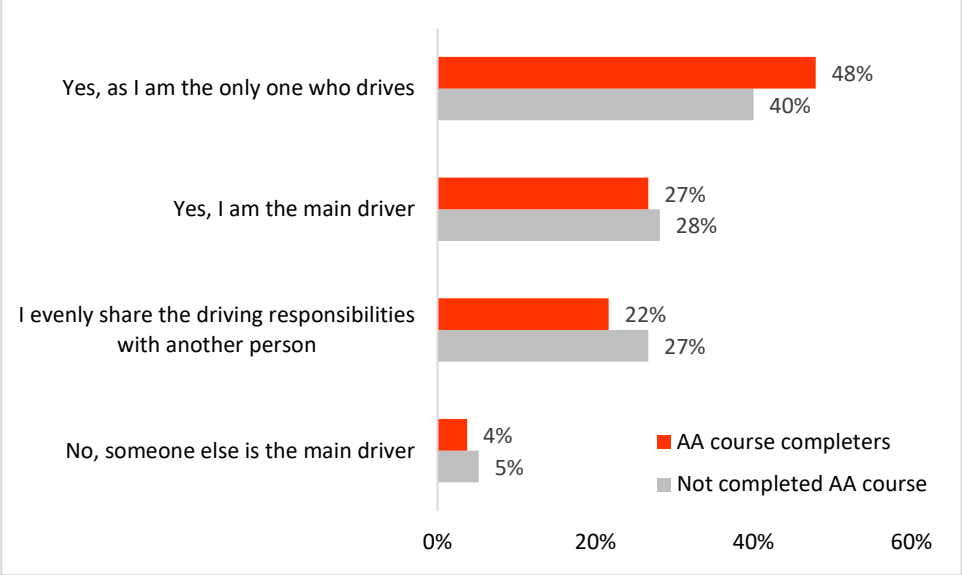

Figure 4-14 AA Offer completion by household driver contribution

4.3.2 Does the offer support driver confidence?

People who reported attended the AA senior drivers' course were also significantly more likely to have some level of driving related anxiety (t (1729) = -2.01, $p < .05$). There were indications that the course reassured more anxious drivers. Respondents who completed the course were able to select from a list of what outcome(s) they believe came from their participation in the course (see Figure 4-15). Overall, 68% of course attendees believed that the course gave them confidence in their driving ability. A comment box allowed people to add more detail to the response.

> "Felt very comfortable with the experienced AA driver who was with me. Pointed out a few things which I have taken on board. I took advantage of this AA facility earlier this year as well as a few years back. I think it is really beneficial for older driver's and would definitely recommend it. Gave me the confidence to know that I was still driving safely, not only for me but for others on the road."

Additionally, 40% reported their road rule knowledge improved, and 28% reported driving more safely. As part of the offer drivers were able to gain feedback on constructive areas for improvement:

> "I had 3 faults which I have now corrected and was pleased with the result"

Only 21% believed they had no meaningful change in their driving experience. However, of this group 44.6% had reported they had gained confidence in their driving ability because of the course. Similarly, many commented that they felt reassured in their ability and enjoyed receiving complimentary feedback from the instructors.

Figure 4-15 Proportion of drivers who reported the following outcomes having completed the AA Offer

4.4 Impacts of no longer driving

A sample of 32 drivers who were no longer driving answered specific questions relating to the reason they stopped, how they were travelling now, and any impact on their travel needs and wellbeing. The average age of drivers when they stopped driving was 82.4 years (SD = 7.5 years; Range 68-94 years). Overall, 70% of those that had stopped driving reported some form of impairment that affected their driving.

Problems with physical health was the most common reason, reported by over half (56.3 %) of those who had stopped driving (see Figure 4-16). The next most common reasons for no longer driving were feeling unsafe or anxious, and problems with vision. It is notable that about 1 in 5 did state that better travel options meant they no longer needed to drive themselves.

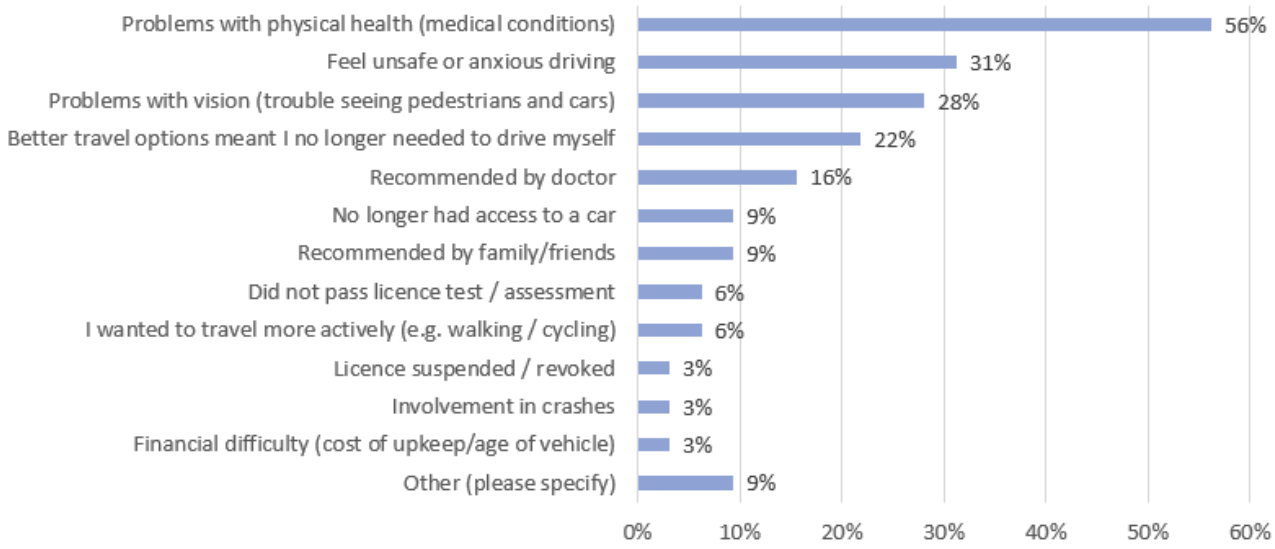

Figure 4-16 Reason why they were no longer driving (ordered by frequency; they could select all that apply)

When asked about how they travelled now, family and friends, walking, taxi / uber, and bus were the main methods (see Figure 4-17).

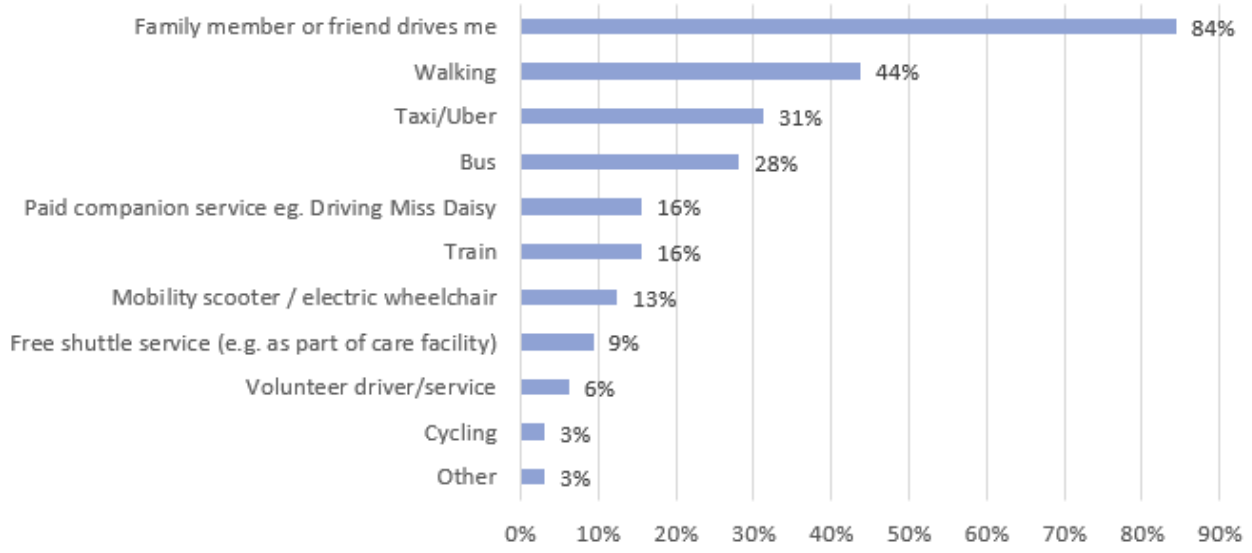

Figure 4-17 Travel modes used (ordered by frequency; they could select all that apply)

When asked about trips they would still like to make, but do not because they no longer drive, the top trip types affected were shopping, personal business, visiting family / friends, and social or entertainment trips (see Figure 4-18). About 3 in 4 of those no longer driving are not making trips they would like to, for both necessary and social reasons.

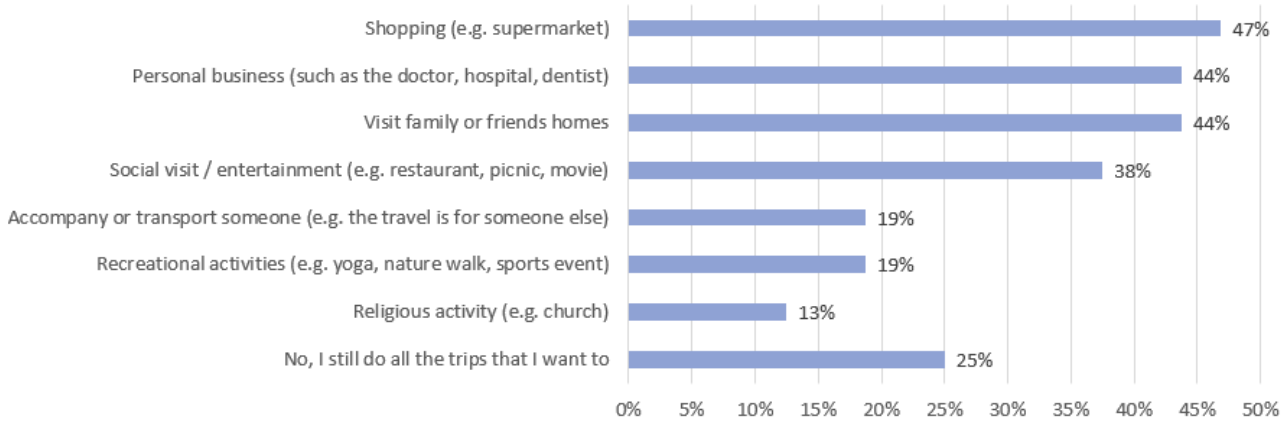

Figure 4-18 Trips no longer made because they no longer drove (ordered by frequency; they could select all that apply)

In relation to positive changes, the majority of those no longer driving found their alternatives worked for them, they could get to where they needed, and were less anxious when travelling (Figure 4-19). On the negative side, most that no longer drive were less engaged in social events and activities, and about 1 in 3 felt socially isolated, which indicates mental wellbeing impacts.

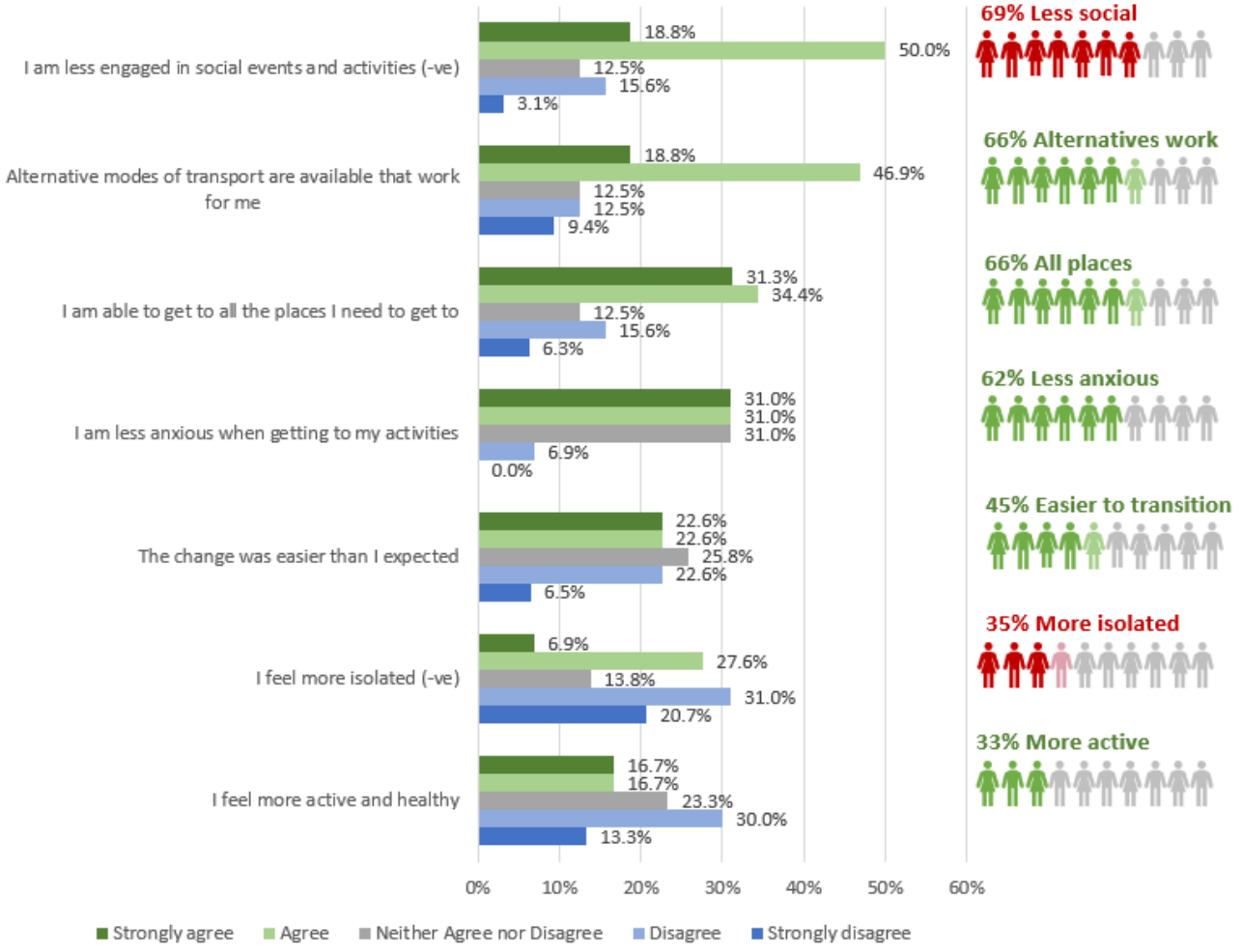

Figure 4-19 Level of agreement with positive and negative impacts of no longer driving (ordered by percent agreement)

5 Discussion and conclusions

5.1.1 *Driver anxiety, self-pacing and other drivers*

Anxious drivers make up the majority of this sample of older drivers, with about 6 in 10 of our drivers aged 55 and over, with about 1 in 10 of those having moderate to extreme anxiety. This is not only higher than many other overseas studies; but it also shows a trend towards greater anxiety in New Zealand over the last decade, with 30% more older drivers reporting some level of anxiety when driving (Taylor, 2011).

6 in 10 drivers over 55 years of age report some level of driver anxiety

Interactions with other drivers is the most common cause

This study has also revealed that Driver Anxiety is a better indicator of self-pacing behaviour (i.e., avoiding certain driving locations, manoeuvres, or conditions) than simply looking at age. This was also found by Charlton et al. (2006) where those with lower confidence were about 4 times as likely to self-pace or limit their driving. This is likely because Driver Anxiety considers a broader risk profile, of which only about 1 in 5 anxious drivers relate to cognitive or physical changes due to age.

The reported key cause of Driver Anxiety appears to be the behaviour of other drivers. The driving style of other drivers was the third most common reason reported by older Australian drivers as being a problem (after driving at night or in poor weather and driving on unfamiliar roads; Oxley et al., 2010). Anecdotally, some of this relates to driver impatience and courtesy, so appropriate speed management and support for a mindset of kindness around older drivers is something to consider (i.e., consider that they are being safe by self-pacing themselves, so give them the space and time to do this).

5.1.1.1 Is anxiety increasing in our older drivers?

There is some evidence that over the last decade there has been an increase in driver anxiety (especially mild anxiety when compared with Taylor's (2011) sample of older drivers using the same age range). If this finding valid it shows that we have moved from 26% to 56% of drivers with anxiety (within the 55-73 year-old age group) over the last decade (using the same exact question format).

New Zealand drivers have become more anxious over the last decade

With about 3 in 10 more older drivers with some level of anxiety

This finding could be a result of differences between our sample and Talyor's (2011), or it could indicate changes over time in relation to driving anxiety. Taylor's sample had more females and included non-drivers (7.4% non-drivers). Consequently, it would be reasonable to expect our participants to be less anxious than Taylor's (2011) due to females reporting higher driving-related anxiety. Similarly, it would seem reasonable to expect that non-drivers might be more anxious when asked about their anxiety.

These differences would indicate that New Zealand drivers have become more anxious over the last decade. Other factors that came through in anecdotal driver comments indicated that drivers had become more impatient (which could relate to a higher population of drivers) and that Covid-19 had increased anxiety around driving (e.g., going back to driving after being out of practice and potentially having aged physically without an ability to gradually adjust over time to the physical changes).

5.1.1 How does anxiety relate to crashes and safety?

At-fault crashes are a contributing factor towards anxiety

However, there is limited evidence to suggest anxiety is causing crashes

A key question around driver anxiety is, what is the right level? Low anxiety could be equated with caution, and high anxiety could arguably lead to making errors. In a study of older female drivers in Australia (aged 60 or more years), less confident older drivers were about twice as likely to have been in crash-involved in the last 5 years (Oxley et al., 2010). Further, Sagberg (2006) found that drivers with diagnosed anxiety issues had a 3.15 times higher likelihood of being crash-involved. However, regression analyses cannot determine whether the low confidence or anxiety contributed to the crash or whether the crash contributed to the low confidence or anxiety.

Within our study there is also evidence that those drivers that had moderate to extreme anxiety are more likely to be in an at-fault non-injury crash.[4] However, there is also unique evidence to support the theory that the at-fault crash has contributed to the anxiety (as opposed to the anxiety contributing to the crash). When those drivers that stated a recent crash caused their anxiety were removed from the analysis, the anxiety-crash finding disappears (i.e., it is no longer significant). We can infer from this that post-crash anxiety is an issue, and a crash event is a good mechanism for triggering improved support services.

5.1.2 How are our drivers self-pacing?

3 in 10 drivers alter their driving for safety reasons

Avoidance of right-turn movements and night driving appears lower than other studies

About 3 in 10 drivers change their driving due to safety reasons, like avoiding certain driving conditions to improve their road safety (which is marginally higher than the 25% found by Crutchley (2014)). Other studies, like Charlton et al. (2006) have indicated the choice was related more to lifestyle (40%) than age-related safety changes (20%).

When it comes to avoidance or planning trips on routes that avoid certain conditions some comparisons of driving conditions across New Zealand (across two different time periods) and Australia can be examined (see Table 5-1). This indicates that over time, within New Zealand, avoidance of less safe routes that include right turn movements has decreased, which could indicate a road safety challenge. Avoidance of night driving that impacts on visibility also appears to be lower, both within New Zealand over time and between countries. Avoidance of driving in rain conditions was reasonably consistent (14-17% avoidance).

Over time, motorway avoidance may have decreased in New Zealand, however, this could be due to the inclusion of "Expressways" within our study. Similarly, peak traffic avoidance is slightly higher (6% higher) in the New Zealand sample compared with Australia, which could be due to the term "busy traffic" (arguably harder to avoid in a higher population country) as opposed to peak traffic which is time-based.

[4] As a self-report study, it is worth noting that anxious drivers may be more likely to reflect on and therefore recall and self-report non-injury crashes (i.e., non anxious drivers may underreport or be less likely to rate themselves as at fault in these events).

Table 5-1 Proportion of drivers engaging in avoidance behaviour in different conditions in three Australasian surveys of drivers[5]

Avoidance (self-pacing) condition	Our study (2022), New Zealand (aged 55 or more)	Crutchley (2014), New Zealand (aged 75 years or more)	Charlton, et al. (2006), Australia (aged 55 or more)
Motorways / expressways	6%	11% *(motorways)*	-
Peak or "rush hour" traffic	28%	-	22% *(busy traffic)*
Heavy rain	17%	-	14% *(rain)*
Night driving	17% (unlit) / 9% (lit)	30%	25%
Merging	1%	3.5%	6%
Right turn movements across traffic	6%	13%	6%

5.1.3 Where are areas where drivers need more support?

Older drivers benefit from safer speed and high-risk intersections treatments

Driving conditions where driver discomfort is high, but avoidance is difficult, are areas where older drivers arguably need greater support. This includes from in-vehicle technology (i.e., when it comes to parking, where the physical movement of turning to look can be more difficult), and from more forgiving designs (i.e., use of roundabouts or controlled turn movements at signalised crossings). Specific locations where discomfort is high, and avoidance is difficult include:

- Locations with high traffic interactions: High traffic intersections, roundabouts, right turns across traffic, merging
- Parking buildings
- High speed areas.

Arguably, from this list parking buildings and roundabouts have a high level of safety relative to high-traffic intersections, intersections that require right turns across traffic, and high-speed areas (see Stage 3 of this older driver project). The safer speeds arm of the Road to Zero action plan is very supportive of older drivers, including where there are lowered speeds and infrastructure improvements (MoT, 2019). However, right turns across traffic, while arguably one of the riskier behaviours for older drivers, are only avoided by 6% of drivers (this does not alter significantly across age group; see Figure 4-11). Consideration should be given to age friendly routes when designing intersections to enable access and equity for the full range of our drivers. Such routes typically involve making the gap acceptance process easier for older drivers by reducing speeds and the number of separate traffic movements they must contend with at once, in some cases down to zero as with protected right turns at traffic signals.

[5] Where the survey term is slightly different the wording has been added in brackets beside the percentage.

5.2 Sub-group analyses

5.2.1 How can the AA Senior Driver Offer better support our drivers?

2 in 3 drivers say they are more confident having done the offer

Anxious older drivers are more likely to take up the senior driver offer. The largest benefit from the offer appears to be improved confidence in their ability to continue driving safely, with 2 in 3 drivers stating this as a benefit. As anxiety around driving appears to increase earlier, the AA could consider lowering the existing 74-year threshold for the offer to better unlock this function to support a wider group of older drivers. Also, tools that may further support the anxiety-mitigation component of the offer could include (following Gandolfi, 2020):

1) Structure around self-assessment: Providing tools and tips for older drivers that are concerned about their own performance (e.g., see also Appendix B)

2) Training around advanced driver assistance systems (ADAS) and navigation systems (safer routes and journey planning): Providing independent knowledge around what vehicle features are supportive (i.e., when looking for a new vehicle) and ensuring identification and understanding of the useful features in the existing vehicle.

Another group that appeared underrepresented by the offer were drivers that shared driving responsibilities evenly, so considering how to target this group could be further examined – including looking at discounting couples together and sharing a couples-based approach.

The final group were those older drivers that were less anxious and also less likely to opt into this type of offer. For arguably more confident drivers, they may have more interest in the technology and features around their vehicle (e.g., ADAS), so contacting this group around the vehicle purchase decision or recent purchase phase may be a target point (i.e., focussing on the vehicle rather than the driver).

Another may be looking at incentivisation. For example, looking at other successful programmes (such as Ride Forever) that capture extrinsic (monetary insurance-based incentives) as well as intrinsic (acknowledgement-based incentives, including a bronze, silver, gold tiered system) for demonstrating safer driving behaviours within course completion (ACC, 2022).

5.2.2 What are the impacts of no longer driving?

2 in 3 non-drivers are less socially active

1 in 3 non-drivers feel isolated

Only 1 in 10 drivers make active plans to stop driving

About 75% of those no longer driving have trips they would like to make but no longer make (this includes functional medical trips as well as social trips). There was evidence that most drivers reduced their social engagements, and about 1 in 3 had increased feelings of isolation, which could have mental wellbeing impacts. Most drivers relied on friends and family to meet their needs around trips (84%), as opposed to public transport services.

In relation to the reason for no longer driving, the key reasons were anxiety, physical and cognitive ability (which supports recent New Zealand research by Shope et al., 2019). Advice from doctor comes up less frequently for this New Zealand sample (16%) compared with targeted older driver research conducted on drivers that had decided to stop driving in the US (27%; Persson, 1993). The New Zealand sample was more likely to report anxiety (31%) than the US sample (20%; Persson, 1993).

So arguably, our drivers are more likely to actively take the initiative to stop driving before someone tells them to do so for a medical reason. It could be that they know themselves better,

or it could be that they are stopping before they need to because of anxiety, which may not always be beneficial. For example, driving cessation has been associated with several health problems, but particularly depression, including a review study that indicated almost double the risk of increased depressive symptoms (Chihuri, et al., 2015). Further, taking the initiative to stop does not mean this is well planned: Charlton et al. (2006) found that only 1 in 4 drivers had made plans for driving cessation. In recent New Zealand research, while about 44% had considered how they might stop driving (but not made plans), only 1 in 10 older drivers had developed a plan (Brookland & Owen, 2019).

Some key points are that:

- Based on the sample of our drivers, there seems to be a reasonable level of autonomy over the decision to stop driving, as opposed to simply being told to stop immediately.
  - Therefore, support around how to self-pace, and planning for when to stop based on visual, cognitive, and physical limits is appropriate.
  - Involving friends and whānau is this process would be beneficial, as they are a key informal support network.
- About 1 in 3 drivers found the transition to stop harder than expected and about 1 in 3 had increased feelings of isolation, so some people need more support.
  - Providing tools for key support people to better identify alternative travel services has been recognised as a need (e.g., Choi & Dinitto, 2016). This includes for informal (friends and whānau) and formal supporters (caregivers)
  - Early planning around the walkability of where someone lives is also a key part of success, as continued engagement in pedestrian-based travel (including walking, or using a wheelchair or scooter) has also been linked to reduced depression as well as having other physical benefits (e.g., Choi & DiNitto, 2016)
  - Leveraging off existing programmes that are more mature around providing sustainable transport services for seniors could be helpful (e.g., for community-based transport solutions see www.intamerica.org).

5.3 Recommendations

That the Automobile Association of New Zealand consider the following to support drivers who are 55 years and older:

- Support initiatives for driving conditions where a high proportion of older drivers are uncomfortable driving, have difficulty avoiding, and where crash outcomes are more severe for older drivers, including intersections with right turns across traffic and higher speed areas that have lower crash safety ratings. This could include:
  - Supporting Road to Zero initiatives that have positive outcomes for older drivers (MoT, 2019), especially those around safer speeds and high-risk intersection treatments
  - Education, trip planning and trip replacement opportunities (e.g., peak hour travel, longer trips, night driving)
  - Longer-term decision support around opportunities to support safer travel, including where to live (i.e., pedestrian friendly environments or proximity to public transport) or what safety features to look for in a vehicle (i.e., in-vehicle support technologies)
- Widen the existing Senior Driver Offer to include those from 70 years of age
- A young-old cohort for an offer that is linked to the motivations around confidence and defensive driving for this group
- Review of successful education systems that use incentives (extrinsic or monetary as well as intrinsic) to both increase reach of the education programme and motivate safer driver behaviours

- Review use of tools that support confidence in self-assessment (leveraging off our existing desire to have autonomy) and improve planning and early discussions with friends and family around self-pacing when it comes to their driving
- Continue to monitor driver crashes, anxiety, and self-pacing behaviour over time to evaluate the success of any support

That the Automobile Association of New Zealand and partners consider the following recommendations:

- Setting up a multi-agency working group around transitioning out of driving (or adding to an existing working group agenda). Look at interventions and research on what is effective and equitable. Raise this in the context of road safety action plans, like the Road to Zero
- Examine crash-involvement of older drivers with the insurance sector, including reviewing an opportunity to look at incentivising support services that are known to improve safer driving in older populations (e.g., the process engaged with by the Ride Forever motorcycle program, where changes to the excess are used as incentives; ACC, 2022).

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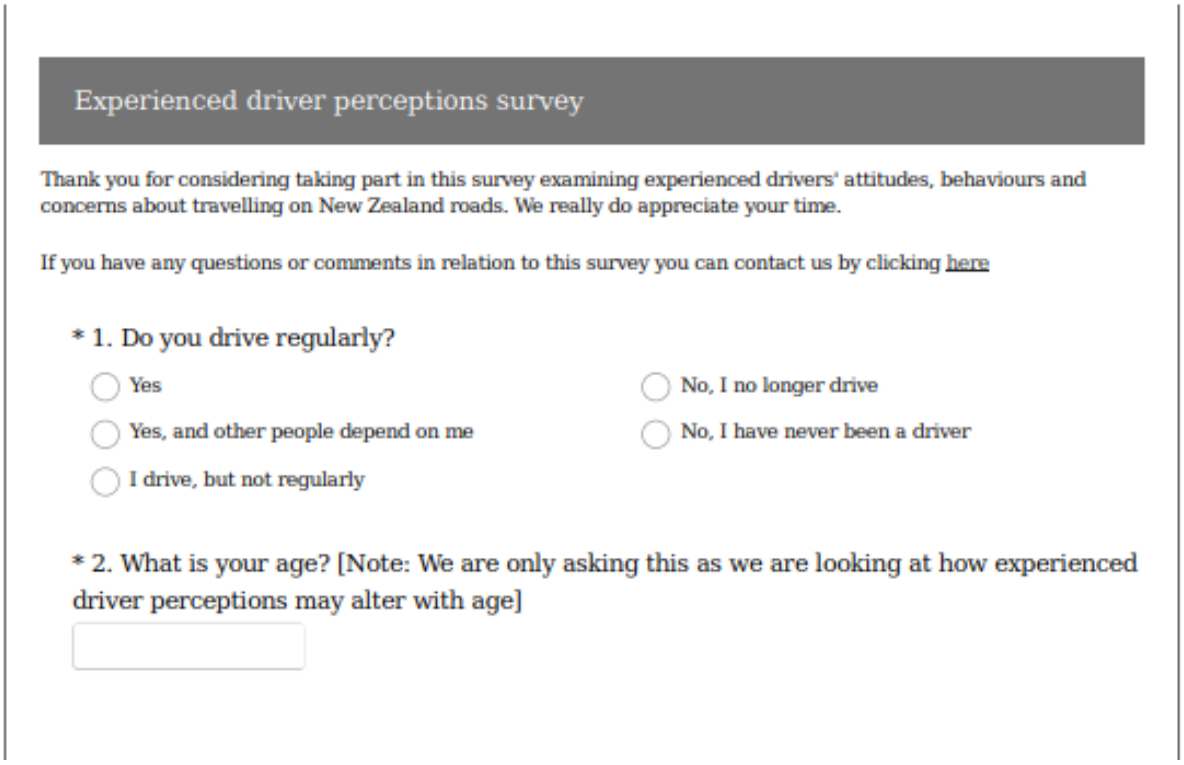
Appendices

Appendix A: Experienced driver perceptions survey



Experienced driver perceptions survey

Thank you for considering taking part in this survey examining experienced drivers' attitudes, behaviours and concerns about travelling on New Zealand roads. We really do appreciate your time.

If you have any questions or comments in relation to this survey you can contact us by clicking here

* 1. Do you drive regularly?

- Yes
- Yes, and other people depend on me
- I drive, but not regularly
- No, I no longer drive
- No, I have never been a driver

* 2. What is your age? [Note: We are only asking this as we are looking at how experienced driver perceptions may alter with age]

Experienced driver perceptions survey

Your travel

* 3. In a typical week (outside any restrictions due to COVID-19), how many hours do you typically drive? [i.e. where you are the driver, not the passenger. Your best guess in fine.]

- ◯ Less than 1 hour per week
- ◯ Between 1-2 hours per week
- ◯ Between 2-4 hours per week
- ◯ Other (please specify)
- ◯ Between 4-6 hours per week
- ◯ More than 6 hours per week
- ◯ I do not know

4. What are your transport options for the following types of trip?

	I sometimes walk, cycle or take public transport to do this	I could easily walk, cycle or take public transport to do this	It would be difficult for me to walk, cycle or take public transport to do this	I have to do this by car	I don't make these trips
Shopping (e.g. supermarket)	◯	◯	◯	◯	◯
Personal business (such as the doctor, hospital, dentist)	◯	◯	◯	◯	◯
Religious activity (e.g. church)	◯	◯	◯	◯	◯
To go to work	◯	◯	◯	◯	◯
To go to education	◯	◯	◯	◯	◯

5. What are your transport options for the following social types of trip?

	I sometimes walk, cycle or take public transport to do this	I could easily walk, cycle or take public transport to do this	It would be difficult for me to walk, cycle or take public transport to do this	I have to do this by car	I don't make these trips
To visit family or friends homes	◯	◯	◯	◯	◯
Recreational activities (e.g. yoga, nature walk, sports event)	◯	◯	◯	◯	◯
Social visit / entertainment (e.g. restaurant, picnic, movie)	◯	◯	◯	◯	◯
Accompany or transport someone (e.g. the travel is for someone else's purpose)	◯	◯	◯	◯	◯

Experienced driver perceptions survey

6. Thinking about your travel and the trips you have made over the last month, how often did any of the following occur?

	Not in the last month	Rarely	Sometimes	Often	Always
Other drivers were driving too fast	○	○	○	○	○
Other drivers drove too close behind me (tailgating)	○	○	○	○	○
Another driver honked their horn at me	○	○	○	○	○
I had to brake or swerve suddenly	○	○	○	○	○
I caused someone else to brake or swerve suddenly	○	○	○	○	○
Getting into and out of car parks was very easy for me	○	○	○	○	○
A pedestrian, cyclist or vehicle appeared out of nowhere	○	○	○	○	○
I have had trouble looking over my shoulder (e.g. when reversing or changing lanes)	○	○	○	○	○

7. Still thinking about your travel and the trips you have made over the last month, how often did any of the following occur?

	Not in the last month	Rarely	Sometimes	Often	Always
I actively enjoyed driving	○	○	○	○	○
I took a less direct route because if felt safer for me	○	○	○	○	○
I travelled at a less convenient time because if felt safer for me	○	○	○	○	○
I have had trouble looking over my shoulder (e.g. when reversing or changing lanes)	○	○	○	○	○
I felt anxious while driving	○	○	○	○	○
I felt tired while driving	○	○	○	○	○

Experienced driver perceptions survey

Changes in your driving

* 8. Have you found that you have altered your driving over the last five years to accommodate for changes you've experienced (such as aching joints, changes to eyesight or hearing, headaches, difficulty concentrating, fatigue)?

- ◯ Yes, I have made changes to make driving safer (e.g. avoiding certain driving conditions)
- ◯ Yes, I have made changes but for other reasons (e.g. comfort, or prefer to take other modes)
- ◯ No, I have not altered my driving

* 9. When you drive, how do you manage the following road conditions or activities?

	I avoid this (where I can)	I do this, but I am uncomfortable	I do this comfortably	N/A
Motorways/Expressways	◯	◯	◯	◯
High traffic intersections	◯	◯	◯	◯
Roundabouts	◯	◯	◯	◯
Higher speed areas (100km/h or more)	◯	◯	◯	◯
More moderate speed areas (70-80km/h)	◯	◯	◯	◯
Parallel parking	◯	◯	◯	◯
Parking buildings	◯	◯	◯	◯
Merging with other traffic	◯	◯	◯	◯
Right turns across traffic	◯	◯	◯	◯

* 10. When you drive, how do you manage the following road conditions or activities?

	I avoid this (where I can)	I do this, but I am uncomfortable	I do this comfortably	N/A
Long distance trips	◯	◯	◯	◯
Peak or "rush hour" traffic	◯	◯	◯	◯
School areas during drop-off/pick-up times	◯	◯	◯	◯
Being a sober driver for others	◯	◯	◯	◯
Driving alone	◯	◯	◯	◯
Driving at night when the road is lit	◯	◯	◯	◯
Driving at night when the road is unlit	◯	◯	◯	◯
Driving when there is strong glare	◯	◯	◯	◯
Driving in heavy rain	◯	◯	◯	◯

Experienced driver perceptions survey

11. How would you rate the quality of your driving now compared with 5 years ago?

- ◯ Not as good
- ◯ About the same
- ◯ Better

12. Have you been involved in any of the following types of collision when you were driving over the last 5 years?

	No	Yes, but not one where I was at fault	Yes, and one where I was at fault
Collision involving serious injury	◯	◯	◯
Collision involving minor injury	◯	◯	◯
Collision involving no injury (i.e. vehicle damage only)	◯	◯	◯

Experienced driver perceptions survey

* 13. Please consider the level of anxiety you feel when driving

0 Not at all anxious — 10 Extremely anxious

14. Thinking about your anxiety score you just provided, which of the following best describes any change in anxiety related to driving you may have experienced in the last 5 years?

- ◯ I have become less anxious about driving
- ◯ No change
- ◯ I have become more anxious about driving

Experienced driver perceptions survey

15. What are the reasons for having any level of anxiety when driving?

- ☐ I am generally an anxious person
- ☐ Due to physical or mental changes I have experienced (e.g. eyesight, difficulty concentrating)
- ☐ Other drivers making me nervous (e.g. driving too fast or when overtaking)
- ☐ Having been in or witnessed a crash
- ☐ Someone I know was in a crash
- ☐ Other (please specify)

Experienced driver perceptions survey

AA Senior Driver Offer

16. What best describes your experience of the AA Senior Driver Offer?

- ◯ I have used the AA Senior Driver Offer
- ◯ I have heard of this offer and I am interested in attending in future
- ◯ I have heard of this offer but I was not interested in attending
- ◯ I have not previously heard of this offer
- ◯ I am not sure if I have heard of this offer previously

Experienced driver perceptions survey

AA Senior Driving Offer

17. yWhat was the outcome of the Senior Driving Offer for you? [Please tick all that apply]

- ☐ It gave me confidence in my driving
- ☐ My risk awareness improved
- ☐ I drove more safely
- ☐ My road rule knowledge improved
- ☐ It made my driving more fuel-efficient
- ☐ I understand how to best use my vehicle's technology and features (e.g. active safety systems, infotainment system)
- ☐ I have recommended it to others
- ☐ There was no meaningful change in my driving experience

18. What was the best part of the session for you?

Experienced driver perceptions survey

Non-drivers

19. When did you stop driving?

- ○ Within the last year
- ○ Within the last 1-3 years
- ○ Within the last 4-5 years
- ○ More than 5 years ago

20. Why are you no longer driving? (select all that apply)

- ☐ Better travel options meant I no longer needed to drive myself
- ☐ I wanted to travel more actively (e.g. walking / cycling)
- ☐ Problems with vision (trouble seeing pedestrians and cars)
- ☐ Problems with physical health (medical conditions)
- ☐ Feel unsafe or anxious driving
- ☐ Recommended by doctor
- ☐ Recommended by family/friends
- ☐ No longer had access to a car
- ☐ Financial difficulty (cost of upkeep/age of vehicle)
- ☐ Did not pass licence test / assessment
- ☐ Involvement in crashes
- ☐ Licence suspended / revoked
- ☐ Other (please specify)

21. What alternative means of transport do you use? (select all that apply)

- ☐ Family member or friend drives me
- ☐ Bus
- ☐ Train
- ☐ Walking
- ☐ Cycling
- ☐ Other (please specify)
- ☐ Mobility scooter / electric wheelchair
- ☐ Free shuttle service (e.g. as part of care facility)
- ☐ Volunteer driver/service
- ☐ Taxi/Uber
- ☐ Paid companion service eg. Driving Miss Daisy

22. Thinking about the trips you made back when you were driving. Are there any of the following trip types that you would still like to make, but do not because you no longer drive?

- [ ] No, I still do all the trips that I want to
- [ ] Shopping (e.g. supermarket)
- [ ] Visit family or friends homes
- [ ] Religious activity (e.g. church)
- [ ] Personal business (such as the doctor, hospital, dentist)
- [ ] To go to work
- [ ] To go to education
- [ ] Recreational activities (e.g. yoga, nature walk, sports event)
- [ ] Social visit / entertainment (e.g. restaurant, picnic, movie)
- [ ] Accompany or transport someone (e.g. the travel is for someone else's purpose)

23. Thinking about your change to no longer driving, please answer the following

	Strongly disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly agree	Not sure
I am able to get to all the places I need to get to	○	○	○	○	○	○
I am less engaged in social events and activities	○	○	○	○	○	○
I am less anxious when getting to my activities	○	○	○	○	○	○
The change was easier than I expected	○	○	○	○	○	○
Alternative modes of transport are available that work for me	○	○	○	○	○	○
I feel more isolated	○	○	○	○	○	○
I feel more active and healthy	○	○	○	○	○	○

24. Do you have any other comments about no longer driving?

Experienced driver perceptions survey

More about you

* 25. What is your gender?

- ◯ Female
- ◯ Male
- ◯ Gender diverse
- ◯ Prefer not to say

26. Which of the following best describes your ethnicity? [Please select all that apply]

- ☐ New Zealand European
- ☐ Other European
- ☐ Māori
- ☐ Samoan
- ☐ Cook Islands Māori
- ☐ Tongan
- ☐ Niuean
- ☐ Chinese
- ☐ Indian
- ☐ Middle Eastern / Latin American / African
- ☐ Pacific peoples
- ☐ Asian

Other (please specify)

27. Please indicated which of the following best describes the area you live in.

- ◯ Urban
- ◯ Suburban
- ◯ Rural

28. What best describes your living situation?

- ◯ I am living alone (private home)
- ◯ I am living with friends / flatmates (private home)
- ◯ I am living with my partner / family (private home)
- ◯ I am living in a retirement village / community
- ◯ I am living in a rest home / care facility
- ◯ Other (please specify)

29. Are you the main driver in your household?

- ◯ Yes, as I am the only one who drives
- ◯ Yes, I am the main driver
- ◯ I evenly share the driving responsibilities with another person
- ◯ No, someone else is the main driver

30. We want to make sure that our transport system is accessible to everyone. If you have any conditions that could impact on your ability to drive, please let us know so that we can look at these responses.

- ☐ Physical
- ☐ Vision
- ☐ Hearing
- ☐ Speech
- ☐ Mental or cognitive
- ☐ No, I do not have any impairments

31. Do you have any other comments?

Appendix B

Support materials, including self-assessment tests, refresher education, and other information-based resources (adapted from Hakamies-Blomqvist et al., 2004)

https://www.nzta.govt.nz/safety/what-waka-kotahi-is-doing/education-initiatives/senior-drivers/

- New Zealand-based resources, including a "How's your driving" self-rating assessment section (based on the AAA assessment) and link to "Staying Safe" courses to enrol in that has classroom-based content, and a "Driving safely as a senior" booklet.

http://www.aaafoundation.org/pdf/older&wiser.pdf
– This is a self-study leaflet for older drivers, published by the AAA foundation for traffic safety.

https://aaafoundation.org/category/vulnerable-road-users/

- A number of studies and resources for older drivers

http://www2.ake.fi/ikaTOT/
– This is an Internet based self-test for older drivers, managed by the Finnish vehicle administration centre. The test can be done in Finnish or Swedish, and it comprises of 10 in-traffic photos with questions and an overall assessment of the traffic related knowledge.

http://www.dorset-cc.gov.uk
– Dorset county council's mature drivers' training course, carried out as discussions course with an option for on-road test performance. Aimed for drivers 55+.

http://www.cheshire.gov.uk/roadsafety/publications.htm
– This is a Cheshire County Council's web-resource with lots of self-study material for different driver groups. The materials aimed for older drivers include information on, e.g., vision, medications, and driving.

http://www.aarp.org/55alive/
– A web-resource maintained by the American Association for Retired Persons, for refreshing and retraining purposes, aimed for motorists 50+. This program has insurance discounts attached.