

FLOOD EVACUATION SOCIAL RESEARCH

FOR THE HAWKESBURY-NEPEAN
FLOOD RISK MANAGEMENT
DIRECTORATE

Final Report

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DISCLAIMER

In preparing this report we have presented and interpreted information that we believe to be relevant for completing the agreed task in a professional manner. It is important to understand that we have sought to ensure the accuracy of all the information incorporated into this report.

Where we have made assumptions as a part of interpreting the data in this report, we have sought to make those assumptions clear. Similarly, we have sought to make clear where we are expressing our professional opinion rather than reporting findings. Please ensure that you take these assumptions into account when using this report as the basis for any decision-making.

This project was conducted in accordance with AS: ISO20252:2012 guidelines, the international quality standard for market and social research, to which Newgate Research is accredited. Project reference number: NGR 1711016.

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EXECUTIVE SUMMARY



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EXECUTIVE SUMMARY

The key findings follow from a quantitative telephone survey conducted with n=386 household decision-makers from across the Hawkesbury-Nepean Valley in April 2018. Newgate Research conducted this survey on behalf of Infrastructure NSW to guide the implementation of the Hawkesbury-Nepean Flood Risk Management Strategy, with a particular focus on supporting the introduction of new flood evacuation road signage.

Floods in context: risk and experiences

- ◆ Positively, there is strong community cohesion within the Hawkesbury-Nepean Valley Floodplain (HNVFP), with three-quarters (74%) of household decision-makers claiming they often do things to help others.
- ◆ **Floods are considered to have the lowest risk of affecting participants' properties when compared to severe storms and bushfires.**
 - ◇ When asked to rate the perceived risk on a 0-10 scale, where 0 meant no risk and 10 meant an extremely high risk, just over one in six participants perceived a high risk (18% gave rating of 7 or above).
 - ◇ By comparison 40% perceived a high risk of a severe storm, and 39% for a bushfire.
- ◆ **A potential explanation of this finding is low flood exposure. Out of floods, bushfires and severe storms, participants were least likely to have experienced a flood.**
 - ◇ Just over a third (38%) had previously experienced a flood, compared with 50% for a bushfire, and 58% had been through a severe storm.
 - ◇ Participants in the Richmond-Windsor Floodplain were most likely to have previously experienced a flood (46%).

Flood preparation and awareness

- ◆ **Generally, the community has a low level of preparedness for a flood.**
 - ◇ Where 0 meant not at all prepared and 10 meant totally prepared, over a third (36%) rated themselves as *not at all prepared*. Only one in ten rated themselves as *totally prepared* (11%).
 - ◇ Reflecting this self-assessment, most participants (79%) had done nothing at all to prepare for a flood.
- ◆ **High levels of unpreparedness are likely due to low risk perceptions.**
 - ◇ When participants were asked if they agreed with the statement 'there isn't much point preparing for a flood because the risk of flood is so low' almost two thirds agreed (64%).

Response and evacuation

- ◆ **While most participants had not prepared for a flood, they were confident they would know what to do in an evacuation.**
 - ◇ When asked to rate their confidence evacuating on a 0-10 scale, where 0 meant not at all confident and 10 meant totally confident, over half (58%) rated themselves quite highly (i.e. gave a 7 or above).



EXECUTIVE SUMMARY *CONT'D*

- ◆ **Additionally, most people thought they knew the evacuation routes.**
 - ◇ When asked to rate their awareness of evacuation routes on a 0-10 scale, where 0 meant very poor awareness and 10 meant excellent awareness, most thought they were very aware (82% gave a 7 or more).
- ◆ **However, these results should be interpreted with caution. Prior research suggests that participants may not be as knowledgeable and confident as they self-report.**
 - ◇ Participants often believe they can use common-sense in evacuation scenarios, but are largely unaware of what to do when faced with specific situations. This should be considered in light of the fact that most had done no preparation whatsoever for a possible flood.
- ◆ **Indeed, participants' awareness of flood evacuation procedures was quite low.**
 - ◇ Only 32% could identify three or more things they should do when evacuating.
- ◆ **A small proportion of participants maintained they would wait for further instructions after hearing an evacuation order, and almost half (50%) claimed they would try to return home, even if access was cut.**
 - ◇ A quarter (25%) said they would seek further information from authorities before leaving, after hearing of an evacuation order.

Demographic sub-groups of interest

- ◆ Generally, men are more likely to be apathetic about the risk of flooding, and demonstrate a certain amount of bravado about their capacity to deal with a flood.
- ◆ Meanwhile, women and those with children or pets were more likely to be scared or panic, and to try to return home in a flood, even if told access was cut.
- ◆ Additionally, retirees and those living with disability may be more vulnerable in flood situations; they are more likely to need help and less likely to be able to evacuate quickly.

These results point to substantial opportunities to improve flood awareness and preparedness among residents of the HNVFP. There are also considerable barriers to residents following evacuation orders or knowing what to do.

The research suggests that those who have not experienced a flood require particular attention – highlighting the need to make the risk of flooding 'real'. Gender- and age-targeted communications and engagement may be particularly beneficial for certain segments of the community.

The results also raise questions that would be best addressed through deeper evaluation of local residents' perceptions, attitudes, values, experiences and behaviours – suggesting the need for qualitative research.

INTRODUCTION



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BACKGROUND



OBJECTIVES

Infrastructure NSW (INSW) commissioned Newgate Research to undertake a program of social research to guide the implementation of the *Hawkesbury-Nepean Valley Flood Risk Management Strategy*, with a particular focus on supporting the introduction of new flood evacuation road signage.

The first phase of this program centred on the synthesis of key demographic data from the Australian Bureau of Statistics' (ABS) 2016 Census.

The second phase of the program involved recruitment of Hawkesbury Nepean Valley Floodplain (HNVFP) residents to a flood evacuation driving simulation.

This report outlines the findings of the third and final phase of research, consisting of a quantitative telephone survey of HNVFP residents to evaluate community awareness, perceptions, attitudes and behaviours in relation to potential floods. This follows a similar survey conducted by Newgate in 2014, though the sampling approach was very different for this survey so the results are not directly comparable.

Specifically, the 2018 telephone survey examined:

- ♦ Existing awareness of flood risk in the valley;
- ♦ Prior experiences with natural disasters;
- ♦ Level of preparedness for flood events; and
- ♦ Likely responses to flooding and evacuation orders.

Responses were examined for differences by demographic, behavioural and geographic sub-groups.

METHODOLOGY

The findings were based on a 17-minute telephone survey completed with n=386 residents of the HNVFP, between 17 April 2018 - 01 May 2018. This sample size yielded a best-practice maximum error margin of +/-5% at the 95% confidence level. See Appendix 1 for the participant profile.

Landline and mobile numbers were sourced from the electronic White Pages, with fieldwork undertaken by Newgate's ISO-accredited supplier CanvasU using a questionnaire developed by Newgate.

All participants were the main or joint decision-maker in their household when it came to major household decisions, as an approximation for likely household decision-making in the event of an emergency or natural disaster.

Representative place-of-residence quotas were set for the four regions comprising the HNVFP – the Penrith Floodplain, the Richmond-Windsor Floodplain and the suburbs surrounding these floodplains.

Soft quotas were also set for gender and age to ensure a good mix of participants, though the final sample skewed older due to the nature of household decision-makers and this being somewhat different from population characteristics.



Final results were weighted by number of residences by area to correct for sampling bias. All data presented through the report are weighted, unless otherwise specified.

Due to differences in the sampling and weighting approaches, comparisons to 2014 results are indicative only, and are included separately within the appendices.



NOTES TO READER

When interpreting the findings, please note the following:

- ◆ For the quantitative research results, the base (number and type of respondents asked each question) and the actual survey questions are shown at the bottom of each page.
- ◆ Weighted results are shown throughout the report, unless otherwise specified. For full details, please see the Methodology section.
- ◆ Relevant statistically significant differences between subgroups or questions are identified throughout the report at the 95% confidence level. These are either reported in written format, or using light purple or orange shading to signify a significantly higher or lower result:  
- ◆ All questions were examined for statistically significant differences by demographic, behavioural and geographic sub-groups, where meaningful in the context of the question. Where differences have not been discussed, it should be assumed that no differences existed or were noteworthy.
- ◆ Throughout the report the term 'nett' has been used where coded responses that are similar in nature have been grouped into one overarching theme (e.g. 'strongly agree' and 'somewhat agree' netted as 'agree').
- ◆ 'Prompted' responses identify that participants were offered a list of choices to select from and 'unprompted' questions allowed for participants to provide verbatim responses that were subsequently coded into themes.

- ◆ Results may not always total 100% due to rounding or multiple-response questions.
- ◆ To ensure data reliability, results are typically only shown when the sample sizes are at least n=30.
- ◆ A list of the 48 suburbs that comprise the four broad floodplain regions have been included in the appendices.
- ◆ The sampling and weighting approach used in this study differ significantly from those employed in the 2014 study. Consequently, interpretations of differences over time should be made with caution.

Comparisons to the 2014 survey:

- ◆ The 2014 sample was sourced from an address database maintained by the State Emergency Service (SES), targeting those whose addresses could be matched to landline phone numbers. Interlocked place-of-residence quotas and weights were also set by flood risk, zone and topography, though not for gender or age as the focus had been on geographic representativeness.
- ◆ The 2018 sample design and sourcing technique was completely different and did not include flood zone or flood risk quotas; due to this, fewer participants were likely to have lived in high flood risk areas than in the 2014 sample. As a result of these differences, definitive conclusions cannot reliably be drawn about the reasons for differing results between the two survey, beyond the sampling differences.

FLOODS IN CONTEXT



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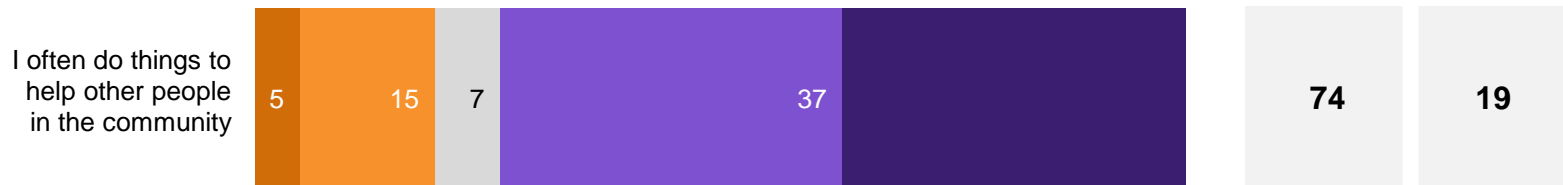


COMMUNITY COHESION IN THE HNVFP

Three-quarters (74%) of household decision makers in the HNVFP claim they often do things to help others in the community, suggesting strong community cohesion

Community attitudes (%)

Nett (%)



■ Disagree strongly ■ Disagree somewhat ■ Neither agree / disagree ■ Agree somewhat ■ Agree strongly



More likely to disagree

- ◆ Participants who haven't previously experienced a flood, compared to those who have (24% vs. 11%).



More likely to agree

- ◆ Participants who have previously experienced a flood, compared to those who have not (86% vs. 66%).

The sub-group differences above could be attributed to the fact that those who had experienced a flood at some point in their lives were more likely to be longer-term residents, who naturally have a higher likelihood of having community ties given their tenure. Over half (57%) of those who have lived locally for 30yrs+ had experienced a flood vs. only 43% of newer residents.

Base: All participants (n=386)

Q1. Do you agree or disagree with the following statement? And is that strongly or just somewhat? I often do things to help other people in the community.

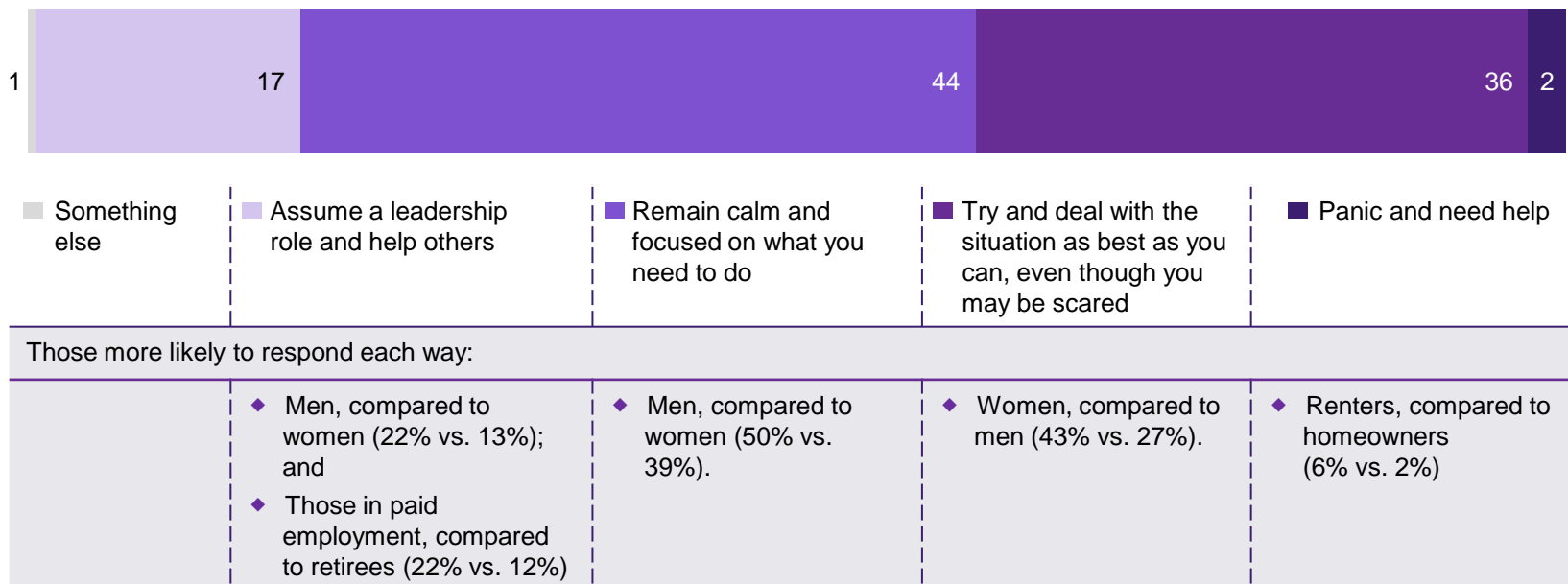


LIKELY RESPONSE TO EMERGENCY SITUATIONS

Three in five thought they would remain calm and focused in an emergency (44%) or even assume a leadership role (17%), while just 2% believed they would panic

Likely response to emergencies (%)

Single response required



In a pattern that recurs throughout the results, men were more likely to state that they would remain calm, assume leadership roles and 'know what to do' compared to women. It is important to note that these are survey participants' expected behaviours and not necessarily reflective of actual behaviours in disaster situations.

Base: All participants (n= 386)

Q3. People respond to emergencies in different ways. In an emergency situation, which of the following four items best matches how you would tend to respond...?

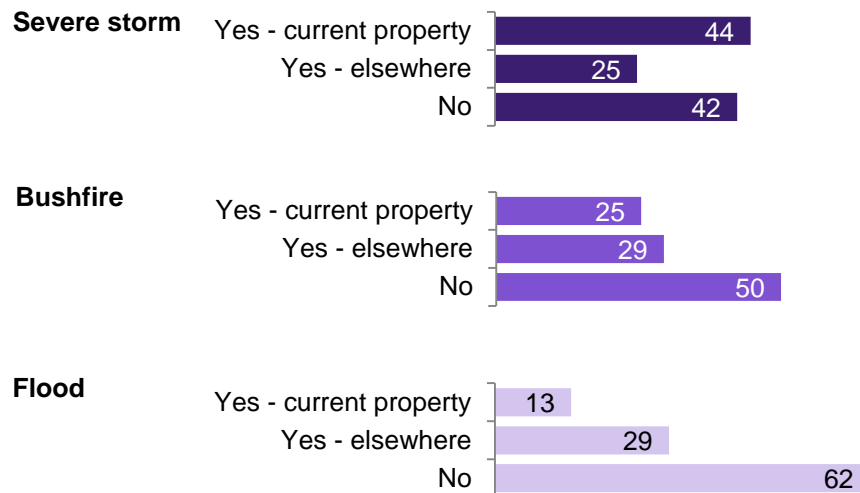


PRIOR EXPERIENCE WITH NATURAL DISASTERS

Two in three (62%) have never experienced a flood before

Natural Disaster Experience (%)

Multiple selections of 'yes' possible



Nett Yes (%)*

	HNVPF	PF	RW	FS
Severe storm	58	56	63	52
Bushfire	50	52	54	37
Flood	38	33	46	31

The boxes highlighted in light purple contain a significantly higher result.

** Hawkesbury-Nepean Valley Flood Plain (HNVPF), Penrith floodplain (PF), Richmond-Windsor floodplain (RW) and the suburbs surrounding these two floodplains (FS).*

Base: All participants (n=386)

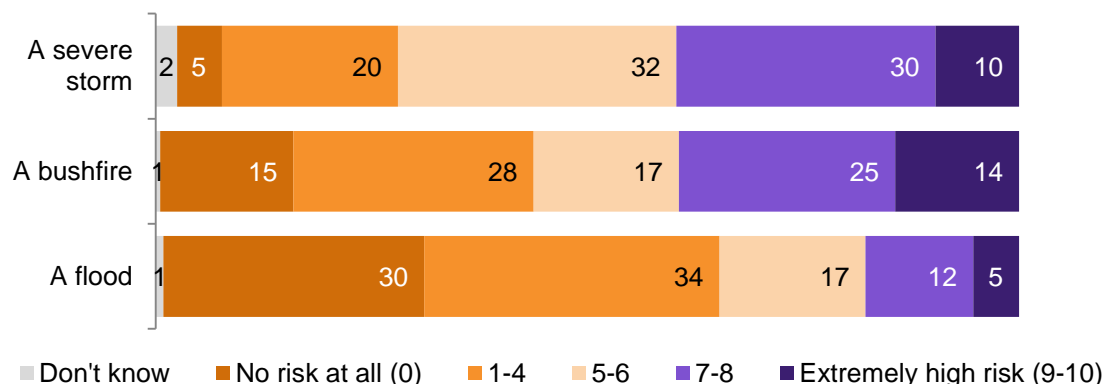
Q6. Have you personally ever experienced any of those – either at your property or somewhere else, or both?



PERCEIVED RISK OF NATURAL DISASTERS

Only one in six (18%) felt there was a high risk of flooding – significantly lower than bushfires (39%) or severe storms (40%), perhaps reflecting their limited past exposure

Perceived risk of natural disaster affecting your property (%)



Nett (%)

Low Risk (0-4)	High Risk (7-10)
26	40
43	39
64	18



More likely to perceive low flood risk

- ◆ Men, compared to women (73% vs. 57%);
- ◆ Has not experienced a flood, compared to those who have (72% vs. 52%);
- ◆ Survey participants *without* specific vulnerability factors (referred to as 'non-vulnerable' throughout this report), compared to 'vulnerable' participants* (70% vs. 55%); and
- ◆ Those outside of the Richmond-Windsor Floodplain (69% vs. 57%).



More likely to perceive high flood risk

- ◆ Has experienced a flood, compared to those who have not (28% vs. 12%);
- ◆ Women, compared to men (24% vs. 10%); and
- ◆ Agreed that they often did things to help others in the community, compared to those who did not (21% vs. 9%).

Three in ten (30%) believed there was no risk of flooding at all.

Base: All participants (n=386)

Q5. Using a scale where 0 means no risk at all and 10 means there is an extremely high risk, please tell me how much risk you think there is of each one affecting your property within the next five or so years.

PREPAREDNESS AND AWARENESS



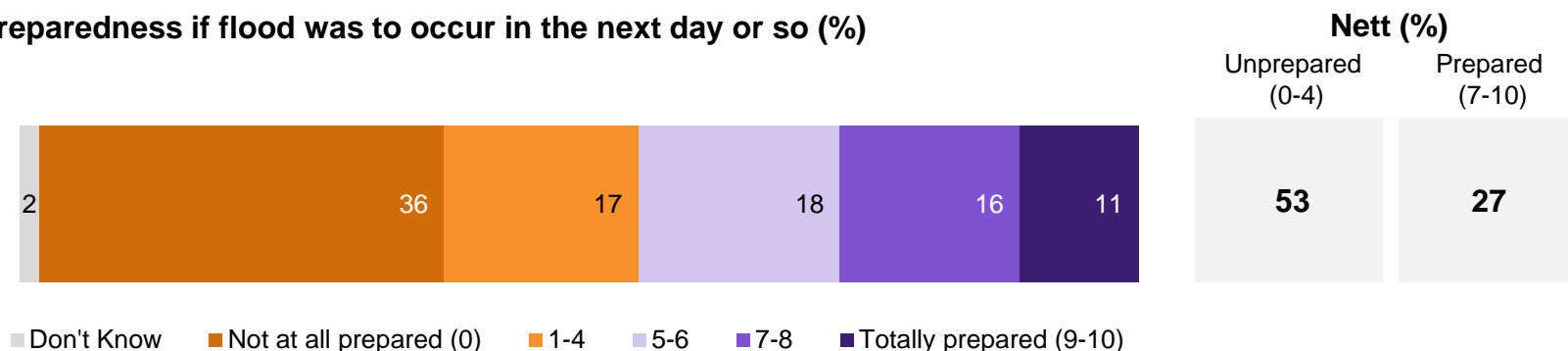
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STATED FLOOD PREPAREDNESS

Reflecting perceptions of low flood risk, less than a third (27%) said they were truly prepared for a flood – while a third (36%) said they have not prepared at all

Preparedness if flood was to occur in the next day or so (%)



More likely to be unprepared

- ◆ Disagreed that they did things to help others in the community, compared to those who agreed (67% vs. 49%);
- ◆ Live in Penrith Floodplain, compared to other parts of the valley in the survey sample (64% vs. 46%);
- ◆ Live with someone under 18 (65% vs. 50% others);
- ◆ Aged 18-54, compared to 55+ (62% vs. 48%);
- ◆ Vulnerable participants, compared to non-vulnerable participants (61% vs. 49%); and
- ◆ Have not experienced a flood elsewhere, compared to those who had (58% vs. 46%).



More likely to be prepared

- ◆ Report doing things to help others in the community, compared to those who do not (31% vs. 17%);
- ◆ Aged 55+, compared to 18-54 (31% vs. 21%); and
- ◆ Not living with children under 18, compared to those who are (30% vs. 17%).

In summary, those who feel they would be most unprepared are those who: are less community-connected, have children under 18 years of age living at home, are themselves younger or have not experienced flooding before.

Base: All participants (n=386)

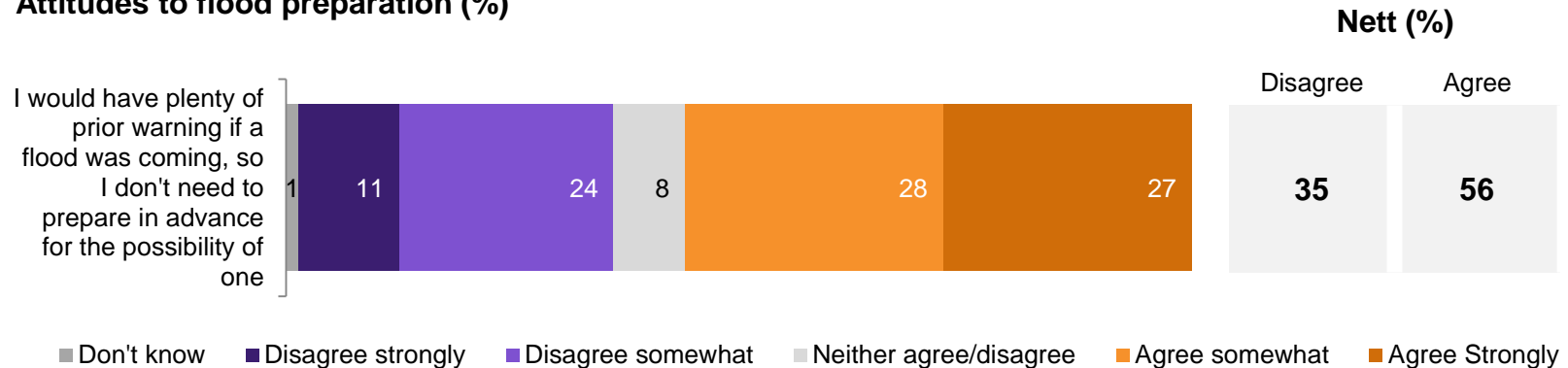
Q11. How prepared do you think you'd be if there was a flood at your property in the next day or so where 0 means not at all prepared and 10 means totally prepared



ATTITUDES TO FLOOD PREPARATION

Over half (56%) believed there was no need to prepare because they would have plenty of prior warning – with the sentiment stronger among homeowners

Attitudes to flood preparation (%)



More likely to disagree

- ◆ Renters, compared to homeowners (46% vs. 32%);
- ◆ Women, compared to men (40% vs. 29%); and
- ◆ From a culturally and linguistically diverse ('CALD') background, compared to non-CALD participants (42% vs. 30%).



More likely to agree

- ◆ Home-owners, compared to renters (59% vs. 42%).

The results suggest opportunities to target male and non-CALD members of the community with specific messaging regarding the need to prepare – noting, however, that this was a broad challenge across the entire local community.

Base: All participants (n=386)

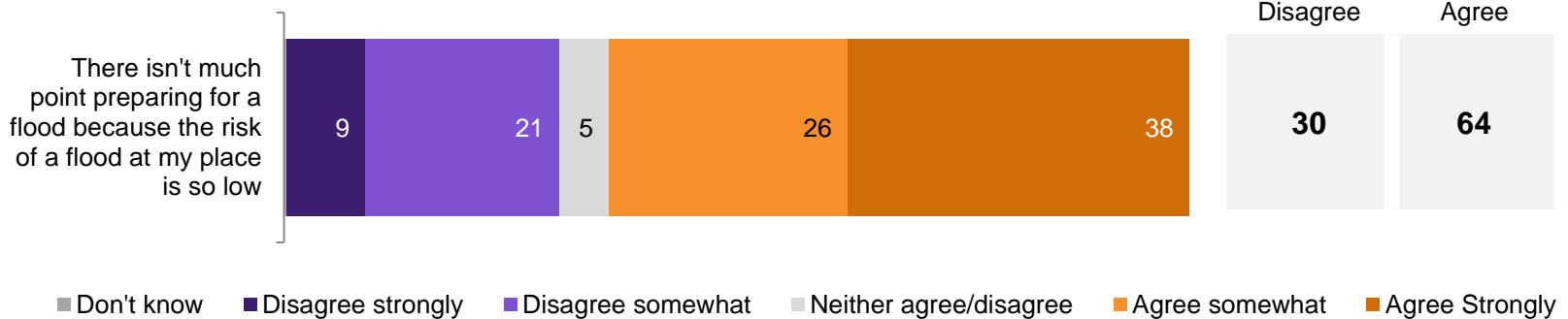
Q13. Do you agree or disagree with this statement? And is that strongly or just somewhat?



ATTITUDES TO FLOOD PREPARATION CONT'D

An even greater proportion (64%) were not prepared because the risk of flooding was so low to them – particularly among those who had not experienced flooding

Attitudes to flood preparation (%)



More likely to disagree

- ◆ Live with children under 18, compared to those who do not (41% vs. 27%);
- ◆ Experienced a flood, compared to those who have (41% vs. 24%)
- ◆ Aged 18-54, compared to participants aged 55+ (37% vs. 26%)
- ◆ Vulnerable participants, compared to non-vulnerable participants (36% vs. 26%); and
- ◆ In paid employment, compared to retirees (33% vs. 22%).



More likely to agree

- ◆ Have not experienced a flood, compared to those who have (70% vs. 54%); and
- ◆ Men, compared to women (70% vs. 60%).

Base: All participants (n=386)

Q13. Do you agree or disagree with this statement? And is that strongly or just somewhat?

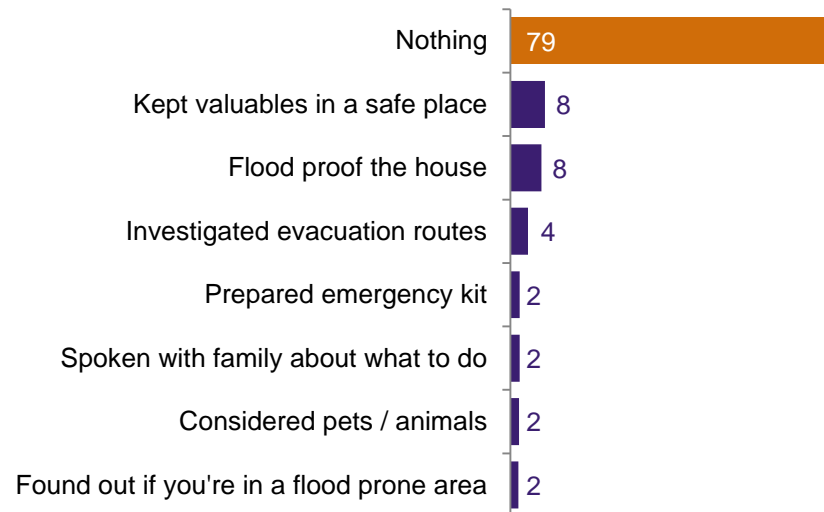


FLOOD PREPARATION EFFORTS

Four in five (79%) had done nothing to prepare for a flood

What households have done to prepare for a flood (%)

Top unprompted mentions 2%+; multiple selections possible



More likely to have done nothing to prepare for a flood

- ◆ Do not own pet/livestock, compared to those who do (86% vs. 75%); and
- ◆ Have not experienced a flood, compared to those who have (83% vs. 72%).



More likely to have done 3+ things to prepare for a flood

- ◆ Live with someone with a disability, compared to those who don't (7% vs. 2%).



2% of participants could identify 3+ things they had done to prepare for a flood

Base: All participants (n=386)

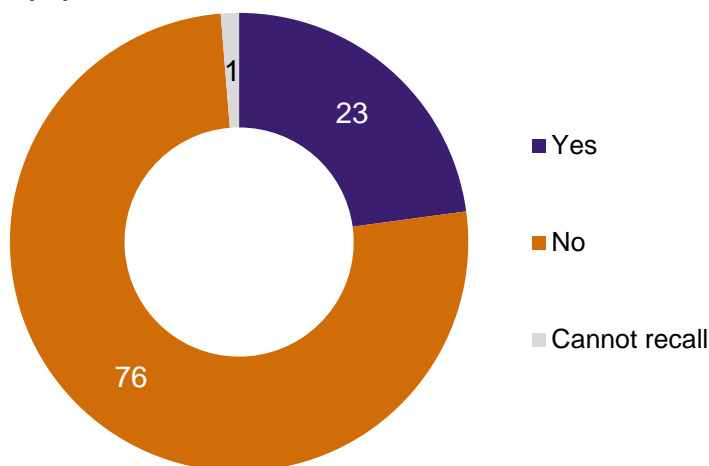
Q15. What has your household done to prepare or be ready for a potential flood, if anything? Do you have anything else in place that would help you in the event of a flood?



RECALL OF FLOOD-RELATED INFORMATION

A quarter (23%) recalled recently seeing flood-related information about the local area – with recall strongest for print channels (newspapers, magazines, brochures)

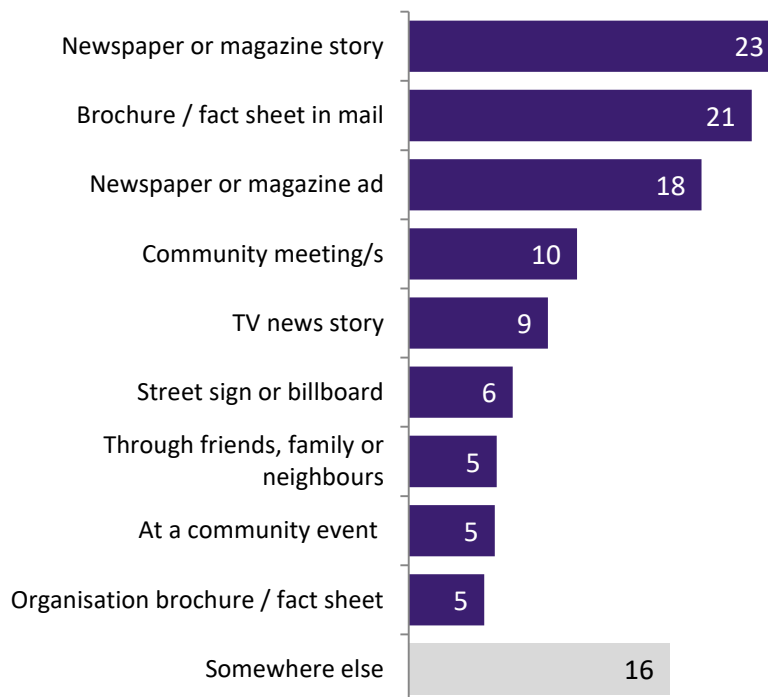
Memory of flood related information about local area (%)



Stated recall was significantly stronger among those who had lived in the area for 40 years or longer (38% vs. 17% of those living in the area for under 40 years). This could be due to a range of reasons e.g. communication efforts may have been more effective in reaching longer-term residents, or they may be more engaged and likely to notice such communications, especially given they are also more likely to have experienced a flood. This would worth exploring in future research.

Where the information was received from (%)

Top unprompted mentions 5%+; multiple selections possible



Base: All participants (n=386) / Base: Participants who had seen flood related information (n=87)

Q18. Have you recently seen or heard any flood related information about your local area? This could be about flood risks, past floods, planning or preparing for a flood or what to do in a flood evacuation. / Q19. And where did you get that flood related information from?

RESPONSE AND EVACUATION



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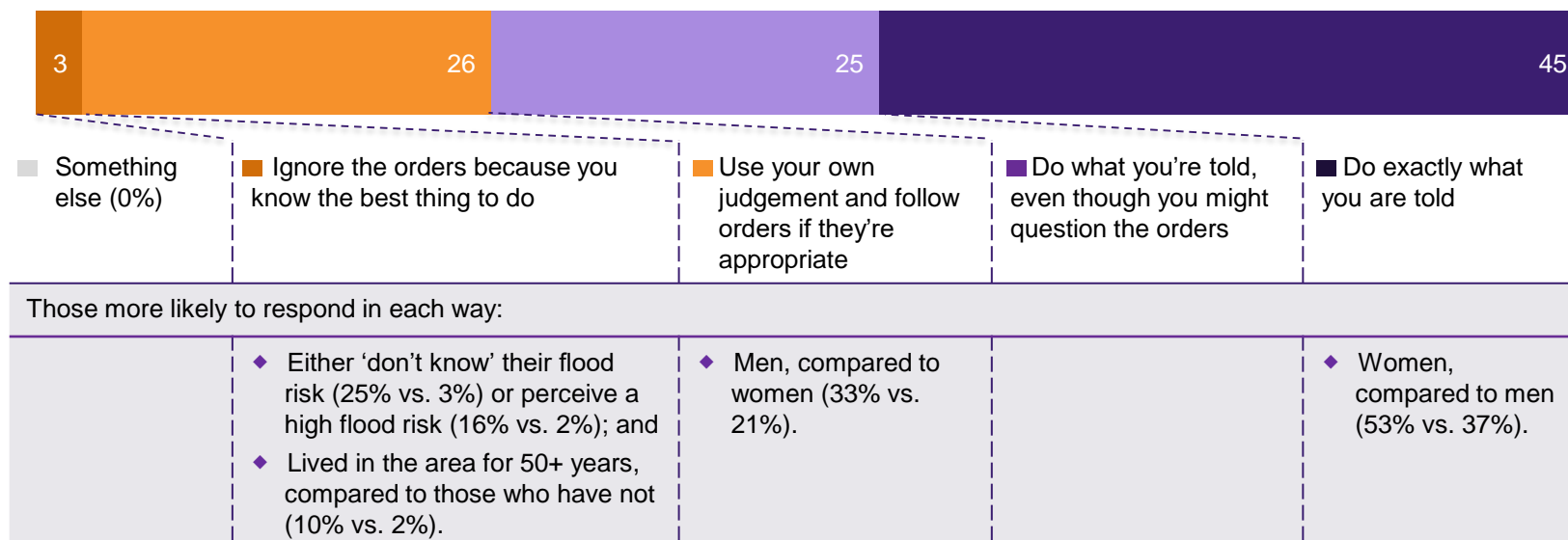


LIKELY RESPONSE TO EMERGENCY EVACUATIONS

The majority (71%) would follow orders to evacuate even if they questioned the orders – though three in ten (29%) said they would rely on their own judgement

Likely response to emergency evacuations (%)

Single response required



Longer-term residents also appeared to be the most difficult to convince to follow instructions during an evacuation. Findings from previous research conducted by Newgate for INSW suggest this could be a result of these residents' prior experience in surviving floods – indeed, those who have lived in the area for longer were more likely to report experiences of flooding at their current address.

Men were again more likely to say they would ignore orders or follow their own judgement (nett 36% vs. 24% of women); the reverse, of course, was also true, with nett 76% of women saying they would follow evacuation orders vs. 64% of men.

Base: All participants (n=386)

Q4. In an emergency situation, if you are given instructions or orders from an emergency service organisation to evacuate your home within 30 minutes, which of the following four items best applies to how you would respond...

CONFIDENCE IN KNOWING WHAT TO DO

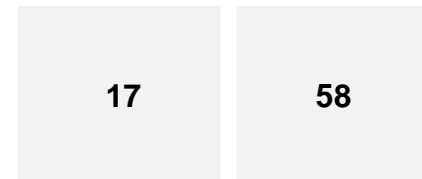
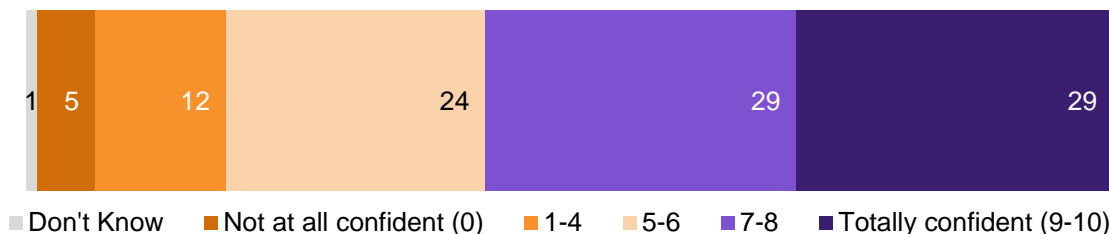


Three in five (58%) were reasonably confident they would know what to do following an evacuation order – though the previous research suggests this is likely overstated

Confidence knowing what to do after receiving an evacuation order (%)

Nett (%)

Unconfident (0-4) Confident (7-10)



Prior research undertaken by Newgate for Infrastructure NSW suggests there is a degree of bravado in people's expectations that they will know what to do if ordered to evacuate. The sentiment expressed by participants in qualitative research was often that they would 'just use common sense' – but when asked about their response in specific scenarios, it became clear that participants were less certain of the right course of action.



More likely to be confident

- ◆ Men, compared to women (68% vs. 49%); and
- ◆ Have previously experienced a flood, compared to those who have not (65% vs. 53%).

Base: All participants (n=386)

Q10. How confident are you that you would know exactly what to do if you heard or received an evacuation order due to severe flooding approaching the area where you live, using a scale where 0 means not at all confident and 10 means extremely confident?

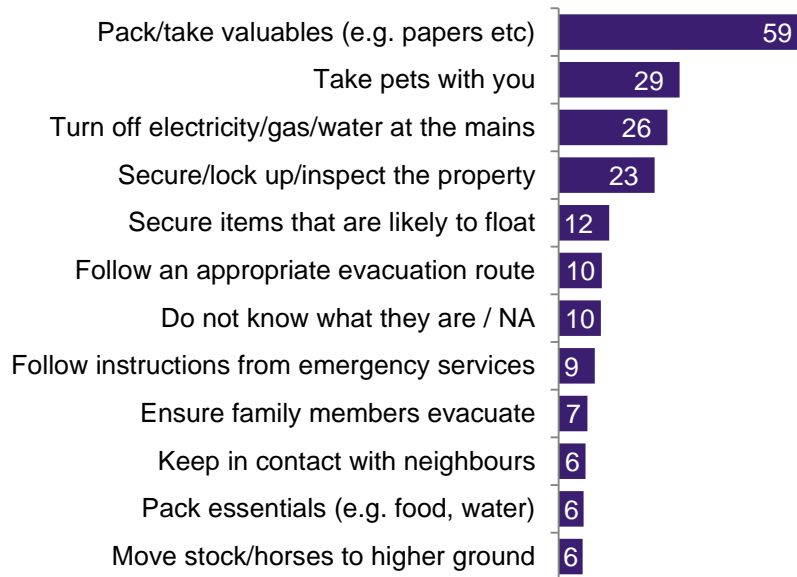
AWARENESS OF EVACUATION PROCEDURES



Only a third (32%) could name three or more things they would do during an evacuation

Awareness of flood evacuation procedures (%)

Top unprompted mentions 5%+; multiple selections possible



More likely to be able to identify 3+ things

- ◆ Renters, compared to those who own their home or are paying a mortgage (43% vs. 29%);
- ◆ Living with a child under 18, compared to those who are not (42% vs. 29%);
- ◆ Participants with pet/livestock at home (39% vs. 19%); and
- ◆ Women, compared to men (38% vs. 24%).



More likely to be able to identify nothing

- ◆ Did not agree they often helped others, compared to those who did (17% vs. 8%); and
- ◆ Have not experienced a flood, compared to those who have (13% vs. 5%).



32% of participants could identify 3+ things they should do when evacuating

Base: All participants (n=386)

Q23. What are the things you need to do when evacuating during a flood, both before leaving home and after? What else?

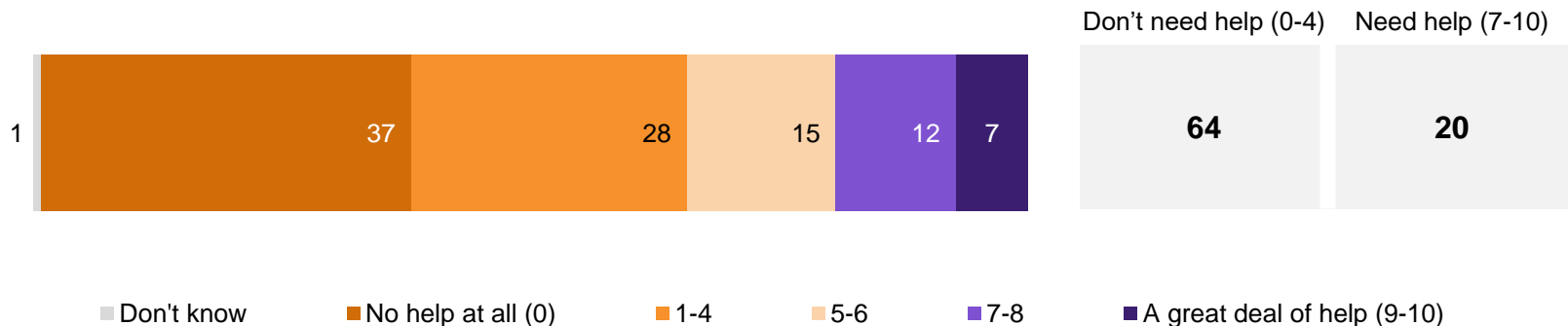


EXPECTED NEED FOR ASSISTANCE EVACUATING

One in five (20%) felt they would need quite a lot of help to evacuate – higher among those with a disability or living with someone with a disability (51%)

The extent to which help would be needed to evacuate (%)

Nett (%)



Less likely to need help

- ◆ Men, compared to women (77% vs. 54%);
- ◆ Do not live with a person with a disability, compared to those who do (69 vs. 36%);
- ◆ Homeowners, compared to renters (68% vs. 50%); and
- ◆ None-CALD participants, compared to CALD participants (69% vs. 57%).



More likely to need help

- ◆ Live with a person with a disability, compared to those who do not (51% vs. 15%);
- ◆ Renters, compared to homeowners (29% vs. 17%);
- ◆ Women, compared to men (26% vs. 12%); and
- ◆ Retirees, compared to those in paid employment (23% vs. 14%).

Base: All participants (n=386)

Q14. And how much help if any would you need evacuating from your property if the call came to do so, where 0 means you'd need no help at all and 10 means you'd need a great deal of help.

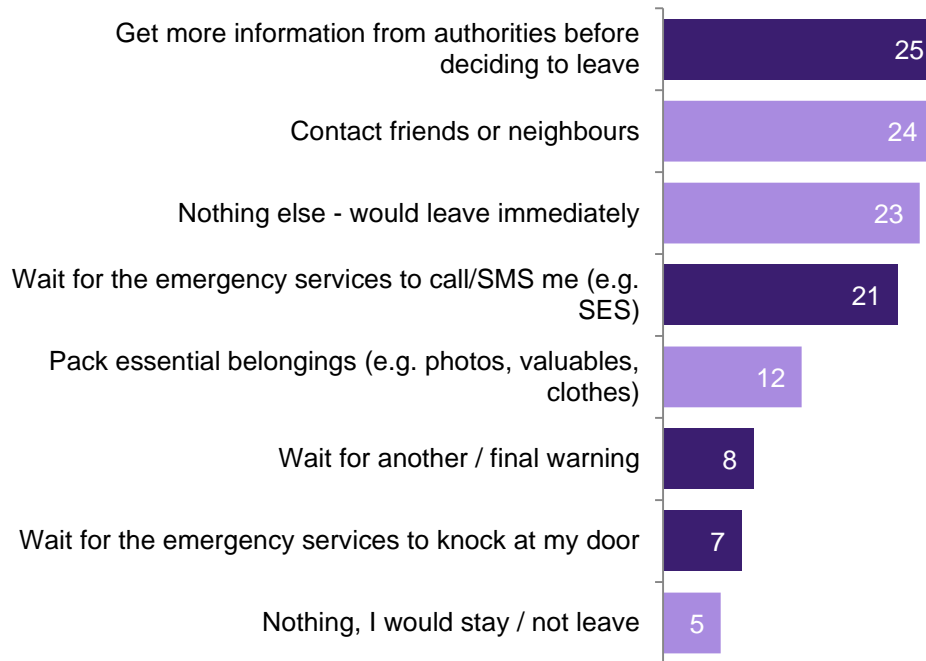


LIKELY RESPONSE TO EVACUATION ORDERS

Nearly half would wait for more information from authorities – including SES alerts, final warnings and door knocks – before deciding to leave

What would you do or wait for before leaving? (%)

Top mentions 5%+; multiple selections possible



47%
would wait for
further official
information

More likely to wait for more official information...

- ◆ Larger households in general (e.g. 60% of those with 5+ people vs. 47% of those with <5);
- ◆ Aged 18-54, compared to 55+ (60% vs. 39%);
- ◆ Live with children under 18, compared to those who do not (57% vs. 44%); and
- ◆ Lived in the area for less than 40 years, vs. longer-term residents (52% vs. 36%).

These results suggest the need to ensure communications collateral and channels are prepared and ready to deploy in the event of an emergency – and that messages should be broadcast across multiple channels once an evacuation order has been issued to ensure residents follow through and don't delay.

Base: All participants (n=386)

Q24. If you heard through mainstream or social media that people in your street had to evacuate their properties during a flood, what would you do, or wait for, before leaving?

ESTIMATED TIME REQUIRED FOR EVACUATION

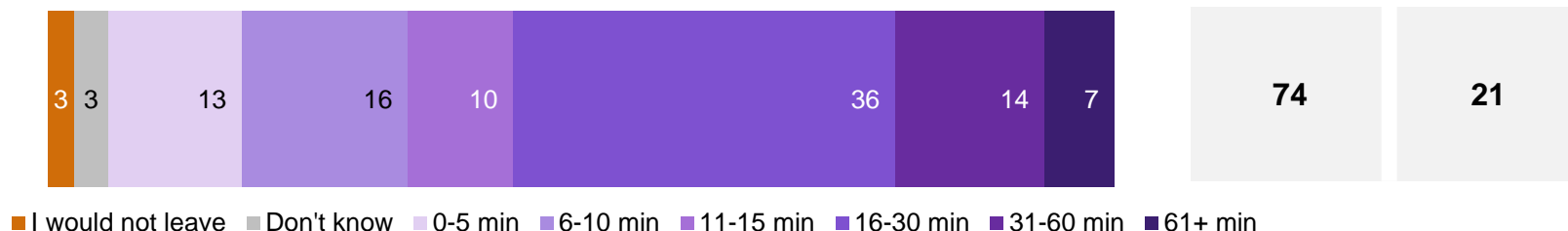


Three-quarters believe it would take them half an hour or sooner to evacuate, with more Penrith residents likely to do so than Richmond-Windsor residents

Estimated time it would take to evacuate (%)

Nett (%)

Evacuate quickly (0-30 minutes) Evacuate slowly (31+ minutes)



More likely to evacuate slowly

- ◆ Living in the Richmond-Windsor Floodplain, compared to all other floodplains (29% vs 15%).

NB: Estimates of time required did not differ among those who have and haven't experienced a flood in their lifetime.



More likely to evacuate quickly

- ◆ Aged 18-54, compared to 55+ (81% vs 69%);
- ◆ Living in the Penrith Floodplain, compared to all other floodplains (80% vs. 69%); and
- ◆ Participants in paid employment, compared to retirees (79% vs 68%).

Base: All participants (n=386)

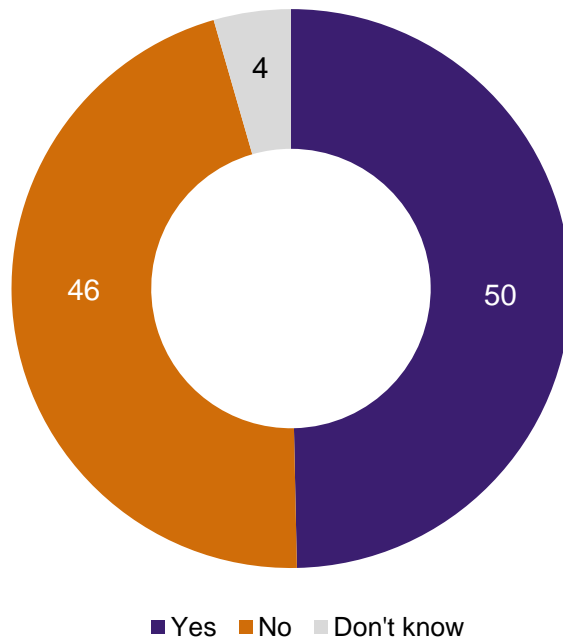
Q28. After receiving a flood evacuation order directly from the SES, how long do you think it would take you to leave your property? Please give your best estimate in hours and/or minutes.



STATED INTENTION TO RETURN HOME

Of concern is that one in two people would attempt to return home even if told access was cut due to an evacuation – particularly younger residents and those with children or pets

Would try to return home if area was evacuated (%)



More likely to return home

- ◆ Have 3+ people in their household, compared to 1-2 person households (64% vs. 37%);
- ◆ Aged 18 - 54, compared to 55+ (62% vs. 42%);
- ◆ Live with pets/livestock, compared to those who do not (60% vs. 31%);
- ◆ Live with a child under 18, compared to those who do not (60% vs. 47%);
- ◆ In paid employment, compared to retirees (59% vs. 37%); and
- ◆ CALD participants, compared to non-CALD participants (57% vs. 45%).



Less likely to return home

- ◆ Retirees, compared to those in paid employment (60% vs. 36%);
- ◆ Have only 1 – 2 people in their household, compared to 3+ (59% vs. 31%);
- ◆ Would 'do exactly what they were told' in an emergency, compared to other responses to an emergency (56% vs. 38%); and
- ◆ Aged 55+, compared to 18-54 (54% vs. 33%).

Base: All participants (n=386)

Q32. If you were outside of your local area and heard that access to your area was cut due to a flood evacuation, would you still try and go back to the area – for example, to help evacuate children, pets or other family members?

EVACUATION ROUTES & DRIVING



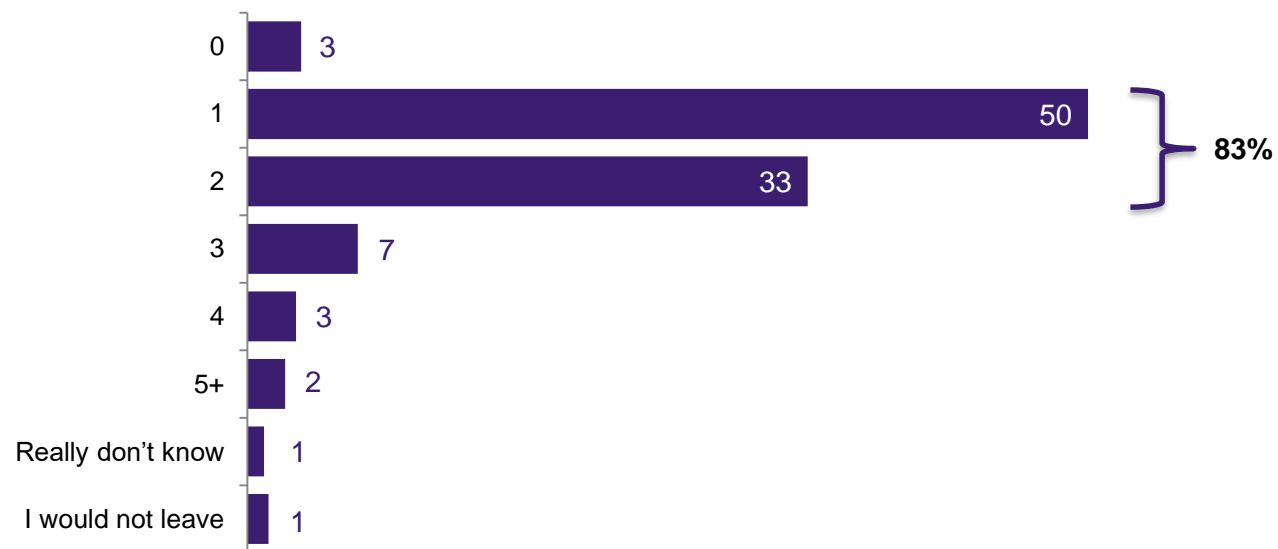
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CARS REQUIRED FOR EVACUATION



More than four in five (83%) anticipate using only one or two cars to evacuate, with sub-group differences largely reflecting differences in household size

Number of cars it would take to evacuate (%)



More likely to use 1-2 cars to evacuate

- ◆ Live in the Penrith Floodplain, compared to the Richmond-Windsor Floodplain and Floodplain surrounds (89% vs. 78%)



More likely to use 3 – 5 cars to evacuate

- ◆ Live in the Floodplain Surrounds, compared to the Richmond-Windsor Floodplain and the Penrith Floodplain (23% vs. 10%)

Base: All participants (n=386)

Q29. How many cars do you think your household would use to evacuate?

TYPICAL DRIVING FREQUENCY



Just under one-tenth of decision-makers drove only a few times a month or less frequently – and they were more likely to live in households experiencing disability



More likely to be infrequent drivers

- ◆ Live with a person with a disability, compared to those who do not (20% vs. 6%);
- ◆ Retired, compared to participants in paid employment (13% vs. 1%);
- ◆ Do not live with pets or livestock, compared to those who do (13% vs. 4%);
- ◆ Live in a 1-2 person household, compared with a 3+ household (12% vs. 2%);
- ◆ Aged 55+, compared to 18 – 54 (10% vs. 3%); and
- ◆ Live without a child under 18, compared to those who do (10% vs. 1%).



More likely to be frequent drivers

- ◆ In paid employment, compared to retirees (99% vs. 87%);
- ◆ Live with a child under 18, compared to those who do not (99% vs. 90%);
- ◆ Live in a 3+ person household, compared to a 1-2 person household (98% vs. 88%);
- ◆ Aged 18 – 54, compared to 55+ (97% vs. 90%);
- ◆ Live with pets or livestock (96% vs. 87%); and
- ◆ Do not live with a person with a disability (94% vs. 80%).

Base: All participants (n=386)

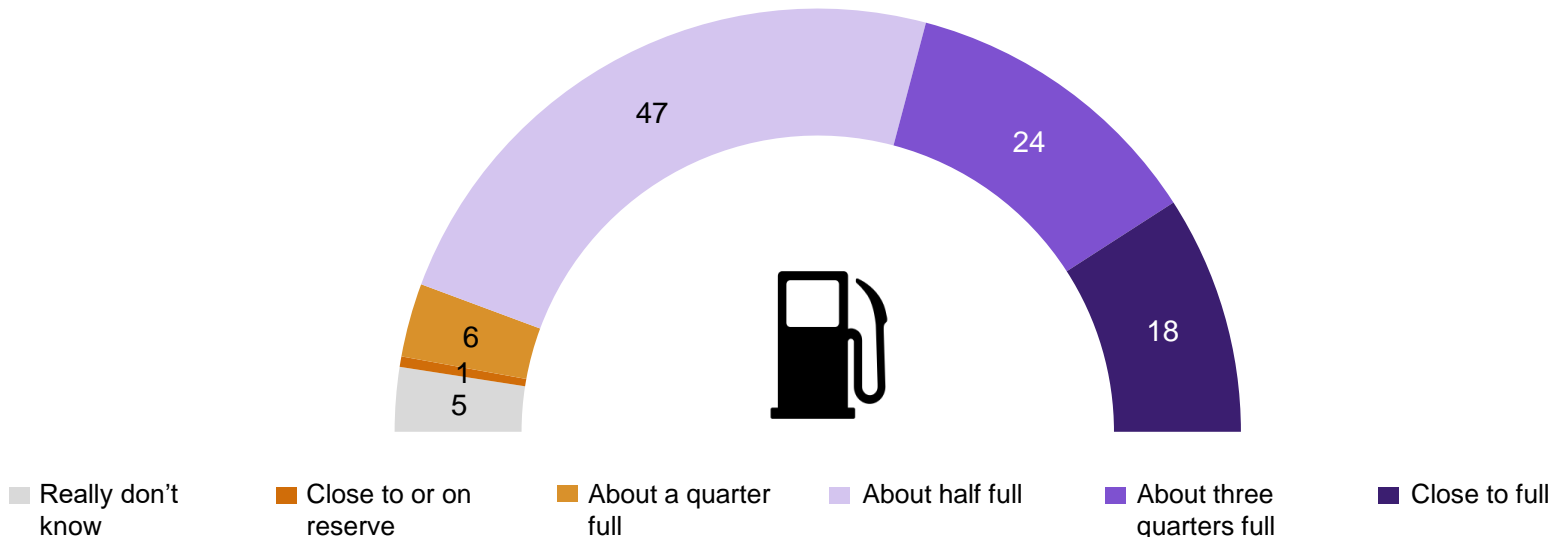
Q30C. Over the past 12 months, how often did you tend to drive in your local area?



TYPICAL FUEL RESERVES

Nine in ten (88%) household decision-makers said their car typically had at least half a tank of fuel

Average amount of fuel in car at any given time (%)



More likely to be close to or on reserve

- ◆ Need 'a great deal of help' preparing to evacuate (rated 9-10), compared to those who do not (7% vs. 0%); and
- ◆ Report not often helping others in the community, compared to those who do (3% vs. 0%).



More likely to be three quarters or close to full

- ◆ Self-report as 'well prepared for a flood' (rated 7-10), compared to those who felt less prepared (57% vs. 36%).

Base: Participants who would use one or more car in an evacuation (n=371)
Q30B. And for the main car you use, at any given time is the fuel more likely to be...?

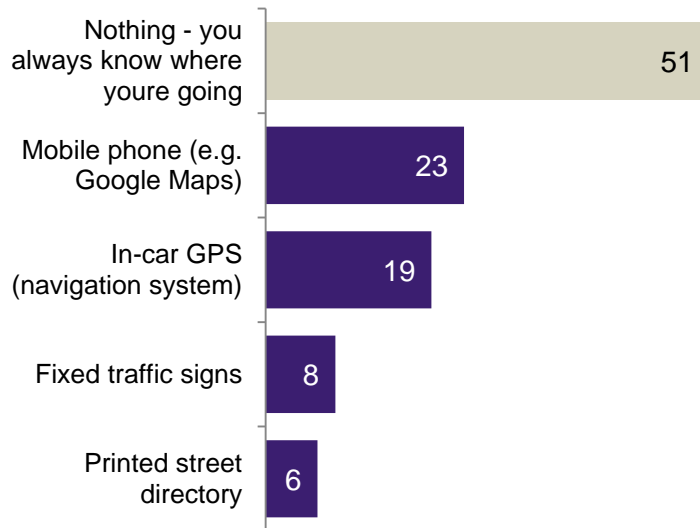


INFORMATION SOURCES USED FOR NAVIGATION

Participants were most likely to follow variable road signs during a flood (63% when prompted), even though these were not typically cited for general driving

Top information sources used for directions generally – Unprompted*

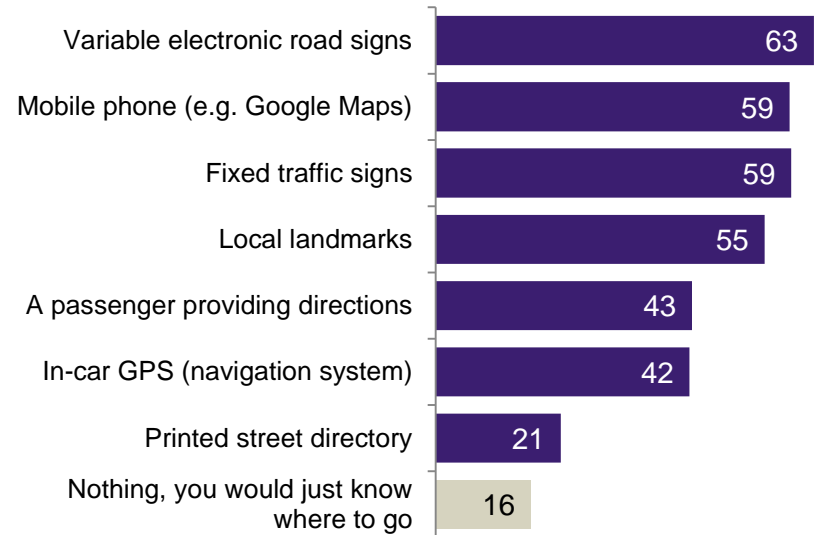
Top mentions 5%+; multiple selections possible



Vulnerable participants were significantly more likely to use a printed street directory during severe flooding compared to non-vulnerable participants (28% vs. 17%).

Top information sources would use for directions during severe flooding – Prompted (%)*

Multiple selections possible



** Please note, differing results for these questions are likely due to the difference in question type – i.e. unprompted versus prompted response options.*

Base: Participants who drive in their local area (n=366)

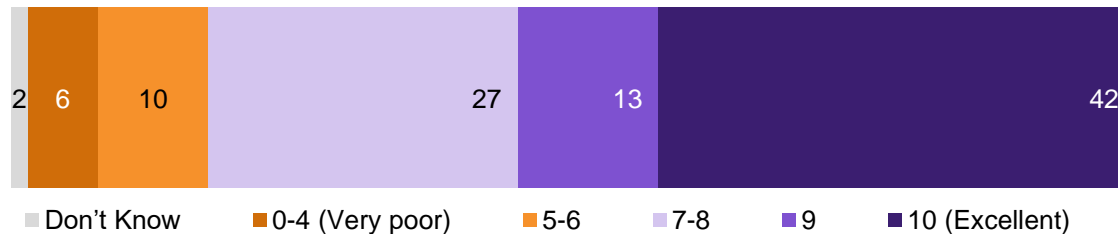
Q30D. When driving in your local area these days, what information sources do you use to find your way to specific places? / Q30E. Imagine you are evacuating out of your area due to a severe flood. Would you be likely to use any of the following information sources to work out which way to go?

STATED AWARENESS OF EVACUATION ROUTES

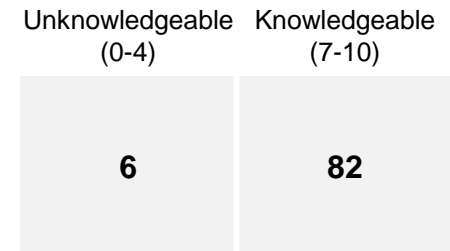


Four in five (82%) believed they were aware of appropriate flood evacuation routes, though this is again likely to be overstated and requires further evaluation

Knowledge of evacuation routes (%)



Nett (%)



More likely to feel unknowledgeable

- ◆ Renters, compared to home-owners (16% vs. 4%);
- ◆ Report they do not often do things to help other people in the community, compared to those who do (12% vs. 5%); and
- ◆ Women, compared to men (9% vs. 2%).



More likely to feel knowledgeable

- ◆ Men, compared to women (89% vs. 77%);
- ◆ Homeowners, compared to renters (86% vs. 70%);
- ◆ Live with pets or livestock, compared to those who don't (86% vs. 76%); and
- ◆ Non-vulnerable versus vulnerable survey participants (86% vs. 76%).

As highlighted earlier, prior research suggests these results may be artificially heightened and participants may not be as knowledgeable of evacuation routes as they believe. To properly measure participants' awareness of evacuation routes, further research should be conducted.

Base: All participants (n=386)

Q30F. In the event of serious flooding, various roads and routes in the area are likely to be cut-off by flood waters and therefore unsafe to use in an evacuation. Using a scale where 0 means very poor and 10 means excellent, how would you rate your knowledge of which roads or routes you would

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EVACUATION DESTINATIONS AND STOPS

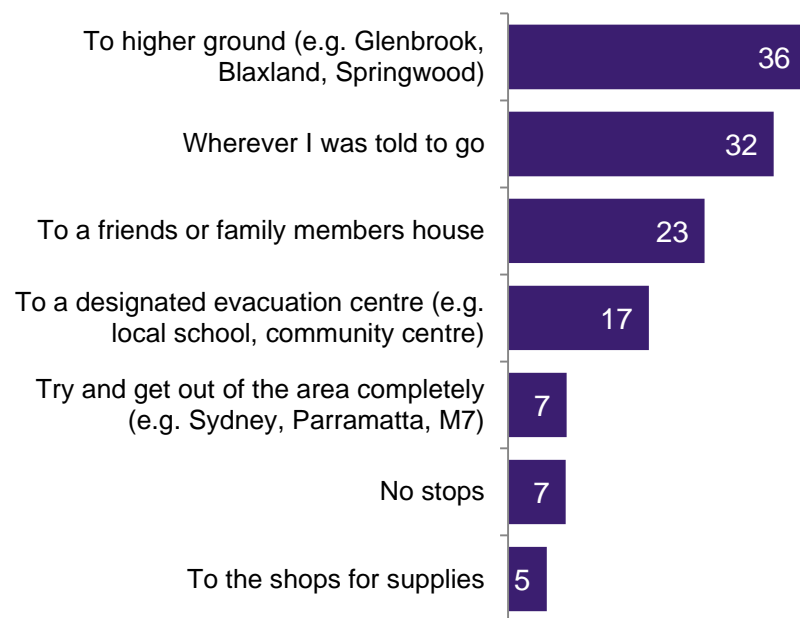


Evacuation destinations would be similar during the day and in the middle of the night, with most leaving for higher ground or wherever authorities told them to go



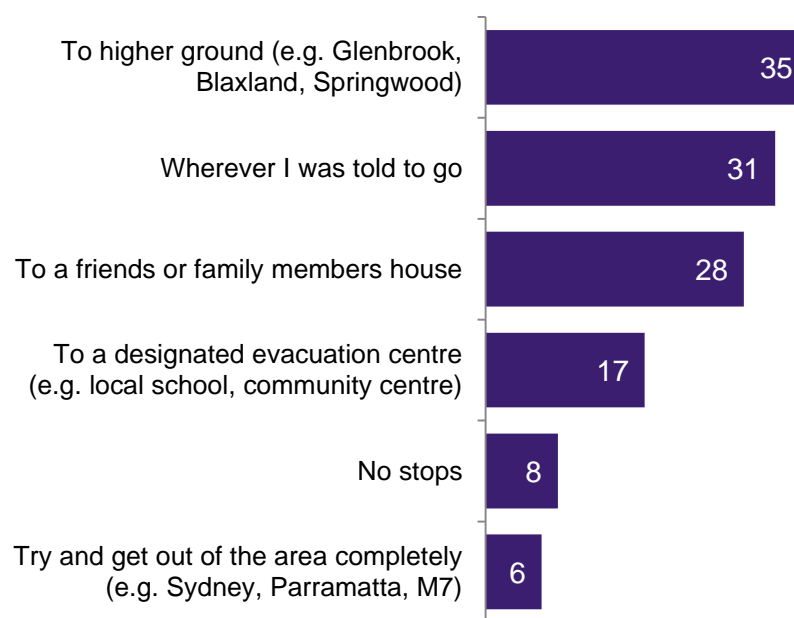
Evacuation destination and stops during the daytime (%)

Top unprompted mentions 5%+; multiple selections possible



Evacuation destination and stops around midnight (%)

Top unprompted mentions 5%+; multiple selections possible



Base: All participants (n=386)

Q31. An evacuation order involves telling people they need to leave straight away, and where they need to go in the event of a flood. If you received an evacuation order from SES during the daytime, where would you go, and would you make any stops along the way? Tell me any stops you'd make and where you'd like to go / Q31B. And if you received an evacuation order from the SES around midnight, where would you go, and would you make any stops along the way? Tell me any stops you'd make and where you'd like to go

APPENDICES



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APPENDIX 1: PARTICIPANTS PROFILE



DEMOGRAPHIC BREAKDOWN

FLOODPLAIN*	UNWEIGHTED %	%	n
Penrith Floodplain	37	44	143
Richmond-Windsor	46	40	178
Floodplain Surrounds	17	17	65

HOME STATUS	%	n
Owner	79	306
Renter	19	73
Other	2	7

EMPLOYMENT STATUS	%	n
Full time	27	104
Part time	9	35
Casual	5	19
Self-employed	6	23
Unemployed	2	10
Retired	44	169
Home duties	6	22
Other	2	10

DISABILITY	%	n
Has a disability	6	24
Lives with a person with a disability	9	35
NETT	14	54

AGE	%	n
18-34	9	36
34-54	29	112
55+	62	238

YEARS IN LOCAL AREA	%	n
0-9	15	56
10-19	17	68
20-29	21	81
30-39	19	71
40-49	17	63
50+	12	45

CULTURAL AND LINGUISTIC DIVERSITY	%	n
One or both parents born overseas	34	135
Speaks a language other than English at home	6	24
Aboriginal or Torres Strait Islander	3	11
Migrated to Australia in the last 10 years	2	6
None of the above	62	236

GENDER	%	n
Male	46	175
Female	54	211

VULNERABLE?	%	n
Yes**	37	144
No	63	242

# PEOPLE IN HOUSEHOLD	%	n
1	17	63
2	36	141
3	19	71
4	14	53
5	8	34
6+	6	24

* NB: Weighted percentages shown here, except in the case of floodplains – where the unweighted percentages are also shown; these reflect the sample achieved by location, which was very close to the target quotas. The data were subsequently weighted to reflect the proportion of households per location as per Census 2016, to correct for the slight sampling bias.

** **Vulnerable participants** were those who: live with a child under two years old; live with someone with a disability / has a disability themselves; identify as Aboriginal or Torres Strait Islander; speaks a language other than English at home; has not driven in the past 12 months; believed they would need quite a lot of help preparing to evacuate (rated 7 or more out of 10).

HNVFP SUBURBS



Penrith Floodplain	Richmond-Windsor Floodplain		Floodplain Surrounds
Emu Heights	Agnes Banks	Mulgrave	Box Hill
Emu Plains	Berkshire Park	Pitt Town	Cattai
Jamisontown	Bligh Park	Pitt Town Bottoms	Forest Glen
Leonay	Castlereagh	Richmond	Freemans Reach
Mulgoa	Clarendon	Richmond Lowlands	Grose Wold
Penrith	Cornwallis	South Windsor	Maraylya
Regentville	Cranebrook	Vineyard	Maroota
South Penrith	Ebenezer	Wilberforce	Marsden Park
Wallacia	Hobartville	Windsor	North Richmond
	Llandilo	Windsor Downs	Oakville
	Londonderry	Yarramundi	Riverstone
	McGraths Hill		Sackville
			Shanes Park
			Wisemans Ferry

APPENDIX 2: DIFFERENCES COMPARED TO 2014





DIFFERENCES COMPARED TO 2014 SURVEY

The sampling and weighting approach used in this study was fundamentally different from the 2014 study. Consequently, definitive conclusions cannot be drawn about the reasons for differing results beyond sampling differences; interpretations of differences over time should be made with caution and should be considered indicative only. The extended time since major flooding has occurred in the area may have also been an influencing factor.

- ◆ The 2014 sample was sourced from an address-point database maintained by the SES, with only 27.5% of phone numbers able to be subsequently matched (older phone connections).
 - ◇ Interlocked place-of-residence quotas and weights were set by flood risk, zone and topography. By comparison the 2018 sampling technique did not include flood zone or flood risk quotas, and fewer participants were likely to have lived in high flood risk areas compared to the 2014 sample.
 - ◇ The 2014 sample also skewed older, had more females, was more likely to be experiencing disability in the household, and had virtually no-one aged under 35.
- ◆ In this survey, fewer participants had experienced a flood (either locally or elsewhere), at 38% in 2018 vs. 48% in 2014.
 - ◇ Perhaps as a consequence, the proportion who believed there was a high risk of flooding in the local area was also lower (18% vs. 33%).
 - ◇ The results above may have also impacted flood preparedness, with fewer participants feeling highly prepared (27% rated themselves 7 or more out of 10 vs. 37% in 2014), and more who had done nothing to prepare (79% vs. 67%).

- ◇ Echoing this, more participants in this survey felt there wasn't much point preparing for a flood because the risk was so low (64% vs. 43%).
- ◆ Meanwhile, more participants said they would wait for follow-up contact from the authorities before responding to an evacuation order (nett 47% vs. 26%).
 - ◇ Indeed, fewer participants felt very confident they would know what to do during an evacuation (58% vs. 73%).
 - ◇ More participants also said they would ignore orders in an emergency situation because they would know what to do (3% vs. 0%).
- ◆ Finally, more participants said they would attempt to return home even if access had been cut due to flooding (50% vs. 27%). However, this is likely a result of a question wording change designed to elicit a more accurate estimate of potential behaviour, with the 2018 question offering reasons such as checking on family or pets.
- ◆ All other key evaluation metrics for Infrastructure NSW have remained comparable between the two surveys.

Prior flood experience	Perceived risk of flood	Have done nothing to prepare
48% 38%	33% 18%	67% 79%
2014 2018	2014 2018	2014 2018

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