FINAL REPORT

Road Empathy | Understanding and Evaluating Campaigns for Behaviour
Change in Young Drivers and Vulnerable Road Users

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Swinburne University of Technology's Acknowledgement of Country

We respectfully acknowledge the Wurundjeri People of the Kulin Nation, who are the Traditional Owners of the land on which Swinburne's Australian campuses are located in Melbourne's east and outer-east, and pay our respect to their Elders past, present and emerging.

Commissioning and Funding

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Contents

List of Figures and Tables

Abbreviations

ACT   Australian Capital Territory
UCD   user centred design
VIC   Victoria
VRU   vulnerable road user

Executive Summary

Road safety campaigns account for a significant proportion of government road safety spending. Many of these campaigns use universal communication principles to communicate and resonate with a broad target audience. This project involves developing a research-informed behaviour change road safety campaign targeting young (18–25-year-old) drivers in the ACT. The research employs behaviour change conceptual frameworks to better understand this demographic. The findings of this study will enable designers and agencies to develop evidence-based road safety campaigns and lead to further research and studies.

The years between 18 and 25 are critical, as many young people transition from being vulnerable road users (VRUs)—pedestrians or cyclists—to drivers or motorcyclists. While this demographic will continue to be VRUs, they learn new behaviours and form new perceptions about VRUs as they commence driving. This study examines the perceptions and opinions of 18–25-year-olds in relation to road safety from the perspective of being both a driver and VRU.

This report focuses on the findings from both Stage 1 (user-centred design (UCD) workshops and eye-tracking) and Stage 2 (UCD workshops). This report was completed later than anticipated due to COVID-19 restrictions, which extended the time needed to recruit participants and revise research activities. Nonetheless, the project has generated valuable insights into this unique target audience.

A well-designed, considered, and impactful road safety campaign can be the catalyst for meaningful behavioural change (Robertson & Pashley, n.d.). This is recognised in many countries, particularly Australia, where federal and state governments budgeted $2 billion for road safety campaign initiatives in 2020–21 (Department of Infrastructure Transport Regional Development and communications, 2021).

Young drivers aged 17–25 years have relatively high involvement in risk-taking behaviours (Kaye et al., 2016) and a risk of accident involvement in the first months of teenage licensure four times higher than that of other drivers (Simons-Morton et al., 2015). Inexperience and exuberance contribute to young road users being a high-risk demographic (Wang et al., 2010). Thus, they are a prime target for road safety behaviour change campaigns.

While road safety campaigns are common in today's media landscape, this study examines a less scrutinised aspect: campaign messaging and its relationship to imagery. It targets 18–25-year-olds through user-centred design (UCD) workshops and rigorous pre-testing activity using eye-tracking technology. It also investigates the benefits of understanding the relationship between different road-users—drivers, motorcyclists, cyclists, pedestrians—specifically in relation to youth.
For the benefit of the Justice and Community Safety Directorate, this report presents the following:

* **Stage 1 recap** (Activity 1: UCD workshop and Design Recommendations; Activity 2: Eye tracking and Stimuli Development; Testing: Eye tracking and heat maps; Discussion)
* **Stage 2** (Participants; Design and Procedure; Analysis; Results and Discussion; Conclusion)
* **Future Research**
* **The Campaign**

Introduction

The primary goal of this project was to gain deep insights into the perceptions of the 18–25-year-old demographic regarding visual materials and messages in behaviour change campaigns developed to motivate road safety amongst young drivers and vulnerable road users (VRUs). The second component of the project was to develop a behaviour change campaign informed by the findings over three stages of research involving participants from the Australian Capital Territory (ACT) (study 1, 2 and 3) and Victoria (VIC) (study 1 and 2).

Our research was prolonged by the COVID-19 pandemic, but we have now completed all the components outlined in the funding application. Our findings include significant insights into the relatability of the visual imagery and messaging types; local knowledge and preferred viewing locations (digital and physical world); diversity of the demographic in the ACT; and the shift in advertising methods required to communicate with road users (drivers, cyclists, motorcyclists, pedestrians) with varied experience across a range of media formats.

Using our findings, we produced a behaviour change campaign, along with a set of specifications that rationalise our design decisions, and which can be used to guide the development of other campaigns for the demographic in the ACT. Our campaign underwent evaluation in Activity 3 and was subsequently refined for submission.

Recap

In Stage 1, we undertook a review of literature on the effectiveness of specific messaging and road user relationships in road-safety campaigns. This enabled the team to refine the problem outlined in the original funding grant. Alongside a review of literature pertaining to road safety concerning 18–25-year-olds, we looked for literature that explored the type of communication that motivates young people and encourages behaviour change (to inform the user-centred design (UCD) workshops), as well as literature relating to the pre-testing of advertising campaigns (to inform the eye-tracking activities).

Findings from the literature review (from Stage 1 report):
1. Five categories of persuasive messages are found in road safety campaigns: reason, negative emotions, positive emotions and social values, threats of enforcement, and humour (Guttman, 2015)
2. Existing studies provide inconsistent evidence about the effectiveness of specific messaging types, highlighting that it is essential to identify the most relevant and effective messaging category
3. Studies of various road users' relationships reveal an 'us vs them' attitude in most road users, especially those sharing road space, such as drivers and cyclists (Hoekstra, Twisk & Hagenzieker, 2018)
4. Pre-testing is an essential aspect of the campaign creation process.

Study 1: UCD Workshop

Based on the four findings from the literature, the first UCD workshop was developed to ensure a better and specific understanding of audience preferences through pre-testing. It involved 30 people aged 18–25 years (the target demographic) 19 from ACT and 11 from VIC . These workshop activities prompted and facilitated discussions about current road behaviour and helped us to answer the following questions:

1. What are the current attitudes and behaviours around VRUs in the ACT and Victoria, and what are the underlying reasons for those attitudes and behaviours?
2. How are different road safety messaging types viewed? Which is likely to influence young ACT and Victorian road user behaviour the most, and why?
3. Which communication channels (e.g. print, web, social media) are the most effective for communicating road safety messages to young ACT and Victorian road users?

Design Recommendations

1. **Unambiguous messaging**
    Participants stated that behaviour change campaigns should contain a small amount of text and that the message should be straightforward to avoid confusion. This was highlighted as critical in a diverse community with different experiences.

2. **Credible information that can be taken in and acted on quickly**
    There was a preference for messaging which allowed information/knowledge to be applied immediately.

3. **Photographs and videos of real-life scenarios are valuable**
    Participants preferred to see images and text rather than text-only campaigns, and perceived real-life scenarios as more relatable than illustrative ones.

4. **Localised anecdotes and storytelling from members of the same age group**
   Participants commented on the location of messages as a trigger for behaviour change
   when driving. For example, pedestrians noted that they had to be cautious on Bunda Street,
   and drivers spoke of a notorious roundabout; such location-specific anecdotes suggested a
   preference for specific and targeted messages.

5. **Similarity of the opinions from each section of the workshop participants**
   While groupthink can be perceived as problem in this type of discussion, it provided invaluable
   insight into how this age group communicates and underlined the importance of peers'
   opinions. The participants used their friends' stories and experiences when explaining their
   opinions, reinforcing the importance of peers' experiences and opinions in the formation of their
   own. This finding highlights the importance of ensuring that future campaigns are created to
   reflect the target groups' lives and are localised and incorporate their own voices.

6. **Preference toward enforcement and reasoning style messages**
   Results from Stage 1, task 3 highlighted varied opinions about the message categories.
   Discussions amongst some participants suggested that enforcement messaging was likely
   to influence some types of road use behaviours, such as anti-social road use and failure to
   obey road rules, while it was perceived as a less effective influence for other issues, such as
   distraction. Other participants associated enforcement with authority or as a threat. Similarly,
   reasoning was perceived to likely influence some road behaviours. Reasoning messaging
   was associated with logic and providing the relevant information and directive, yet it was also
   perceived as generic and complicated at times.

Study 2: Eye tracking

In developing the campaign stimuli for an eye-tracking study, we developed 20 campaign image
stimuli in the form of posters for all the categories tested in the first workshop: reason, negative
emotion, positive emotion, humour, and enforcement. The aim was to understand the visual
elements, such as image and type, that attracted participants attention in the posters, and compare
that data to the verbal responses collected during the first workshop discussion.

Stimuli Development

The image stimuli developed for the reason and positive emotion messaging types used wide shots
to include various road users and their surrounds at the pedestrian crossing, on the road and at the
traffic lights. In the negative emotion and enforcement image stimuli, closely cropped shots were
used to focus on specific details, such as a crashed bicycle, a pedestrian, or a mobile phone screen in
front of a car.

Choice of typeface was an important consideration, particularly from legibility and readability
perspective. Legibility refers to the degree to which a person can recognise individual character form
(e.g. 'S' 'T', 'O' and 'P'), while readability refers to the degree to which a person can group character
forms to understand the word and consequently the concept it represents (e.g. 'STOP'). A sans-serif
typeface (e.g. Arial) offers better visual legibility against complex backgrounds like images, because
the construction of the characters is comprised of uniform thickness stroke weights, and therefore
offers consistent contrast against its background. In contrast, a serif typeface (e.g. Times New
Roman) can slow reading and in extreme cases present reading ambiguities; this is not optimal for
short measures or lines of type that are typically used for advertising posters such as road safety
campaigns (Dobres, Chrysler, Wolfe, Chahine, & Reimer, 2017).

Furthermore, condensed sans-serif typeface in which the characters have a variation narrower in width in relation to their height than the standard style for the same typeface – or a typeface designed specifically to offer this in application (e.g. Trade Gothic), will offer an inherent advantage in this type of advertising context/application, because it allows the type to be set at a much larger size on the layout, and takes up less horizontal space in relation to its height, therefore improving the readability of the message (Garvey, Zineddin & Pietrucha, 2001). A sans-serif condensed typeface also promotes faster eye scanning of words since it requires less eye movement, which enhances reading speed and comprehension. This is a significant consideration for text in large-format advertising and information design.

We were conscious of the tone of voice in the stimuli messaging, because our findings indicated the participants were more likely to listen and relate to communications from their own demographic. Therefore, the perceived 'tone-of-voice' of sans-serif fonts was aligned with the intention of the campaign messages to 'connect and remind' rather than 'command' the reader. The size and colour of the type provides sufficient legibility for text and visual contrast (respectively) against a complex image background of the campaign visuals (Carroll, 2010).

Testing

Eye tracking

In the eye-tracking testing, each stimulus was marked with regions depicting the message (type-communication), primary objects (e.g. car, pedestrian – image-based communication) and relative space around objects (image-based communication). For each of these regions, for each stimulus, the duration of fixations (a participant's gaze on a particular image region) was measured in milliseconds, and the number of fixations was recorded. To understand how the fixations depended on the five experimental conditions, that is, messaging types (reason, negative emotion, positive emotion, humour and enforcement), the fixation data were analysed by examining their influence alongside that of the four road user types shown in the stimuli (cyclist, pedestrian, motorcyclist and car driver). This was done using a mixed statistical model (General Linear Model), with participant as a random factor to account for unbalanced, missing data.

Message Region: Type-based communication

Duration of fixations in the Message Region differed significantly by road user ($p = 0.02$), messaging ($p < 0.001$), and there was a significant interaction between road user and messaging ($p = 0.003$). The number of fixations in the Message Region also differed significantly by road user ($p = 0.004$), messaging ($p < 0.001$), and again, there was there was a significant interaction between road user and messaging ($p = 0.011$).

Object Region: Image-based communication

Duration of fixations in the Object Region, which relates to image-based communication, differed significantly by road user ($p < 0.001$) and method ($p = 0.013$), and there was a significant interaction between them ($p < 0.001$). This was the same for the number of fixations, which also differed significantly by road user ($p < 0.001$), messaging ($p = 0.003$), and once again a significant interaction was found between them (F($p < 0.001$).
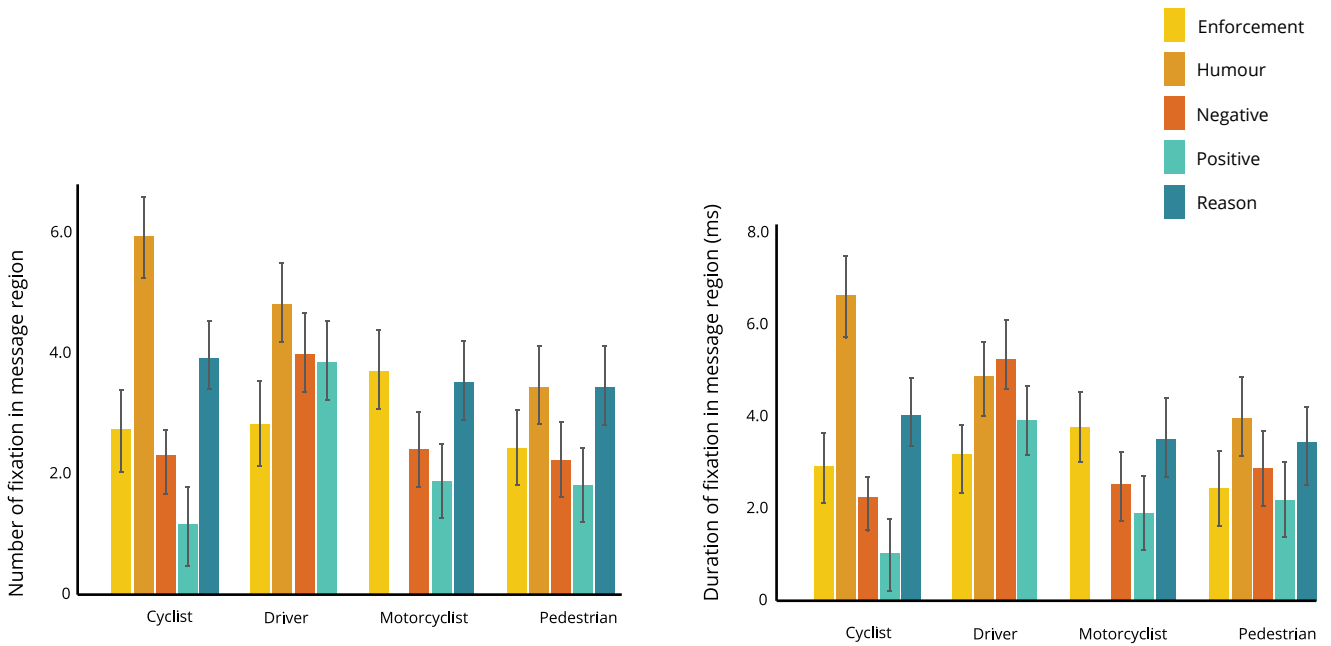
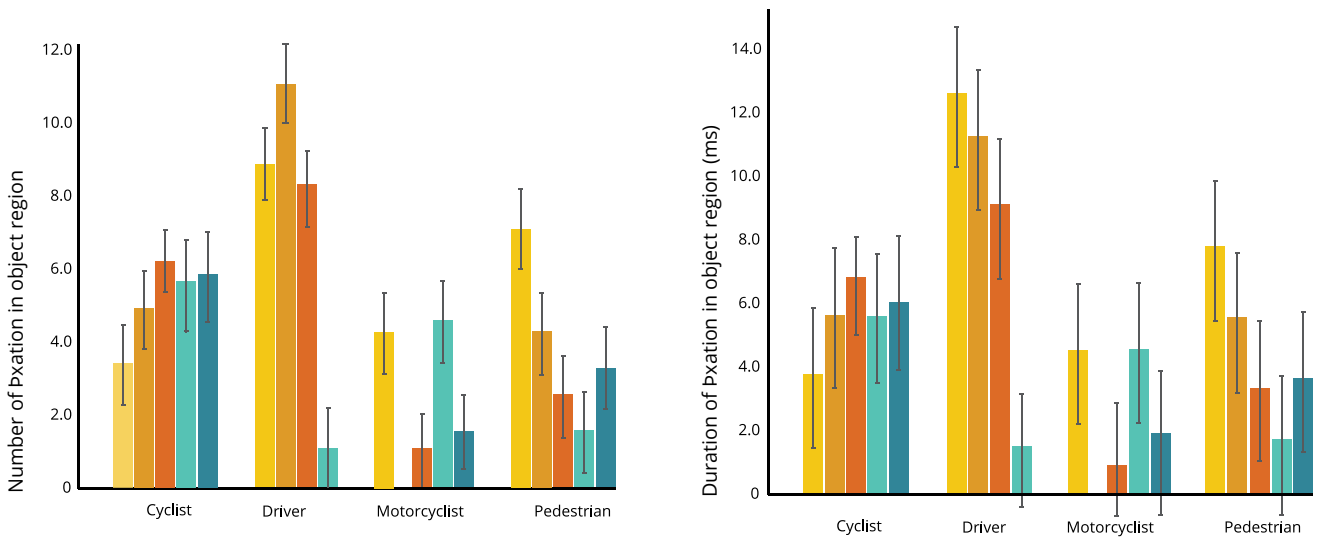**Figure 1:** *Eye-tracking results, type-based communication*

Figure 2: *Eye-tracking results, image-based communication*

Taken together, these results revealed that both types of fixation measures – number of fixations and duration of fixations in the specified regions – had very similar patterns. That is to be expected, since the more fixations a person had on a given part of the image, the longer the total time they would fixate on the image. Hence, both the number and duration of fixations are robust indicators of time spent looking at elements of the image stimuli. The results show that for both the text and image-based information presented in each image-stimulus tested, the messaging type and road user type influenced participants' fixation. However, because the type-based communication and image-based communication including the objects were not identical in size across all image stimuli tested, some of the effects recorded here might reflect that aspect rather than a cognitive or attentional effect. In addition, because only one exemplar of each messaging type was combined with one of the road user types, the interaction results need to be treated with caution; they could reflect idiosyncrasies in the specific combinations. To unpack these results further, we analysed heat maps captured during the eye tracking, as well self-reported rating data collected from participants directly after the eye tracking. The results of the self-reported ratings were discussed in the previous report, however, that data needed be refined due an error. The updated data is presented in Appendix 2.

Heat maps

Heat maps of the user gaze highlighted the connection between the message, the image and the tagline. Further analysis of the time users gazed at the image stimuli revealed that participants spent different amounts of time looking at the images and messages; notably, participants fixated on the 'humour' messages. However, in comparison to the manipulation check reported next, the participants did not categorise the humour messaging correctly, and therefore the amount of time spent could have been attributed to understanding the message and its intended actions. 'Reason' and 'positive' messages and objects received similar amount of fixation. With 'enforcement' and 'negative' messaging, on the other hand, participants fixated more on objects than the message. A possible explanation for the difference is that the enforcement message was easy to understand, and participants consequently focused on other spaces in the image stimulus, which included objects and neutral spaces.
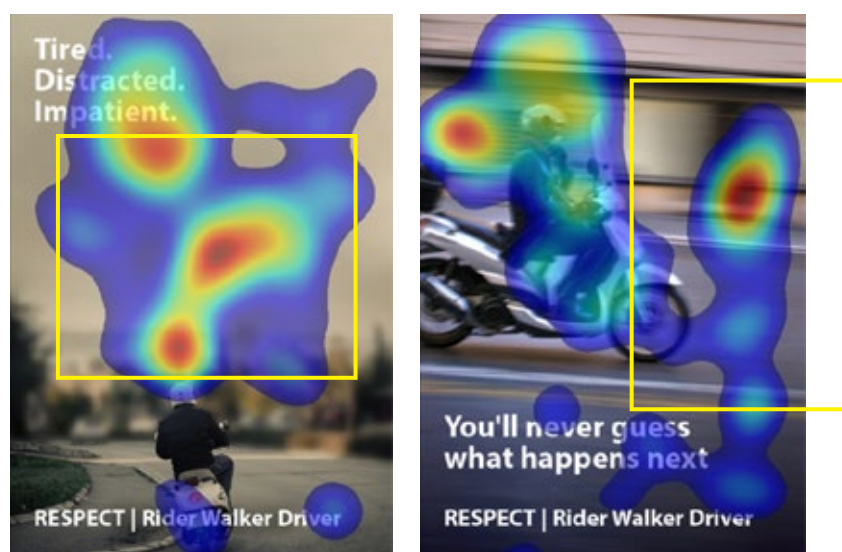
Figure 3: *Heat map fixation on neutral spaces*

Beyond the fixation on message and objects, our findings show that the participants' gaze fixated on neutral space in some of the stimuli (Figure 3). In Figure 3b, the message 'you'll never guess what happens next' seems to have directed the participants' gaze toward the front of the object, as if in anticipation of what could happen next. Speculatively, it could mean that participants are staring into spaces to construct their narrative based on the message and visual scenario provided.

Discussion

Based on the eye tracking – heatmaps and the participant ratings – there was substantial variation in the messaging and images that stimulate behaviour change in the 18–25-year-old demographic, which was in keeping with the results from the UCD workshops. Despite the differences, there were patterns that we used to brief designers who were in the same demographic as the 18 – 25-year-old participant. Patterns that emerged included a preference for reasoned messaging and enforcement.

Throughout the eye-tracking research, the notion of enforcement was perceived as an effective messaging type, although some enforcement messaging was also categorised as 'reason' in the manipulation check. Participants highlighted different perceptions of enforcement based on the context or type of road user. For example, participants suggested:
- positive enforcement was more effective for drivers and motorcyclists
- negative enforcement was more effective for pedestrian and cyclists.

Conceiving design strategies for this demographic is complex and requires a nuanced understanding of young people's language, behaviours, preferences and very specific locational details. While all activities in Stage 1 were conducted with 18–25-year-olds from the ACT and VIC as a comparison, as discussed in the Stage 1 report.

While there were slight differences in the data between the ACT and VIC participants, in progressing to Stage 2, the research team made the decision to focus on the ACT participants and develop a behaviour change campaign for pre-testing, evaluation and further refinement. The following seven design recommendations guided the conceptual development, design and implementation of the behaviour change campaign.

Design recommendations

1. Identify effective messaging types for the various types of VRUs
2. Develop a campaign that appeals to logic and reason
3. Develop a campaign that delivers useable messages 'in the moment'
4. Develop a compelling copy line that directs the users' gaze points
5. Design a campaign that is compositionally strategic, positioning emotive visual components centrally and providing neutral spaces for the users to take in the enhanced communication
6. Design a campaign copy line that integrates with the image, enhancing the message and motivating behaviour change
7. Deconstruct and document the behaviour change campaign with annotations highlighting appropriate design considerations validated by evidence

Study 3: Final Workshop

Extending on previous activities in stage 1, study 3 aimed to develop road safety campaign images that would appeal to VRUs. Using the insights from studies 1 and 2, campaign images were designed by junior designers employed by the University and who belonged to a similar demographic as the young ACT road users we studied. To influence road use behaviour effectively, the designers used graphic design and messaging informed by the findings and developed specifically to appeal to the target audience. These campaign images were later tested with 18–25-year-old ACT road users who rated their perceived effectiveness and gave insights about preferred campaign delivery.

Participants

Twenty people aged 18–25 years (11 women, nine men, mean age 22.3 years) participated in the study; all were residents of the ACT. All identified as at least one type of road user – pedestrian, cyclist, motorcyclist or driver. Sixteen participants had a driver's licence: 9 full, five provisional and two learners. Nine of 16 licenced participants received their licence from the ACT, four from other Australian states and territories, and three had received their licence overseas. The average driving experience was 3.8 years (range 0.5–5 years). All participants were recruited through Telmy (a professional recruiter) and received an $80.00 voucher in recognition of their participation. All participants were interested in providing feedback about their road use experiences.

Design and procedure

As mentioned earlier, a set of road safety campaign images was designed by university-employed junior designers who were in a similar age demographic (18–24 years) to the participants and were all road users. Consistent with our findings from Study 1, research has shown that connection with peers and the ability to rally under the same idea encourages passion and engagement in campaigns (Vallone et al., 2016, p. 419). Therefore, a design that is developed by the intended user group is more likely to be effective for that group. The key difference between the designers and the participants was that the former resided in VIC rather than the ACT. While we acknowledge that there are distinctions between VIC and ACT road use, our research in Stage 1 highlighted a similar diversity of opinion within the 18–25-year-old demographic. Therefore, our research-led approach was built on shared understanding and empathy between the designers and intended users.

The research team briefed the designers to develop a series road safety campaign images and messages. Using the findings of Study 2, the research team provided the designers with the following five design requirements:
- the campaign must include photographic imagery with concise messaging.
- the messaging must include examples of Positive Reason, Negative Reason, Positive Enforcement and Negative Enforcement.
- the messaging appeals must be relatable to the four different road user types – driver, motorcyclist, cyclist and pedestrian.
- some of the final campaign images should be able to be delivered in motion-based contexts (e.g. digital posters, social media).

Due to the limitations of the lockdown in Victoria during the study, the designers were unable to undertake photography for the campaign designs and had to use stock photography instead. The designs went through several iterations in consultation with the research team, as well as with an experienced professional advertising communications consultant. The final campaign included 12 images, promoting road safety using current road rules in the ACT. The messaging used realistic images and concise copy lines, some employing rhyming to promote memorability (e.g. '1.5 Saves Lives', which refers to the distance that must be maintained between a motorist and a cyclist). Table 1 shows all 12 campaign images; three were motion-based (indicated).

Stage 2

Table 1: *12 Campaign Images*

Reasoning	Positive	Negative
Driver-Pedestrian		
Driver-Cyclist		
Driver-Motorcyclist	 *https://youtu.be/6fh3uSpmfDY*	

Enforcement

	Positive	Negative
Driver-Pedestrian		
Driver-Cyclist		
Driver-Motorcyclist	 *https://youtu.be/4WRwubv-FbI*	 *https://youtu.be/1vDxUz3fabs*

Participants reviewed the campaign images online using the collaborative digital whiteboard software Miro. Participants conducted their review in groups of five. Each review session was facilitated by two members of the research team who explained the tasks (see below) within study 3 and facilitated the group discussion that followed, which was transcribed for analysis. Participants provided their responses privately using their own Miro board link which they received at the beginning of the session.

In Task 1, participants categorised each campaign image into one of the four messaging types: Positive Reason, Negative Reason, Positive Enforcement and Negative Enforcement. The categories were defined as follows.

- **Positive reasoning:** Presenting facts that appeal to logic and focus on benefits and empathy
- **Negative reasoning:** Presenting facts that appeal to logic and focus on negative consequences
- **Positive enforcement:** Presenting rules that focus on benefits and empathy
- **Negative enforcement:** Presenting rules that communicate using shock and fear.

In Task 2, participants rated each campaign image for perceived effectiveness using a 5-point Likert scale (1= strongly disagree, 2 = disagree, 3 = neither agree or disagree, 4 = agree and 5 = strongly agree). Finally, in Task 3, participants ranked the contexts in which they would prefer to see the campaigns, from 1 to 11 in descending order. The list of contexts ranked was as follows:

- In the immediate area
- Frequently visited place
- Public transport (inside)
- Public transport (outside)
- Public alert on your phone (triggered by geolocation)
- YouTube
- Television
- Radio
- TikTok
- Facebook
- Instagram

At the conclusion of Task 3, the researchers asked participants to discuss and elaborate on their responses for each of the three activities.

Analysis

The data collected underwent quantitative and qualitative analysis. The categorisation task and ranking data were analysed using frequency counts, and the self-reported ratings were submitted for statistical analysis. The workshop transcripts and visual data (i.e. material from the activities) were examined using reflexive thematic analysis following the same procedure outlined in Study 1 (in the previous report). The results of the analysis are discussed in detail next, organised by key themes.

Results and discussion

Task 1: Campaign category review and manipulation check

A manipulation check was conducted to ensure that each campaign image tested represented the intended messaging appeal types: positive reason, negative reason, positive enforcement, and negative enforcement. Participants' campaign messaging categorisation responses were organised using frequency counts, then compared with the intended messaging category. Of the 12 campaign images presented, 9 (75%) were categorised into the intended messaging category by at least 50%: 2 (16.67%) were categorised correctly at least 50% of participants; 4 campaign images (33.33%) were categorised correctly by 50–64% of participants, and 3 campaign images (25%) by 65–70% of participants. The remaining 3 campaign images (25%) were categorised correctly by less than 50% of participants, thus those images were regarded as categorised incorrectly. In one of those three cases the image was categorised correctly by 45% of participants, and as can be seen in Figures 4 and 5 below, participants might not have been able to agree whether the image was enforcement (60%) or reason (40%) messaging, but overall, they perceived it to be more negative (80%) than positive (20%). Given that it was in fact an example of negative enforcement, this suggests that aspects of the messaging did communicate as intended. Overall, when an image was incorrectly categorised, or was evenly split between categories, enforcement and reason messaging appeared to be less easily distinguished than negative and positive messaging.
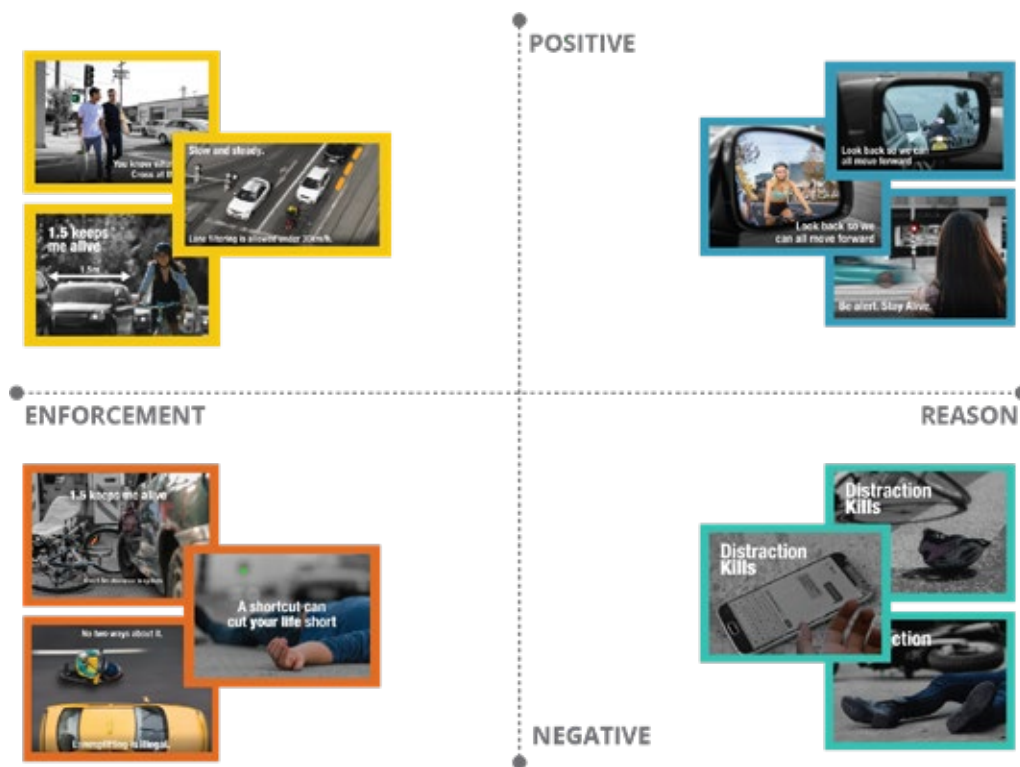
Figure 4: *Intended category*
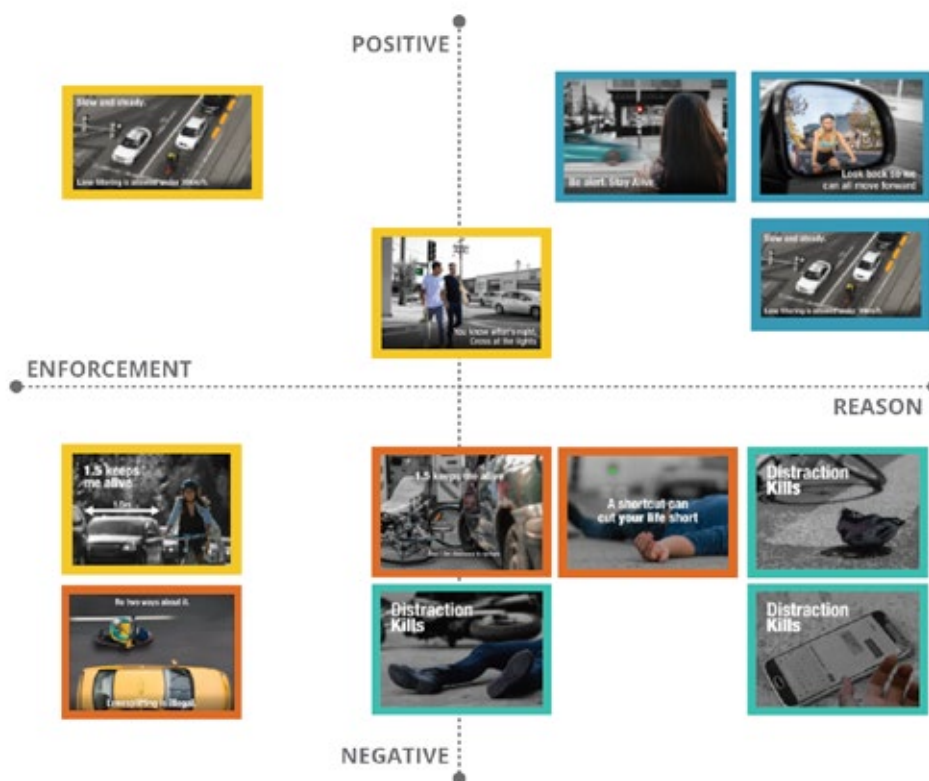
Figure 5: *Participant response*

Interchangeable concepts of reason and enforcement

The results from the first task revealed that participants had diverse perceptions of reason and enforcement. The group discussion after the first activity focused mostly on the confusion between reason and enforcement messaging, which was apparent in the manipulation check analysis discussed earlier (Figures 4 and 5). Within the 18–25-year-old demographic, enforcement was considered official and communicated through 'government' sources. Our findings revealed the use of visual metaphors, such as police officers or monetary fines, were associated with enforcement.

> *"...when you say enforcement I think usually, like when I was in Sydney, I remember I would see signs on public transport that would say, "Fines will apply'." (Participant 5)*

Participants said that the lack of familiar enforcement markers in the campaigns made the images challenging for them to categorise, creating overlap between enforcement and reason. As Participant 5 stated:

> *"It was a bit difficult for me to specify the difference between enforcement and reasoning."*

Through discussion, it emerged that familiar markers for enforcement included shock and fear imagery, including body parts, figures on the road or visible destruction to vehicles.

"The most ambiguous [one] to me is the one that says, 'Distraction kills' but has like a photo of a phone with a scratched screen. That's just like the image is just not as shocking. 'Distraction kills' is clear enough.... But the image that goes with it [is] a bit too [general]." (Participant 10)

"Just the imagery is powerful enough. Just thinking about it without experiencing it is pretty scary." (Participant 3)

Similarly, participants' concepts of shock and fear varied. For some participants, an image of a broken phone triggered a fearful or shocked response, while for others, the connection between the message and the non-specific visual was not perceived as relating to enforcement.

We also observed some confusion when participants organised the campaign material into the reason category. Reason messaging in this study was considered as messaging that encouraged people to take actions due to a motivating factor. In some instances, the reason could be perceived as a reasonable or logical action in a given scenario. That said, we acknowledge that the benchmark for reasonableness varies between individuals and what one person considered as enforcement could very well be logical or reasonable for others.

Negative and positive messages

Unlike for enforcement and reasoning, most participants were confident in their differentiation of positive and negative messages. Negative messaging was the least ambiguous; almost all participants noted that negativity was associated with any visual or text-based message that made them feel uncomfortable or showed any sign of human suffering.

"For me, at first, I sort of do my negative first ... so if the pictures have some people ... on the floor like broken ... I would just put all to negative. And the rest, like some people walking on the street, or like some object I would just put it in positive." (Participant 18)

"I think I just pick the negative enforcement the easiest, because I just choose the ones that makes me feel a little bit uncomfortable and like a little bit sad or anything." (Participant 17)

"... in the negative area I will just put [images showing] someone die on the floor, or lie on the floor, that kind of thing, I would just put it for negative." (Participant 19)

This suggests that emotional messaging appeals, particularly negative emotion, were easier for the participants to characterise than reason or enforcement messaging.

Task 2: Effectiveness ratings

Analysis of participants' perceived effectiveness ratings for each campaign images (Figure 6) showed that there was a statistically significant difference between the four messaging appeal types (fp < 0.05)
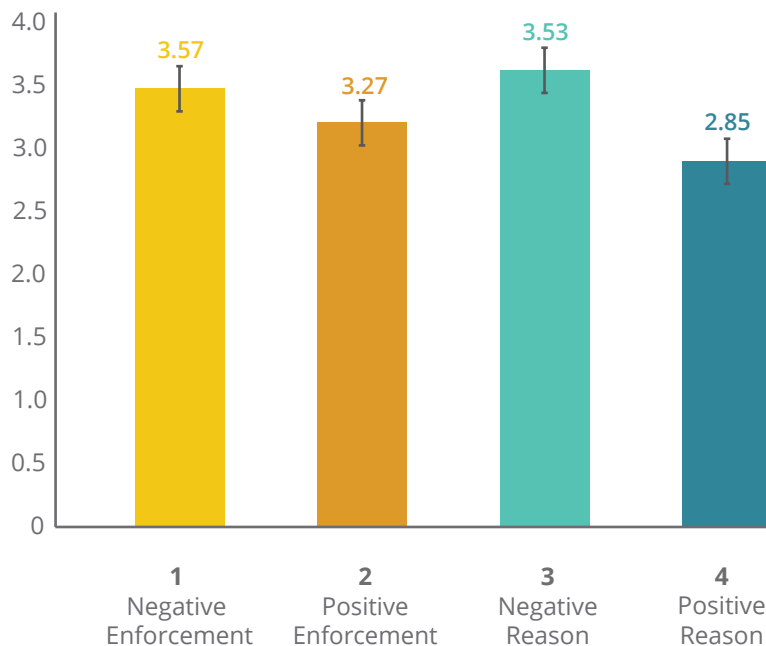
Figure 6: Means and standard errors of ratings of the four messaging appeal types

Post hoc analysis of these results revealed that participants perceived the negative reason messaging (M=3.63, SE=0.246) to be slightly but significantly more effective than negative enforcement (M=3.57, SE=.116, p < 0.05) in influencing their road use behaviour. However, both those negative messaging appeals were perceived to be more effective than the positive reason messaging appeal (M=2.85, SE=1.287, p < 0.05). There was no significant difference between the positive enforcement messaging appeal (M=3.27, SE=0.160, p > .05) and the three other messaging types (negative enforcement, negative reason, positive reason). There was also no significant difference between the mean ratings given by the three road user types (motorcyclists, cyclists, pedestrians), and no significant interaction between the messaging and road user types (p > 0.05). These results suggest that the participants were more responsive to messaging that communicated the negative outcomes of road use behaviours, whether it appealed to reason or enforcement, than positive messaging.

The quantitative findings highlighted participants' perceptions that reason and enforcement could be interchangeable, with a slight preference for a negative messaging style. The discussion after the activity found that some of the participants characterised the campaign designed to appeal to logic and reason, with a positive image, as general or non-emotional. Enforcement and negative images associated with the campaign imagery that integrated either shocking or fear-inducing images with messaging were perceived to be more emotionally appealing (Figure 7).
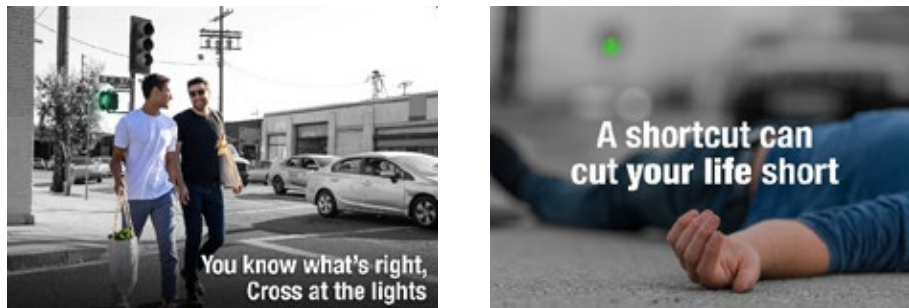
Figure 7: Positive reasoning (left) and negative reasoning (right) campaigns

Some participants noted that an emotional campaign message, especially a negative one, is likely to capture audience attention. Participants perceived the images with positive messaging as reality, while the negative messaging presented alternate realities – 'what could have been' scenarios.

"The idea of preventing something bad from happening is really a powerful motivator. I think just seeing ads that say, hey, if this happens, that something bad will happen, I think it would prevent me from doing bad things if that makes sense." (Participant 6)

"That negative reasoning and negative enforcement will be the most effective for me since it will suggest something of the consequences if I don't follow the road rules. So, I will harm someone, or I will get fined, or something like that will be more personalised for me." (Participant 9)

"I agree … that the negative reasoning seems to have more of an impact, and it kind of like cuts to the chase, like this is the direct consequence of not following the road rules." (Participant 8)

Despite the higher preference for negative campaigns, most participants preferred more logical (less emotive) and instructive campaign messages over emotional ones.

"Something like, 'Distraction kills', or like, 'Be alert', 'cause I don't see any action involved with that one, as in like I try to be more alert, but I'm not sure what action should I take if I see that road safety campaign." (Participant 16)

"For me … I did find clear rules, or what I should do, more effective. Because then I'm like, okay, it's telling me what to do." (Participant 2)

Participants who expressed confidence in their driving skills also expressed a preference for clear and instructive campaign messaging. Fear and shock associated with negative messaging was perceived as ineffective, due to the lack of a clear information about specific action that could improve their road use behaviour.

Relatable visual scenarios in campaigns

Despite the varied preferences and responses about the effectiveness of the emotional messaging appeals, it was clear that the relevance or relatability of the campaign images to specific individuals was important. The more the participants could immerse themselves in a presented scenario, the more likely they were to perceive the communication as effective and take it seriously.

We found that one of the primary factors that influenced participants' perceptions of the effectiveness of the campaign messaging types was their ability to relate them to their own road use behaviours. Campaign images perceived as irrelevant or unrelated to the participants' road use rated lower, because participants felt that the campaign was not directed at them.

"For me, the ones I put as disagree, is really because I'm just a pedestrian, so anything pertaining to cyclists or driving isn't very relevant to me. And I just don't have the capability to retain so much information." (Participant 14)

"If I'm at the lights I'm not going to be moving anyway, so I guess it's up to [the cyclist] to not have an incident themselves, cause, I can't really do anything about it if I'm not doing anything." (Participant 13)

"I had this negative experience of getting into an accident being a biker, so that's why I would say it's strongly agreed ... So everything I strongly agree is mainly based on my own experience." (Participant 4)

Participants who identified themselves as drivers and pedestrians stated they would rate a campaign where a cyclist was the main subject as less effective, even if the general message were beneficial for multiple road users. On the other hand, as noted above, when the content aligned with participant's road user role or their previous experience on the street, it was regarded as effective.

The level of participants' road-use experience was another important factor. A participant who considered themselves a confident and experienced cyclist stated that a fear-based campaign would not influence their cycling behaviour, because they believed they understood the precautions and road rules, both as a driver and a cyclist. In contrast, another participant, who considered themselves a less experienced driver and cyclist, said that they were keener to pay attention to road rule campaigns due to their inexperience.

"So, with the phone, like using your phone and saying, 'Distraction kills', I think that's obvious so it wouldn't change my behaviour at all. Then, 'Look back so we can all move forward', 'cause I do cycle as well, but I take precautions as to where I cycle." (Participant 12)

"I think it's when, as a younger driver, so I'm on a provisional licence for instance, it's a lot easier to lose that licence. And being in a new environment makes me more cautious about how to behave. Whereas if I'm more acclimatised to being a pedestrian, 'cause I've walked around on streets my whole life, I might not pay as much attention so I might be more likely to jay walk or something like that." (Participant 20)

Depiction of real people and their physical attributes also influenced how participants related to the campaign images. Seeing people from your community, age, socio-economic background, or ethnic group is known to create resonance (Telenta et al., 2020), and that effect was apparent in our findings. Participants showed a preference for images that included images of people they could identify with. They noted that seeing people, especially someone with a similar physical appearance to them, affected how they perceived the effectiveness of the message.

"I also found [campaigns] that contained people in them were a bit more personal. And, for example, the one that just has like a helmet on the ground I didn't find that as effective." (Participant 8)

"She's blonde and around my age, and maybe looks a bit like me, and so your eye is drawn to that, and so I think seeing someone that perhaps kind of could be you or something is more likely to have an impact." (Participant 15).

The relatability of the campaign scenarios also extended to situations where participants could not relate to certain situations in their daily lives. One defining example was the 'jaywalking' campaign message, which participants perceived as largely irrelevant. The dispersed nature of traffic in the ACT

made it common for people to jaywalk, therefore, it was harder for the participants to get a sense of urgency and relate jaywalking with danger or dangerous scenarios.

> *"I just thought that in general people will jaywalk if they think the road is clear anyway. And I don't know if that sign would really influence many people's behaviour." (Participant 11)*

> *"So, the only one I had in disagree was the jay walking one. And I think it's kind of just probably the context of living in Canberra, it not being as, or not being perceived as dangerous to jay walk as there's not a lot of traffic around. And I think it probably wouldn't affect my behaviour." (Participant 15)*

> *"I think most people jaywalk if they can see an opportunity to jaywalk, so it wouldn't change my behaviour." (Participant 12)*

Campaign images that showed scenarios directly relevant to the participants' daily lives were also perceived to be effective, such as the 'walking and texting' behaviour.

> *"I think it's very much like targeted to our age group of like her just saying, [...] 'oh, I'm only a few streets away, I'll just text.' I think young people can tend to do and rationalise that, so I think that one is probably the most impactful because it's saying distraction kills [...] It's kind of like a blanket statement that's a very real possibility, which I think can make it more realistic for people our age and stuff." (Participant 1)*

This quote demonstrates that despite the participant stating a preference for negative messaging, it is the relatable element of texting that reflects their daily life that allows them to picture themselves in the scenario. That relatability left a meaningful impression. This suggests that campaign effectiveness is in part influenced by the audience's ability to relate to the scenario, the people and the objects being presented in the messaging in relation to their daily lives.

Rapid comprehension is key

Participants commented on the role of the text and images and how they affected their understanding and the perceived effectiveness of the campaign messaging. Consistent with the findings from the eye tracking, participants generally looked for elements of the campaign that helped them make sense of the scenario they were viewing. Both image and text guided participants' attention, and there appeared to be no preference for one over the other, but perceptual factors such as contrast were reported to affect some participants' attention.

> *"Some of the pictures are darker and harder to distinguish, or there's more going on, so the text is the obvious thing to look at." (Participant 1)*

> *"I think the first thing that I noticed were the words and not the pictures. Just because the pictures, it does not draw your focus to it." (Participant 14)*

> *"I look at the text first because I think that gives context to how I should interpret the image." (Participant 12)*

> *"I think the first is the image, then I will read the text, and then I will just go back to the image again." (Participant 19)*

Participants also asserted that short text (i.e., text containing few words) was clearer and more effectively communicated the message than long text. In addition, participants expressed a preference for messaging that was direct and to the point.

"I think I definitely preferred the ones that were a lot shorter, that contained – in terms of the text – contained a lot less words." (Participant 8)

"I also thought the shorter messages were more effective." (Participant 7)

"I feel like if it's short and it's to the point it's a lot easier to understand and to grasp. And you can read it a lot faster, so if you're on the bus or something, or you're walking past and you see it, it's a lot easier to just read it in a few seconds and keep it in the back of your mind, compared to something that is longer and takes a while to read and might not stay with you as much." (Participant 6)

Taken together, the results of Activity 2 suggest that for this participant group, campaigns that would most influence their future behaviour should focus on the negative outcomes of specific road use behaviours and communicate the core messages directly and concisely. In addition, the campaign must include scenarios that relate to their everyday lives and personal behaviour.

Task 3: Context Ranking

Participants ranked the 11 messaging locations as shown in Figure 8. They preferred messaging to be placed in locations that related directly to the respective road use behaviour.

Preferred Campaign Locations

Most preferred = 1, least preferred = 11

1	In immediate area
2	Public Transport (Outside)
3	Public alert on phone (Triggered by Geolocation)
4	Frequently visited place
5	Public Transport (Inside)
6	Facebook
7	Instagram
8	YouTube
9	TikTok
10	Radio
11	Television

Figure 8: *Ranking of 11 messaging locations*

Messaging located in the immediate area where the desired behaviour could be actioned was deemed relevant and had ease of access than messaging on social media and traditional media channels such as television and radio. Additionally, messaging in a specific location was perceived to be more likely to lead to immediate action or behaviour change, because it addressed a road user's behaviour in a specific situation in which they could respond immediately, rather than having to retain that message for future use.

Immersion and immediacy

The reason most participants ranked 'in the immediate area' highly was because they acknowledged that they had difficulty in focusing on and retaining road safety messages, despite understanding their importance. Participants believed that a strategically located campaign would help them to immerse themselves in the visual scenario being presented to then act at the right time and place.

"I think the most effective would be the immediate area. So, let's say if an accident happened a week … [it will create] some form of alertness when they see [it], I should look out. It's like an immediate response." (Participant 4)

"For me I similarly place 'in the immediate area' as my top. Primarily because I think that I'll be looking out for signs about what to do and what not to do when I'm approaching an activity." (Participant 14)

"Because there's no point seeing it and then forgetting about it later on. You want to kind of get people in the moment." (Participant 15)

The preference for geolocation alerts was consistent with the preference to receive important information in the moment that was informative, useful and could be acted on immediately. The concept of geolocation links with the interoperability of a range of technology where this demographic could contribute to such as pinning road conditions and establishing 'geofencing' around local road conditions. However, unlike 'in the immediate area', there was an enforcement aspect to the messaging because it was perceived to be directed by authority, such as government. The enforcement aspect of the messaging was viewed differently: some participants were concerned that the method was intrusive, while others considered that it would be helpful because reinforced the message's importance.

I put 'public alert' as the next, but I think that it may not work if you get too many alerts because people will just get annoyed, and they just like delete them once they see it. (Participant 14)

I feel like if I got a government mandated message on my phone or something I would definitely notice it. 'Cause it feels like it's really important, rather than just something that you can ignore. (Participant 3)

Campaign frequency and unconscious inputs

'Frequently visited place' ranked fourth in campaign location preference. While multiple participants mentioned similar locations such as universities, cafés or their neighbourhoods, understandably the areas varied from person to person.

"If it's just in shops, there's a big sign, then I could just incorporate it into my everyday life, and then maybe enforce my thinking of maybe I should be more careful and be more alert." (Participant 17)

"Well just for me, 'cause I take public transport a lot, and when I see an ad on the light rail or whatever, like every day it's there, and every day I will constantly see it. And so it slowly gets in my brain, 'cause I was thinking about it, and I remember the ad in the tram right now, the AGL ad, so it's pretty effective." (Participant 2)

"So my number one was public transport. I think in Canberra we always see [the light rail]

going past, and buses are everywhere as well, and a nice big message on the side of a bus I feel like when you're stopped at a light, or see it going past, you sort of can't help but notice it."
(Participant 11)

Many participants reported spending a lot of time on social media platforms such as Facebook, Instagram and YouTube, which have spaces for advertising. Social media has been used by governments and other organisations to broadcast campaigns that target younger audiences. This method allows users to freely browse and consume content without the constraints of prescheduled content programming.

"I'm not going to hear them on the radio really or see them on the TV, 'cause I don't watch TV. Most people are on YouTube or Facebook or Instagram, TikTok, that kind of thing. So if that's the demographic you're targeting I think, even if they'll ignore, they'll definitely see it and retain that information." (Participant 1)

"Like apps or social media, I use most in like leisure time [so I put it] near the top [of the ranking activity]. So Instagram, TikTok, Facebook, things like that." (Participant 20)

However, the level of autonomy in social media browsing means that it is easier for campaign content to be ignored or deliberately skipped by users. Additionally, virtual private networks and ad blockers, which allow users to tailor their online experiences, means that there is a high probability that certain campaign won't reach the intended target audience.

"Well if it's on the phone I'm probably less likely to take it seriously, 'cause I think a lot of people are just used to swiping whenever they see things. You know, get it off the screen as soon as possible." (Participant 5)

"Putting the ads on YouTube, Instagram or TikTok would not be effective since again it's really easy to scroll past, and it won't target a large amount of audience." (Participant 9)

"In terms of Facebook and YouTube, I put 'em pretty low 'cause I only use 'em on my computer, and on my computer I use an ad blocker, so I would never see any ads there." (Participant 13)

"I put some of the leisure – more the social media [message locations] at the bottom, 'cause some social media are used for like other promotional stuff, other advertisements, which is not aligned with road safety." (Participant 16)

Participants reported that their social media use was typically for leisure and socialising, making it less likely that they would be immersed in road safety campaign messages via these channels. Even participants who ranked social media highly acknowledged that there was a high probability of a campaign being ignored. However, participants thought the exposure frequency social media affords was valuable, because they perceived that users might subconsciously notice and learn from the message, thus eliminating the need for any conscious effort to engage.

"Social media would be effective just because people use it so often, and so they would be seeing these messages more regularly. And I guess while they can scroll past it, it would be kind of just this constant reminder." (Participant 8)

"I think I'd prefer when I'm just walking around and then where there's a sign there I don't feel like – so it sort of inputs the message while I'm relaxing." (Participant 17)

"Also, radio's my second, because it's something in the background but then when you hear something that instructs you, you remember it." (Participant 12)

"Frequently visited places, I placed them relatively low on the list because I think it's not very pertinent to the situation, and after a while it just becomes background noise, where you do see the message, but you do not retain the information." (Participant 14)

These results are consistent with our earlier findings that participants require direct messaging that would enable them to take action immediately rather than having to notice and remember information or directives to apply in other future scenarios. While participants reported using social media frequently, the self-directed nature of the medium meant a high probability of ignoring or missing campaign messaging when compared with road safety advertising placed in specific locations during daily road use.

Conclusions

Taken together, the results of all studies revealed considerable diversity in the participants' opinions, preferences and experiences with regard to road safety campaigns. The research uncovered insights into the contexts that shaped participants' perceptions, attitudes and behaviours. Our findings suggest that to ensure strategic and targeted messaging that resonates with the 18–25-year-old demographic and creates the desired behaviour change, campaigns must relate to young adults' daily lives, be concise, highly targeted, and conscious of diversity. Factors such as local knowledge, cultural and personal dynamics, common sense and logic, as well as their experience as road users, influence young adults' responses to campaign messaging, and are therefore crucial considerations for campaign development.

Our findings highlight five elements that must be addressed to maximise road safety campaign effectiveness for young VRUs in the ACT:

- Duration of driving experience
- Type of road user
- Local knowledge and situational contexts
- Physical, ethnic and cultural depiction
- Reaching the 18–25-year-old demographic.

These insights are discussed in detail below, and recommendations are presented.

Duration of driving experience

The experience of the participants was a major factor in this study; our findings show a broad range of experience within the seven-year age span. Drivers with the least experience – probationary licence-holders – expressed that they were more likely to engage and respond to campaign messaging. They perceived the reason and enforcement campaigns as informative and educational, helping them to improve their driving and develop awareness of issues they were yet to experience. Some of these drivers perceived the negative campaign stimuli as effective motivators, because they constructed a narrative that included themselves in the campaign. They explained that they took a cautious approach to driving because they did not want to experience the scenarios depicted in the campaigns. In contrast, participants with more road use experience made more confident statements about their driving ability and were less affected by the threat and fear-based negative messaging styles, consistent with the literature (Tay, 2005, p. 947). However, all participants agreed that driving skills require ongoing practice acknowledging that they preferred messaging that could be acted upon immediately. Consideration of these issues resulted in development of the following design recommendations:
- Images and/or textual messages must be adapted for different levels of driver experience to motivate ongoing learning and awareness
- Messages must be actionable and educational.

Type of road user

Participants identified themselves as drivers, pedestrians, cyclists, motorcyclists or a combination of these categories. In addition to their preferred road use modality, all participants were pedestrians, and as such, we believed campaign stimuli targeting pedestrians would have engaged all participants. However, in reality the participants' identities were strongly linked with the type of vehicle they used most; they tended to overlook their roles as pedestrians.

In viewing campaign stimuli that involved drivers and pedestrians, the drivers among the participants took a driving perspective. Likewise, cyclists focused on the campaign stimuli relevant to cyclists, and patterns were similar among motorcyclists and pedestrians. Deviations from this pattern occurred only when there was a point of familiarity in the campaign stimuli; for example, a driver who focused on a cyclist in one image did so because she 'looked like them', so they could mentally place themselves in the scenario.

Participants who identified as pedestrians focused on pedestrian campaign stimuli and viewed any messaging from drivers', cyclists' or motorcyclists' perspectives as largely irrelevant. Nevertheless, they had empathy with some scenarios due to experiencing road rage, distracted driving or anti-social driving behaviour while being passengers in vehicles. Again, the ability to relate a scenario to daily lives and experiences influenced the importance or relevance of the campaign messaging for individual participants.

The participants perceived a hierarchy of responsibility on the road, with drivers perceived as bearing the most responsibility. Interestingly, cyclists were the most critiqued. Drivers implied cyclists did not abide by the road rules, while pedestrians regarded them as annoying. The participants discussed unconscious biases such as these as they emerged, highlighting assumptions tied into the identity associated with road user type. These insights informed the following design recommendations:

- Campaign imagery and textual messaging must be both specific and use a range of characters representative of different road users
- Campaigns must include imagery and textual messaging that can demonstrate multiple points of view
- Messages must relate directly to recipients' actual activity as road users
- Novices and experienced road users need different types of messages.

Local knowledge and situational contexts

Local knowledge and situational context were significant factors in perceived campaign effectiveness. Our participants wanted up-to-date information that could be actioned immediately. As discussed above, participants often pictured themselves in the scenarios presented in the campaigns; communications that coupled this with local knowledge and sometimes hazardous road conditions were the most compelling. In discussions, participants highlighted specific road issues, particularly in the ACT, whether it was a dangerous crossing, roundabout, or an unsafe section of road. Drivers spoke of specific locations or landmarks relating to these spots, while pedestrians and cyclists spoke of 'near misses' in the ACT CBD, particularly on Bunda Street. However, when using those locations in the campaign stimuli, it emerged that locations are described in a localised way. The campaign imagery of a cyclist with the headline 'I nearly hit a pedestrian at Bunda Street. Watch out for them' was criticised by ACT participants, who explained the phrase should have been 'on' Bunda Street not 'at' Bunda Street, highlighting the nuanced communication about the local area. If this is incorrect, the local young road user community perceive it as unauthentic. Furthermore, there was a shared perception that if a law was perceived as irrelevant in the local context it would be ignored, an example being jaywalking. The participants, particularly students (international and local), stated that the low traffic density in Canberra meant jaywalking was common; as such, they were quite open about disregarding the law, crossing roads at will to reach shops or bus stops. This localised knowledge assisted the development of communications that could be actioned 'in the moment', which was found to be highly relevant to the participants' context. However, the nuances of the location and the way in which it was discussed were perceived as being critical for relatability. In response to these findings, the following recommendations were created:

- Develop a resource that collects perceptions of young drivers in relation to road users and real time discussion of road use, road safety and road conditions
- Develop authentic tone of voice pertinent to this group
- Campaign imagery and messaging must speak directly to members of the target group in their immediate surrounds
- Locate communications in the immediate area of ACT to maximise their likelihood of influencing behaviours
- Scenes and scenarios must involve identifiable locations familiar to the viewer.

Physical, ethnic and cultural depiction

The study engaged with young professionals, tradespeople, students (international and local) and part-time and full-time workers. All these people brought to the discussion the diversity of their backgrounds, likes and dislikes, and road use behaviours learned from living in other countries. Those factors alone highlight the complexity of creating campaigns that are relatable to a broad demographic such as 18–25-year-old road users in the ACT, and how to ensure the messaging resonates with them. This insight is broad and requires further research, but in the short term it informed the following design recommendations:

- Campaigns must communicate the responsibility of users for road safety
- Campaigns must represent and communicate effectively to a diverse range of road users and road use experiences
- Campaigns must have multiple narratives that communicate the same idea to appeal to a diverse range of road users and road use experiences
- People in campaign images must be relatable and identifiable (don't use close crops of hand/feet, let the viewer see the 'whole person').

Reaching the 18–25-year-old demographic

The results show both reason and enforcement type messages as the preferred messaging tone. A number of the participants preferred a negative tone while others preferred a more positive and informational message. This reflects the findings in the literature, which show dividing opinion on the efficacy of negative appeal in campaigns. Some studies connect overused/frequent negative appeal campaigns with psychological impacts that invoke self-protection and inaction (Brennan & Binney, 2010). However, there is also debate about whether this strategy motivates necessary real-life action (Witte & Allen 2000) and better efficacy in general (Giachino et.al., 2017). This uncertainty about the psychological response triggered by negative appeals (Carey & Sarma, 2016) makes it essential that negative messages show possible negative consequences while accompanied by logic and informative-based messages. The 18–25-year-olds in the ACT preferred concise messages, realistic and relatable campaign images, and strategically placed campaigns for immediate action. Significantly, while they preferred an instructive messaging type that employs enforcement and reason, they wanted holistic communications using their own and their peer's voices. They did not want to be patronised – they wanted to be acknowledged as adults on their ongoing journey and needed relatable communication that was pragmatic and useful.

The preference for geolocation alerts was consistent with the preference to receive important information in the moment that was informative, useful and could be acted on immediately. While this is a critical method of reaching this demographic, the technical requirements of geolocation alerts is beyond the scope of this study and is worthy of another project that explores the interoperability of networked technologies and its dissemination through social media channels.

Our findings showed that this age group rarely watches television and is more likely to engage with behaviour change campaigns in situ – frequently visited places such as public transport and digital social networks. Therefore, this study highlights the need to shift away from traditional big-budget advertising and instead consider how road safety campaigns can be integrated into the local road use environment. It must also respond to the unprecedented growth of social media, which is often mentioned in relation to targeting younger audiences (Prades & Montagut, 2015, p. 255). However, social media must be used carefully given that campaign messaging can be filtered, skipped or ignored. While there is still room for traditional campaign elements, such as posters and short TVC commercials, these are only part of a complex system of communication that can be rolled out across multiple media formats. Therefore, our final design recommendations for a road safety campaign targeting 18–25-year-olds road users in the ACT are:

- Develop a multifaceted project brief that is implemented across public transport, adshels (poised for risk scenarios), uses geo-location-based messages and advertising space in social media, amongst other formats
- Establish a system that invites 18–25-year-olds to comment on road issues to inform campaign messaging and enable it to be reliable, recent and in the target audience's own voice
- Develop ongoing narratives that evolve over time and 'nudge' the demographic continually without being obtrusive or overbearing.

As part of our research, we have refined the campaigns developed for study 3 based on the participants recommendations. The design briefs developed for this revision can be found in Appendix 2 and the exemplar campaigns and guideline in the next section.

Future research

Our research was conducted during the 2020–21 COVID-19 pandemic and was restricted by lockdowns in Victoria and the ACT. While were able to conduct eye-tracking research in the ACT between lockdowns, we were unable to observe VRU road use behaviour in situ. Future research could examine specific road safety issues in the Canberra area, and road safety messaging and campaigns could be developed in consultation with VRUs to increase their effectiveness. That approach could target specific locations and use local knowledge to understand and describe the road safety issue in ways that are relatable to the impacted VRUs.

Given the challenges of capturing VRUs' attention with road safety campaigns and their preference for direct and targeted messaging that enables them to act immediately, future research should consider the role of technology in helping VRUs moderate and modify their road use behaviour through greater awareness of their actions and attitudes. Separate studies in the following areas would further advance knowledge of the 18 – 25-year-olds and methods to influence positive road use behaviour:

- Advanced vehicle dashboard technology such as [CAR]A (Car + Advantage) that can be used to measure, monitors and mentor young drivers via access to telematics (Empowr Mobility).
- Geolocation alerts/'geo-fencing' that communicate changed road conditions to young drivers and VRUs. This technology can be used for all VRUs, not just drivers.
- All posters could include sensors that nudge users with additional prompts to promotes ongoing road use awareness and improvement.

Campaign Toolkit & Guidelines

VRU Design Toolkit

To guide future road safety campaigns targeting VRU audiences in the ACT, a design toolkit was developed to provide key insights and recommendations.

Insights

1. **Audiences' road experience influence campaign effectiveness**
   A road user's experience will directly influence their road use confidence level and level of engagement with road safety messages. Road safety campaigns should consider distinct types of messaging to appeal to novice road users e.g., learner driver or probationary license, and more experienced road users e.g., full-licensed driver, experienced cyclists. For example, a campaign targeting a novice road user could remind them about the road rules, while a campaign targeting an experienced road user could remind them about the dangers of complacency.

2. **Effective campaigns target the relevant road users**
   An effective road safety campaign will target the relevant road users. For example, in the case of shared road use involving drivers, cyclists and e-scooter riders, it would be essential that the campaign represented all those user groups. This helps an audience understand the roles and responsibility of the different road user groups, as well as promoting an understanding of shared responsibility when using the roads.

3. **Audiences respond to local knowledge and situational context**
   Campaigns that include local knowledge and context such as vernacular, places and images of relatable people will resonate with audiences. When an audience can identify themselves in the messaging scenario being presented in a campaign, they are more likely to relate to it and consequently act appropriately in response to the messaging

4. **Campaigns must be inclusive and represent diverse groups**
   Campaign images of road users, which will ideally be photographs, must include a range of people including, people of different ethnicity, cultures, gender identity, and socio-economic groups. For people to relate to a campaign messaging scenario they must first be able to identify themselves in it.

Table 2: *Final Campaign Images*

	Inexperienced	Experienced
Targeting cyclists about pedestrians		
Targeting cyclists about cars		

Message Style

Messaging that combines enforcement appeals and reason appeals, and which focusses on the negative consequences of certain road use behaviour resonates with the audience. We recommend clear and actionable messages that are constructed to be both cautionary yet actionable.

Message Length

Short, clear, direct, and concise messages are recommended to optimise audience attention and behaviour change. Previous research has shown that road users can read only 3-4 words in a single glance at a sign. While it is essential that a campaign message includes all the necessary information, concise and straightforward text is advocated for a quicker reading times and message comprehension. Shorter reading times are preferred by audiences' because they support prompt action.

*Experience level is not applied to images targeting pedestrian, as every pedestrian considered equally experienced.

** Instead of experience level, a variety of subjects can be used under the same message to ensure both relevance and inclusivity.

Experience level irrelevant*

Targeting pedestrians about cars

*** multiple variant of subjects applied*

Message relatability

Campaign messaging, including images, must be relatable to the audience. The audience must be able to identify themselves with the messaging scenario, including the scenario itself e.g. be cyclist themselves, as well as identify themselves physically within the images e.g. have the colour hair, or similar clothing clothes etc. This might to lead multiple images being used for the same campaign as shown on examples for 'campaigns targeting pedestrians about cars' above**.

Image

Campaign messaging, including images, must be relatable to the audience. The audience must be able to identify themselves with the messaging scenario, including the scenario itself e.g. be cyclist themselves, as well as identify themselves physically within the images e.g. have the colour hair, or similar clothing clothes etc. This might to lead multiple images being used for the same campaign.

Inexperienced		Experienced	
Targeting motorcyclists about cars			
Targeting drivers about pedestrians			
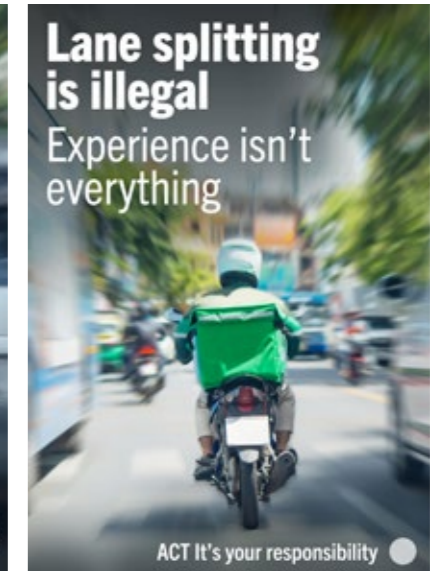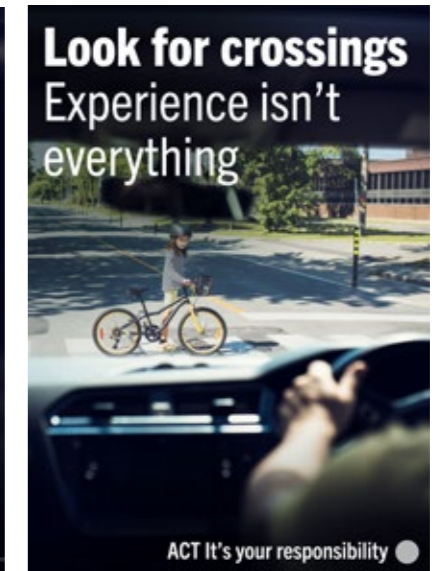
Inexperienced		Experienced	

Targeting drivers about cyclists
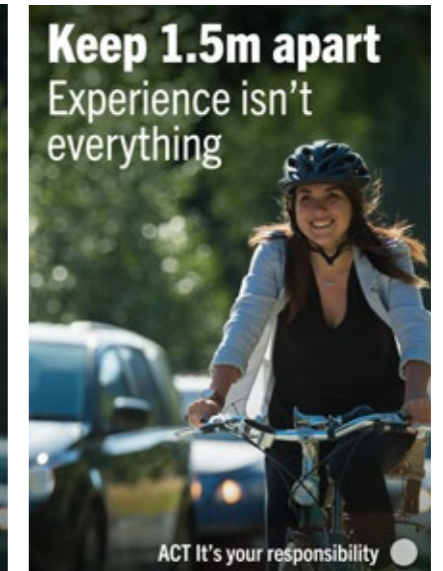
Targeting drivers about motorcyclists

Action line
Tagline

ACT It's your responsibility ⬤

Action Line
Tagline

ACT It's your responsibility ⬤
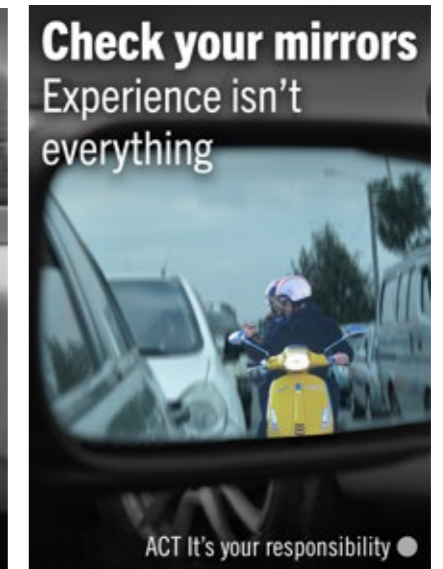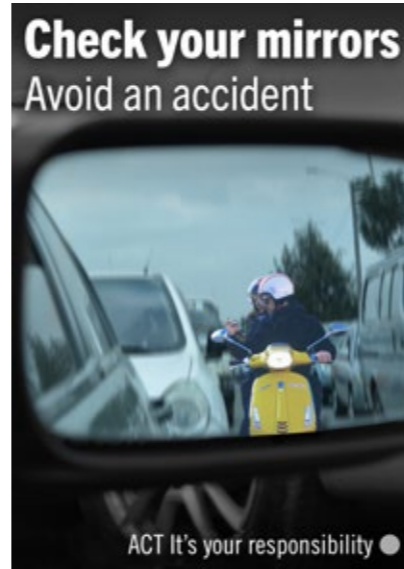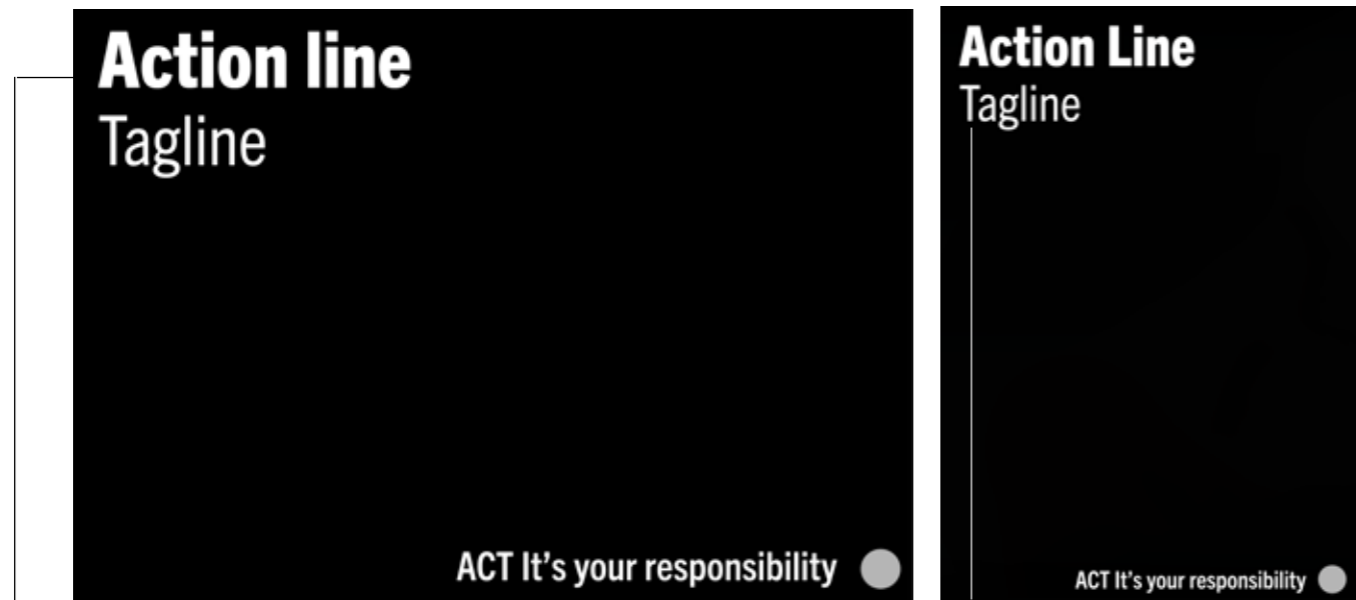
Trade Gothic Next LT Pro
in heavy condensed

THE QUICK BROWN FOX JUMPS
OVER THE LAZY DOG
the quick brown fox jumps over the
lazy dog

Trade Gothic Next LT Pro
in condensed

THE QUICK BROWN FOX JUMPS
OVER THE LAZY DOG
the quick brown fox jumps over the
lazy dog

Typography

We recommend the use of sans-serif typefaces such as Trade Gothic Next which is available in Adobe fonts under both personal and commercial license. Sans serif such as Highway Gothic and Clearview Signage, are used for road-sign designs in many countries (Dobres et al., 2017). These typefaces have proven to be superior in legibility when compared to serif style, especially when positively contrasted against backgrounds (Centre for Inclusive Design and Environmental Access, 2010). To further support legibility, we recommend to use semi condensed typeface and that type not be set in all uppercase letters, which can make differentiating letter or character forms difficult (Bertucci & Crawford, 2015).

Layout

To ensure message legibility and reading ease we recommend simple layouts that include:
· Ensure the campaign message is located on the top left of the design to aid reading ease and time
· The contrast between the type and the image must be maximised to aid reading ease and time
· Consider bold, high-contrast type to ensure legibility particularly for designs with busy backgrounds. In case of busy background, use vignette to ensure that the message remained legible.
· Use negative space to assist the audiences' conceptual thinking. Negative space provides a 'break' between objects giving the audience 'clear space' to consider the relationship between objects, the messaging meaning and narrative

In Immediate location

Immediate location means campaign image placement that triggers targeted audience into immediate action. The suggested placement includes the outside of public transport.

While the example of billboard is not shown since its use is not allowed in ACT, the importance of strategic campaign placement could mean that some exemption should be considered for non-political and non-profit campaign messages.

Figure 9. Campaign mockup on the back of the bus

Figure 10. Campaign mockup on the side of the bus
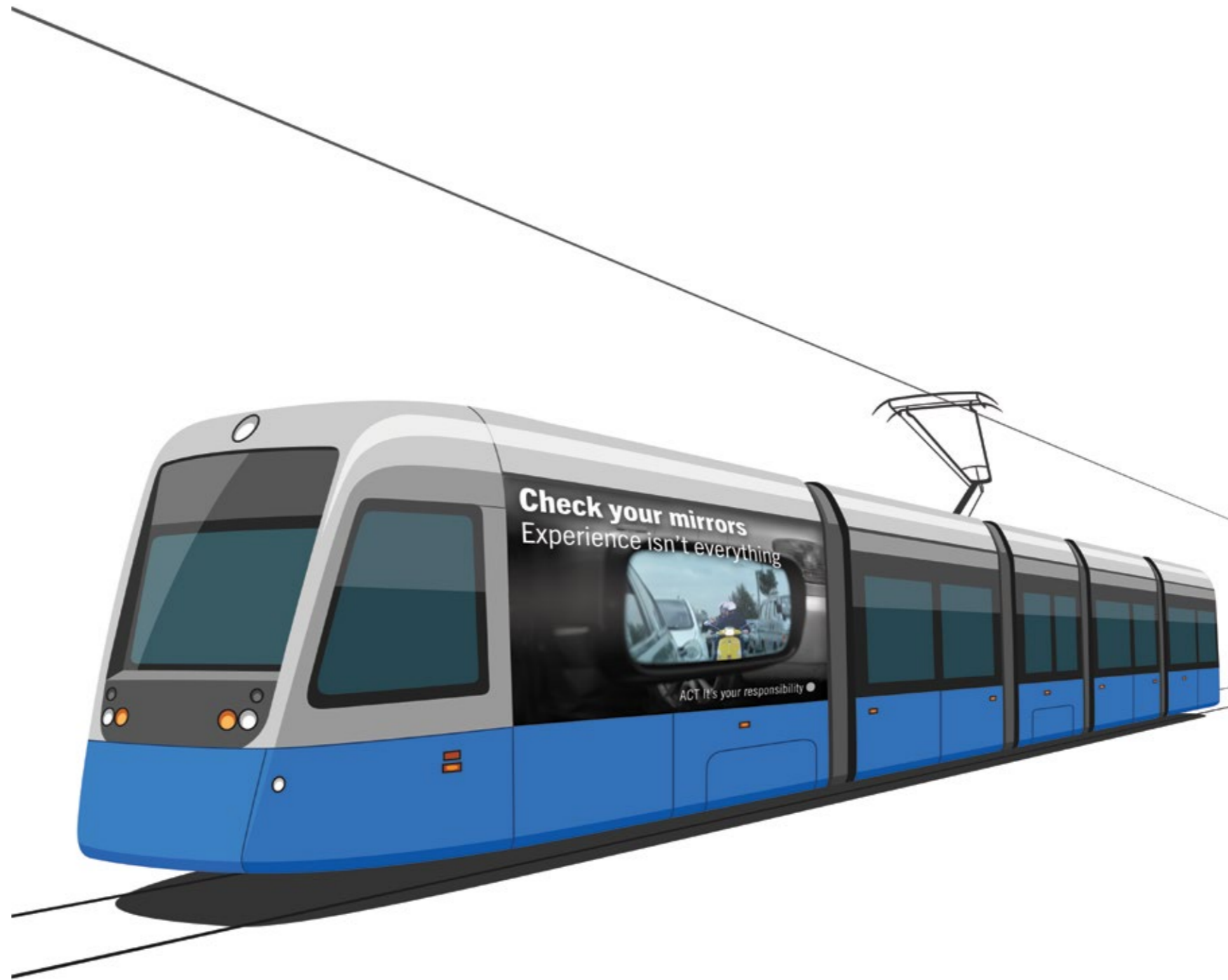
Figure 11. *Campaign mockup on tram (outside)*

Frequently visited places

This section includes samples of campaign placement in places frequently visited by target audience of the campaign, which include:

1. Tram, light rail and bus stops
2. The inside of public transport
3. Frequently visited social spots
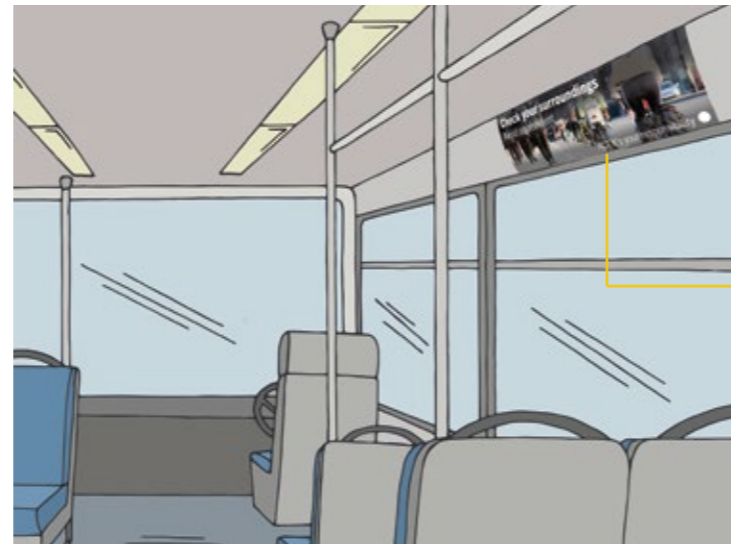
Figure 12. Campaign mockup on the inside of the bus

Figure 13. Campaign mockup on the inside of the light rail or tram

Figure 14. Campaign mockup on tram or light rail stop (1)

Figure 15. Campaign mockup on tram or light rail stop (2)

Figure 16. Campaign mockup inside a cafe

Social Media Roll Out Recommendation

Included in this report are a short social media roll out and planning which was based on the findings from our participants and the Australians' youth social media habit taken from yellow.com.au (2020).

Our Main Recommendations:

• Use Instagram as the primary hub, as it is the most common platform used by the age group.
• Branch out to Facebook in order to broaden the scope of content and following.
• In Instagram you can share content via an organization page (Instagram feed and story) and paid advertising which are highly recommended to ensure that the message is reaching wider-audience more effectively.

Recommendation for Instagram Feeds, Story and ads:

• **Aim for regular posting** in order to gain a following and trust, post on the main Instagram feed 3 times a week and aim to post daily content on Instagram stories (see figure 19). fifty-five percent of Australian younger generation shows to be checking their social media at least 10 times a day (Yellow, 2020). Posts should also be matched into the most popular times for social media use are both first thing in the morning, during lunch break and in the evening before bedtime (Yellow, 2020).
• Use **industry contacts** to share our content across their social media accounts to attract a following.
• Interacting with your audience allows you to gain an insight into what issues are bothering them and in turn how a road safety campaign can be targeted to them. Therefore, the content should also be relatable and motivate interaction.

Evaluation

In order to ensure the effectiveness of using social media/Instagram in this way, evaluating the effectiveness of posts is crucial. This can be done by looking at the progression of follows and the content receiving the most likes and comments. Constant reflection on what worked best for the audience should be considered when updating the social media content. Generally the posts should shift to the most effective content that is engaging the audience.

Content example:

• Post current issues effecting ACT road users
• Pose questions to your audience:
  e.g. What areas of the roads in the ACT affect you?
• Post traffic/road updates onto Instagram stories as they happen, meaning the young road users stay informed about the road conditions as they occur.
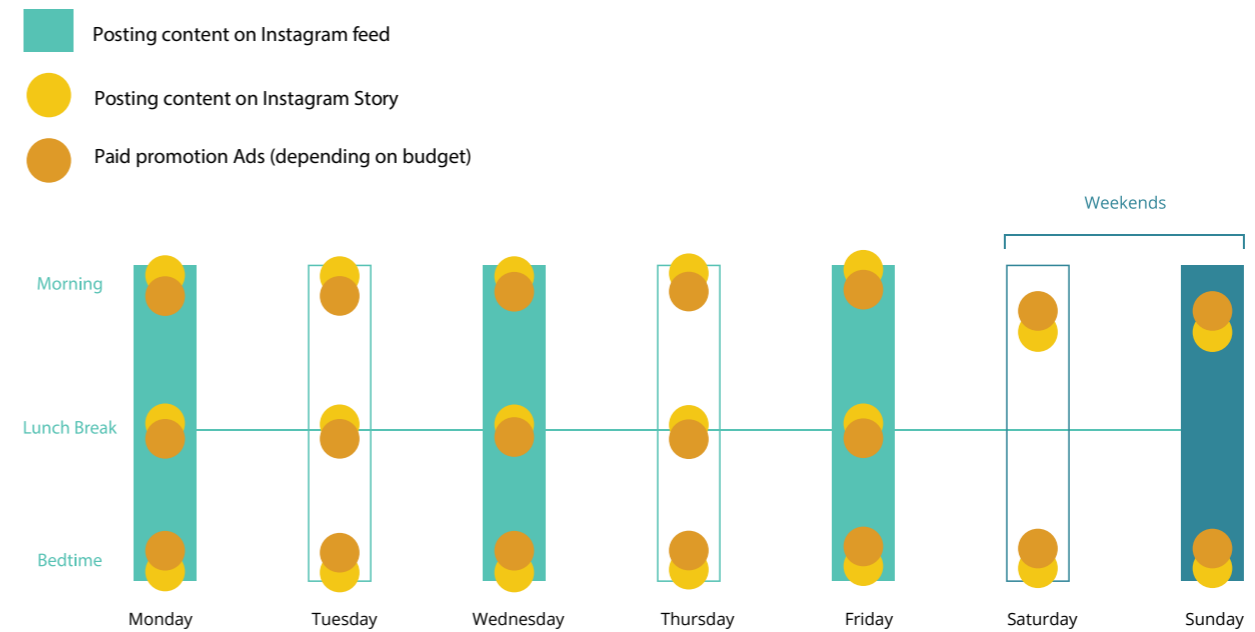
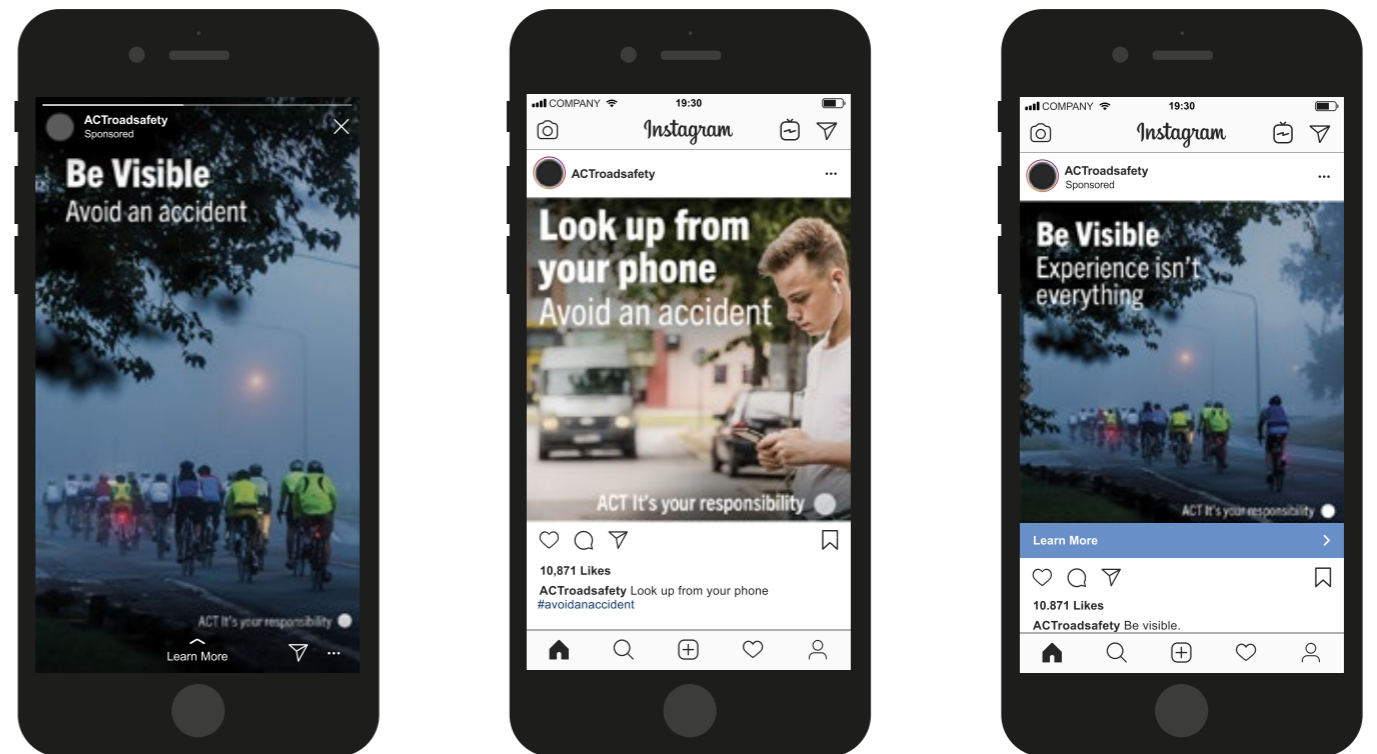**Figure 17.** *Social media roll out visualisation*

Figure 18. *Instagram story, Instagram post and Instagram ads sample.*

Limitation

For the benefit of the research report, the design recommendations outlined here were implemented in the design exemplars provided. However, due to the COVID restrictions in place at the time of the study, the design team were unable to undertake photography and had to rely on purchased stock photography, which limited the potential of the design outcomes. The images included in the exemplars were purchased from creditable stock photography libraries with the appropriate licenses. If the exemplars were to be implemented in a state-wide road safety campaign, a separate set of licenses would need to be purchased. Alternatively, we recommend that the ACT Government commission photography that would appropriately capture local ACT road use contexts and scenarios to ensure that the campaign was relatable to ACT audiences.

Licensing detail for images

Images used in the campaign were purchased through Istockphoto.com with a standard license. For licensing detail please refer to the license agreement listed on:
www.istockphoto.com/legal/license-agreement

For the list of images we use in the final image please refer to the stock photo reference list (p.49).

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Stock photo ID:1247810417
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Study 1 Eye-Tracking Stimuli and Result

REASON

Pedestrian
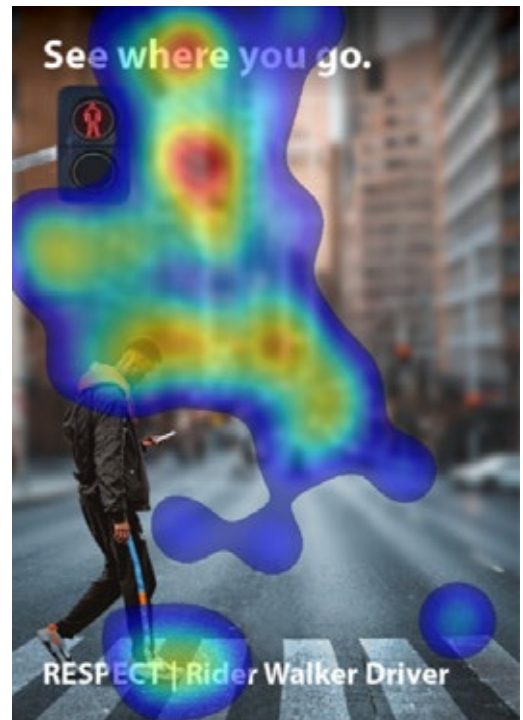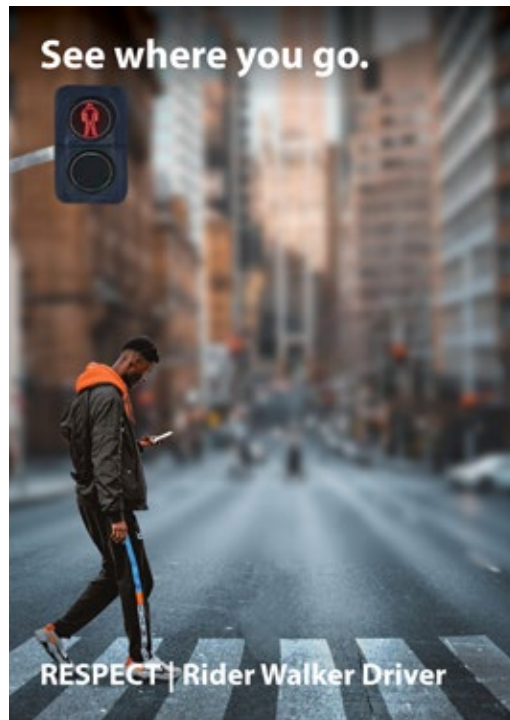
Cyclist
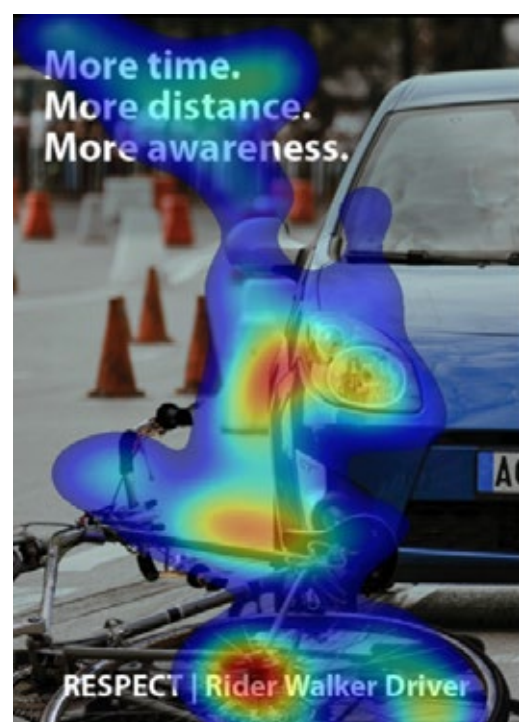
Study 1 Eye-Tracking Stimuli and Result
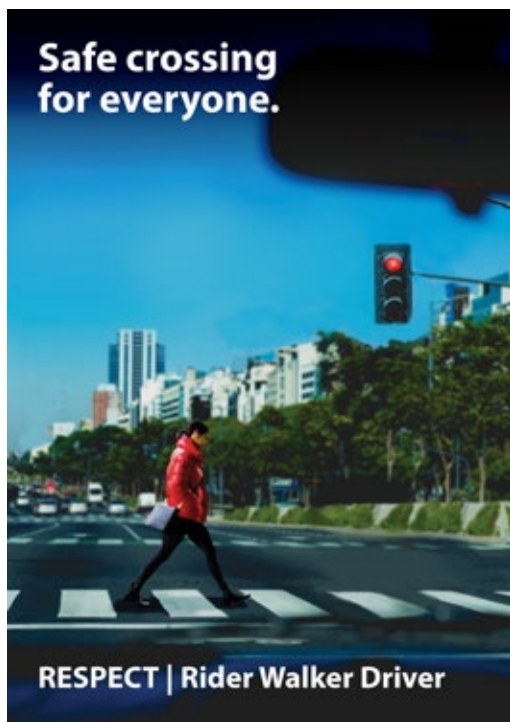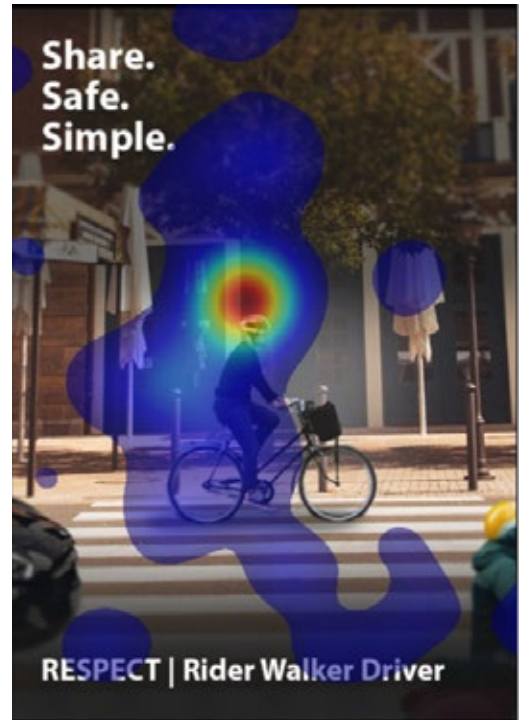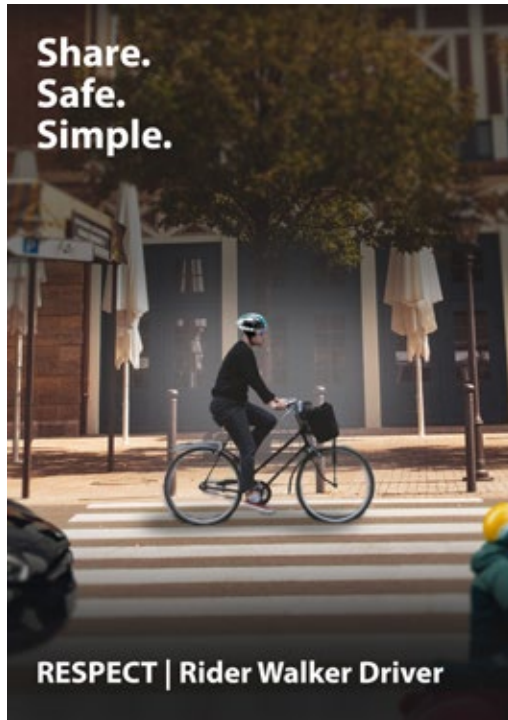
REASON

Motorcycle
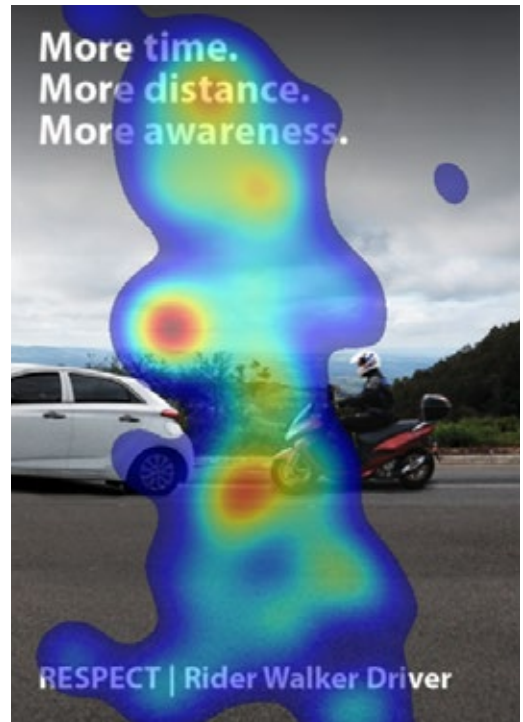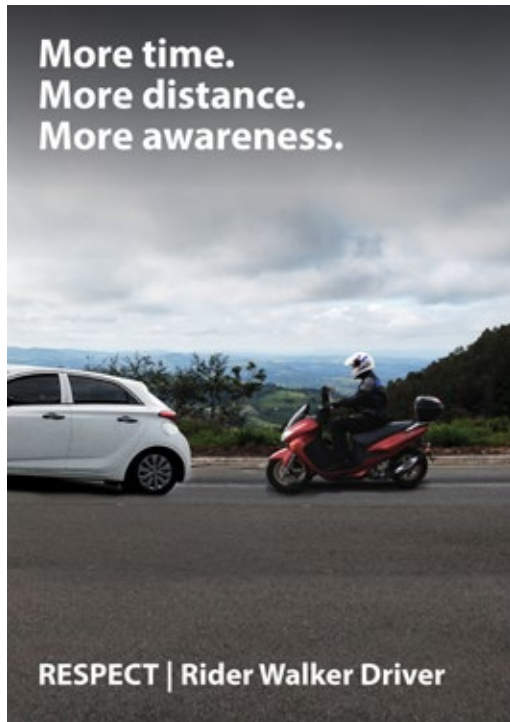
POSITIVE MESSAGE

Pedestrian
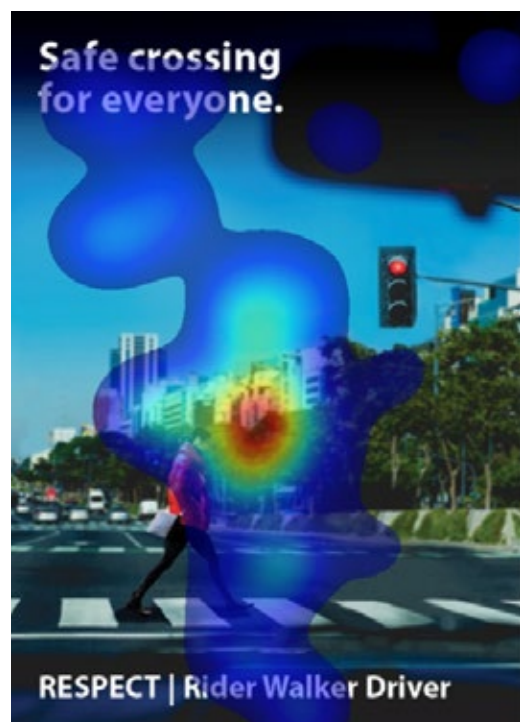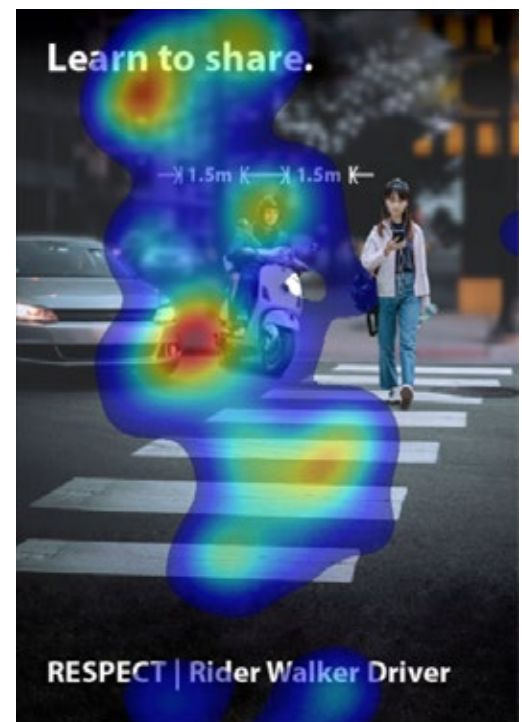
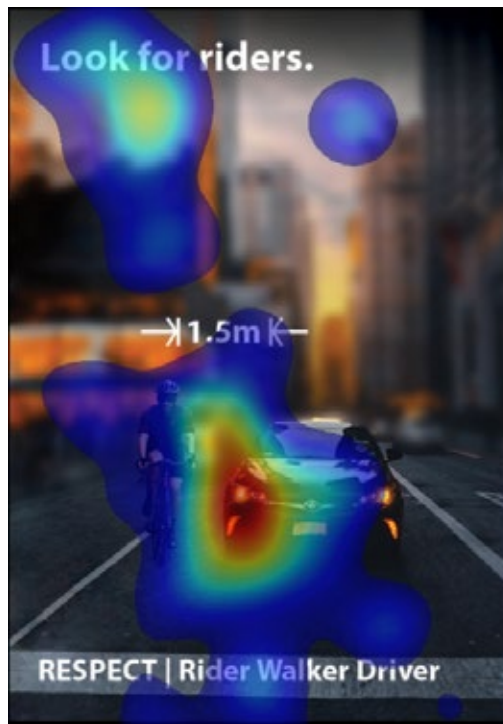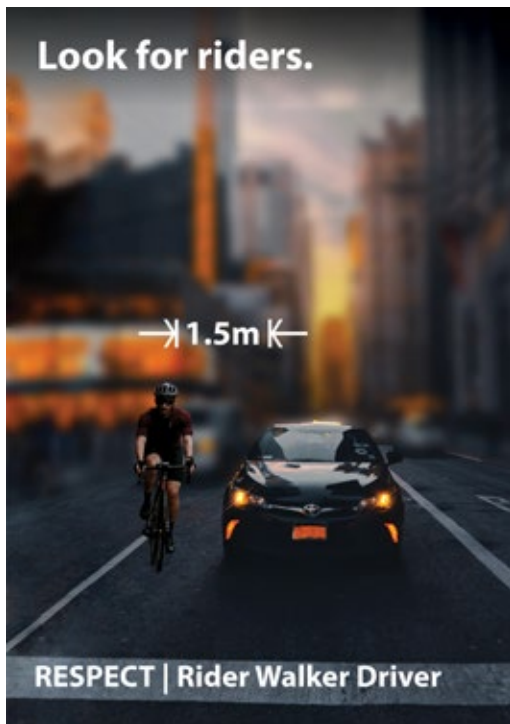## Study 1 Eye-Tracking Stimuli and Result

POSITIVE MESSAGE

Cyclist

Motorcylist

Study 1 Eye-Tracking Stimuli and Result
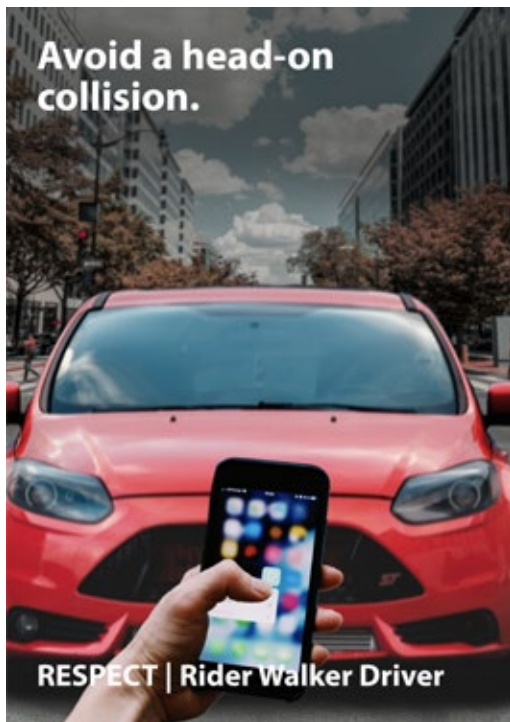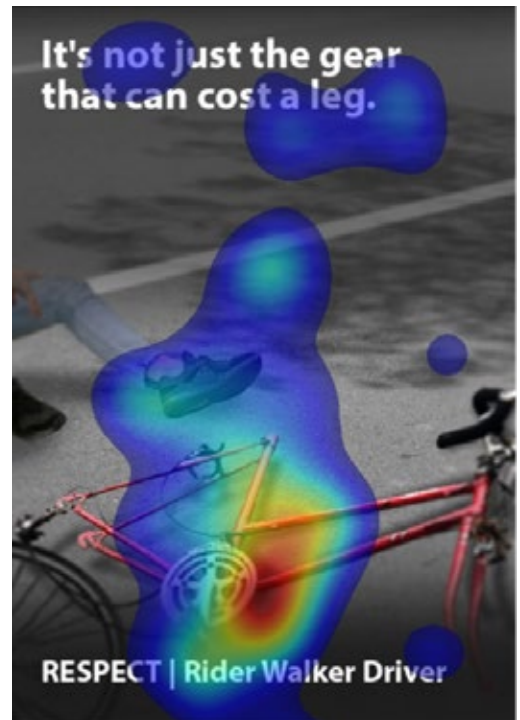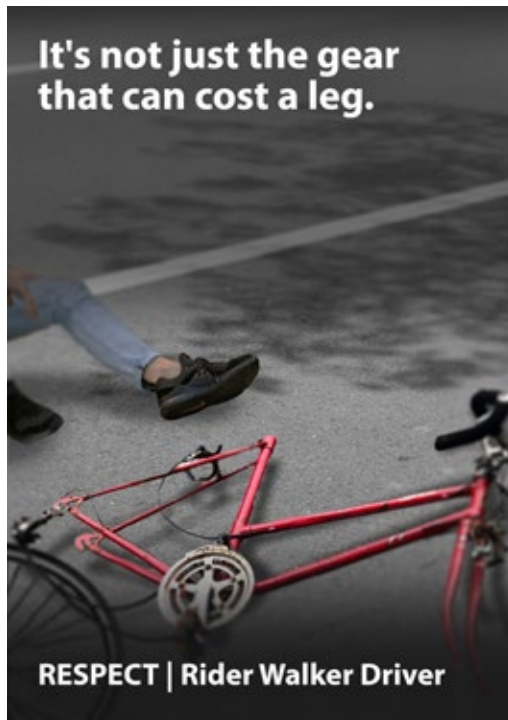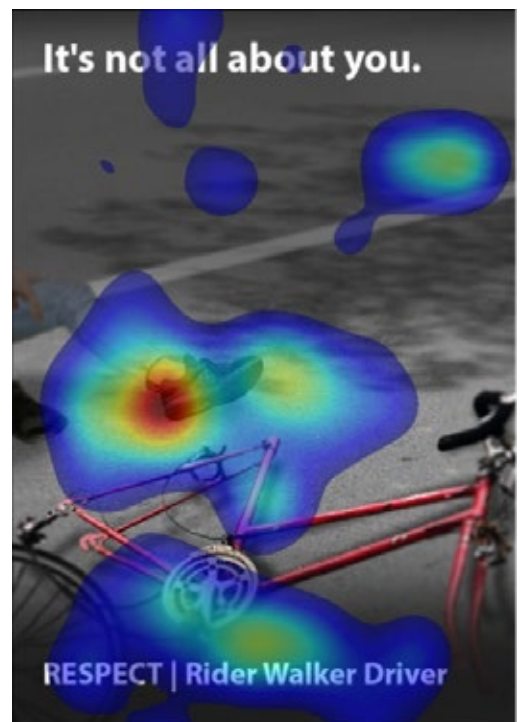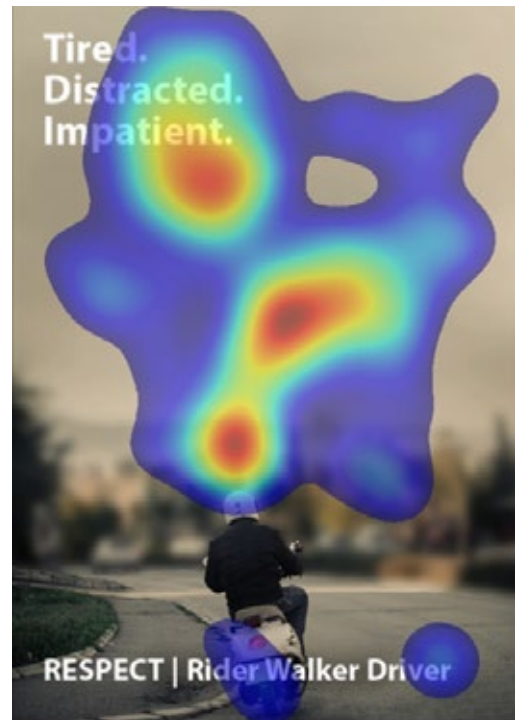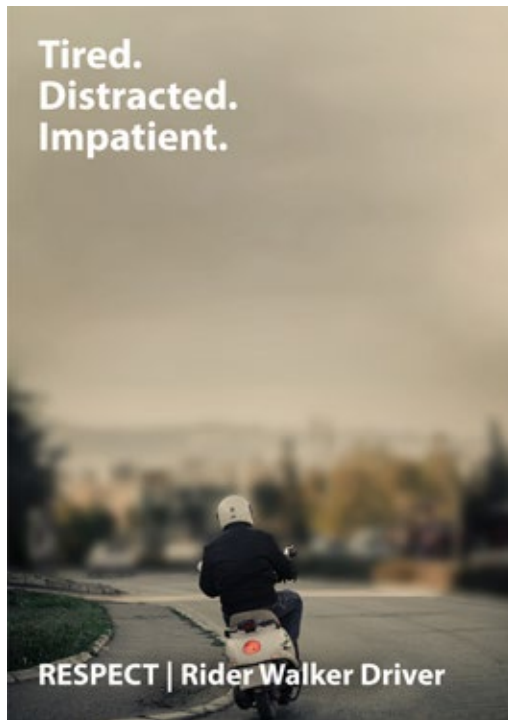
POSITIVE MESSAGE

Driver

NEGATIVE MESSAGE

Pedestrian

Study 1 Eye-Tracking Stimuli and Result
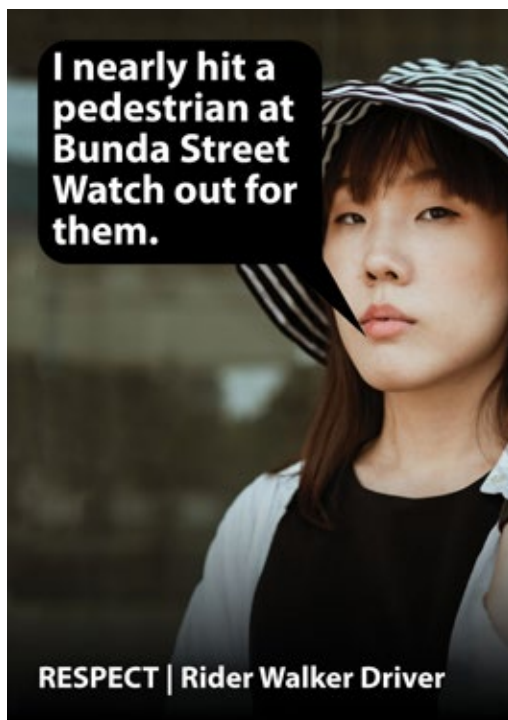
NEGATIVE MESSAGE

Cyclist

Cyclist

Study 1 Eye-Tracking Stimuli and Result

NEGATIVE MESSAGE

Motorcyclist

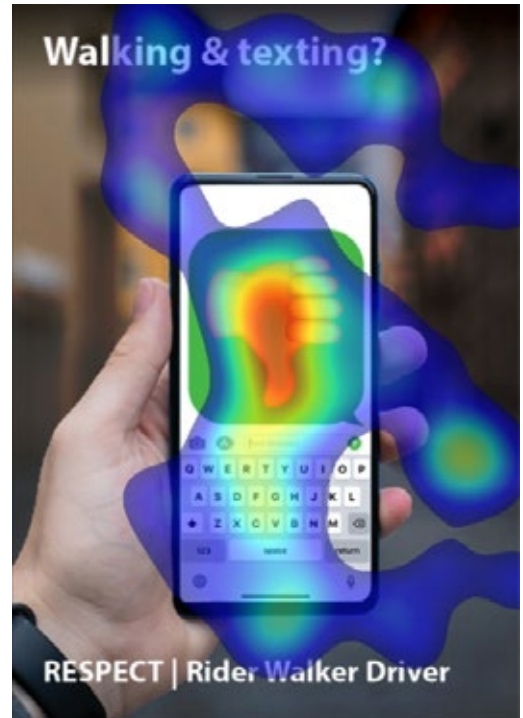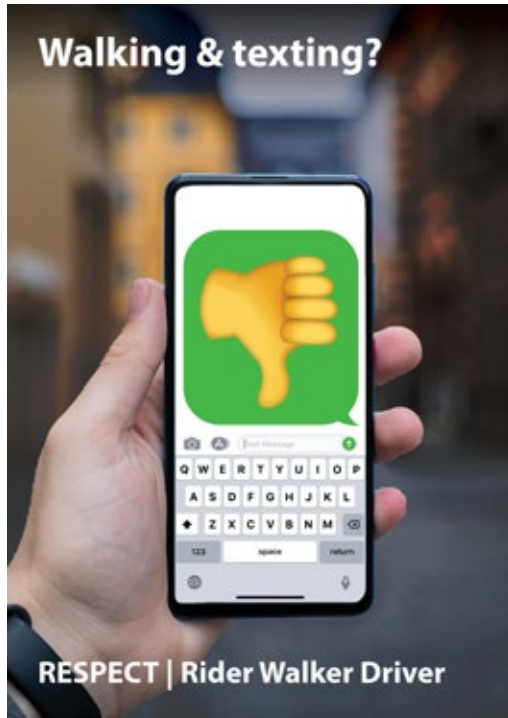
Driver
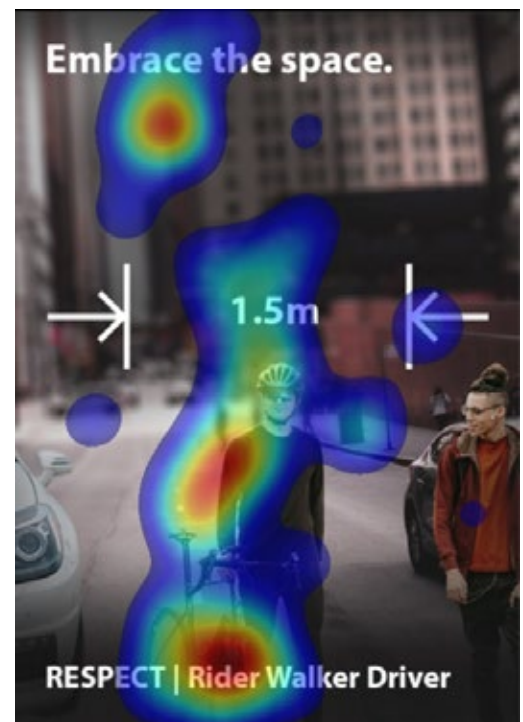
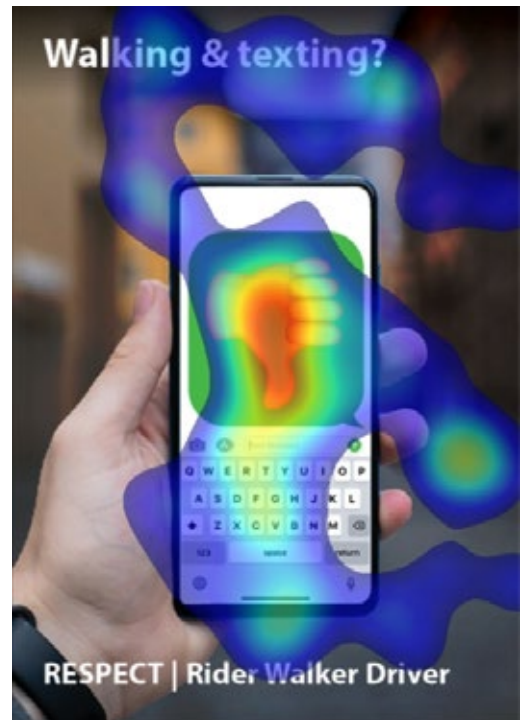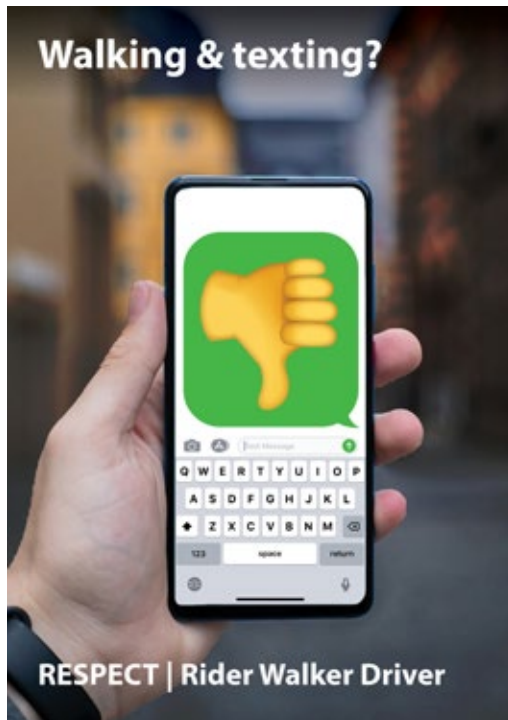## Study 1 Eye-Tracking Stimuli and Result

HUMOUR

Pedestrian

Cyclist
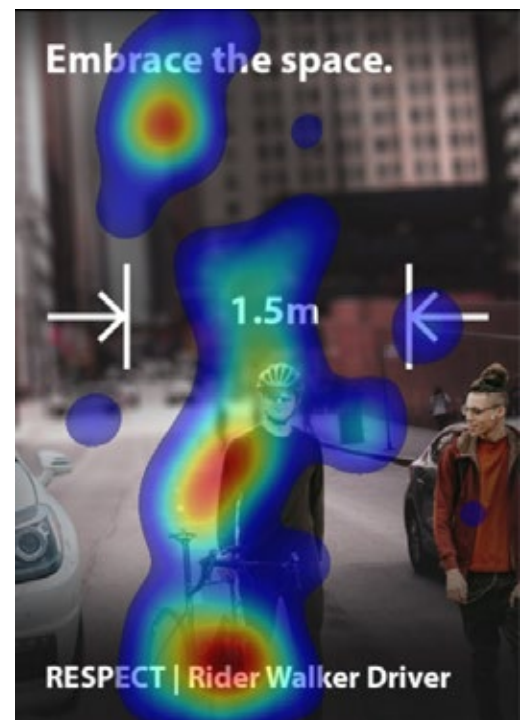
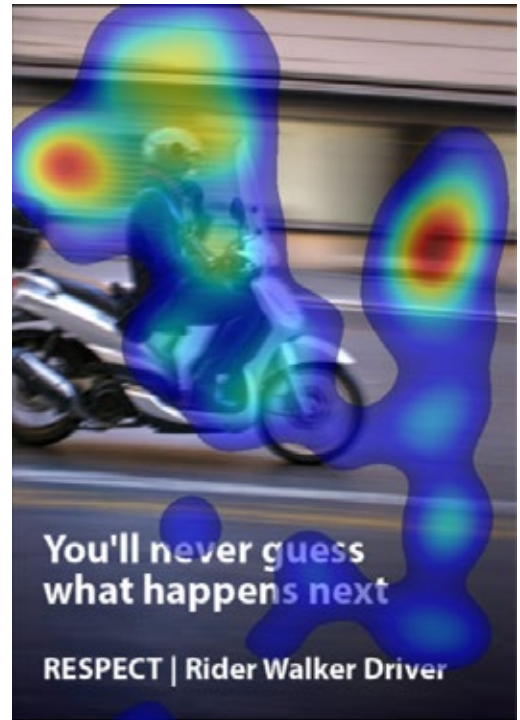## Study 1 Eye-Tracking Stimuli and Result

HUMOUR

Pedestrian
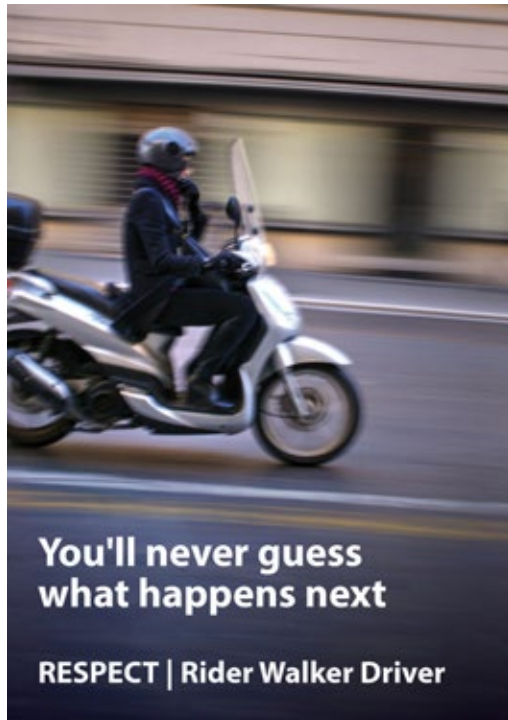

Cyclist
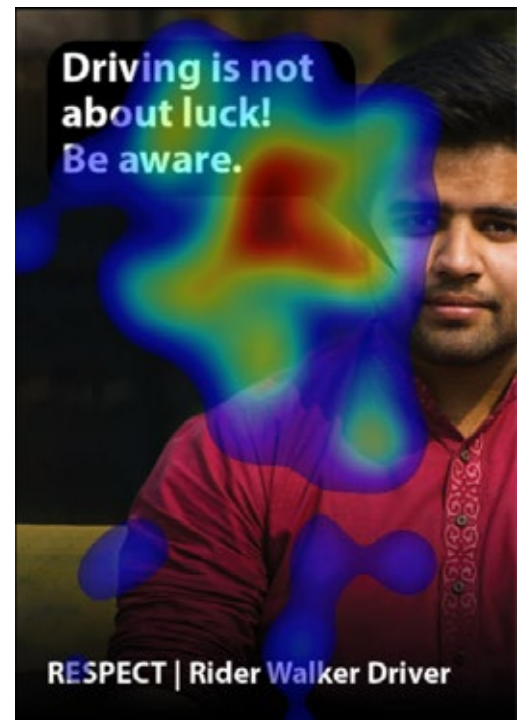
Study 1 Eye-Tracking Stimuli and Result

HUMOUR

Motorcyclist

Driver
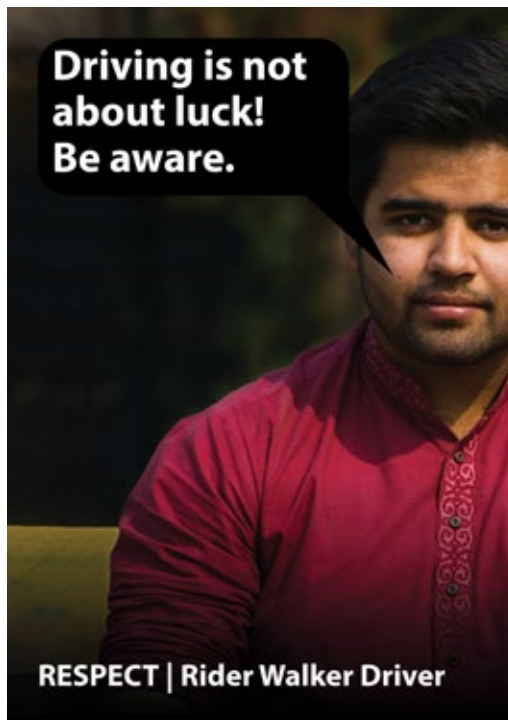
Study 1 Eye-Tracking Stimuli and Result

ENFORCEMENT

Pedestrian

Cyclist
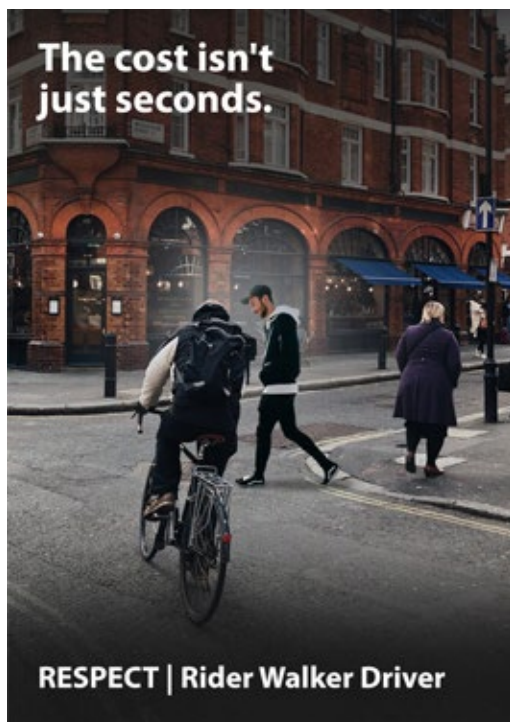
Study 1 Eye-Tracking Stimuli and Result

ENFORCEMENT

Motorcyclist
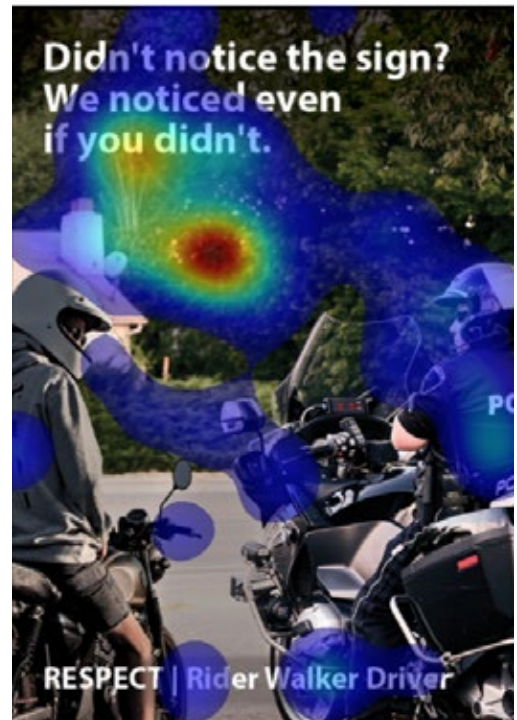
Driver

Study 2 | Self Reported Rating (Revised)

Study 2 Campaign Ratings ACT
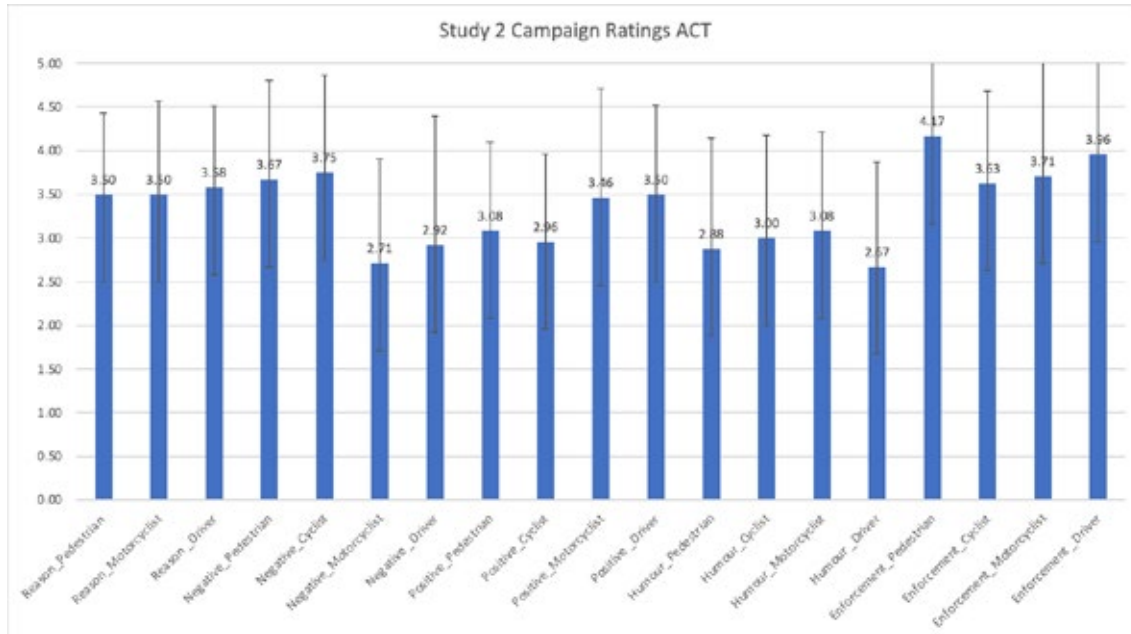
ACT ratings		
Reason_Pedestrian	3.50	0.93
Reason_Motorcyclist	3.50	1.06
Reason _Driver	3.58	0.93
Negative_Pedestrian	3.67	1.13
Negative_Cyclist	3.75	1.11
Negative_Motorcyclist	2.71	1.20
Negative _Driver	2.92	1.47
Positive_Pedestrian	3.08	1.02
Positive_Cyclist	2.96	1.00
Positive_Motorcyclist	3.46	1.25
Positive _Driver	3.50	1.02
Humour_Pedestrian	2.88	1.26
Humour_Cyclist	3.00	1.18
Humour_Motorcyclist	3.08	1.14
Humour _Driver	2.67	1.20
Enforcement_Pedestri	4.17	1.13
Enforcement_Cyclist	3.63	1.06
Enforcement_Motorcyc	3.71	1.30
Enforcement _Driver	3.96	1.16

Study 2 | Self Reported Rating (Revised)

Study 2 Campaign Ratings Victoria
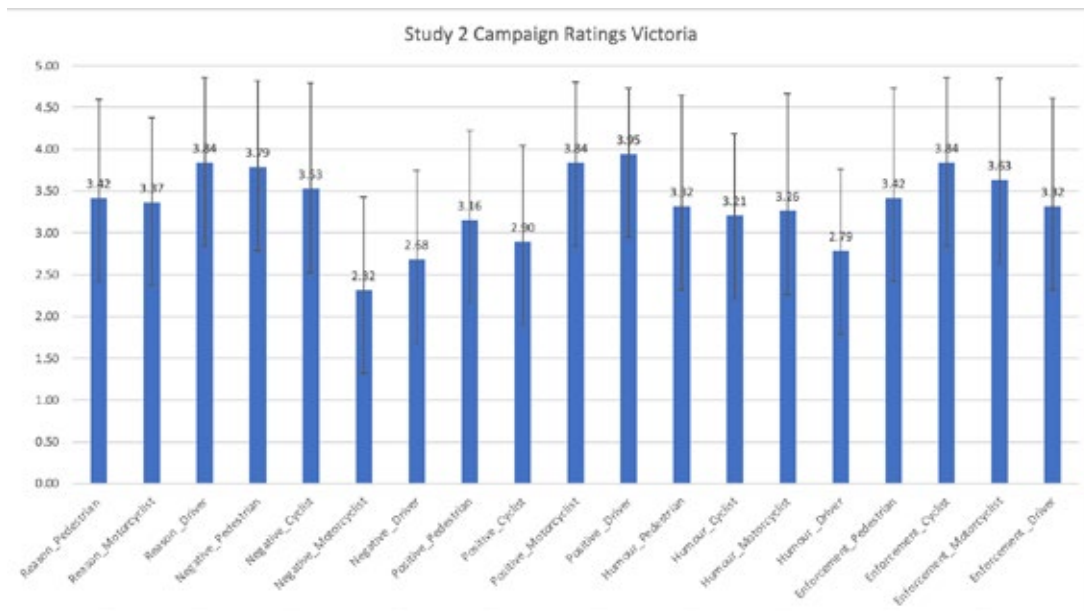
Vic ratings		
Reason_Pedestrian	3.42	1.17
Reason_Motorcyclist	3.37	1.01
Reason _Driver	3.84	1.02
Negative_Pedestrian	3.79	1.03
Negative_Cyclist	3.53	1.26
Negative_Motorcyclist	2.32	1.11
Negative _Driver	2.68	1.06
Positive_Pedestrian	3.16	1.07
Positive_Cyclist	2.90	1.15
Positive_Motorcyclist	3.84	0.96
Positive _Driver	3.95	0.78
Humour_Pedestrian	3.32	1.34
Humour_Cyclist	3.21	0.98
Humour_Motorcyclist	3.26	1.41
Humour _Driver	2.79	0.98
Enforcement_Pedestri	3.42	1.31
Enforcement_Cyclist	3.84	1.02
Enforcement_Motorcyc	3.63	1.21
Enforcement _Driver	3.32	1.29

Final Campaign Brief

FINAL STAGE Designs — ACT Vulnerable Road Users — Behaviour Change Campaign
(ref:AE10.10.21) v.1

Production of a range of Campaign FINAL DESIGN samples that exemplify the key research findings

Deadline: 25 October 2021

Review and Reference:
Evolving from the layouts, styles and tag lines established in earlier stages.
Identify and collate which previous examples can work with the final stage findings/parameters

ACTIONS:
Primary
• Adapt any suitable previous material to fit the new findings (13 Oct)
• Establish and commence documentation format *(see general plan below)
Secondary
• Workshopping a range of text taglines for the campaign
• Devise NEW material and layouts based on the key point insights listed above.

Layouts should feature full human figures —Text tag lines in lower case sans serif (semi condensed)
Eg: *Calibri *Franklin Gothic Condensed Medium *Trade Gothic Condensed Bold — or similar.
• Produce a range of new visual responses and tag lines for review and refinement (18 Oct)
• Adapt all artwork to comply as close as possible to formats (eg:) Bus sides and panels (mostly landscape but of differing proportions)
AND –
ADSHEL poster format (see oOH! Media resources link)
https://oohmedia.com.au/category/resources/

ALL images used in sample layouts must be separately recorded with a source link.

• A title cover
• A summary of the campaign strategy (information to be provided) (1 page)
• A comprehensive visual presentation of campaign examples with annotations.) (pages as required)
• A summary of the campaign guideline strategy detailing the key strategic points of implementation (information to be provided)) (1 to 2 pages)
• A visual guide to implementation locations (information to be provided) (1 to 3 pages)

Final Campaign Brief

COMMENTS AND NOTES **to inform design final design responses**

Messages must be explicit and relatable
They must communicate Vulnerability of individuals rather than culpability or attempting to invoke complex messages of empathy.

- Messages must be targeted and identifiable with the target individual. (Readers must see themselves in the image and scenario)
- Images must portray scenarios and individuals that are highly identifiable with the recipient
  *Using locations that are specific, and identifiable (not generic) to the experience of the individual and the ACT location. (Therefore not 'big city' images. Use urban and not overly glamourous settings or figures)

Core aspects of the campaign messages and images

Appearance — People in the images must look like the viewer — and be as directly/wholly identifiable/relatable (don't use close crops of hand/feet etc, let the viewer see the 'whole person'.
User role — Must relate directly to their actual activity as road users
Experience — Novices and Experienced users — need different types of messages (see below)
Locality and direct context – Scenes and scenarios must be an identifiable location familiar to the viewer

• Try to use the same (similar) message contextualized to each 'group'. (keep it simple 3 to 4 words)

Message focus — TWO Levels of Experience

• Combine — Reason and Enforcement together— the 'tone-of-voice' is instructive and authoritative
• TWO levels of experience — Campaigns must address two sub-groups.
• Novice users needing instructions and clarity (less than 1 year)
• More experienced needing enforcement (reminders?) (2 to 5 years)

Campaign foundations — Refer to previous outcomes.

Stay 1.5 metres from Cyclists
Stay clear and share the footpath Cyclist / Pedestrians
Distractions
Visibility (Motorcyclists)
Fatigue

Formats are contingent on selected media
Research findings highlight the exclusion of social media platforms as ineffective and/or inappropriate (Appendix 9)

NOTE: Billboards are not permitted in ACT, therefore roadside messages must be excluded.

Final Campaign Brief

Style of Execution

- Devise — Simple direct messages that do not require digestion or analysis (thinking) — that provide a clear succinct and identifiable scenario of risk / vulnerability.
- NOVICE road user messages must have an Instructive focus and tone-of-voice. Not punitive or threatening — but just clear direction on what to do.
- EXPERIENCED road user messages must have an Instructive focus and tone-of-voice. Not punitive or threatening — but just clear direction on — how to act/respond.
- Campaign images contain individuals that are directly identifiable with   (invoking viewer response 'This is me, or a close friend'
- Campaign location images that look familiar for the ACT — or ARE location specific to the ACT (no 'big city' locations)

Key strategic criteria

Significant factors in message maintenance are:
- Frequency and Volume (making the message unavoidable) — This is preferred to creating 'memorable or evocative messages that rely on 'recall'.
- Location context and immediacy — being relevant at the right time and situation and context. Images should work strongly with the context/location or medium.

Strategic placement to maximise frequency and volume in the user contexts— ion consideration of the limitations of billboard and other advertising restrictions in the ACT.

Buses — (and perhaps other Govt vehicles)

- External Bus advertising optimises opportunities for providing both high frequency and high mobility of messages — and can offer a range of diversity and volume for each vehicle installation.
- Specific location messages can be tailored to Bus routes and conditions
- Busses are in higher volume on roads precisely at the time of peak risk/traffic—therefore offering volume messages at the most appropriate time.
- Surfaces of the bus can display different messages targeted at where the road user/individual is.(footpath/road)

(LEFT) Kerbside (Pedestrians and Cyclist messages)
(RIGHT) Drivers and Motorcycle
(FRONT) Reversed for rear view mirror Drivers and Motorcyclists 1:1.5? ratio — reversed type & image viewable in mirrors of cars/Mcycle
(REAR) Drivers and Motorcyclists 1:2 ratio? format. (Risk of pedestrians straying/crossing into traffic —>)
(Motorcycles / Cyclists lane splitting)
* Use a die line bus illustration to show 'in situ' messages for each specific surface.

PT (Public Transport) STRATEGIC INTEGRATION DESIGNS — Other PT options are ADSHEL posters specifically for drivers showing pedestrians/cyclist images in poised situations that simulate risk scenarios — (see below)
• ADSHEL Poster facing oncoming traffic with image of bike / pedestrian about to lurch in front of traffic from the footpath —>.

Final Campaign Brief

Examples: ADSHEL (poised for risk scenarios)

ADDITIONAL OPTIONS for an integrated approach ADSHEL/BUS combinations
· Graphic integration of images from ADSHEL WITH the Bus's (Front/Rear advertising) —
The layout and message are extended by viewing the ADSHEL poster and the BUS together.
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GEO-LOCATION based Messages (AUDIO ONLY)
USING Google Maps and Apple Maps, etc.
· Link audio messages to current traffic data updates already offered on these apps — locations or times— that play
audio message taglines at specific locations based on traffic density and known peak activity for pedestrians/cyclists.

· Example audio warning. "For 500 metres… You are entering a Pedestrian and Cyclist high risk area ahead"

Primary targets are:
· Drivers, and Pedestrians who will more likely to be using phone navigation —
· Cyclists, e-scooters and Motorcyclists less likely to use phone maps while moving given the risk of distraction — should other strategies be considered?

Vehicle formats and resources (Busses ACT)

There are currently 10 different Bus vehicles operating in the ACT (Canberra region)
Each present consideration to scale and proportion of 'side of vehicle' (and front/rear of vehicle) artwork.
The likk below offers accurate visual references to the vehicles listed below.
NOTE; Specific vehicles are used in specific locations based on passenger volumes, and sometimes manoeuvrability in streets.
This can offer a guide to focused or specific messages based on location use.
source: https://www.transport.act.gov.au/travel-options/bus/about-the-fleet

Hino Poncho HX9
IRISBUS Agoraline
MAN A69 18.310
MAN A69 18.320
Renault PR100

Final Campaign Brief

Scania K320UB (14.5m)
Scania L94UB
Scania K360 UA
Scania K3620 UB CB80
Scania K320 UB Bustech VST

Sample vehicle images available at the above site link.

example: Renault PR100

example: IRISBUS

example: SCANIA 360UA

The ACT.GOV site also contains images of road users etc used for ACT material — However, these may not be ACT specific.
https://www.transport.act.gov.au/

• The site also contains advice on road for:
Cyclists
https://www.transport.act.gov.au/travel-options/walking-and-cycling/cycling
Walkers
https://www.transport.act.gov.au/travel-options/walking-and-cycling/walking
ShareBikes & eScooters
https://www.transport.act.gov.au/travel-options/walking-and-cycling/bike-share

Final Campaign Brief

SUMMARY OF KEY POINTS FOR DESIGN See also : (Appendix 8)

- Messages must have clarity in the text and image and aim to provide 'action and consequence of actions' information.
- Messages must be 'convenient, immediate and actionable (DO-able at the time)
- Messages must be 'short, simple and directly instructive' — for quick comprehension
- Messages must be 'high impact instructions' (NOT warnings)
- Messages must be 'directly relatable to the reader's personal situation' —(must be 'about me')
- Messages must provide a clear distinction of the 'type of road user targeted' in the message—no ambiguity or 'collective responsibility'
- Messages must be directly related to 'specific road rules' (or issues?) — specific and direct messages.
- Messages must strike a 'factual and instructive' tone of voice
- Messages should communicate 'road user roles' that are clearly defined
- Avoid 'talking down' or being too 'inclusive' to the audience

Supplementary notes appendix to briefing — Campaign parameters and guide to campaign design criteria (AE)

1. General comments on findings
Some confusion between Reasoning and Enforcement (see below)
- Reasoning — is positively rationalizing attitudes and behaviours in the context of a situation and its stakeholders
- Enforcement — is understanding that poor decisions and actions may be penalized or punished
- Some indication of different responses based on ethnicity/culture— based on contexts of shared community responsibility and on cultural attitudes to enforcement.

2. Core message themes
- Strong focus on 'identifying ourselves' in the campaign image/message
- Inclusive 'me' identifiable and directly instructive messages
- Strong focus on 'instructive' and 'cause and effect' scenarios

3. Core message components
- Images are considered more 'connective'— focus on making individuals in images "look like the audience of the campaigns"
- Image and text work best in concert, together to reinforce the message for best impact
- Simple clear direct messages — (not to be complex, provocative or evocative)

4. Three key evidence points
- Inclusive — reader needs to 'identify strongly (personally and physically) with the subject in the image/message'
- Identifiable—needs to be 'familiar and relevant to the audience's personal experience'
- Instructive — message needs to 'tell me what to do'

5. Exclusions
- Inclusiveness, sense-of-community and empathy ARE NOT broadly evidenced as strong message motivators (1.b)

6.   (deleted for this document)

Final Campaign Brief

7. Response differences by gender
• Universal gender preference for REASONING with a NEGATIVE tone.

8. KEY POINTS FOR DESIGN
• Messages must have clarity in the text and image to provide 'action and consequence of actions' information.
• Messages must be 'convenient, immediate and actionable (DO-able at the time)
• Messages must be 'short, simple and directly instructive' — for quick comprehension
• Messages must be 'high impact instructions' (NOT warnings)
• Messages must be 'directly relatable to the reader's personal situation' —(must be 'about me')
• Messages must provide a clear distinction of the 'type of road user targeted' in the message—no ambiguity or 'collective responsibility'
• Messages must be directly related to 'specific road rules' (or issues?) —specific and direct messages.
• Messages must strike a 'factual and instructive' tone of voice
• Messages should communicate 'road user roles' that are clearly defined

9. Notes on types of effective media and effectiveness
• Social media is 'for fun' and not considered appropriate for road safety messages
• Social media messages are 'easy to ignore' and unlikely to create awareness or campaign traction.
• Media MUST BE 'unavoidable' or experienced in context, in an immersive way.
• SOURCE OF MESSAGE must be credible and authoritative to imbue 'credibility' (Form authorized sources)

10. DESIGN POINTS in Summary (road users 18 to 24)

Create

• Messages must be simple (as few words as possible), that are direct and instructional and provide clarity on each road user's responsibility.
• Messages must be relatable to the reader's personal experience and situation.
• Messages that are factual and clearly come from a source of authority.
• Visuals and text that have the same message/outcome/consequence in the layout (Reiterative)
• Focus on Reason (road user conduct) and Enforcement as the campaign motivators.