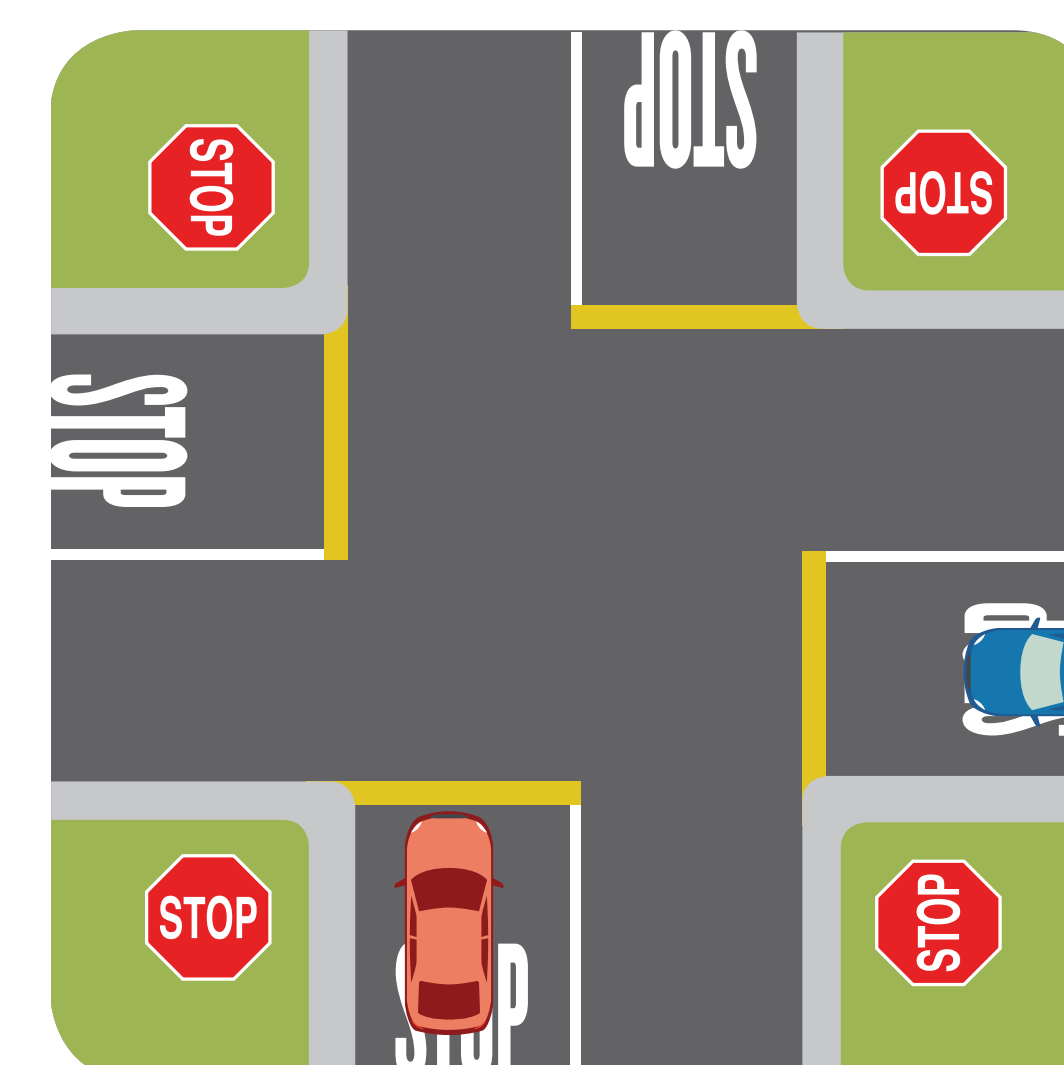


4x Stop: Whose Move?

Stemming from a ‘whose move?’ priority dilemma (Figure 1), research into four-way stop intersections was undertaken. The intersections are uncommon but scattered across New Zealand and there is little evidence of the efficacy of them.

NZ media has highlighted uncertainty in both the industry and general users about how four-way stop intersections work. One was labelled “Wellington’s most puzzling intersection”.

FIGURE 1
Whose move?



User Perceptions

An online survey was used to investigate how people:

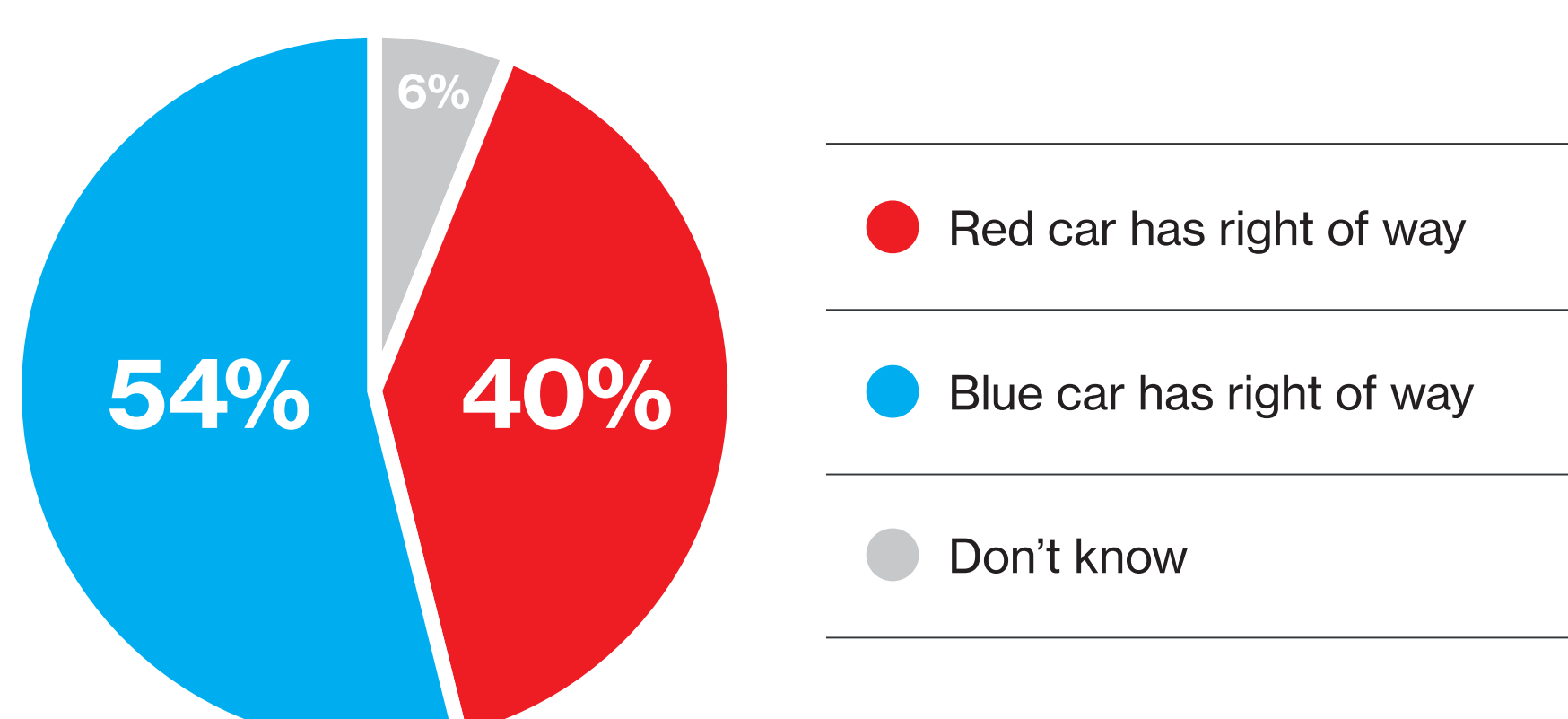
- Use four-way stop intersections
- Perceive four-way stop intersections in terms of challenge and safety compared to other types of crossroads

Figure 2 summarises the response to the priority question and the reasoning provided.

Figure 3 compares the level of confusion and safety felt by drivers and cyclists respectively. Motorists found four-way stop intersections the most challenging whereas cyclists did not experience the same level of challenge. Overall, people felt safest at roundabouts, followed by four-way stop intersections.

FIGURE 2

Overall response (n=70) and weighted summary of reasoning provided to the questions asking which car has priority (Figure 1)



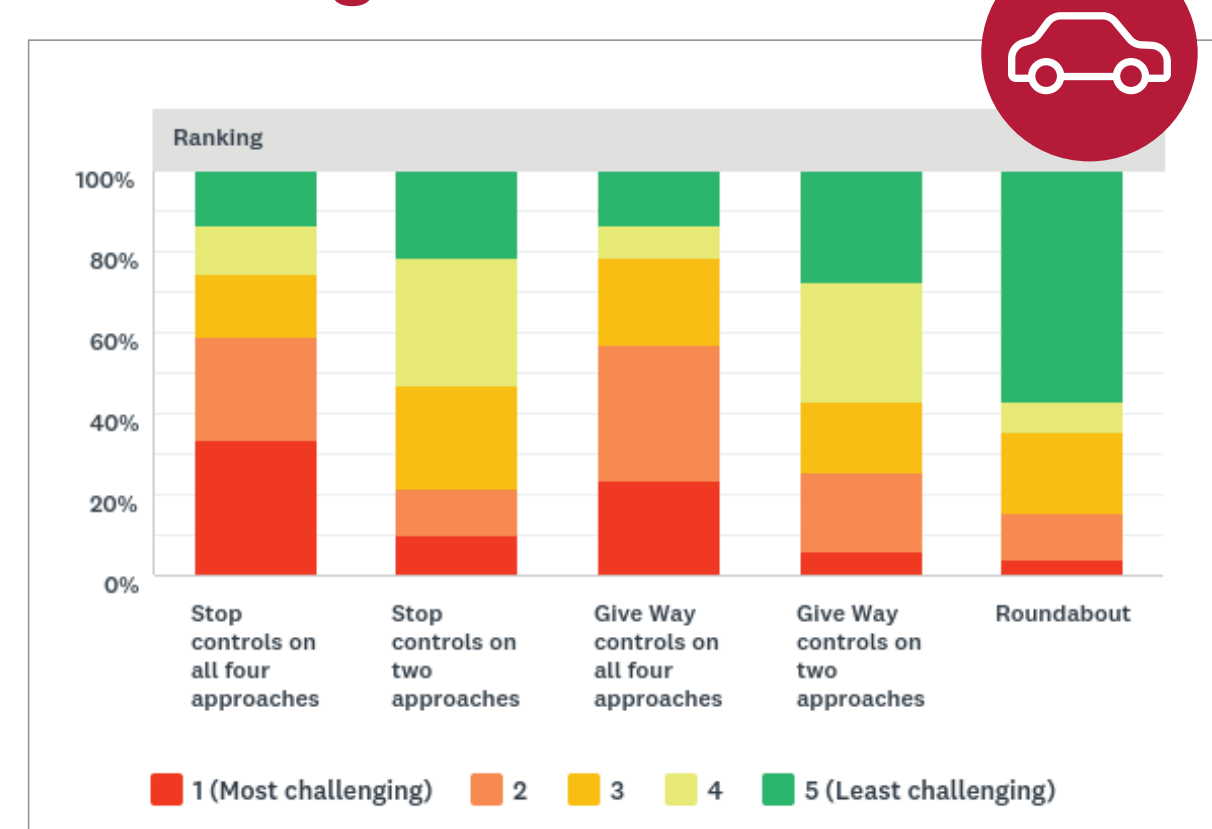
Give way to your right.
Blue car is still approaching.
Like a roundabout. Give way to your left.



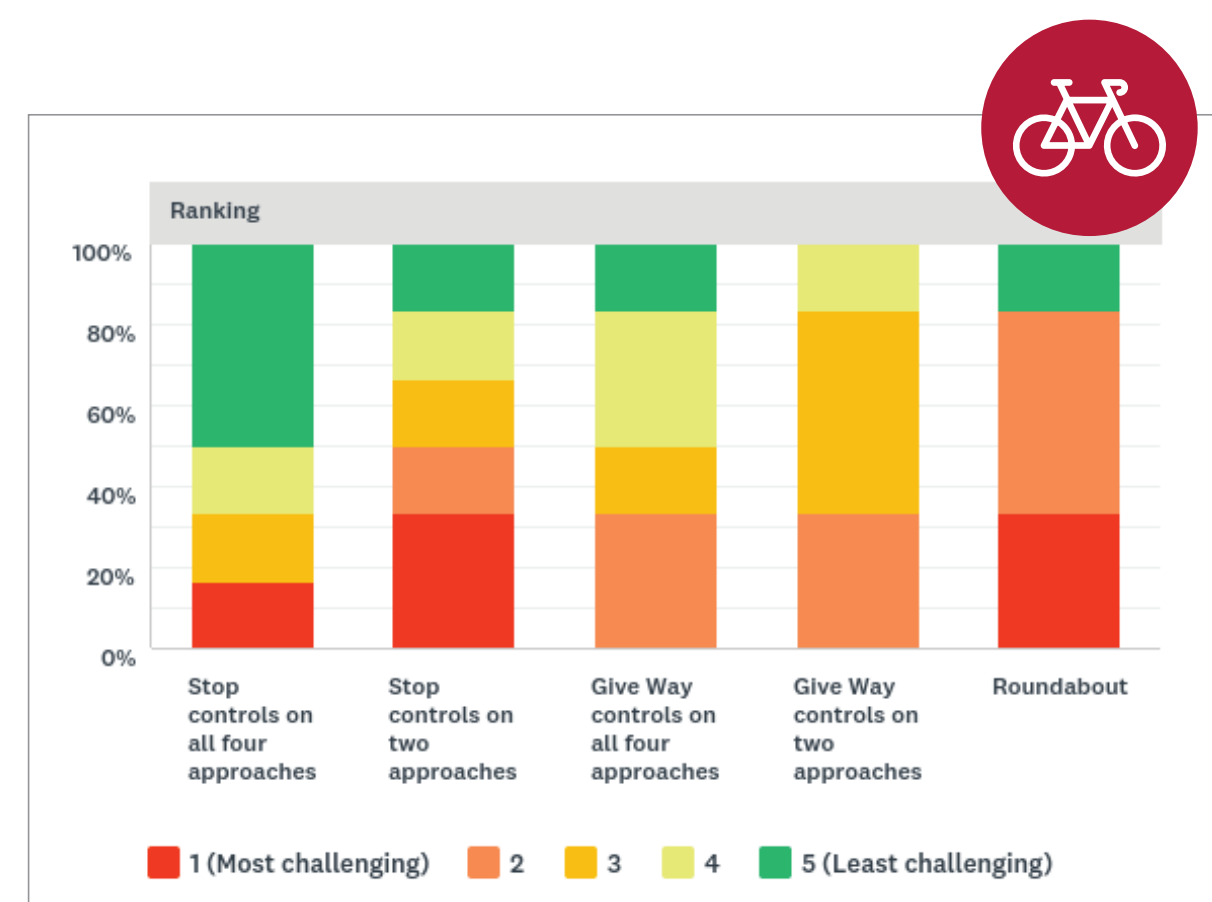
FIGURE 3

Ranking of crossroads intersections in terms of how challenging and safe responders feel the intersections are as a driver (n=51) and as a cyclist (n=7).

Challenge



Safe



Legislation

Four way stop intersections are permitted under Rule 4.2 of the Land Transport (Road User) Rule 2004 (Amended 2017). It states that “a driver approaching or crossing an intersection must give way to any vehicle approaching or crossing the intersection from his or her right”, unless they are turning or about to turn, in which case the driver “must give way to any vehicle not... making a turn” (New Zealand Government 2018). However, the Land Transport Rule does not define “approaching” – is it irrespective of distance?

The New Zealand Road Code states that at a stop sign you must “stay stopped until you have given way to all other vehicles” and “if you and another vehicle are both facing stop signs, use the give way rules” (NZ Transport Agency 2015). The give way rules reflect the legislative requirement by first stating that you must give way to non-turning vehicles. The ‘give way to your right’ rule is the final point, and only applies to situations not already specified.

Safety Performance

Three clusters of comparable crossroads intersections with different forms of priority control were identified. Each cluster included at least one four-way stop intersection. Risk metrics and crash factors were analysed for each of the 21 intersections, including 5 four-way stop intersections.

None of the crashes reported at the four-way stop intersections were associated with the form of control. Owing to the low instance of crashes that have occurred at the intersections, no crash commonalities were identified. Each of the four-way stop intersections had low Collective and Personal Risks and Level I LoSS. This was mirrored in the intersections with different forms of priority control.

Conclusion

The study exposed a high level of ambiguity surrounding four-way stop intersections in New Zealand. In response to ‘Whose move?’ (Figure 1), the majority of survey respondents said the blue car has right of way. This was reflected in the regulatory framework, however it was evident that there was inadequate legibility.

There are several limitations in this study, most notably small sample sizes and that the safety analysis was limited to Christchurch intersections.

Overall, four-way stop intersections generate a sense of challenge amongst users, yet users feel relatively safe. There is minimal evidence of the safety performance of four-way stop intersections compared to other forms of control. Further research could be conducted to determine the effects of the uncertainty associated with the legislation, safety performance and public perceptions of four-way stop intersections.

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