Perceptions of safety and fairness in road spaces shared by pedestrians, cyclists and drivers[1]

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Introduction

Shared road spaces often bring pedestrians, cyclists and drivers into close contact, but concerns about safety and the fair allocation of road space can discourage active travel. This study tested whether simple design changes can change how people perceive a range of shared spaces in Ireland, including crossings, cycle lanes, bus stops and roundabouts. It also examined whether effects differ across road users, and whether people who are more worried about travelling in shared road spaces respond differently to these changes.

Data and methods

A nationally representative online survey experiment of 1,600 adults in Ireland was conducted. Participants viewed images of six shared road spaces in Dublin and were randomly assigned to different design versions. These included the existing layout or AI-generated versions with interventions such as bollards, improved signage, clearer lane

1 This ESRI Research Bulletin summarises the findings from Fox, C. A., Timmons, S. and Lunn, P. D. (2026). Perceptions of safety, fairness and risk in road spaces shared by pedestrians, cyclists and drivers. npj Sustainable Mobility and Transport. Available at: https://rdcu.be/frs8E

markings, removal of parked cars, and redesigned roundabouts with dedicated walking and cycling infrastructure. Participants rated each space for perceived danger, fairness, the likelihood that a driver or cyclist would yield, and expected injury severity in the case of a collision. Analyses compared ratings across designs from the perspectives of pedestrians, cyclists and drivers separately, while controlling for demographic factors.

Results

Perceptions of safety and fairness were often aligned across different types of road users. Interventions such as bollards at left turns across cycle lanes and removing parking adjacent to crossings were consistently rated as safer and fairer by pedestrians, cyclists and drivers. These findings suggest that pedestrian- and cyclist-focused designs can improve perceptions of safety and fairness without diminishing driver acceptance.

The clearest difference between groups concerned roundabouts: introducing protected walking and cycling infrastructure improved perceptions of safety and fairness among pedestrians and cyclists but reduced perceived safety and fairness among drivers. Despite these differences between groups, the protected roundabout produced the largest perceived improvements in driver yielding behaviour and correct priority knowledge across all road users. It is likely that the increase in perceived danger from protected roundabouts among drivers encourages more cautious driving and greater yielding, enhancing safety for all road users.

Across all design scenarios, people who reported higher worry about travelling in daily life consistently rated shared spaces as more dangerous. Some interventions, including those that clearly separate different road users, were particularly effective at reducing perceived danger among people with higher levels of worry.

Conclusions

Simple design changes can make shared road spaces feel safer and fairer, especially when they unambiguously show who has priority and

physically separate different road users. The findings of this study suggest that testing designs in advance and considering the views of different road users can help when planning these spaces. While changes in how safe people feel do not always lead to changes in behaviour, they represent an important step and may encourage more active travel, supporting healthier and more sustainable communities.