Institute of Transport Economics
Norwegian Centre for Transport Research

Summary

Road user interactions
A survey from nine urban areas in Norway

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Interaction in traffic is a recurring issue and this survey reveals the challenges experienced by pedestrians, cyclists and motorists when they interact with each other. The report lays the groundwork for considering potential road user interaction campaigns.

The results show that although many experience the interaction with others as safe and smooth, there are exceptions. Cyclists feel less safe, and more frustrated, when faced with motor vehicles (particularly trucks and buses), while motorists and pedestrians feel less safe and more frustrated when interacting with cyclists and e-scooter riders. Recurring problems include passing uncomfortably close, failure to yield, and inadequate use of lights and high-visibility clothes or items. There is also a lack of knowledge about right-of-way rules for cyclists, as well as which rules apply for cycling in pedestrian streets and for the use of e-scooters. Use of turn signals, and other forms of signalling, and awareness of blind spots seem to be the topics that are most suited for new campaigns or other traffic measures in Norwegian urban areas.

What characterizes the road user interaction?

Several urban areas in Norway have adopted a zero-growth objective which states that all traffic increases should occur through increased numbers of people walking, cycling or using public transport. Since vulnerable road users are at a higher risk than motorists of being killed or injured in traffic, it is a challenge to ensure that the zero-growth objective does not come at the expense of Vision Zero; no fatalities or serious injuries in road traffic.

The purpose of this survey is to identify what road users themselves experience as challenges in their interaction with other road user groups, and whether there are specific types of road users and/or situations that prove to be problematic. Additionally, the aim is to provide a sound knowledge base to assess whether to continue the "Share the Road" campaign or whether other campaigns and measures may be more appropriate to improve road user interaction in Norwegian urban environments.

The nine regions of interests were Oslo/Akershus, Bergen, Trondheim, Nord-Jæren, the region of Kristiandsand, Buskerudbyen, Grenland, Nedre Glomma and Tromsø. To ensure respondents from all relevant urban environments, the survey was conducted by Kantar AS, using their probability based access panel.

The final sample consisted of 3713 respondents (53% men, mean age = 56) who were classified as cyclists (n = 931), pedestrians (n = 942), or motorists (n = 1840). To ensure a big enough sample of cyclist viewpoints, all who cycled weekly were categorized as cyclists. Remaining respondents were categorized as pedestrians or motorists depending on whether they walked or drove a car more often.

Results were analysed using table analyses, t-tests and multivariate regression analyses. The latter makes it possible to combine several factors and see how much variation each can explain, as well as to control for different factors.

Feelings of safety and frustration

An important aspect of road user interaction is how it's experienced by road users. In line with the theory of strategic interaction, which was also used in an earlier interaction study between cyclists and motorists (Fyhri et al., 2012), we included questions of frustration as well as questions of perceived safety. While feelings of safety have often been investigated, less research exists on whether vulnerable road users experience their interaction with other vulnerable road users as frustrating or smooth.

Feelings of frustration naturally affect the experience of the interaction, but can also lead to changes in the road users' own behaviour, for example by driving more aggressively or breaking more traffic rules (Kaiser et al., 2016; Precht et al., 2017).

Respondents, categorized as either cyclists, motorists or pedestrians, were asked how they in general experience their interactions with eight different road user groups. The scales were 5-point and went from "very frustrating" to "very smooth" and from "very unsafe" to "very safe", with higher scores meaning more positive interactions.

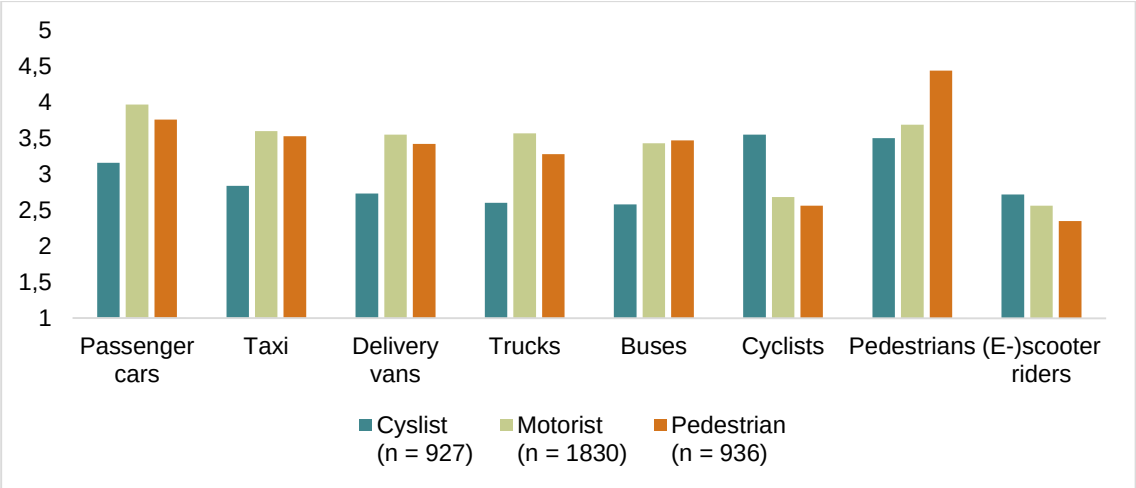

Figure S1: Cyclists', motorists' and pedestrians' ratings of interaction with eight types of road users on a scale from 1 (very frustrating) to 5 (very smooth). Average.

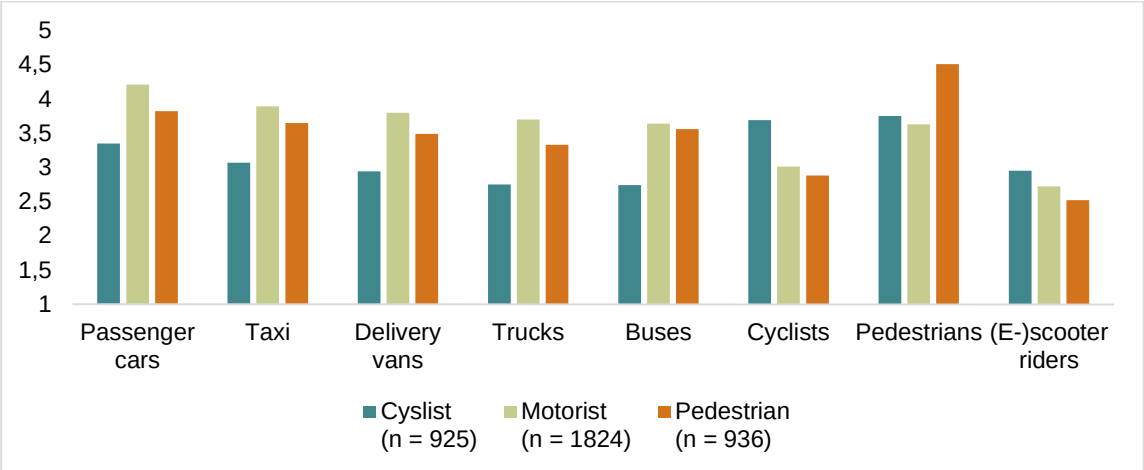

Figure S2: Cyclists', motorists' and pedestrians' perceived safety when interacting with eight types of road users on a scale from 1 (Very unsafe) to 5 (Very safe). Average.

The results show that motorists and pedestrians on average feel less safe and more frustrated when interacting with cyclists and (e-)scooter riders than with other road users. Cyclists, on the other hand, feel most unsafe and frustrated when interacting with motor vehicles, especially trucks and buses.

Regression analyses show that the differences between cyclists, motorists and pedestrians persist when controlling for region, age and gender. In addition, we found that women generally find the interaction to be less safe and less smooth than men, and that older respondents feel less safe than younger ones when meeting (e-)scooter riders and cyclists. They also find the interaction with (e-)scooter riders and cyclists more frustrating than younger respondents do.

Respondents from Oslo/Akershus rate the interaction with cyclists and (e-)scooter riders as more frustrating and less safe than respondents from the other regions, while there is little or no difference between respondents from regions when rating interactions with pedestrians or motor vehicles.

Interaction issues and attitudes

Cyclists, pedestrians, and motorists were asked how big of a problem they believe different types of behaviour from other road user groups to be for their own group. The type of behaviour that is considered most problematic for cyclists is that motorists are too close when overtaking. Pedestrians experience the behaviour of (e-)scooter riders and cyclists (e.g. coming abruptly from behind) as clearly more problematic than motorist behaviour (driving too fast or not stopping at the footpath).

The behaviour that is considered most problematic for motorists is that vulnerable road users don't use lights or reflective items in the dark. Interestingly, both pedestrians and cyclists also think this is very problematic for motorists.

As all groups were asked to assess how problematic the different types of behaviour were for all groups we could examine the extent of agreement between cyclists, motorists and pedestrians.

The results show that motorists and pedestrians respond very similarly to how problematic different types of behaviour are. There are more discrepancies between motorists' and cyclists' assessments, and between cyclists' and pedestrians' assessments of problematic behaviour. Underestimating how problematic one's own behaviour is for the opposing party can result in acting less considerately than one otherwise would.

Respondents were also asked if they think that some road user groups are "less concerned with road user interaction than others". Over half of the pedestrians believe that cyclists and (e-)scooter riders care less about road user interaction than other groups. Similarly, almost half of cyclists and motorists say the same about (e-)scooter riders. However, many respondents have no clear opinion. Some state that there are inconsiderate people among all road users and that one shouldn't generalize. All road user groups are least likely to rate their own group as "less concerned with road user interaction than others".

Naturally, interaction issues arise when road users use the same space, either over longer distances or as their paths intersect. All road user groups think that cyclists to a greater degree should have the right to share areas with motorists than with pedestrians. Most respondents also think that (e-)scooter riders to a greater degree have the right to share areas with cyclists (bicycle lanes) than with pedestrians (pavements and pedestrian streets). Pedestrians and cyclists disagree that "motorists should have as much right to the city centre as other road users", while motorists believe they should have the same right.

A regression analysis showed that people who did not drive a car in the summer of 2019 are more in disagreement with that claim, along with people who live in/near the city centre, compared to people who live outside the city centre.

Respondents were also asked to comment on what they think is needed to improve interaction in traffic. More than half of the respondents left a comment, indicating that the topic is engaging. The comments vary from specific suggestions to rants about certain road user groups (often cyclists or e-scooter riders). The specific suggestions mainly concerned three topics: 1) stricter rules and stricter penalties for breaking existing rules; 2) improved instruction in traffic rules, especially for younger cyclists and e-scooter riders; and 3) attitude changes, with regard to paying more attention and having more respect for fellow road users.

Traffic experiences

About a tenth of the respondents say they have experienced one or more collisions over the past five years, while a fifth say they experienced one or more near-collisions during the summer of 2019. Among those who have experienced a collision, a little more than a third say they have changed their behaviour since, with the most common change being that they are more cautious or avoid similar situations.

When asked how often they experience dangerous situations with different road user groups, we see that the answers mirror the differences in subjective safety. Cyclists say they experience dangerous situations most often with motor vehicles, especially the heavier ones, while both pedestrians and motorists mostly say that they experience dangerous situations with cyclists and (e-)scooter riders.

The results show that most people say that they "never" received negative gestures or were yelled at, and the vast majority say that they "never/very rarely" yell at or direct negative gestures at others. There are exceptions, however.

Group differences reveal that more motorists, compared to cyclists and pedestrians, have received negative gestures. Since previous reports have shown that conflicts between motorists and cyclists are often between motorists and "exercise cyclists", we also examined whether those who more often cycled with exercise as the main purpose had experienced more negative events. A greater proportion of exercise cyclists than regular cyclists say that they have experienced both receiving negative gestures, being yelled at, and being forced off the road.

When it comes to negative events experienced by the three road user groups, we see that a large proportion of pedestrians have experienced uncomfortably close overtakings from (e-)scooter riders and cyclists. Many motorists mention experiences with cyclists and other motorists who fail to yield when they should, and many cyclists say the same about motorists.

When asked how they contribute to positive road user interactions, many say that they seek eye contact when they "negotiate" about who should pass first. Many pedestrians state that failure to make eye contact with the driver can result in feeling unsafe or frustrated when interacting with motor vehicles.

Knowledge

There is a great deal of uncertainty regarding what rules apply to the use of (e-)scooters, with slightly better knowledge among those who used (e-)scooters during the summer of 2019 than those who didn't. However, very few of the respondents (4%) had used an (e-)scooter during that period. Among those who had not used (e-)scooters, about half answered correctly (i.e. the same rules for e-scooters as for cyclists) and almost a third said "don't know".

We also showed a picture of a pedestrian street with a cyclist among the pedestrians and asked "how fast is it permitted to cycle in streets like this one?". A little over half answered "approximately walking speed" and a little less than a fifth answered "the cyclist must walk the bike". Both of these answers can be consistent with Norwegian law, depending on how the one interprets the amount of people pictured and the letter of the law. However, there is some uncertainty, as one fifth of the pedestrians say they don't know. Uncertainty regarding which rules apply may exacerbate feelings of unsafety or frustration when pedestrians interact with (e-)scooter riders and cyclists.

On the other hand, uncertainty regarding rules may in certain situations lead to better interaction through negotiations and communication, for example between cyclists in pedestrian crossings and motorists. On the question of right-of-way in such situations, many of the motorists believe that the cyclist has the right-of-way. While this is wrong, it hardly has any negative consequences for safety. It is more concerning that about every tenth motorist believes that they have the right-of-way when turning right through a cycle lane where a cyclist is going straight ahead.

Conclusion

The results show that many challenges associated with road user interaction in urban areas are related to sharing the same area, for example when cyclists cycle on the roadway or when cyclists and (e-)scooter riders use pavements. Motorists experience a lack of use of light and reflective items, as well as generally unpredictable behaviour among vulnerable road users, as important sources of frustration and decreased perceived safety. Cyclists say motorists often do not comply with right-of-way rules and that they feel uncomfortable when being overtaken by cars or buses. Exercise cyclists experience more negative interaction events than other cyclists.

Based on the interaction problems identified we believe that there are two topics that are particularly suited for new campaigns or measures in Norwegian urban areas. The most important issue when considering the risk of serious accidents concerns blind spots and collisions when motor vehicles make a right turn that conflicts with a cyclist, (e-)scooter rider or pedestrian who is going straight ahead. Many of the most serious accidents involving vulnerable road users, especially with heavy vehicles, in Norwegian urban areas occur in such situations.

Another important issue is inadequate use of turn signals and other forms of signalling. Many point out that it causes frustration and unpredictability. This can also create misunderstandings and serious accidents. With an increase in the number of cyclists and (e-)scooter riders, signalling becomes more important for traffic safety both in interactions between these and motorists, but also between vulnerable road users on pedestrian and bicycle lanes.

Information- and attitude campaigns to improve interaction in these situations can be good measures, but research shows that it varies whether they have had measurable effects on

behaviour and safety in traffic. A number of studies show that the chances of getting the desired effect of campaigns are greatest if you place the message close to where the problem is, if you combine information measures with concrete guidance and training, and if the police supports the campaign by controlling behaviour.

With regard to the two aforementioned issues, the presence of the police could be a natural part of a campaign as the behaviours that causes problems also violates traffic rules. In addition, the presence of the police will most likely increase the effectiveness of the measure.