

Cyclist yielding behaviour when merging at T-junctions



Problem description

Cyclists are subject to traffic rules just like motorized vehicles but due to their agility, size and speed, as well as the lack of law enforcement, they do not always comply with them. Policy makers and infrastructure designers are interested in and could benefit from understanding the behaviour of cyclists towards rules, so that they can develop and apply appropriate design guidelines. One situation of interest is the yielding behaviour of cyclists merging at a T-junction and the corresponding guideline pertains to the use of lane markings to make the junction safer and more efficient. To assess this, video data has been collected as part of a large-scale cycling experiment which includes two scenarios with and without lane markings.

Assignment

The objective of this project is to investigate the effect of lane markings on the yielding behaviour of cyclists by means of statistical analyses and modelling. More specifically, the following steps will be executed:

- Literature study to determine metrics that capture priority behaviour.
- Extraction of these metrics from the collected video footage of cyclists merging at a T-junction.
- Analyses of the extracted dataset. These may entail (but not be limited to):
 - statistics of the interactions that take place at the junction, including number of cyclist encounters at the junction, groups sizes, number of times cyclists yield, yielding time.
 - characterisation of cyclists based on their yielding behaviour.
 - characterisation of observed conflict severity.
 - conditions under which cyclists yield, such as the number and speed of cyclists approaching from the right and from the back.
- Comparison of the yielding behaviour with and without lane markings. The comparison can be performed by statistical tests and/or modelling.
- Drawing conclusions from the comparison and drafting design guidelines and recommendations with respect to the use of lane markings at bicycle junctions.

This Master thesis includes an internship at the Dutch road safety research institute SWOV.

Information

Transport & Planning department

Thesis supervisor: prof. dr. ir. Serge Hoogendoorn

Daily supervisors: ir. Alexandra Gavriilidou & dr. ir. Winnie Daamen

External supervisor (SWOV): dr. Matin Nabavi Niaki

Contact: a.gavriilidou@tudelft.nl