

Measures for Improving the Safety of Bicyclists at Signalized Intersections

Master's Thesis of Md Azizur Rahman

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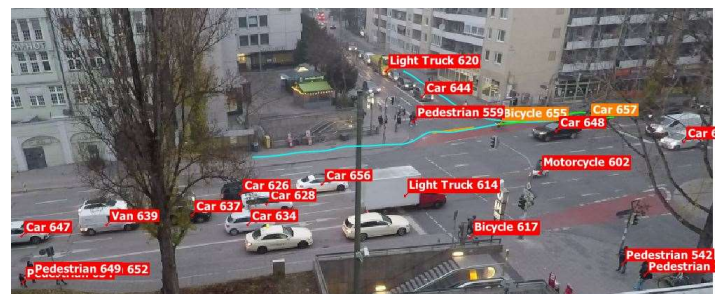


One of the safety measures is the installation of an additional signal for left-turning bicyclists (yellow circle). The main intention of this signal head is to provide the information about the bicycle signal state to the right-turning vehicles (red arrow) waiting in the waiting zone to turn right.

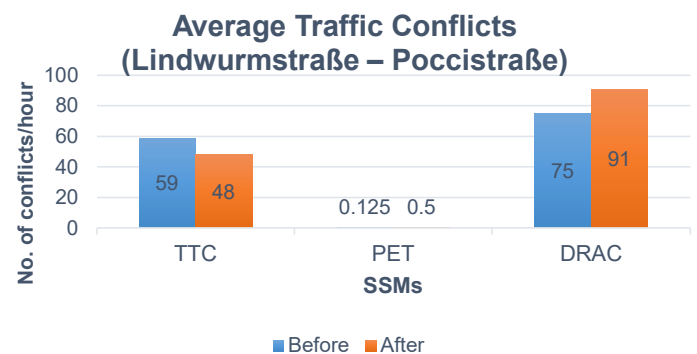
Objective Evaluation

In order to evaluate the measured safety, traffic conflicts based on three surrogate safety measures: time-to-collision (TTC), post encroachment time (PET), and decelerate rate to avoid collision (DRAC) are calculated. A pre - and post - video analysis is carried out to understand the impact of installed measures. Results obtained from the video analysis show no improvement in safety after installing new signal strategies at the Lindwurmstraße – Poccistraße intersection. From the manual conflict survey at Marsstraße - Seidlstraße, a significant decrease in traffic conflicts is observed, indicating a remarkable safety improvement when an additional bicycle signal head for left-turning bicyclists is installed.

The objective of this thesis is to investigate the objective safety by installing bicycle safety countermeasures and to evaluate their impacts on the right-turning vehicle-bicycle interactions at a signalized intersection, also, to capture the perception of cyclists towards bicycle facilities. An automated video analysis-based technology "DataFromSky" is used to objectively measure the impacts of the safety measure and an in-situ questionnaire survey is carried out to gather the perception of cyclists regarding the installed safety measures, their behavior at the intersection, and knowledge about the common traffic rules. Two signalized intersections: Lindwurmstraße – Poccistraße, and Marsstraße – Seidlstraße is taken into account as the study area.

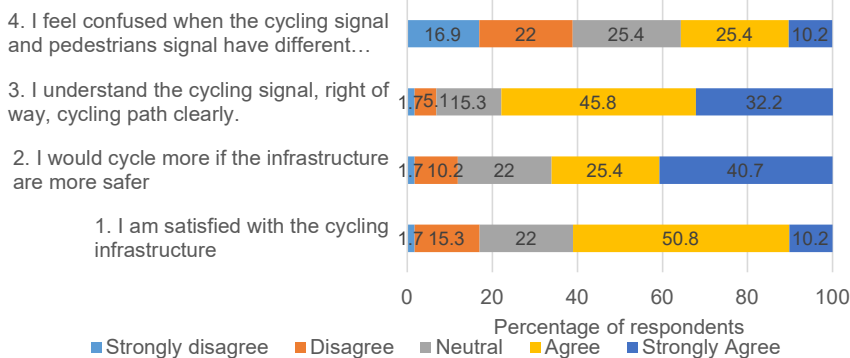


Sample conflict obtained from DataFromSky



Sample of the evaluation results

Understanding Bicyclists' Perception towards Bicycle Facilities



Sample of the evaluation results

Perceived Safety

Results obtained from the in-situ survey show that subjective risk perception is improved when an additional bicycle signal head is installed. Also, a significant lack of information among the bicyclists is observed regarding traffic rules, bicycle facilities, right of way, etc. Furthermore, participants tend to cycle more if the cycling infrastructure were safer.