

Traffic conflict analysis using an instrumented bicycle on cycle tracks of Valencia

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ABSTRACT

Separated bidirectional cycle tracks in Valencia (Spain) are usually placed between pedestrian sidewalk and motor vehicle parking lanes. Tracks may be delimited by marking, trees, hedges or curbs. Cyclists must yield to pedestrians at intersections, while motor vehicles crossing the track must yield to bicycles.

In this research, an instrumented bicycle equipped with four cameras, four laser rangefinders, a laser pointer, a microphone and a GPS tracker was ridden on six cycle tracks. In contrast to naturalistic studies [1], researchers rode the bicycle at selected locations concentrating the data on certain infrastructure conditions. Exclusively conflicts involving motor vehicles or pedestrians were analysed, obtaining several conflict indicators, such as Time to Collision (TTC), Conflicting Speed (CS) and Post Encroachment Time (PET) as well as a subjective risk perception of every conflict (coded from 1 to 5) [2]. Conflicts were classified as static objects, wrong circulations (pedestrians or motorbikes circulating on the cycle track), and crossings, either according to regulations or not. A total of 650 conflicts (70% involving pedestrians) were observed after 10 hours and 130 km travelled distance.

The study showed that it is possible to obtain the main conflict indicators from quasi-naturalistic data, allowing the researchers to identify cycle track hotspots. The study compared conflict rates (conflicts per km) and conflict type distribution among locations, in order to detect the effect of different cycle track boundary conditions.

By comparing objective with subjective measures, a relation between TTC, CS and subjective risk perception was found. The frequency of subjective risk perception decreased with severity, being distributed as a pyramid, where the base was the less severe conflicts and the vertex the most severe, as explained by traffic conflict techniques.

Keywords: bike safety, pedestrians, traffic conflict, cycle track, instrumented bicycle.

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