

Risky situations of cyclists in French cities

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The increase in the number of cyclists in cities is a current mobility issue for communities. In this context, the safety of cyclists is a major issue. In Paris, 10% of those injured in 2017 were cyclists (ONSIR, 2019).

In order to design relevant and accepted countermeasures to ensure safety (e.g. infrastructure, education, ITS), it is necessary to understand the actual behaviours of cyclists, the risky situations they encounter and their interactions with other road users. According to cognitive ergonomics, optimizing existing situations necessarily involves considering human behaviour in the real world, i.e. not experimentally designed and combining behavioural data and subjective experience of individuals. Such naturalistic studies on cyclists are very scarce (Dozza et al., 2012; Gustafsson and Archer, 2012; Johnson et al., 2013.) and have never been conducted in France.

This paper presents a study aimed at understanding what cyclists do in the real world and the risky situations they face during their cycling journeys in Paris and Lyon. 75 cyclists (mean age 34, 21 males, 54 females) were followed up during one month in all their usual journeys from September 2019 to September 2020. Each cyclist was equipped with a GPS camera embedded on the top of their helmet (3200 trips recorded), completed a diary to identify their daily risky situations and participated in weekly interviews to review the video recordings of their own cycling behaviour and explain the reasons he perceived the critical situations as such (375 interviews). Data analysis thus allows us to understand the context of these risky situations (facilities, road users, traffic conditions...) and the cyclists' decision-making process in these situations.

1081 risky situations were identified by the 75 participants, i.e. cyclists encountered an average of 15 situations each during the studied period. 13 typical risk scenarios were identified by clustering similar risky situations. The main scenarios are 1) a road user that tightened the cyclist (24% of all the risky situations), 2) failure to comply with a give way at an intersection (10%), 3) a road user crossing cyclist lane during lane filtering (10%). Risky situations mainly take place on facilities close to the road shared with other road users (42%). The users that are the most involved in these situations are car drivers (46%) followed by pedestrians (13%) and powered two-wheelers (11%). Based on these results, a map of risky situations according to the cyclists in Paris and Lyon was created. This map has to be combined with the accidents map to have a complete view of cyclists' safety. The paper also presents the gain of this approach: how useful these field study results are for public policies in the promotion, the supervision and the design of facilities including cyclists.

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