A comparison of different surrogate safety measures for conflicts involving vulnerable road users

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Abstract

Using crash data as the main data source for safety evaluation has some well-known limitations. Therefore, surrogate safety measures have become a popular method to investigate road safety. Many different indicators have been developed over the years, but there is no universal understanding of which indicators are most suitable for which situations. So far, none of the indicators has been proven to really outperform the other indicators. Furthermore, researchers already hinted that one universal surrogate safety measure that can be applied at all types of traffic events and for all road users may be impossible, since different measures are triggered by different aspects of the interaction process. Examining the potential of different surrogate safety indicators is therefore becoming more important.

This study sets out to compare different surrogate safety measure on a dataset containing 280 preselected moderate-to-severe interactions between vulnerable road users and motorized traffic at an urban intersection in Hasselt, Belgium. A number of promising surrogate safety indicators (TTC_{min}, $T_{2,min}$, PET, Extended Delta-V and the Swedish Traffic Conflict Technique) were selected and have been measured for all interactions. The aim is to investigate the differences between the indicators in how they rank the severity of the different interactions and how they distinguish severe from non-severe events. Patterns of agreement and disagreement between the indicators are explored and strengths and weaknesses are identified. The results are also compared with crash records for a five year period.

The data analyses are currently ongoing, so no final results and conclusions are available yet. The first analyses suggest substantial differences between the different indicators in the ranking and selection of severe traffic events between the different indicators.

Key words

Extended Delta-V, Post-Encroachment-Time, Surrogate Safety Measures, Time-To-Collision, Vulnerable Road Users