Surrogate measures of safety (SMoS) can provide a method for reasonably quick and easy risk assessments in many different traffic situations. Instead of relying on accident data, SMoS uses predefined safety indicators to identify safety critical behaviour in traffic. SMoS have several advantages compared to more traditional safety analyses based on accident data. It is possible to make a risk assessment before any accidents have occurred and it is also possible to make risk assessment in locations with lacking accident history data.

However, the main concern regarding surrogate measures of safety is the accuracy of risk assessments made with the various safety indicators. While previous research has shown a strong relationship between the frequency of safety critical events and police reported accidents, this research is quite old and was mainly focused on events between motor vehicles (1).

This work aims to provide a new evaluation of SMoS with a focus on vulnerable road users. The aim is also to provide a solid comparison between the most commonly used safety indicators using several different threshold values for the various indicators.

The data used for this evaluation are video recordings made at 26 signalized intersections in 7 different European countries within the InDeV Eu project. At each location, encounters between left-/right-turning motor vehicles and vulnerable road users (both cyclists and pedestrians) have been studied for a period of three weeks. Also, to provide an approximate risk assessment based on accident data, accident data from 50 similar locations in each country have been gathered.

The main safety analysis contains two separate evaluation approaches. The first approach estimates the daily frequency of safety critical events and correlates them with an estimation of the accident frequency using the gathered accident data. Several different indicators with different threshold values are compared to find the best performing safety indicator. This approach also accounts for exposure by estimating the frequency of relevant meetings (or encounters) at the recorded locations and estimated ADT values from manual counts for the 50 similar locations in each country.

The second approach focuses in more detail on the relationship between the frequency of safety critical events and encounters. This approach includes data from only 1-day at each location but can in turn provide a more detailed analysis. The main aim of the second approach is to study how different threshold values affect the number of safety critical events per encounter. By investigating how this relationship changes, it is possible to find a suitable threshold value that provide a “good enough” risk assessment while maintain a relatively high frequency.
This twofold approach provides two important outcomes. Firstly, it offers two different approaches to evaluate the effectiveness of SMoS which makes potential agreement between the methods decidedly significant and secondly, it can also provide some insight into the benefits of expanding the observational period from 1-day to 3-weeks which is important when applying SMoS in a more practical setting.

Results from both approaches and an in-depth discussion regarding the most suitable safety indicator and threshold as well as the benefits of an extended observational period will be presented at the conference.