

## Analysis of red light negation and safety at signalized intersections



### Problem description

In 2022, 745 persons were killed and about 8.300 were seriously injured in road traffic crashes. Almost 40% of the fatalities and two thirds of the seriously injured were cyclists. This is reported in 'De Staat van de Verkeersveiligheid 2023' published in December 2023 by SWOV.

In The Netherlands 31% of the traffic fatalities and 54% of de cyclist fatalities happen at intersections. Particularly signalised intersections (VRI) appear unsafe due to their relative high infrastructure design complexity, high and mixed modality traffic flow (motorised traffic and vulnerable road users like cyclists and pedestrians). There is a lack of scientific evidence about the current safety impact of design elements of VRI intersections, including variations in signalling and on the traffic safety impact of red light running.

The following overall research questions will be addressed: does the probability of crossing on red light increase the longer you have to wait? Can we determine the relationship between - for instance - red light violations, clearance time, green time and waiting time with available synchronised V-logs and video recordings?

### Assignment

The study starts with a review of the literature on intersection safety and determinants of red light running, leading to a set of more specific research questions or hypotheses regarding the factors that are considered of importance to red light running. This phase also includes a search for methods to observe and record red light violations. The second phase is an analysis of red light violations; two data sources are available: 1) data files (V-logs) of traffic control systems, and 2) video images of the traffic flows used by the Canadian company Transoft, Inc. to calculate trajectories. For the analysis both data sources need to be used and combined. We assume that for this study the following is helpful: experience with programming image recognition algorithms (e.g. in Python) and affinity for road safety research.

The study and its results are reported in a master's thesis.

### Information:

Transport & Planning department

Thesis chair: Marjan Hagenzieker (T&P)

Daily supervisor TU Delft tbd

Workplace is at SWOV in The Hague; daily supervisor from SWOV: Reinier Jansen (SWOV)

This is a paid internship, standard compensation

Contact: [Reinier.Jansen@SWOV.nl](mailto:Reinier.Jansen@SWOV.nl) for more information