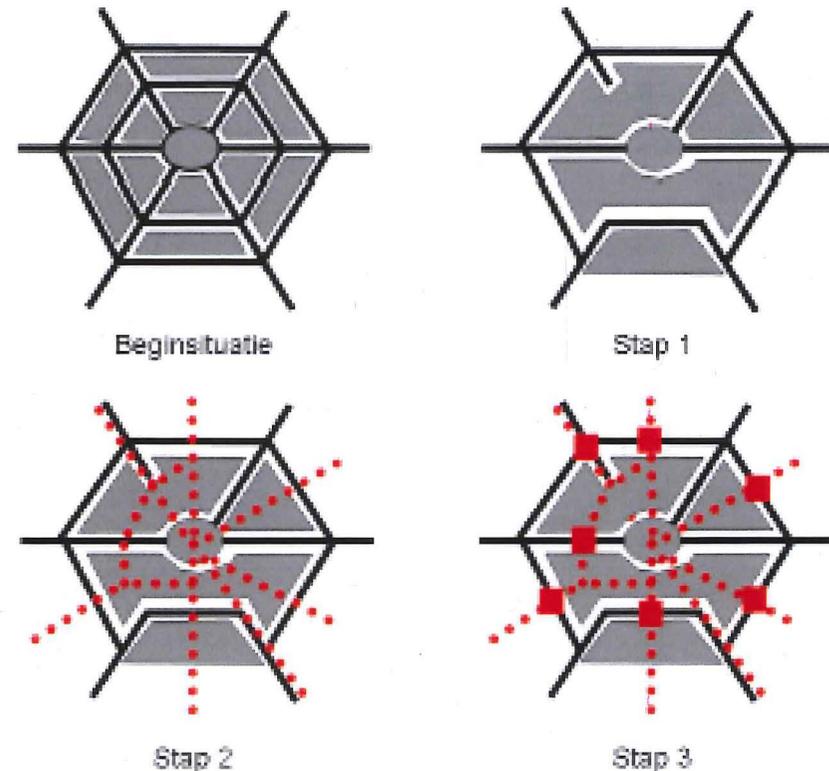


Untangling the cycling and traffic network

Three stages

- Base
- Step 1 – Reducing general traffic routes
- Step 2 – Bike and pedestrian routes through residential precincts
- Step 3 – Excellent crossing facilities for walking and cycling routes across the main road network



Source – SWOV 2013. *Duurzaam Veilig, ook for ernstig verkeersgewonden. R-2013-4.*

(Sustainable Safety, also for serious traffic injuries)

Summary

Sustainable Safety, also for serious road injuries

The number of serious road injuries in Dutch traffic develops far less favourably than the number of fatalities. The aim of this report is to investigate if and how the concept of sustainable Safety can be expanded and/or further developed so that the number of serious road injuries will decrease more substantially in the future. As the numbers of serious road injuries in crashes with and without motorized vehicles develop differently, and since these types of casualties are also of a very different nature, they will be dealt with separately in this report.

Relatively few fatalities and many serious road injuries occur in crashes without motorized vehicles. Moreover, the number of serious road injuries increases in this type of crash; presently, more than half of the serious road injuries occur in crashes without motorized vehicles. The increase in the number of serious road injuries in crashes without motorized vehicles and the fact that relatively few fatalities occur in these crashes explains, to a large extent, the difference in development between fatalities and serious road injuries in the Netherlands.

At the time Sustainable Safety was developed, the problem concerning crashes without motorized vehicles was not clearly apparent, if it were observed at all. Until now, Sustainable Safety has not paid attention to these crashes explicitly. This report is a first attempt to apply the Sustainable Safety concept to crashes without motorized vehicles, and to develop it for this purpose. Considering that 98% of these crashes are cycling casualties, we initially restricted ourselves to these crashes. We applied the current principles of bicycle crashes without motorized vehicles (see the table below). Subsequently, we developed them into functional requirements and design requirements for bicycle crashes without motorized vehicles.

Principle	Development for bicycle crashes without motorized vehicles
Functionality	Various types of facilities may also be distinguished for bicycles, depending on their function (flow or exchange/residence).
Homogeneity	It may be studied whether cyclists should also be separated among themselves with respect to speed, and, possibly, mass, volume and manoeuvrability as well.
Predictability	To what extent are cycling facilities designed for easy recognition by cyclists and to what extent are their expectations with respect to road surface, road layout and behaviour of other road users correct?
Forgivingness	It may be investigated whether the infrastructure for cyclists, the bicycle and the cyclists could be made more forgiving.
State awareness	State awareness among cyclists may be investigated, specifically with respect to alcohol.

Development of the five Sustainable Safety principles for bicycle crashes without motorized vehicles.

The design requirements thus drawn up for bicycle crashes not involving motorized vehicles were subsequently compared with the current design standards. It showed that the current design directives already include a number of requirements directed towards a forgiving cycling infrastructure. We recommend examining the current design directives structurally, keeping in mind a forgiving cycling infrastructure and appropriate new functional requirements. We recommend examining this process in a more wide-ranging group, and discussing the application and development of Sustainable Safety for bicycle crashes without motorized vehicles with CROW, Fietsberaad (Cyclists' Council), police-makers, road authorities and the Dutch Cyclists' Union. Moreover, for this kind of development of Sustainable Safety, a follow-up study is necessary with respect to a number of issues. Relevant research questions are:

- Is it feasible to distinguish between bicycle facilities with a flow function and an exchange function and which road safety requirements must be drawn up for both types of facilities?
- What are the expected road safety consequences of the separation among cyclists with respect to speed, size, mass and/or manoeuvrability and how can this be developed?
- To what extent are bicycle facilities recognizable for cyclists and to what extent are expectations by cyclists correct?
- How can the Sustainable Safety principle of forgiveness be further developed for bicycle facilities, the bicycle and the cyclist?
- What is the situation concerning state awareness among cyclists, for instance, with respect to alcohol and which type of policy is capable of enhancing state awareness so that, for instance, cycling under the influence of alcohol is reduced/avoided?

The number of serious road injuries involving motorized vehicles shows a decline, most probably owing to Sustainable Safety. However, the decline in the number of serious road injurious in crashes with motorized vehicles is less substantial than the decline in the number of road fatalities. This may be partly due to Sustainable Safety itself. This is not only directed towards the prevention of crashes, but also towards the reduction in the severity of the injuries. Measures concerning this latter – for instance, a lower impact speed or protection of road users – have more effect on the number of fatalities than on the number of serious injuries. This is probably also the case for measures with respect to enforcement and education. An even greater decline in the number of serious road injuries in crashes with motorized vehicles could be the result of taking measures mainly focussed on reducing crashes with a relatively large number of serious road injuries.

Finally, this study has also resulted in two other recommendations. Firstly, we recommend also developing the Sustainable Safety concept for the policy areas of enforcement and education and transforming them into practical tools. Secondly, we recommend investigating the reasons why the infrastructure seems to play an important part in single bicycle crashes, whereas the directives include design requirements to prevent these crashes. A possible cause that is interesting to further investigate is whether these directives are adhered to in practice, and, if not, why not.

