Summary

For accidents in which no motor vehicles are involved, the risk of being injured, especially for senior citizens, is increasing. To reduce that risk, it is not enough to only implement infrastructural and bicycle-focused measures. Approximately half of all accidents were in fact partly caused by the (unsafe) behaviour of cyclists. Measures that target the cyclists' behaviour are therefore also needed. Sociopsychology and behavioural economics both offer possibilities to achieve this.

The bicycle is an attractive transport mode, but there are risks associated with cycling. The number of people seriously injured in traffic accidents is increasing and many of these people are cyclists. Older cyclists in particular are at greater risk, especially because they are more vulnerable (their bones for instance are more brittle) and have weaker physical conditions (such as functional limitations, slower reaction times and less muscle strength).

The Netherlands' bicycle policy is a collective responsibility of the decentralised partners (municipalities, provinces and water boards) and the national government. The national policy is established in the Road Safety Strategic Plan (*Strategisch Plan Verkeersveiligheid*), which is collectively drafted by the decentralised partners and other relevant parties. This report offers these parties specific targets for improving bicycle safety through influencing peoples' behaviour.

Serious injuries among cyclists
Although the number of traffic fatalities in the Netherlands is decreasing, the number of serious injuries is increasing. The majority of people seriously injured are cyclists: in 2009, this figure totalled some 11,000 people. For approximately 85% of these injured cyclists, no cars or other motorized vehicles were involved in the accidents. Senior citizen cyclists especially run a greater risk of being seriously injured, which, in part, is due to the deterioration of bodily functions related to sight, hearing, reaction time, muscle strength and balance. Seniors citizens partially use experience to compensate for this deterioration of abilities.

Among the senior citizen demographic, we can make distinctions according to gender. Until the age of 59, men are at greater risk per bicycle kilometre than women. Above the age of 60, however, the risk for both men and women increases sharply.

We can also make distinctions among these target groups according to cycling activities. The majority of accidents occur during daily bicycle journeys (shopping, work, social visits). Approximately 30% of 50+ people are involved in a bicycle accident during a journey to or from a recreational activity.

A global overview of the causes of accidents exists. First, accidents are related to infrastructure, such as for example pavements, poles or other obstacles and pitfalls along the way. Second, the bicycle is the cause: a foot slips from a pedal or part of the bike is defective. The third factor is the person; that is, the cyclist makes for instance a clumsy manoeuvre or is disturbed by another road user. In practice, a

combination of these three factors is usually involved. A pole is placed in an awkward location for example, the bicycle's brakes fail or the cyclist's thoughts are elsewhere.

Improving safety by influencing behaviour
Safety not only has to do with physical aspects, but rather also with behaviour. Bicycle paths can be safely constructed and bicycles in good working order, but those who act unwisely endanger themselves and/or others. Influencing behaviour can therefore contribute to bicycle safety.

Behaviour can be controlled in various ways. First, this can be achieved by taking human nature into account. People do not always make rational, well-informed decisions; behaviour is often intuitive and subconscious. Second, the social environment can be used to control behaviour; we allow our choices to be dependent on the opinions and actions of other people. This report focuses on these two types of control: taking human nature into account and using the social environment.

Taking human nature into account
Human thought has two sides. On the one side, it consists of a quick, impressionable system (the intuition), and on the other a rational, deliberate system (the ratio). The first way of thinking creates distorted images, of which the following are examples:

- Many people perhaps underestimate the scope of the traffic safety problem. Horrific murders garner more media attention than traffic fatalities and serious injuries.
- People do not associate bicycles with danger. The bike 'feels good' and has a positive image (fast, healthy and non-polluting).
- We are, as people, creatures of habit. Even if our physical condition no longer permits it, we will still get on our bicycles.
- When accidents occur, people are prone to quickly look for a cause that does not involve them. We do not make mistakes, but rather are 'victims of circumstance'.
- People are by nature optimistic and overestimate their own abilities. As such, some 90% of car drivers believe they are better (car) drivers than everyone else.
- This self-overestimation is unjustified; if people focus on a specific task that demands their full attention, they quickly ignore other matters.

These biased images are associated with an 'illusion of invulnerability'. Policymakers can take this illusion into account in order to make seniors conscious of the fact that bicycles present far greater risks than people often think. They can also inform older cyclists of the various ways in which the physical and mental capacities of older people decrease: those who are limited in some way and know the risks are quicker to adapt their behaviour accordingly. The ratio (the deliberate way of thinking) will give intuition (the quick, impressionistic manner of decision making) a helping hand.

Older cyclists would benefit from being given a more realistic impression of the risks they face. They can be informed about the 'illusion of invulnerability' and their decreasing abilities, but it is much better if these older cyclists *experience* this for

themselves. Seniors must see ‘first hand’ that they no longer see as well, hear as well, and need more time to react than they did twenty years ago. This does not mean that seniors should ride their bicycles less often, but rather that they should cycle more *sensibly*. This realization could also prompt them to opt for a customized bicycle or to use another mode of transport.

Using the social environment

Behaviour is also influenced by social environments and the norms that apply in those environments. A red light means we must stop and wait; this is formal norm. However, if many cyclists run red lights, we quickly begin to think that this norm should not be taken too seriously, because a larger group of people does not adhere to it.

In the context of traffic safety, the government can use these formal and informal norms. Consequently, we then have the option of reminding people of the formal norms, via roadside billboards and campaigns, such as for example the campaign entitled ‘A gentleman in traffic’.

Because people do not follow traffic rules, dangerous situations arise. The campaign *Vriendelijkverkeer.nl,* initiated by the Cyclists Union, attempted to highlight this fact. A campaign can also use the fear appeal: with certain restrictions, a campaign that plays on anxiety can be effective. If people are conscious of the dangers and risks, they will be more likely to exhibit the recommended behaviour.

The government can also point to ‘what most people do’, or to how leading people in the immediate social environment (the peer group) act. If for example most seniors purchase bicycles that have low mounts, this is ‘social proof’ that it was based on a wise choice. In addition, role models from the world of cycling (like Joop Zoetemelk, a former Dutch professional cyclist and now senior citizen) can demonstrate how they bike in a safe manner despite their limitations. Family members, fellow senior citizens and/or authorities in certain professions (doctors, physiotherapists or bicycle sellers) can play a role in such campaigns by proving good examples or by informing seniors of what they should and should not do.

Conclusion

Cycling is healthy, ensures that senior citizens remain mobile, and contributes to maintaining social contacts. However, there is also a flip side to the coin. The social and personal damage resulting from traffic accidents is high for cyclists, and this especially applies to senior citizens who are seriously injured while cycling. It pays then to also invest in the safety of cyclists. The measures implemented on the individual and social levels can also be applied in combination: it is not ‘or or’ but rather ‘and and’.

To a certain extent, some measures can be directly applied. There is also still much that we do not yet know about this subject. The extensive amount of research conducted about the safety of car drivers stands in sharp contrast to the relatively few available studies pertaining to the safety of cyclists. Consequently, a group of cycling experts has been working on a National Bicycle Research Agenda (*Nationale Onderzoeksagenda Fiets*) since 2011.

Based on this study, KiM concludes that additional research focused on the target group ‘senior citizen cyclists’ (the accidents, skills and risk perception), perception research conducted among older cyclists, and practical research exploring the effects of behavioural measures, are needed.