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SWOV Fact sheet

Phone use by cyclists and pedestrians

Phone use by cyclists and pedestrians like making calls, texting, surfing the internet, or listening to music,¹ carries an increased risk. Operating a touchscreen while cycling is the most dangerous of these activities. In 2016, the Minister of Infrastructure and the Environment started to prepare a legal ban on smartphone use while cycling. Presently, however, legislation still is absent and the Dutch Government opt for using education, information and technology to influence behaviour. For this last option a security app for cyclists has been developed.

How dangerous is using a phone while cycling?

Two Dutch studies found that phone use preceded and possibly played a part in 3 to 4% of the bicycle crashes with injury [1] [2]. Furthermore, phone use just before such a crash was mentioned almost as frequently as listening to music using a music player (phone use before the crash: 4.3%; listening to music before the crash: 4.8%) [1]. As cyclists much more frequently listen to music than use a phone, this indicates that phone use (calls and texting) is a higher risk factor for bicycle crashes than music.

How dangerous is using a phone while walking?

For the Netherlands no data is available about pedestrians who are injured as a consequence of phone use while walking. In the United States, the percentage of pedestrians who died in a road crash while using the phone, rose from less than 1% in 2004 to 3.6% in 2010 [3]. As yet, there is no direct evidence that using the phone while walking increases the risk of a crash [4]. However, pedestrians who use a phone while they walk do behave less safely. They walk slower, do not follow as straight a course, and are less in balance. They bump into something or someone more often, and others also bump into them more frequently [3].

Why is it dangerous to use a phone in traffic?

Telephone use can distract us from traffic [5]. When a road user is looking at the phone screen, he does not have his eyes on the road and listening to music while wearing ear or headphones sometimes stands in the way of hearing other traffic approach. Phone use also can take our attention away from traffic, for example, when typing in a number or message. The latter is sometimes done using both hands, which entails the risk of reduced vehicle control in addition to the risk of distraction. The music we listen to or the conversation we have can also affect our mood and distract us that way [6] [7].

What happens if cyclists use a phone?

Research shows that cyclists who use their phone while cycling (conversation and typing or reading text messages [2] [8] [9] [10]):

- cycle at a lower average speed;
- experience greater mental effort;
- experience more risk;
- overlook something more frequently;
- display unsafe behaviour more often.

The above studies indicate that typing while text messaging has the greatest effect on cycling behaviour. Cyclists who are texting, for example, cycle more towards the middle of the cycle track. Cyclists themselves also experience texting as the most dangerous activity.

The use of a smartphone with touchscreen while cycling appears to be more dangerous than the use of a phone with push buttons [11]: cyclists tend to cycle even further from the curb when using a touchscreen. This increases the risk of conflicts with cars. In addition, they also miss more objects in the periphery of the field of view. The difference probably occurs because the use of a touchscreen

¹ Before the smartphone had been developed, individual music players were generally used. This type of music player was often the device that played a role in the somewhat older studies into the effect of listening to music.

requires more visual attention than a device with push buttons on fixed positions that can therefore be found by touch.

Research [2] [9] showed that listening to music by cyclists has no effect on speed, lateral position, and noticing visual stimuli. However, cyclists who listen to music do more frequently miss important auditory information from the traffic (a bicycle bell, horn), especially when in-ear headphones² are used and when listening to loud or up-tempo music. Furthermore, the cyclists themselves indicated to experience a higher risk while listening to music than without music. It has also been observed that cyclists who listen to music more often cycle through the red light [2] and display other unsafe behaviour (for example, cycling against traffic, not slowing down at intersections with poor visibility, cycling on the pedestrian crossing) [8].



What happens if pedestrians use a phone?

While using a phone pedestrians display less safe (crossing) behaviour: less careful, longer crossing time, crossing when a car is approaching [12] [13] [14] [15] [16]. Especially calling and typing text messages lead to more unsafe behaviour; listening to music does this to a lesser extent [3] [13].

Furthermore, it appears that especially typing and, to a lesser extent, reading text messages go hand in hand with a less functional gait: pedestrians walk slower, less in a straight line and with more imbalances. This causes additional risk to pedestrians who need to avoid obstacles or cross a road [12]. Not all studies in this field, however, point in the same direction. For example, performing various cognitive tasks, including phone use, simultaneously showed no effect on the stability of the gait as measured on an instrumented treadmill [17].

Which measures can be implemented to reduce the risk of phone use while cycling and walking?

Prohibition

It is not forbidden in Netherlands to operate the phone or other equipment while cycling or walking. In 2016, the Minister of Infrastructure and the Environment started to prepare a legal ban on smartphone

² In-ear listening devices are listening devices that are placed in the auditory duct.

use while cycling [18]. This does not only concern handheld phone use (making calls and texting with the phone in the hand), but also operating the smartphone while it is in a holder attached to the handlebars of the bicycle. In Europe the legislation on this issue is varied. In Sweden, Finland, Norway, England and Ireland, for example, handheld phone use on the bicycle is also allowed, but it is banned in Denmark, Germany and Austria. A ban on phone use while walking is extremely rare.

Education and public information

Education and public information can contribute to the awareness of cyclists and pedestrians that phone use increases their risk in traffic. The campaign message can be strengthened by the following elements: 'humour', 'learning-by-errors' and the 'good example' [19] (see also the archived SWOV Fact sheet [Mass-media information campaigns about road safety](#)).

A questionnaire study among more than 1200 young people [20] makes the following recommendations for road safety campaigns: let youngsters experience how difficult it is to cycle with a mobile phone; provide evidence to youngsters that their friends/girlfriends use the phone on the bicycle less often than they think; let youngsters themselves think of arguments against phone use on the bicycle (self-persuasion); teach youngsters that it is safer to use one earpiece if they want to listen to music; teach youngsters that they can get off the bike or wait before they answer a telephone [20].

In the period 2014-2016, the Ministry of Infrastructure and the Environment in the Netherlands has been working closely with KPN, Vodafone, T-Mobile, UPC and Ziggo in a campaign for responsible use of the smartphone in traffic [21]. The providers work together for this purpose. At the kick-off of the campaign the Minister and the providers have signed a covenant. Team Alert and the Dutch Traffic Safety Association support the actions. An important part of the new campaign is a specially developed security app for cyclists, the 'Fietsmodus'-app ('Cycle mode' app; see below).

Technology and behavioural influence combined

Apps for cars are already being developed that turn off certain features of the smartphone as soon as the vehicle travels at a certain speed. This is also a possibility for influencing undesirable phone use by cyclists (and pedestrians). In this context, the 'Cycle mode' app was introduced late 2014. This app is based on a combination of stopping undesirable behaviour and rewarding appropriate behaviour. When the app runs during cycling, the screen of the smartphone switches off and cannot be used. Cyclists who use this app can collect reward points with which they have a chance of winning movie tickets, a t-shirt or a bike. If they use the smartphone anyway, the app will be interrupted and earn them no reward points during that ride. No study has yet been made of the effectiveness of the app in reducing phone use while cycling.

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