

## Roadside advertising and information

### Summary

Roadside advertising and information billboards can distract a driver from the driving task. Particularly billboards with moving parts draw the driver's attention and can endanger road safety. Billboards placed at road level distract the attention more than advertising which is placed at (great) height. At provincial and municipal level, the Netherlands does not yet have uniform guidelines for the placement of roadside advertising and information billboards. Further research, for instance making use of simulator studies or field experiments, can possibly shed more light on the effects of such boards.

### Background

Since 2002 seven life-size advertising billboards are attached to the front of a cinema alongside the motorway (A12) in the Dutch town of Ede. Initially the municipality tolerated these billboards on the condition that the cinema would still apply for a permit. According to Rijkswaterstaat, the Directorate-General for Public Works and Water Management, these billboards distracted passing drivers and consequently could have a negative effect on road safety. Therefore, Rijkswaterstaat wanted Ede municipality to prohibit this form of advertising. At the request of both Rijkswaterstaat and Ede municipality, the Dutch knowledge organisation TNO investigated the distraction caused by the billboards (Martens, 2005). Four experts surveyed the situation and concluded that seven billboards were quite many, and that drivers had to look away from the road to observe the billboards. However, they were also of the opinion that a driver could ignore the billboards. TNO advised Ede municipality not to give a permit for seven billboards, but to allow a maximum of two billboards with a limited amount of information. Based on TNO's opinion that motorists were indeed in a position to ignore the billboards, Ede municipality did grant the cinema the permit (for seven billboards) in 2005 (Press release Ede municipality, 12 April 2005).

The above example does not stand alone. It is often the case that advertising is placed close to the roadside, and that certain parties fear a negative effect on road safety. SWOV Institute for Road Safety Research, regularly receives questions from concerned drivers and also from manufacturers of roadside advertising who want to know if these large advertisements do indeed have a negative effect on road safety. The answer to this simple question, however, is not so easy to give. It gets even more complicated if the question is not about advertising billboards, but about information panels which are intended to improve road safety. Just like advertising, these information billboards could distract motorists from the driving task, and thus have a negative effect on road safety, but on the other hand, these information billboards give drivers information which could improve road safety.

This SWOV Fact sheet examines the distracting effect of advertising and information billboards. SWOV Fact sheets [Use of mobile phone while driving](#) and [Concentration problems behind the wheel](#) discuss other kinds of distraction in traffic.

### What is the effect on road safety of roadside advertising and information?

Little is known about the relation between roadside advertising and information and crashes. Roadside advertising and information, however, do intend to draw the attention of passing drivers, thus allowing them to shift their attention away from the traffic situation. The difference between roadside advertising and roadside information is that information draws the drivers' attention to traffic relevant matters, while this is not the case for advertising. Therefore, it is logical to expect that especially advertising billboards increase the crash rate. To find proof for this surmise, crash studies were carried out and observational and behavioural research was done.

### Crash studies

Wallace (2003) has made a survey of crash studies that investigate which roadside elements (including advertising and information billboards) have a negative effect on road safety. Wallace distinguishes correlational studies (which relate the number of crashes with the presence of a roadside element) and before-and-after studies (which determine whether there are more crashes after the

object was placed, than there were before it was placed). According to Wallace, particularly this first type of research encounters methodological problems. Because almost every study he discusses was both correlational and fairly old (before 1980), it is not possible to draw solid conclusions. However, Wallace considers it proven that, although roadside advertising and information have no demonstrable influence on road safety, they sometimes do indeed have a negative effect. An example are busy intersections, where billboard that have nothing to do with traffic, unnecessarily distract the drivers at precisely the moment in which they need to aim their attention at the traffic. Furthermore, confusion could arise about advertising and information on the one hand, and traffic signs and other indicators on the other, when they are similar in design or colour. Hagenzieker (1994) also made this observation.

Tantala & Tantala (2005) and Smiley et al. (2005) made more recent crash studies. The first study, which consisted of a correlational study and a before-and-after study, only looked at the effect of large advertising billboards on road safety, although the authors acknowledge that this type of billboard actually was only a small part of all billboards alongside the road. They found that advertising billboards alongside the road did not have a statistically significant effect on the occurrence of crashes, and that there was no causal relation between the presence of such billboards and the number of crashes. Smiley et al. (2005) did a before-and-after study into the effect of dynamic advertising billboards, as these are supposed to be a larger source of distraction than static advertising billboards (Luoma, 1986; Boersema et al., 1989; Beijer et al., 2004). However, Smiley et al. (2005) were unable to conclude that dynamic advertising billboards caused more crashes than static advertising billboards.

#### *Observational and behaviour studies*

Observational and behaviour studies into the effect of advertising and information along the roadside examine the manner in which motorists react to such objects. These studies can be carried out on the road (Beijer et al., 2004; Smiley et al., 2005; Kettwich et al., 2008), or in a laboratory (Crundall et al., 2006; Young et al., 2007). Beijer et al. (2004) measured how long and how often drivers looked at specific roadside billboards. They appeared to look longer and more frequently at billboards with moving parts. Taking this as a basis, Smiley et al. (2005) made an elaborate study of the effect on road safety of moving pictures. Not only the previously mentioned crash study, but a behavioural study also was part of this research. In the behavioural study, the eye movements of a number of drivers were recorded while crossing intersections both with and without dynamic advertising billboards. This study showed that drivers did not look at traffic signs less frequently if dynamic advertising billboards were present, but that some drivers did show unsafe behaviour while looking at the dynamic signs. Kettwich et al. (2008) used an eye tracker to investigate whether subjects driving a car were indeed distracted by advertisements. This study showed that none of the subjects looked at the advertisements for longer than a second. On the basis of this result they concluded that roadside advertising does not have a measurable effect on road safety.

Crundall et al. (2006) investigated the difference between advertising billboards at road level and advertising at a height of three metres above the road. They concluded that the billboards at road level caught the attention of the subjects more frequently and held it longer than the suspended boards, and that this was mainly the case for subjects who were given the task of spotting dangerous situations. Especially in a dangerous situation it is important for the driver to have his attention on the road; an advertising billboard can slow the driver's reaction time, which increases the chance of a crash. Young et al. (2007) used a simulator to study the effect of roadside advertising on a driver's concentration and his behaviour. One of the results was that drivers leave their lane more frequently when roadside advertising is present. In addition, an indication was found that more crashes occur when billboard advertising is present. More convincing was the effect on the task load: it was significantly greater when advertising billboards were present than in situations where they were not.

The literature mentioned above takes the assumption that advertising and/or information billboards mainly have negative effects on road safety as a starting point. Wildervanck (1989), however, is of the opinion that such boards may in some cases have a positive effect. He uses a straight and deserted motorway in a monotonous surroundings as an example. Such a road makes few demands on the driver, which causes a strong decline of his arousal (mental activity level). When something unexpected happens, the low arousal usually prevents the driver from acting fast and adequate. Diminished arousal may be prevented by offering a driver some distraction on such roads, for instance by placing advertising billboards.

### **Which are the guidelines for placing advertising and information billboards?**

The Ministry of Transport has clear directives for placing roadside advertising and information billboards. Within the national road network supervised by Rijkswaterstaat it is not permitted to place advertising close to the roadside of trunk roads, other than at filling stations and parking lots. Billboards aimed at increasing road safety and information panels about road works, are allowed at the roadside.

If, however, advertising billboards are placed outside the national road network, the Ministry of Transport has no authority to prohibit them; the province or municipality on whose territory the billboard is placed, then determines whether or not it is allowed. Each province and each municipality is entitled to its own guidelines, which may differ from the Rijkswaterstaat guidelines. A few examples to illustrate the situation:

The provinces of Flevoland and Utrecht prohibit placing billboards (or other moveable objects) in rural areas in such a way that they are visible from a public road, public water, a railway, or any other publicly accessible location (Provincie Flevoland, 2005; Provincie Utrecht, 1996; 2003). Both provinces have some exceptions to these rules, for instance for boards containing road information. In addition, boards that are placed to improve road safety are explicitly allowed in the province of Flevoland. For possible exemptions from the prohibition the province of Flevoland demands that the billboard may not be in conflict with protection of the landscape, or with the road safety interests; the province of Utrecht, however, does not take the effects on road safety into consideration for exemptions.

In Amsterdam no advertising may be placed on or alongside the public road (Gemeente Amsterdam, 2008). There are exemptions from this prohibition, but traffic may never be endangered. Slotervaart District goes a little bit further. In the *Advertising memorandum* this district explicitly states that advertising objects may not hinder visibility, they may not be fitted with changing or flashing lights, daylight reflecting materials, or sound, and must be placed a minimum of one metre from the edge of the road. (Stadsdeel Slotervaart, 2007). This illustrates that even within one municipality there are differences in guidelines for placing advertising and information billboards alongside the road.

Of course it remains difficult to judge in advance whether advertising has a negative effect on road safety. Van 't Hof et al. (2006) present a step-by-step plan to help road authorities to decide whether an advertising billboard or other special object can be placed along a certain road without having a negative effect on road safety.

### **Will there be supplementary studies?**

At present SWOV does not carry out research into the effects of roadside advertising and information. However, as we are frequently asked about this subject, such research may be advisable for the future. Two types of research could be considered: crash studies, and observational and behavioural research.

Crash studies are very complicated methodologically, as Hagenzieker (1994) and Wallace (2003) indicated. Moreover, crashes are rare events, so that the research should be large-scale and of long duration to make even rough conclusions possible.

Observational and behavioural research can indicate to what extent advertising billboards distract road users' attention. This will enable estimates of the consequences for road safety. There are various ways in which observational and behaviour research can be carried out:

- To determine the extent of distraction by advertising alongside the road, two groups of subjects are shown *photographs*. Advertising objects are present in the photographs of one group. Both groups are given the task to find something relevant to traffic. The difference in reaction time gives an indication of the distractive effect.
- In *simulator studies* photographs can be replaced by moving pictures. The advantage of a simulator study is that changes in driving behaviour, for instance in speed or in lateral position, can also be registered.
- In *field experiments* instrumented vehicles are used.

## Conclusion

Roadside advertising and information billboards are intended to draw the driver's attention, which may cause a diminished attention for the current traffic situation. Information billboards alongside the road serve a different purpose than advertising billboards: these information billboards are intended to increase road safety. However, in both cases the driver's diminished attention could result in more crashes in the vicinity of such billboards. In the past, attempts have been made to show that this is indeed the case, but because of the methodological problems of these studies this has never been done in a sufficiently reliable manner. As society is interested in this subject, supplementary research is advisable.

Studies from previous years show that it is better not to place advertising and information billboards at busy traffic spots. It must also be prevented that they resemble traffic signs or other traffic indicators, because this could be confusing. Furthermore, blinking and moving objects have proven to be difficult to ignore. Therefore dynamic advertising and information are ill-advised.

Different levels of government all have their own guidelines for the placement of advertising and other objects on or alongside the road. Unambiguous guidelines are advisable.

## Publications and sources

### [Dutch SWOV-reports have an English summary]

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