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SWOV Fact sheet

Penalties in traffic

Summary

Traffic offenders are penalized in various ways: fines, (temporary) driving licence suspensions, confiscation of their vehicles, penalty points, mandatory participation in rehabilitation programmes, prison sentences or community service. The aim of penalties is to punish offenders, to protect society and to influence the behaviour of offenders and all citizens (prevention). Many studies have found that the combination of enforcement and penalties prevent the violation of traffic regulations and increase road safety. However, the most common type of penalty at the present time, a fine, has been found to have limited effect.

As people differ in their motivations and their ability to change their traffic behaviour structurally, some types of penalty and treatment have better effect than others for different groups of offenders. Technological applications will play an increasingly important role in 'tailored penalties'.

Background and content

Among other things, penalties are an instrument for steering undesirable behaviour in a desirable direction by linking negatively perceived consequences to the undesirable behaviour. The current penalties for traffic violations in the Netherlands mainly consist of imposing fines. Penalties also include (temporary) driving licence suspension, mandatory participation in special rehabilitation programmes, and prison sentences or community service for serious traffic offences that result in injury. Since 2002, novice drivers are allotted penalty points for serious violations. In June 2011, a penalty point system for repeated serious drink-driving offences was introduced in the Netherlands. This fact sheet discusses the effectiveness of penalties and the factors that play a role in this. The information in this fact sheet is partly derived from international research studies. However, a system that works well in one country does not necessarily work equally well in another country. Differences in legal context and cultural norms must be taken into account. But when applied correctly, results from other countries may also be relevant to the Netherlands. The opposite of penalizing – rewarding correct traffic behaviour – is another instrument that can influence behaviour, but it is not discussed in this fact sheet. For information about this subject see SWOV Fact sheet [Rewards for safe road behaviour](#). Separate SWOV Fact sheets have been published on specific effects of penalties in the form of demerit points systems and educational measures: [Demerit points systems](#) and [Rehabilitation courses for road users](#).

Why are penalties necessary in traffic?

Traffic regulations direct the mutual relationships between road users and the relationships between road users and their surroundings. They are intended to promote the safe and rapid flow of traffic. According to the Sustainable Safety vision, unintended errors and *unconscious* violations by road users can be prevented by means of a clear road layout, understandable and realistic traffic regulations and good traffic education (Wegman & Aarts, 2006). In this vision, the enforcement in traffic and punishment of offenders is a final but necessary step in preventing road users from *intentionally* offending against traffic regulations.

The practice of imposing penalties serves a number of (social) goals: *retribution* (somebody has to 'pay'), *protection of society* (those not participating in traffic cannot commit offences), *influencing the offender's behaviour* to prevent repetition of the undesirable behaviour and *influencing the behaviour of all citizens* (through the general normative effect of the law and penalties).

The purpose of retribution is not so relevant for the prevention of crashes, and in practice few offenders are actually removed from traffic. However, a positive effect can be expected from influencing the behaviour of the offender himself/herself and of citizens in general. Therefore, this fact sheet focuses mainly on the latter two objectives of penalties in traffic.

How do penalties work?

The effect of penalties can be (theoretically) understood in two ways (Van der Pligt et al., 2007). The first, the *instrumental approach*, is based on deterrence, and regards the fear of being punished as the central mechanism for avoiding certain behaviour. According to the classic deterrence theory (formulated in the 18th century by the philosophers Bentham and Beccaria) and the later 'operant conditioning theory' (formulated by, among others, Skinner) penalties can influence human behaviour. According to these theories the certainty, speed and severity of the penalty determine the effectiveness of that penalty in mutual interaction.

Normatively oriented theories hold that criminal law and the chain of law enforcement based upon it can only be effective when citizens are familiar with the norms and rules in force and are convinced that compliance with the rules is important (Andenaes, 1974). Punishment as a mechanism for getting people to obey the rules has a much greater effect when that punishment is compatible with the norms, values and the sense of justice of the citizens themselves. According to this approach, it is the social disapproval that turns a formal penalty into a psychological penalty.

Punishing traffic violations is part of the chain of traffic law enforcement (*Figure 1*). The first link in the chain, which is the foundation of traffic law enforcement, is traffic legislation. The legislation defines the rules for traffic participation and determines the possibilities for tracking down and punishing violations. The actual enforcement of the rules leads to an enforcement pressure or *objective probability of detection*. Ultimately, however, it is not about the objective probability of detection, but the *subjective probability of detection* – that is, road users' assessment of the likelihood of being caught breaking the rules. The subjective probability of detection is partly determined by the objective probability of detection, and also, for example, by coverage in the media, public information campaigns and stories told by friends and acquaintances.

When road users consider the subjective probability of detection to be sufficiently likely, they will avoid violating regulations. The combination of enforcement and penalty is *generally* preventative when road users avoid traffic violations on the basis of the expected negative consequences. We speak of *specific* prevention when road users avoid committing traffic violations on the basis of fines or penalties they had to pay as a consequence of earlier violations. Specific prevention therefore involves a change in behaviour resulting from the penalty itself.

Can the threat of a penalty prevent violations?

Most studies show that road users commit fewer offences when confronted with a greater likelihood of being apprehended and punished. This applies to various violations such as speeding, drink-driving, driving without using a seat belt, and red light running (see the SWOV Fact sheets [Police enforcement and driving speed](#) and [Effects of police enforcement of protection devices and moped helmet use and red light running](#)). It therefore involves the general preventative effect of being threatened with punishment. Below the effectiveness of increasing the punishment will be discussed.

Although the threat of enforcement and punishment reduces the number of violations, there is a limit to what this can achieve. A constant level of enforcement and punishment is not enough in the long term to further reduce the number of violations. Research in the area of speed enforcement has found that increasing the number of man-hours in speed enforcement or the number of speed surveillances with a factor of three is often required to create an effect on behaviour and therefore on road safety (Bjørnskau & Elvik, 1992).

Once a certain level of enforcement and punishment has been reached, it becomes comparatively more difficult to realize extra behavioural effects. For example, Mathijssen (2005) found that every doubling of the enforcement level for drink-driving in the Netherlands leads to approximately a quarter fewer violations.

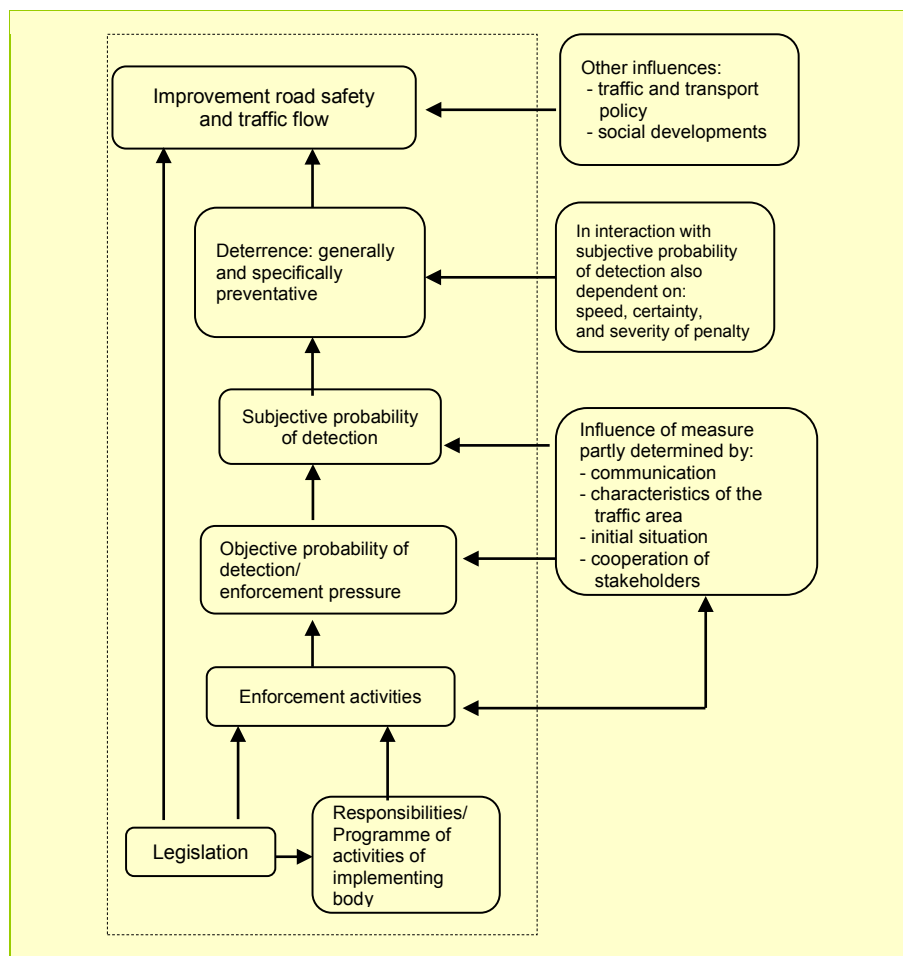


Figure 1. Diagram of the mechanism of police enforcement (inside dotted line), and the influence of external factors (outside dotted line). Source: Goldenbeld & Van Schagen (2008).

What are the effects of increasing fines?

In the Netherlands, the level of traffic fines has been adjusted over time. On 1 April 2008 all fine sizes were increased by 20% on average; on 1 January 2010 the sizes were again increased, now with an inflation correction of around 4%.

Evidence shows that the size of fines has actual effect on violation behaviour. Bar-Ilan & Sacerdote (2001) used the so-called price elasticity of fines to look at the relation between increasing fines and red light running. On the basis of data from Israel and the US, they estimated that each percent increase of fines had led to a decrease in red light running of around one fifth percent (the price elasticity was -0.20). In the Netherlands, research has been done into the price elasticity of fines as well (Moolenaar et al., 2011); the aforementioned fine increases of 1 April 2008 and 1 January 2010 have been taken into account. The price elasticity of speeding fines at section control systems has been estimated at -0.23. In other words: when the fine rate is increased by 1%, the number of violations will decrease by 0.23%. This approximates the above estimation made abroad. However, it should be pointed out that the effects of the fine increases were measured shortly after the increase in the studies above, and especially at locations where the police uses surveillance. The behavioural effects are therefore limited and related to specific times and places.

In the area of seatbelt use there are also indications that the size of the fine influences violation behaviour. A Norwegian study showed that an increase in the fine size by 50% over 10 years for car occupants not using seatbelts related to improved use of seatbelts (Elvik & Christensen, 2007). This correlation was also found in the US (Nichols et al., 2010): an increase of the fine from 25 to 60 dollars improved the use of seatbelts by 3 to 4 percent point and an increase of 25 to 100 dollar increased seatbelt use by 6 to 7 percent point.

What is the effect of fines imposed by a judge?

An Australian study examined whether the size of a penalty has an effect on recidivism (Moffat & Poynton, 2007). This study used a data file of more than 70,000 people who had been fined for traffic offences. This study found no evidence whatsoever for a connection between the size of the fine and the likelihood of an offender being prosecuted again. There was no evidence either that the length of the period for which driving licences were suspended affected the likelihood of an offender being prosecuted again. An American study (Jingyi et al., 2006) showed that a fine for speeding imposed by a judge, whether or not in combination with penalty points, had no effect on the likelihood of people being prosecuted again for a traffic offence.

What are the effects of increasing drink-driving penalties?

In the field of road safety, research has mainly been conducted into the effect of increased penalties for drink-driving. In the Australian state of New South Wales, a doubling of the penalty for drink-driving, introduced in 1998, did not reduce the incidence of drink-driving or the numbers of crashes (Briscoe, 2004). Also in the Netherlands, the much stricter penalties for drink-driving introduced in 1992 (higher fines and faster suspension of driving licences) did not lead to a decrease in drink-driving (Mathijssen, 1994). It even increased somewhat, probably partly due to the noticeable drop in the level of enforcement. The laws in various US states that lay down prison sentences for first-time drink-driving offenders were found to have little or no effect on drink-driving (Wagenaar et al., 2007). In the abovementioned Australian study by Moffat & Poynton (2007) more than half of the over 70,000 traffic offenders in the database had been convicted for drink-driving. This study, too, found no connection between the size of the fine and the likelihood of an offender being prosecuted again. Nor did it find evidence for the duration of the driving licence suspension having an effect on this likelihood.

As opposed to increasing penalties, regular or constant monitoring of alcohol use does have an effect on alcohol offences. For example, in the South Dakota '24/7 Sobriety Program' repeat alcohol offenders could avoid a prison sentence if they could daily prove that they did not use alcohol anymore, either through breath tests in the morning and evening or through using a continuous alcohol monitor. If the tests showed that alcohol had been consumed, this immediately led to a short prison sentence of one or two days. In the period 2005-2010 more than 17,000 inhabitants of South Dakota joined this programme. A comparative study performed by Kilmer et al. (2013) showed that this programme – involving faster and lighter penalties for alcohol abuse – led to 12% fewer arrests of repeat alcohol offenders in traffic, and 9% fewer arrests for domestic violence. The alcolock that was introduced in the Netherlands also relies on regular monitoring of violation behaviour as well. The first evaluation results of the alcolock programme in the Netherlands are expected in 2014 (see SWOV Fact sheet [Alcolock](#)).

Why is the effect of penalties so small for drink-driving?

There are a number of possible explanations as to why the size of the penalty seems to have so little effect on drink-driving. The first explanation is the high alcohol dependency, the drink-drivers' addiction to alcohol, which inhibits them from reducing the alcohol use and makes them persist in the violation behaviour. A second explanation is a subjective probability of detection that is too low. If the offenders are caught once, they do not conclude that the detection level is high, because often they have not been detected for years preceding this first apprehension. Lastly, a possible explanation is that repeat drink-driving offenders are sensitive to the gambler's fallacy, for which Pogarsky & Piquero (2003) found evidence. Drink-drivers who have driven under the influence for years without being detected and penalized, wrongly assume that their risk of being caught decreases after their first apprehension and penalty. Therefore, apprehension and penalties do not lead to a higher but to a lower subjective probability of detection for them.

What is known about the effects of rehabilitation courses for traffic offenders?

Rehabilitation courses are educational measures aimed at deviant driving behaviour of drivers. There are three rehabilitation courses in the Netherlands: the EMA (Educational Measure Alcohol and traffic), the LEMA (the Light EMA) and the EMG (Educational Measure Behaviour and traffic). For example, the EMG is for drivers who have shown undesirable driving behaviour multiple times in one drive. A driver may also be sent to the EMG in case of a single occurrence of a large speeding offence. Whether the Dutch courses such as EMA, LEMA, and EMG lead to less repeat offences as compared to a traditional penalty, is not yet known.

Many rehabilitation courses exist outside of the Netherlands as well. Participation can be voluntary or can be imposed mandatorily, possibly in combination with other penalty measures and possibly linked to a demerit points system. The effectiveness of the courses cannot easily be determined unambiguously (see SWOV Fact sheet [Rehabilitation courses for road users](#)). Some evaluations show an effect on demeanour, behaviour, crash rate, and repeat offences; while other studies show no effects. On the basis of studies it can however be concluded that a rehabilitation course increases in effectiveness when combined with a temporary or permanent suspension of the driving licence (Bächli-Biétry et al., 2007).

What is known about the effectiveness of demerit points systems?

Internationally, points systems are often used to increase the effectiveness of penalties and to prevent repeat offences (a specific preventive effect). In such a system the offender gets a number of penalty points imposed, next to the regular fine, and when a certain number of penalty points is reached, a (temporary) suspension of the driver license is imposed and one has to take a course or take the driving test again.

A recent meta-analysis of demerit points systems shows an initial effect of between 15 and 20% fewer crashes or fatalities and serious injuries (Castillo-Manzano & Castro-Nuño, 2012). These results are based on 24 effect measurements in various European and non-European countries. On average, however, the effects of the points systems have disappeared within less than one year and a half. For more information, see SWOV Fact sheet [Demerit points systems](#).

Tailored penalties?

Traffic offenders differ in the extent to which they can be stimulated and can structurally change their traffic behaviour themselves. Different types of penalties or treatment will work best for different groups of offenders. For example, in the United States Nochajski & Stasiewicz (2006) found that a prison sentence has absolutely no effect on the level of recidivism of drink-drivers, while an alternative penalty, a form of temporary electronic house arrest, turned out to have a positive effect on recidivism.

An effective penalty can consist of a combination of related parts of the penalty, such as temporary confiscation of the vehicle, a temporary driving licence suspension, a fine, or the choice of a rehabilitation programme in exchange for the faster return of the vehicle or driving licence. A first proposal for tailored penalties for notorious traffic offenders in the Netherlands was made by Kuiken et al. (2009). As a measure for road users for whom the Educational Measure Behaviour and traffic (EMG) is not effective, they argue in favour of using an in-vehicle data recorder which not only records offences but also actively reduces the driving speed: a 'speed lock'. Within the *Strategic Plan Road Safety* such a measure was being developed. However, since an evaluation has shown that the developed system is not protected against fraud (Van der Pas et al., 2012), the Dutch Ministry of Infrastructure has abandoned the 'speed lock' for now. For repeat drink-driving offenders, a tailored penalty involves the alcolock combined with a course programme of three half days aimed at making the participants better separate the use of alcohol and driving a motor vehicle (see SWOV fact sheet [Alcolock](#)). On 1 December 2011 this alcolock programme was introduced in the Netherlands. For participants who still cannot separate the use of alcohol and driving a motor vehicle after two years, the alcolock programme will be lengthened by six months each time, until they are able to make the required separation.

Conclusion

The purpose of threatening people with penalties is to make it unattractive to commit violations (general prevention) and the actual punishing of offenders is intended to prevent offenders from repeating the offence (specific prevention). Many studies have demonstrated that combining enforcement and penalties prevents traffic violations and increases road safety. Of course, the penalty must match the severity of the violation and must be substantial enough to influence behaviour, but particularly the frequency, visibility, and unpredictability of inspections are responsible for the general prevention of traffic violations.

Studies show that increasing the fines has a (limited) beneficial effect on the use of seatbelts, speed, and red light running, but the effects were often measured shortly after the introduction of the measure and at places with frequent surveillance. The behavioural effects are therefore limited in time and place. On average, fines are mild penalties. For already relatively severe penalties, such as penalties for drink-driving or penalties imposed by a judge, there is little evidence that an increase in penalty severity has positive effects on behaviour. For repeat drink-driving offenders, however, there is

evidence showing that regular monitoring of alcohol use and fast and light penalties lead to a decrease in recidivism.

Traffic offenders differ in the extent to which they can be stimulated and can structurally change their traffic behaviour themselves. Different types of penalties or treatment will work best for different groups of offenders. To find which penalties or which combinations of penalties are the most appropriate for which groups of traffic offenders further research is required. To an increasing extent, technological applications will play a role in this. On 1 December 2011 an alcolock programme was introduced in the Netherlands to punish and change the behaviour of serious repeat drink-driving offenders.

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