

TRAFFIC SAFETY AND SPEED

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ABSTRACT

The risk level on Norwegian roads is low in a European context. Since 1970 Norway has employed a systematic, long-term approach to traffic safety work. The National Plan of Action for Road Traffic Safety 2010-2013 has set an ambitious goal of one-third reduction in the number of persons killed or seriously injured by 2020. High speed, one of the best documented risk factors for serious accidents, is the subject of several targeted actions — among them a speed campaign.

The objective of this campaign is to reduce the number of people killed or seriously injured. Analyses prior to the campaign showed that men from the ages of 25 to 40 are those who are most likely to exceed the speed limits. The analyses also revealed that they had little knowledge of the relationship between speed and risk.

The first phase of the campaign aimed to increase the level of knowledge in the population about the relationship between speed and risk. This has been pursued through targeted television and radio commercials, supplemented by other public relations channels. Evaluations show that the level of knowledge has increased, self-reported compliance with speed limits has improved, and there are some indications of speed reduction.

1. INTRODUCTION

The risk level on Norwegian roads is low in a European context. Since 1970, the year in which the number of traffic fatalities peaked (560), Norway has employed a systematic, long-term approach to traffic safety work (figure 1). In 2002 Norwegian Public Roads Administration (NPR) officially launched Vision Zero, a vision of no fatalities or serious injuries in road traffic. The focus has been shifted to target the most serious accidents. The number of people killed or seriously injured has been reduced from more than 5,000 a year in 1970 to less than 1,000 in 2010.

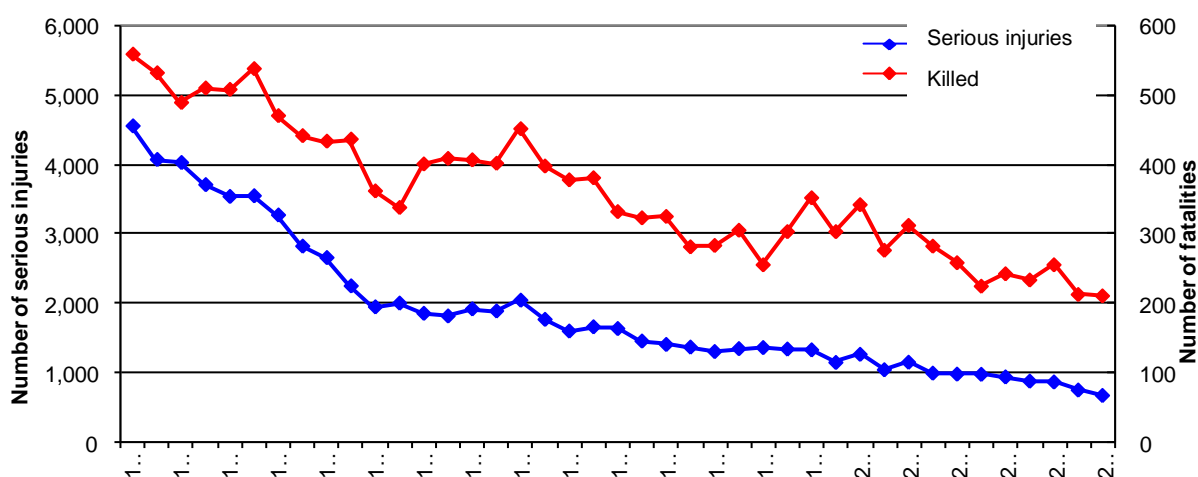


Figure 1 - Killed and seriously injured persons in Norway from 1970 to 2010

The National Plan of Action for Road Traffic Safety 2010-2013 has set an ambitious goal of one-third reduction in the number of persons killed or seriously injured by 2020. To reach this goal we are implementing a wide range of measures, focusing on road users, vehicles, road improvement and prevention of injury.

1.1 Speed is a major contributor to severe accidents

High speed is one of the best documented risk factors for serious accidents. The Power Model, which is based on a meta-analysis of speed studies, shows that a 5 % increase in average speed means a 25 % increase in the number of fatalities (figure 2). The same 5 % increase in average speed has a weaker, but similar effect on accidents with personal injuries, resulting in a 10 % increase. In other words, minor changes in speeds have dramatic consequences for the outcome of an accident.

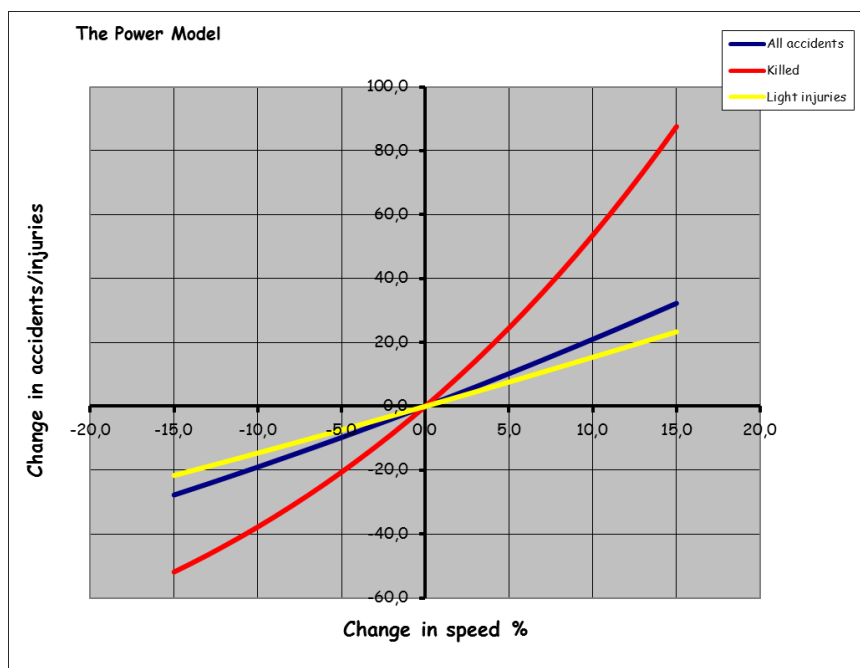


Figure 2 - The Power Model - change in speed and risk (based on Elvik 2009)

The NPRA has conducted in-depth analyses of all fatal accidents in Norway since 2005. These analyses show that excessive speed is the single most important causal factor. Thorough analysis reveals that speed is a contributory factor in more than 50 % of all fatal accidents. In more than 30 % of these accidents, the speed has exceeded the posted limit or has been too high for the existing conditions. Extreme speeds were involved in “only” 20 % of the fatal accidents. In other words, it is not only extremely high speeds that cause fatalities.

- *1.1.1 Targeting the speed problem*

There are several actions that can be used to target the speed problem. A wide range of measures will be implemented to reduce the number of people killed and seriously injured due to excessive speed.

The Norwegian speed system outside urban areas has recently been revised, taking into account our knowledge of critical speed in head-on collisions. There will be even more use of 70 kph speed limits on roads with high traffic volumes without a physical barrier.

To enforce the speed limit we focus on two main measures. The presence of highway police is essential, particularly for apprehending those driving at extreme speeds. In addition, Norway has good results using speed cameras, and we have recently introduced the use of speed cameras to measure average speed. A short description of this system is to be found at the end of this paper.

Intelligent Transportation Systems (ITS) also offer new solutions. Different types of in-vehicle systems can help the driver to keep the appropriate speed, either passively (through information and warnings) or actively (through intervention). The introduction of different types of Intelligent Speed Adaptation (ISA) in new cars is growing. The NPRA will install such systems in all new agency vehicles and is promoting the system to other users as well.

NPRA registrations of actual speed in Norway reveal that more than 50 % of all drivers in non-urban areas exceed the speed limit. Whereas drink driving is considered socially unacceptable, road users do not have the same perception of speed violations. Given this fact, measures targeting the road user behaviour will also have to be considered. The main part of this paper will describe the Norwegian speed campaign.

2. NATIONWIDE CAMPAIGNS IN NORWAY

A key aspect of traffic safety work is to provide information to the public through traffic safety campaigns. Knowledge from accident analysis and research is used to design efficient campaigns. The NPRA combines information and enforcement for maximum effect, prioritising themes in accordance with Vision Zero. Traffic safety campaigns should express preferred behaviour in order to induce safer behaviour.

In 2003 the NPRA adopted a strategy of communication for our campaigns. We wanted a uniform foundation for all our work and to be more targeted in our communication.

The key components of this strategy are:

- A small number of large-scale campaigns: 1-2 campaigns that are carried out over a 3-5 year period
- A combination of available measures (information and monitoring/enforcement, legal framework)
- Defined target groups and a clear message
- A brand image and a tone of voice that is present and recognisable in all the expressions
- The NPRA identified as the originator of the campaigns
- Evaluation before and after the campaigns

2.1 Speed campaign (2009 – 2012)

As part of the strategy for reducing driving speeds on Norwegian roads, the NPRA launched a speed campaign in 2009. The main objective of the campaign is to reduce the number of people killed or seriously injured on Norwegian roads by reducing driving speeds.

The NPRA is collaborating closely with the traffic police during this campaign. Research on road traffic safety campaigns has revealed that the impact is greatest if a number of different measures are implemented. As the police are responsible for enforcing the speed limits, they are a key partner in this campaign.

In a survey from late 2008, 49 % of the respondents said that they often or sometimes drove at 95 kph when the speed limit was 80 kph. Only 13 % responded that they never drove that fast. This is the datum point of the campaign (the reference point for the analysis before the campaign started).

This survey showed that men from the ages of 25 to 40 are most likely to exceed the speed limits. Yet they consider themselves to be responsible drivers who drive at reasonable speeds. The analyses also revealed that there was little knowledge of the relationship between speed and risk, particularly with regard to moderate violations of the speed limits. The drivers' prior experience is overwhelmingly positive: most of these drivers have not been in a serious accident although they most often exceed the speed limit. They are unaware of how much the risk increases with minor changes in speed.

2.1.1 Target group and main message

The moderate speeders who consider themselves to be responsible drivers but still exceed the speed limit are the main target group for our campaign. This is most often men between the ages of 25 and 40.

Speed limits can be dealt with in two ways: you can obey them or violate them. We ask the question:

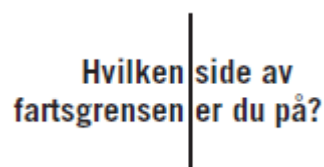


Figure 3 - Campaign logo: "What side of the speed limit are you on?"

2.2 Communication task

As the communication task is complex, it has been divided into phases: Knowledge/awareness – responsibility – social unacceptability – thank you! (when the speed is actually reduced). In this paper we will focus on the first two phases.

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- *2.2.1 Knowledge/awareness*

In order to achieve a reduction in moderate speed violations, we need to raise the awareness and knowledge of the relationship between speed and risk. This first phase has been pursued through targeted television and radio commercials, supplemented by other public relations channels. We have made a selection of facts which are not well known among drivers and which we assume are surprising. One of these is related to the power model and the link between speed and risk.

A second fact is related to the amount of force the human body can stand. It is a myth that if driving a new car with all kinds of safety equipment, you are immortal. There is strong evidence that if in a head-on collision when driving a new car, the probability of surviving drops sharply when the speed exceeds 70 kph.

The third fact is related to the increase in stopping distances. In a situation where something unexpected appears in the road in front of you and you can stop just in time for the obstacle at 80 kph, you would have hit the obstacle at 50 kph if your initial speed had been 90 kph. A mere 10 kph greater speed can be the difference between no accident at all and a severe accident. In our television commercial this physical fact is expressed in a personal and emotional way.

- *2.2.2 Responsibility*

In the second phase we want to define the driver's responsibility. It is often said that being in an accident is bad luck, but in many situations the outcome would have been different if the driver had complied with the speed limit. You can affect your own risk level by choosing the right speed.



Figure 4 - Pictures from the television commercial

2.3 Aims and evaluation

The main aim of the campaign is to reduce the number of people killed or severely injured in traffic in Norway by drivers reducing their speed. As our strategy states, this can be achieved through mechanisms such as greater knowledge of the links between speed, risk and severe accidents. It is also important for us to challenge the fact that moderate speeding is socially acceptable in Norway. An evaluation conducted by the Institute of Transport Economics (TØI) is examining these factors.

▪ 2.3.1 Awareness of the campaign

According to a survey after the first year of the campaign, the attention of the public has been very good. Especially the main target group (ages 25 – 40) and the younger population (18 – 24) reported having noticed the campaign (table 1).

Table 1 - Awareness of the campaign - sample and different age groups. In per cent.

Noticed the campaign	Young people	Target group	Older than target group	Sample
Yes	88	71	52	68
No	7	17	29	19
Do not know / do not remember	5	12	19	13
Total	100	100	100	100

▪ 2.3.2 Knowledge and self-reported speed

Evaluations have shown that the level of knowledge has increased, but the maximum effect is short-term. Some months after the major campaign periods, the level of knowledge has declined, but not down to the initial level.

Self-reported compliance with speed limits has improved. Before the campaign 49 % of the respondents said that they often or sometimes drove 95 kph where the speed limit was 80 kph. This has now declined to 44 %. If we examine the target group in particular, the number has decreased from 64 % before to 54 % after the campaign. Both of these are significant changes.

▪ 2.3.3 Actual speed

There are some tendencies indicating a reduction in the overall speed level on Norwegian roads outside urban areas.

Table 2 - Average speed from 5 measuring stations (85 % and 95 % fractile). Between 10 AM and 3 PM, week 35 – 38 year 2005-09. In kph

	Year				
	2005	2006	2007	2008	2009
Average	30.0	30.2	30.2	30.1	29.6
85 % fractile	38.7	38.9	38.7	38.4	38.0
95 % fractile	35.4	35.5	35.4	35.0	34.4

The average speed was stable from 2005 to 2008, but we can see a slight reduction of 0.5 kph in 2009 (table 2). The amount of traffic increased in the period from 2005 to 2008, then stabilised from 2008 to 2009.

3. CONCLUSION

We see a tendency of change in the desired direction after the campaigns first of four years. Hopefully the changes will continue in the rest of the campaign period. Change in speed behaviour is difficult, but even the small changes as referred to in table 2 will affect the safety levels on the roads.

4. SPEED CAMERAS

An important measure for reducing speed was introduced in 1988 in a pilot project employing speed cameras. In 2010 we have nearly 350 active speed cameras in Norway. If the speed registered is higher than the speed limit, a picture is taken of the driver and the vehicle and triggers the necessary reaction. Approximately 260,000 such pictures were taken in 2009.

Depending on the average speed on the road in question prior to the introduction of speed cameras, installing speed cameras can mean a reduction of driving speeds by 5 to 10 % and of personal injury accidents by nearly 20 %. The greatest reduction is in the number of severe accidents. The impact of speed cameras is unambiguously linked to a reduction in speed also after the camera has been passed. Experience indicates that this reduction may be up to 2-3 kph.

In order to lower the driving speed for as long a distance as possible, we launched a pilot project in 2009 using a system that measures the average speed over stretches of up to approximately 10 km. To accomplish this, two speed cameras are connected, enabling us to measure the average speed. This has resulted in nearly 15 % reduction in the speed level. The reduction in the number of accidents is expected to be close to 25 %, with a corresponding reduction in the number of fatalities by more than 35 %.

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