

Summary

Miniscenario: Speed limit policy

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This report discusses whether changes in speed limit policy in Norway can improve road safety. By speed limit policy is meant the application of a general principle for setting speed limits. Three such principles are compared in the report: (1) Optimal speed limits, by which the total societal costs per vehicle kilometre of travel are minimised; (2) Vision Zero speed limits, by which speed limits are based on biomechanical knowledge of human tolerance of impacts, and (3) An understandable speed limit system, by which speed limits are determined so that most road users find them reasonable and understand why different roads have different speed limits. It is found that optimal speed limits are in most cases higher than current speed limits and will therefore lead to an increase in the number of killed or injured road users. Vision Zero speed limits are lower than some of the current speed limits and will reduce the number of killed or injured road users. An understandable speed limit system implies speed limits that are close to current speed limits, but would allow for selective changes, in particular when offered as jointly lowering speed limits on some roads and raising them on other roads, so that the reasons for different speed limits can be made clear. An understandable speed limit system will not be associated with changes in the number of killed or injured road users.

Principles for setting speed limits

There are many approaches to setting speed limits. In this report, the implications for road safety in Norway of three principles for setting speed limits are compared:

1. **Optimal speed limits.** Speed limits are optimal if they minimise the total costs to society per vehicle kilometre of travel. Total costs include the costs of travel time, accident costs, vehicle operating costs and costs of noise and air pollution (including global warming).
2. **Vision Zero speed limits.** These speed limits are based on the principle that impact energy should never exceed the threshold for lasting injury. When Vision Zero was launched, speed limits consistent with this principle were 30 km/h in areas where pedestrians could be struck by motor vehicles, 50 km/h in junctions where side impacts between cars could occur and 70 km/h on undivided roads where frontal impacts between cars (of equal mass) could occur.
3. **An understandable speed limit system.** The idea of an understandable speed limit system is that speed limits, when viewed as a system, should make sense to road users and that the reasons why different roads have different speed limits are accepted and viewed as legitimate. In Norway, such a speed limit system is likely to be close to current speed limits.

The main question asked in the report is: What would be the impacts for road safety in Norway of adopting these principles for setting speed limits?

Optimal speed limits

Optimal speed limits coincide with the current speed limits of 80 and 100 km/h. For all other speed limits, optimal speed limits are higher than current speed limits. No attempt was made to determine the optimal speed limit on roads where the speed limit is 110 km/h. Optimal speed limits are in no case lower than 60 km/h. This applies even to roads where the current speed limit is 30 km/h. If optimal speed limits are introduced, the number of killed or injured road users can be expected to increase substantially. This sharply conflicts with current political objectives in Norway of reducing the number of killed or seriously injured road users.

In general, optimal speed limits are higher now than when a similar estimation was done in 2002. The chief reason for this is that both accident rate and accident severity have been greatly reduced in recent years. This means that accident costs count for less in the total costs of travel now than they did fifteen years ago. Paradoxically, the more road safety improves, the higher will be optimal speed limits. In estimating optimal speed limits, analysts therefore produce an economic justification for turning around progress in improving road safety by introducing a measure that will increase the number of killed or injured road users.

The report suggests that the time has come for adopting a different approach to setting speed limits in urban areas. One promising approach is the public health perspective, according to which all impacts on public health of urban transport are taken into account, not just traffic injury. From a public health perspective, an important argument for low speed limits in urban areas is that they discourage driving. This may in turn make walking or cycling more attractive. It cannot be ruled out that an analysis of public health impacts would find that the health benefits of walking and cycling, in monetary terms, exceed the losses inflicted on car drivers by forcing them to slow down.

Vision Zero speed limits

Implementing Vision Zero speed limits means that the current speed limit of 50 km/h is reduced to 40 km/h. 60 km/h is reduced to 50 km/h and 80 km/h on undivided roads is reduced to 70 km/h. All other speed limits remain unchanged. Roads with a speed limit of 80 km/h, and a median guard rail, may have a higher speed limit, for example 90 km/h.

It was estimated that Vision Zero speed limits will reduce the annual number of traffic fatalities by between 20 and 38, depending on how well drivers comply with the new speed limits. The mean annual number of traffic fatalities in Norway the last four years (2013-2016) was 147. The annual number of seriously injured road users might be reduced by between 69 and 134 if Vision Zero speed limits are adopted. The mean annual number of seriously injured road users during 2013-2016 was 682.

When Vision Zero was launched, the safe speed limit in urban areas was judged to be 30 km/h. Recent studies show that the probability of survival is more than 90 % for pedestrians struck by cars at 40 km/h. Since drivers are often able to brake before the accident, a speed limit of 40 km/h is regarded as consistent with Vision Zero, as impact speed is likely to often be lower than 40 km/h. It is nevertheless clear that a speed limit of 30 km/h would be even safer for pedestrians.

An understandable speed limit system

A concept of credible speed limits has been introduced in some recent studies of driver opinion about the appropriate speed limit for a given road. Studies have found that driver opinions about appropriate speed limits vary considerably and therefore give little guidance about how to set widely accepted speed limits.

This report therefore introduced a new concept: An understandable speed limit system. All speed limits are viewed as a system; different speed limits are intended to reflect different safety levels of roads. The system of speed limits is understandable when most road users understand and accept why some roads have higher or lower speed limits than other roads.

Recent changes in the speed limit system in Sweden can reasonably be interpreted as an attempt to create a more understandable speed limit system. Speed limits were changed on almost 20.500 km of road. The changes involved both lowering and raising the speed, largely in line with majority opinions as expressed in surveys of road users.

In the case of Norway, it is likely that an understandable speed limit system is close to current speed limits, judging by responses to surveys. It must be kept in mind, however, that there is “conservative” bias in surveys, in that people are more likely to support what is familiar and well-known than to support changes. Since understandable speed limits are likely to be close to current speed limits, they will not be associated with any changes in the number of killed or injured road users.

