

Summary:

A new Objective for Road Safety in Sweden

Background and objective

The Swedish road safety policy is based on "Vision Zero" implying no road fatalities and no severe injuries as the long-term vision. The vision is supplemented with quantitative objectives for specified periods of time. The objective for 2007 was 270 road fatalities. However, this objective was not achieved. 2006 had 445 road fatalities and the preliminary number for 2007 is 490 road fatalities.

The Swedish Road Administration has been assigned by the Swedish Government to propose a new objective applicable from 2008 to 2017-2020.

This report describes and assesses the new model for the future road safety management developed by the Swedish Road Administration and assesses the possibility to achieve various quantitative objectives.

New model focusing on the process

The Swedish Road Administration has developed a model for the future road safety management. The keywords for this model are:

- Regular follow-ups
- Commitment and responsibility by relevant participants
- Management by objectives

To ensure that the new objective as opposed to the earlier objective will be achieved regular follow-ups are planned, consisting of annual conferences where status will be presented, discussed and assessed.

Authorities with the main responsibility for the development of various conditions having impact on road safety should participate in these conferences. These are the police, the Swedish Road Administration, the municipalities, Toyota Sweden AB, the insurance company Folksam, The National Society for Road Safety, The Ministry of Enterprise, Energy and Communications, The Swedish Work Environment Authority and the professions of lorry, taxi and bus driving. In addition, an independent and scientific panel should participate.

In the possible case that the annual objective is not satisfied, solutions of the problem should be proposed. Binding agreement about implementation of these solutions should also be made. Thus, the idea of these annual conferences is to integrate and commit important participants.

Regular follow-ups and assessment of the conditions having impact on road safety are included as an important part of the road safety management. This means that secondary objectives should be formulated in addition to the primary objective to

reduce the number of road fatalities and severe injuries. The Swedish Road Administration has suggested the following seven objectives:

- Speed
- Seat belt wearing
- Safety of cars
- Safety of roads in rural areas
- Safety of roads in urban areas
- Drink-driving
- Bicycle helmet wearing

TØI supports the model developed for the future road safety management in Sweden, because involvement and especially commitment from central authorities are considered essential for the success of the road safety policy. For example the efforts of the police have crucial influence on speed reduction.

TØI also supports the suggestion to focus on the seven secondary objectives. Firstly, these objectives are considered as the most important. Secondly, it is important that there are not too many objectives.

Objectives and achievement of the objective

Table i summarizes the current state with respect to the seven objectives. The most important problem is high speed, because the speed limit is exceeded by about 60 % of the car users. Another important problem is low level of safety on two lane road sections in rural areas. About 75 % of these roads have only 2 EuroRAP stars. A third major problem is drink-driving. About 40 % of the fatalities occur in alcohol-related accidents.

Table i. Summary of the current condition for the seven objectives and assessment of their potential to reduce the number of road fatalities. A potential of 10 means that it is realistic to achieve the objective 100 %, whereas 1 means that it is unrealistic.

	Condition of today	Reduction potential	Realistic potential
Speed	Few drivers observe the speed limit (40-50 %)	Large	2
Seat belt	Relatively many wear seat belt (74-94 %)	Medium	5
Car safety	Medium safety of exiting cars (≈ 40 % of the traffic volume is done by cars with 4-5 EuroNCAP stars)	Medium	8
Rural roads	Low safety on 2 lane roads (75 % with 2 EuroRAP stars)	Large/medium	8
Urban roads,	Few roads with speed limit of 30 km/h and few observe this limit (25 %)	Medium/small	8
Drink-driving	Many fatalities are due to alcohol impairment (40 %)	Large/medium	3
Bicycle helmet	Low use of helmet (20-25 %)	small	2

TØI report 930/2007

The three problems mentioned above are assessed as the objectives having the largest reduction potential. Subsequently follow the use of seat belts and improvement of the safety of cars. In spite of low use of bicycle helmets more use of helmets has only a small potential for reducing the number of road fatalities.

Table i also shows an assessment of the realism of these reduction potentials the next 10 years. Paradoxically, it is assessed that compliance with the speed limit and reduction of drink driving with the largest reduction potential also are the most difficult to realise by 100 %. The objectives that immediately are the most easy to realise are improvement of the safety of cars and improvement of the

safety level of road sections in both rural and urban areas. These objectives can be influenced directly by the system designers consisting of the car industry and the road authorities.

Table ii summarizes the number of road fatalities that can be prevented by means of different degrees of fulfilment of the seven objectives. TØI assesses that 100 % fulfilment of all seven objectives can reduce the number of road fatalities by 230. 460 road fatalities in 2007 are assumed in the calculations. This means that there will be 230 road fatalities in 2017.

However, 100% fulfilment requires comprehensive and extensive safety measures. The realism of this scenario can be questioned. Thus, three other scenarios have been assessed. These are design of the system, traffic behaviour, and business as usual.

“Business as usual” is assessed to result in 320 road fatalities in 2017. Thus, a larger reduction than there has been from 1970 to 2005 requires more comprehensive and extensive safety measures than those implemented so far.

The objectives that immediately are the most easy to realise are objectives that can be influenced directly by the system designers by making more safe cars and roads. However, a 100 % fulfilment of these three objectives will only give a reduction of 110 road fatalities meaning that in 2017 there will still be 350 road fatalities. To achieve for example 270 road fatalities it is therefore also necessary to get up to 50 % fulfilment of the other objectives and partly fulfilment of supplementary objectives as for example improved rescue services.

A third alternative scenario is 100 % fulfilment of four objectives concerning traffic behaviour. This is assessed to prevent 160 road fatalities. To achieve a reduction of 190 fatalities it is also necessary to improve the safety of the cars and roads.

Table ii. Reduction in the number of road fatalities in four different scenarios. The total reductions are adjusted for overlap. The reductions for each objective are also adjusted for overlap in the last three scenarios.

	Absolute		System design		Traffic behaviour		Business as usual	
	Fulfilment	Fatalities saved	Fulfilment	Fatalities saved	Fulfilment	Fatalities saved	Fulfilment	Fatalities saved
Speed	100 %	150	0-30 %	0-50	100 %	100	15 %	22
Seat belt	100 %	40	0-25 %	0-10	100 %	25	25 %	10
Car safety	100 %	40	100 %	35	0-25 %	0-10	80 %	32
Rural roads	100 %	50	100 %	45	0-20 %	0-10	80 %	40
Urban roads	100 %	30	100 %	30	0 %	0	80 %	24
Drink-driving	100 %	50	0-20 %	0-10	100 %	30	20 %	10
Bicycle helmet	100 %	10	0 %	0	100 %	5	20 %	2
Others	-	-	0-50 %	10	0-50 %	10	-	-
Total, reduction	-	230	-	110-190	-	160-190	-	140
Total, fatalities	-	230	-	270-350	-	270-300	-	320

TØI report 930/2007

In this project concrete measures that should be implemented to achieve the different degrees of fulfilment of the seven objectives are not assessed. However, an important point is that the road authorities can only indirectly influence the

most important objectives such as speed, drink-driving and the use of seat belts. The co-operation with other relevant authorities such as the police as the model describes is therefore very important.

Annual follow-ups

An essential part of the model is that progress in realising the seven objectives has to be monitored by annual measurement and assessment. Table iii summarizes the status with regard to current monitoring system for the seven objectives.

Annual measuring of use of seat belts and bicycle helmets and measuring of safety of cars and safety of road sections in rural areas are already established. Measuring of seat belts and bicycle helmets can be continued unchanged, whereas both EuroNCAP and EuroRAP should be further developed. A procedure for monitoring speed is partly established, but this procedure should be systematised, and methods for calculations should be developed.

In addition to police enforcement, monitoring of drink-driving has not been established. Assuming that representativity is wanted, it is necessary to establish a new procedure for monitoring. However, this is difficult because of legal, ethical and resources reasons. Applying the performance indicator for alcohol proposed by the SafetyNet project, i.e. the percentage of fatalities caused by alcohol-related accidents could be considered as an alternative indicator.

Table iii. Status and assessment of existing follow-ups of the seven objectives.

	Status	Assessment
Speed	Partly established	Should be systematised
Seat belt	Established (VTI)	Can be continued unchanged
Car safety	Established (EuroNCAP)	Can be continued, but should be extended
Rural roads	Established (EuroRAP)	Can be continued, but should be extended
Urban roads	Partly established - speed	Should be systematised (speed)
Drink-driving	Not established (police)	Should be established
Bicycle helmet	Established (VTI)	Can be continued unchanged

TØI report 930/2007

Positive side effects on the environment

This project focuses on road safety, and the project shows that reduced speed is the most important condition for reducing the number of road fatalities. Reduced speed will also have beneficial effects for road traffic noise, energy consumption, CO₂, barrier impact and insecurity. This is summarized in table iv.

Table iv. The effects of lower speed on the environment.

	Effect of speed
Accidents	Very large effect
Noise	Large effect
Energy consumption	Medium effect for lorries and small effect for cars
CO₂	Medium effect in the interval 80-130 km/h
Pollution	Small effect on NO _x , CO and PM ₁₀ *10
Barrier	Medium effect in rural areas
Insecurity	Medium effect in rural areas

TØI report 930/2007