

## GOVERNMENTAL STATUS REPORT, SWEDEN

Anders Lie / Claes Tingvall

Swedish National Road Administration

Governmental Status Report

### FATALITIES

The Swedish overall long-term safety objective within the road transport system was settled in 1997, when the Swedish parliament voted for the “Vision Zero”. This vision states that ultimately no one should be killed or seriously injured by the road transport system.

Sweden has a long tradition in setting quantitative traffic safety targets. After a period of positive development in the early 1990ties a target was set at 400 fatalities in 1994. This target was confirmed by the parliament in 1997 and a new 10-year target was set at a 50% reduction for 2007. The target to have a maximum of 270 fatalities in 2007 is a major challenge and will put high demands on all sectors in society influencing the traffic safety level.

**Table 1.**  
**Number of fatalities on Swedish roads**

Accident Year	Fatalities
1989	904
1990	772
1991	745
1992	759
1993	632
1994	589
1995	572
1996	537
1997	541
1998	531
1999	580
2000	591
2001	583
2002	535

With around 600 fatalities per year Sweden is still one of the safest countries when it comes to road traffic, with a level of 6,0 fatalities per 100.000 inhabitants. This is around half of the European Union risk average (10,5 fatalities per 100 000inhabitants).

### ROAD SAFETY ORGANISATION

The Ministry of Industry, Employment and Communications is responsible for the traffic safety in Sweden. The ministry is limited in size and the Swedish National Road Administration (SNRA) handles most of the practical work. The main other bodies active in road traffic safety efforts are the police and the local authorities. Other important parties are the National Society for Road Safety (NTF), with its member organisations, and transport industry organisations. The Group for National Road Safety Co-operation (GNS) is a central body that co-ordinates co-operation between the SNRA, the local authorities and the police. The NTF is an additional member of this group.

### POLITICAL DECISIONS

#### The Vision Zero

In 1995 political activities started to develop a new traffic safety policy. It was decided by the parliament in 1997 as the “Vision Zero”. The parliament decided that the long-term target for the road transport system should be that no one should be killed or receive long-term disability by the system. The Vision Zero is an attempt to change the traditional philosophy to reduce the number of fatalities and injuries by primarily changing the behaviour of the road user. This has been done by legislation, information and education in order to force the road user to adapt to the general principles of the system. In the new strategy the system designers are identified as important bodies and they should have responsibility to develop a safe road transport system that is tolerant to human failures. In a broader sense, the safety of the system has been traded off to mobility, where the mobility has been allowed to be higher than the system can tolerate. In the Vision Zero decision it was clearly stated that the mobility should be a function of the safety level of the system.

### **11-point Programme for Improving Road Traffic Safety**

Early in the year of 1999, the SNRA developed a special road traffic safety plan at the request of the Government. Later the same year, the Government decided on an 11-point programme to increase traffic safety. The last years, the SNRA has primarily worked with six of these points. The remaining five concern: winter tyre requirements, the responsibilities of designers of the road transport system, how society deals with traffic crime, the role of voluntary organisations, and alternative methods for financing new roads.

#### **Focusing on the most dangerous roads**

The measures are to be cost-effective and concentrate on those sections of the state road network where there are most accidents resulting in death or injury. The SNRA has therefore made a list, revised in April 2000, that defines 3 600 km of road where a large number of people have been killed or seriously injured. Targeted road traffic safety measures increased from just over SEK 1 billion in 2000 to almost SEK recent years. This investment, mainly traffic flow separation with central safety barriers, roadside measures, measures at intersections and measures for pedestrians and cyclists, is expected to reduce the number people killed in road traffic significantly. The main road traffic safety investment during the past year has been made in traffic flow separation with central safety barriers to create roads where vehicles cannot meet head-on. This type of road was introduced in 1998 on the E 4 north of Gävle and has since been built on almost 500 km (250 km in 2001) of road. Since the central safety barrier was installed, there have been few accidents resulting in serious injury, far less than previously on these stretches.

The SNRA has been instrumental in developing the technical protocol for the European co-operation programme (EuroRAP) in 2001. This programme provides safety ratings for roads outside of built-up areas based on the risk of being killed or seriously injured. The Swedish motoring organisation Motormännens riksförbund is the Swedish member of the programme.

#### **Safer traffic in the municipalities**

The development of a safe road traffic environment in built-up areas is being implemented through both short and long-term measures. Short-term measures include redeveloping intersections, introducing speed reduction measures at pedestrian crossings, reductions in speed limits etc. In the long term, the

street network is to be classified and streets will then be redeveloped or adapted in other ways to meet safety requirements. The SNRA has contributed to the short-term measures by informing and inspiring the municipalities in meetings with experts, seminars etc. To stimulate the long-term development, the SNRA has provided financial support to municipalities for the classification of the street network and helped municipalities to offer good examples through demonstration projects. A database containing good examples has been set up in co-operation with the Swedish Association of Local Authorities. The database is called The Traffic Bank and is designed to promote knowledge and experience exchange in designing road traffic environments in built-up areas.

#### **Stressing the responsibility of the road user**

Improved observance of traffic regulations can be achieved primarily through a combination of enforcement and information. Regulations for speed restrictions, seat belt usage, drink-driving offences and driving under the influence of narcotics are particularly important. Since 2001, the police, supported by the SNRA, has conducted research activities using automatic speed surveillance and enforcement. Surveillance uses cameras and was carried out on 25 stretches of road where speeding offences have been a particular problem. The total length of road covered was some 400 km.

#### **Safe bicycle traffic**

Separating bicycle and car traffic is important for safe cycling. More cycle paths are under construction and the proportion of cycle traffic that uses cycle paths has increased to around 65%. The SNRA has overall responsibility for increasing cycle helmet use.

#### **Quality assurance of transport with a view to road safety and environmental impact**

Currently almost all county councils, half of the country's local authorities, some ninety companies and a number of other organisations, have begun work to quality-assure their transports. These parties have initiated this process by drawing up transport investigations, developing policy documents and action plans, implementing measures for their own transport and making demands on procured transport. These demands are followed-up to ensure that the transport is carried out using a safe and permissible speed, that seat belts and other protective equipment are used, that the driver is not under the influence of alcohol or drugs and that the vehicle has the highest possible safety standard. Demands are also made to reduce carbon dioxide emissions and other noxious

emissions. These demands are to permeate the management, organisation and control systems of both the contractor and the supplier. In specific terms these measures could be the installation of alcohol ignition interlocks and seat belt reminders, increasing the efficiency of distribution and transport, making demands on safer vehicles etc. The SNRA's own transport procurement now includes road safety and environmental requirements.

### **New technology used better**

New technology can be used to reduce risks at intersections and pedestrian crossings, reduce driving speeds, reminding drivers of inappropriate behaviour, or slippery road conditions. Technology that is under development includes systems to prevent driving under the influence of alcohol, effective seat belt reminders and support for speed adaptation. A series of projects have taken place in this field.

- As part of a demonstration project some 300 taxis, buses and lorries have been equipped with alcohol ignition interlocks. The trial has been a great success and the SNRA has encouraged the introduction of alcohol ignition interlocks at a number of locations in Sweden. Several transport companies have taken their own initiatives. Alcohol ignition interlocks are now installed in over 1500 vehicles, excluding vehicles in trial activities with conditional driving licence revocation. The two major truck suppliers, Volvo Trucks and Scania, offer alcohol ignition interlocks as standard equipment on the Swedish market since 2002.

- The ISA project (Intelligent Support for speed Adaptation) is a large-scale field trial using a speed adaptation system. This three-year has taken place in four municipalities: Umeå, Borlänge, Lidköping and Lund. The final report was presented autumn 2002. The project has clearly shown the potential to increase the safety in built up areas by the technique. The drivers have accepted the systems and an injury reduction around 20 to 30 percent is estimated.

- Sweden has been very active in promoting the introduction of effective seat belt reminders. In 2002 as a direct result of this the European consumer crash test program Euro NCAP started to give credit to vehicles with seat belt reminders. To achieve the credit the reminder must use relatively strong sound and visual signal if the seat belt is not in use. In 2002 a total of nine cars have met the demands from Euro NCAP and scored additional points.

### **New methods for consumer information**

The consumers can influence the safety levels of modern cars. Crash test programs aiming at consumer information can significantly change the cars and the

safety equipment of the fleet. Euro NCAP is an example of a program that has made a major impact on the safety level over the last few years. The concept is based on a selected number of safety critical criteria evaluated in relevant crash tests. The approach used so far has, however, some problem when new safety technologies are introduced. The organisation having the responsibility for testing has no detailed knowledge about the new system and therefore has no strategy how to evaluate and give credit to the new system. Under periods of rapid development there will be a time slack between the new technologies and the moment when the test program can evaluate the system. There is therefore a major need for development of new evaluation methods to be able to give correct credit to the new systems.

One way ahead could be to shift the responsibility for proving the effectiveness. As it is today the consumer rating organisation picks the safety critical areas based on existing knowledge. In the future a possibility is that the manufacturer puts a case in front of the rating organisation, and the organisation decides on the presented facts to what degree and how to credit the system.

Such a new rating concept could supplement today's systems. However, the approach will put a heavy burden on the potential new system to have real and substantial positive effects. High scientific demands must be put on the evidence that a manufacturer put on the table. Generally there will also be a need to monitor the real life effect of the system as it comes out in traffic. The approach has much in common with how new medical treatments are handled by society.

It is clear that in an automotive society with a lot of expectations put on new technology new methods for evaluation and consumer information will be needed. The new methods should reliably distinguish between systems giving substantial positive benefits in real traffic and systems that have small or even negative effect when put out in real traffic.

### **THE CRASHWORTHY SYSTEM**

The Vision Zero concept is requiring a new more holistic perspective on the road transport system. The road users, the vehicles and the roads cannot be considered separately. Instead a system analysis approach is important. Even if this has been discussed before, little progress has been seen. In the new Vision Zero approach the aim is to build a road transport system designed for the capabilities of the human. Among other things this will put focus on injury prevention more than accident prevention. Avoiding accidents is only one strategy if fatalities and severe injuries are to be eliminated. By making

the follow-up on the injury outcome instead of on the accident the problem will have another profile and new countermeasures can be developed.

### System designers – a key group in the Vision Zero

Many different actors design and influence the road transport system – they can be called system designers.

The SNRA is a system player, as are the municipalities and other road managers. All vehicle manufacturers are system designers. Also included are the police who are responsible for traffic control and the rescue service that take care of the victims. Transport companies are crucial system designers who can, through their routines, influence which routes are chosen and driving speeds. Travel and transportation purchasers are also system designers. The demands they place on suppliers are significant to how safely transportation is effected. Politicians and officials working with social planning are other system designers.

The list goes on. It shows that many businesses, government agencies and other organisations can contribute to a safer road transport system. The system designers have an important role to further develop the road transport system.

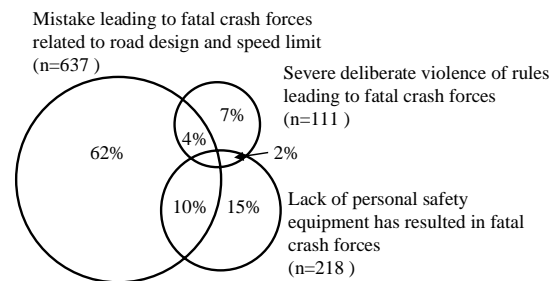
### In-depth studies

One method for identifying effective and long-term sustainable measures for preventing future accidents is through in-depth studies of fatal accidents. These studies are used by key system designers, both at a local level to analyse individual fatal accidents, and at a centralised level to analyse accident and injury types. The Swedish National Road Administration (SNRA) conducts thorough in-depth studies of all fatal accidents. These investigations have been standard practice since 1997. The in-depth studies clarify which aspect of the road transport system failed, thereby causing the collapse in the system that a fatal accident constitutes. Another important aim of the in-depth studies is to increase awareness and commitment among all players in the road transport system, and thereby further improve road traffic safety.

### Reasons for fatal injuries

Once the details of the accident have been compiled and analysed, an assessment is made of the factors that caused fatal injuries. The factors are categorised in three groups:

- Excessive force – when the road-users have done their best to follow traffic regulations and have used safety equipment. They have however made an error that resulted in fatal collision forces, due to the design of the road environment in combination with the prevailing speed limit.
- Excessive risk – when road-users are injured due to insufficient personal protection. The most common scenario is not wearing a safety belt. Another example is cyclists not using cycle helmets.
- Beyond system restrictions – when the road-users have consciously and seriously violated regulations that have a great bearing on the severity of the collision. The most common scenario is greatly exceeding the speed limit.



**Figure 2. Classification of fatal crashes 1998 and 1999.**

### **Systematic collaboration for road traffic safety**

Once a fatal crash every effort must be made to ensure that a similar accident never happens again. It is vital that all instrumental parties in the road transport system work to prevent traffic accidents resulting in serious injuries and death. Therefore, the Swedish National Road Administration (SNRA) is working together with other controlling players that are influential in the road transport.

One kind of co-operation is based on analyses of fatal crashes. The aim is that all partners have a joint understanding of:

1. What happened?
2. Why did it happen?
3. What measures can be taken to ensure that it does not happen again?

The last part is especially important. In a joint discussion each system player should identify the measures can be taken to prevent a similar chain of events in the future. For example: Should roadside obstacles be cleared away? Should the transport company review its routines concerning delivery times? Is the legal speed limit on the road higher than the safety standard of the road environment allows? Are there too few ambulances in the area?

The discussions should focus on looking forward and finding possibilities for improvement. They are not meant to place blame. Deciding who is responsible is a matter for the judicial system.

Finally the SNRA and other system designers are to specify planned improvements based on the discussions and analyses. These statements of intent are to include action points, a time schedule for implementation, scope and reason for improvements. It is also feasible that a system player decides against any alterations. In such a case, the decision is a conscientious decision.

The reports and conclusions from these activities will be sent to the road safety inspectorate.

### **The road traffic safety inspectorate**

A committee work on responsibilities of road transport system designers was initiated in 1999 since one of the main ideas in the Vision Zero concept is to add responsibilities to all bodies in society that influence the safety level in the road transport system. The committee proposed the initiation of a new

authority, a Road Traffic Inspectorate. The government approved the proposal in 2002 and the inspectorate started its activities first of January 2003. The inspectorate is organised as an independent part of the Swedish National Road Administration.

The inspectorate has four main tasks:

- Make holistic analyses of relevant factor influencing the local, regional and national traffic safety action plans and targets. The analyses should focus factor having a significant influence on the design and function of the road transport system.
- Ensure that the system designers have a systematic approach in their work to diminish fatalities and impairing injuries in the road transport system. This work should be done in dialogue with the system designers.
- To co-operate with system designers to enhance road traffic safety. This work should be performed in the spirit of the Vision Zero.
- To initiate a certain degree of research and development relevant to the activities of the inspectorate.

One important activity will be to analyse and make follow-ups of the activities the SNRA and other system designers initiate after investigations of fatal crashes. All reports from these joint studies will be sent to the inspectorate.

The inspectorate has no new legislation at hand to enforce systems designers to take action. The main tool is co-operation and dialogue. The inspectorate will try encouraging development by identifying weak points in the systematic work towards better safety. It will be a both pro-active part and reactive part using a public forum for a continuous improvement of the safety work.

### **CONCLUSIONS**

- The road fatality risk in Sweden is one of the lowest in the world
- The Vision Zero concept is a new strategy to achieve safe road traffic in Sweden
- New very demanding targets (50% reduction in ten years) has been decided
- New responsibilities for system designers can improve the safety level
- A new Traffic safety inspectorate is establishes since 2003

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