

# Renewed Commitment to Vision Zero

Intensified efforts for transport safety in Sweden



Government Offices of Sweden





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# Foreword

Swedish transport safety work is a success. Fatalities in road traffic have been halved since the turn of the millennium. The number of fatalities in the commercial segments of maritime and air transport and among train passengers are very low. Vision Zero, the Swedish transport safety model, has captured the interest of the world. It has laid the foundations for Sweden's good international reputation in the field and is thus also creating favourable conditions for Swedish exports.

However, all successful work should be regularly reviewed and there are both challenges and opportunities inherent in continued transport safety work. About 400 people lose their lives in the transport system every year, about 270 of them in the road transport system. Most importantly, saved lives and fewer serious injuries will reduce suffering for many people, but will also generate significant economic gains for society.

The reduction in fatalities seems to have levelled off in recent years. It is therefore a matter of urgency to bring about intensified transport safety work - a renewed commitment to the work

to achieve Vision Zero. The aim of Renewed Commitment to Vision Zero is to present the current state of affairs, targets and challenges in the area of transport safety and, based on this, to indicate directions for future work. Renewed Commitment to Vision Zero is intended to function as a platform for future initiatives in transport safety. Transport safety work is highly dependent upon cooperation and continued commitment and accountability among relative actors is crucial to its success.

The work we can develop together in Sweden is also important outside our borders. The WHO estimates that traffic accidents will be the fifth most common cause of death worldwide in 2030. This Renewed Commitment is thus also a contribution to the effort to attain the global targets for sustainable development adopted by the UN in 2015.



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Photo: Julia Sjöberg/Folio

# Contents

<b>1. Vision Zero remains the long-term objective</b>	<b>6</b>
1.1 Swedish transport safety targets	6
1.2 Transport safety targets at the international and EU levels	7
<b>2. Current state of transport safety work</b>	<b>8</b>
2.1 Regulations and allocation of responsibility	8
2.2 Operational transport safety work	8
Cooperation	8
Data on accidents and incidents	9
<b>3. Challenges and opportunities</b>	<b>10</b>
3.1 Transport safety trends to 2016	10
Road transport	10
Rail transport	11
Maritime and air transport	11
3.2 External factors	11
3.3 Transport infrastructure	12
3.4 Vehicles	12
3.5 Responsibility of road users	13
<b>4. Directions of future transport safety work</b>	<b>14</b>
4.1 Firmly establish and reinforce work that is already delivering results	14
Effective regulation and supervision in air, maritime and rail transport	14
Accessible high-quality data	14
Safe transport infrastructure	16
Even safer vehicles	16
Continued cooperation	16
4.2 Develop and include new areas	16
Improve road safety for vulnerable road users	17
Suicide prevent	17
Increase compliance with road rules	17
Safer recreational transport	18
4.3 Adapt transport safety work to new conditions	18
Derive more benefit from automation and digitalisation	18
<b>5. Spread Swedish transport safety</b>	<b>20</b>

# 1. Vision Zero remains the long-term objective

Vision Zero for road safety was adopted by the Riksdag in 1997.<sup>1</sup> Soon thereafter, the Riksdag decided overall transport policy objectives for the entire transport system<sup>2</sup> and Vision Zero subsequently applied as the general principle for all modes of transport.<sup>3</sup>

## 1.1 Swedish transport safety targets

The transport safety targets are part of the transport policy objectives structure. They are expressed as specifications of the transport policy impact objectives, one for each mode of transport.

Reducing the number of people killed and seriously injured in road traffic accidents is a vital contribution to reducing the negative impact of the transport system on human health. Examples of other negative health impacts from road transport include heart attack and stroke caused by traffic noise and illnesses caused by air pollution that shorten people's lives.

1 See Bill 1996/97:137, report 1997/98:TU4, Riksdag communication 1997/98:11.

2 See Bill 1997/98:56, report 1997/98:TU10, Riksdag communication 266.

3 See Bill 2008/09:93, report 2008/09:TU14, Riksdag communication 2008/09:257.

**Vision Zero:** The long-term objective is that no one shall be killed or seriously injured in traffic and that the design, function and use of the transport system shall be adapted to the standards this requires. Vision Zero is an approach wherein responsibility for transport safety is shared between individual transport system users and "system designers" (the entities that shape the system, such as the automotive industry, lawmakers and infrastructure owners). If transport system users do not follow the rules - for reasons such as lack of respect, knowledge, acceptance or capacity - or if personal injuries occur in a crash, the system shapers must take further measures to the extent required to prevent deaths and serious injuries.

### Transport policy objectives

**General transport policy objective:** To ensure the economic efficiency and long-term sustainability of transport provision for citizens and enterprise throughout Sweden.

**Functional objective:** The design, function and utilisation of the transport system are to provide everyone with a basic level of accessibility of good quality and usability and to contribute to the development potential of the entire country. The transport system is to be gender equal, meaning that it is to meet the transport needs of women and men in an equivalent manner.

**Impact objective:** The design, function and utilisation of the transport system are to be adapted in such a way that no one is killed or seriously injured and further the achievement of the overarching generational goal for the environment and environmental quality objectives and contribute to improving human health.

### Specifications for the transport safety impact objective (timetabled specifications refer to interim targets):

**Road transport** — The number of fatalities in road traffic shall be halved and the number of serious injuries shall decrease by one quarter between 2007 and 2020.

**Rail transport** — The number of fatalities and serious injuries in rail traffic shall steadily decline.

**Maritime transport** — The number of fatalities in commercial maritime and pleasure boating traffic shall steadily decline and the number of serious injuries shall be halved between 2007 and 2020.

**Air transport** — The number of fatalities and serious injuries in air traffic shall steadily decline.





In densely populated environments, many different transport needs must be met, but often in a smaller land area. This is changing the conditions for transport safety work.

Climate change is one of the greatest social challenges of our time. Society must transition so that it no longer relies on finite resources in general and fossil resources in particular.

Viewed in this context, efforts to achieve safe transport interlock with efforts to build a sustainable transport system. A sustainable transport system is also safe. There are often synergies between safety measures and other actions aimed at achieving a sustainable transport system. As an example, traffic environments that are made safe for pedestrians and cyclists often also become attractive and healthful environments for people to spend time in.

## 1.2 Transport safety objectives at the international and EU levels

Reducing the number of traffic deaths is a global challenge. An estimated 1.25 million people lose their lives in road traffic every year. International bodies and institutions have reacted to these figures in various ways, including setting targets for managing development towards safer transport. The goals of the 2030 Agenda for Sustainable Development adopted by the UN General Assembly in 2015, include a goal of halving the number of deaths from road traffic accidents. Further development of maritime and air safety work is ongoing within UN bodies.

The EU also has set targets for transport safety. For road safety, the European Commission has expressed an ambitious target of approaching zero road fatalities by 2050 and has set an interim target for this effort, which is not binding upon the Member States. The interim target states that the number of road deaths shall be halved between 2010 and 2020. The EU has also set targets for rail transport, which are intended to ensure that railway safety does not deteriorate due to amended regulations on opening the market required to implement EU rail transport policy. Further development of maritime and air safety work is ongoing within the EU.

## 2. Current state of transport safety work

### 2.1 Regulations and allocation of responsibility

Swedish transport safety regulations primarily impose standards on entities that use the infrastructure. This is accomplished in the form of traffic rules, standards applicable to operators/drivers and the design of road vehicles, rail vehicles, ships and aircraft. These rules are usually based on international provisions drafted within various global or regional UN bodies for maritime, air and road transport. The international rules are often incorporated in EU law and have thereby been made Swedish law. In the railway sector, however, EU law is the primary source of the Swedish rules because the scope of international railway safety regulations is limited. In some cases, the EU safety agencies<sup>4</sup> for the various modes of transport are tasked with both drafting and supervising the rules. Most provisions, and this applies to all modes of transport, are the result of ongoing national and international discussion and development of transport safety issues. Regulatory changes have sometimes been initiated following major accidents

that brought to the fore areas that need to be reinforced to improve safety.

Provisions exist to a certain extent that govern responsibility for the infrastructure and its design, but to a lesser extent than rules pertaining to transport itself. These rules are based only partially on international rules or EU law. The design of infrastructure from a transport safety perspective is controlled both by concrete provisions on design standards as well as considerations of a more political nature.

The responsibility for ensuring that transport users and operators comply with the rules is assigned mainly to the Swedish Transport Agency, which is the central supervisory authority for transport matters. The Transport Agency is also the agency that usually issues regulations. In the area of road transport, the Swedish Police Authority also play a key role as an enforcement agency. As regards the level of infrastructure safety, the infrastructure owner or infrastructure manager has a regulated responsibility to ensure that the infrastructure meets current standards.

### 2.2 Operational transport safety work

Operational transport safety work is carried out within the existing regulatory framework. There are many operational processes that are contributing to reducing the number of women and men who are killed or seriously injured in traffic. The greatest breadth in these initiatives is probably in the area of road transport, which is where the number and variety of actors and transport users is greatest. Examples of significant initiatives include efforts by vehicle manufacturers and industry to create new products for safer traffic, insurance companies, civil society organisations and voluntary forces that are contributing with important traffic safety information, as well as industry organisations engaged in ambitious and systematic efforts to improve road safety.

#### Cooperation

Cooperation is essential to successful safety improvement. Although no single agency or organisation has overall responsibility for leading and coordinating transport safety work, cooperation takes place today in various groups organised according to mode of transport. The main actors in the areas of road safety and rail safety are gathered in two

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<sup>4</sup> European Maritime Safety Agency, EMSA, European Aviation Safety Agency, EASA and European Rail Agency, ERA.





Between 25 and 40 people are killed every year in pleasure boating accidents. Unlike those in the picture, many of the people who die in pleasure boating accidents are not wearing life vests, are under the influence of alcohol and are alone in a small boat on a minor waterway.

arenas for cooperation, the Group for National Cooperation - Roads, and the Group for National Cooperation - Rail (GNS<sup>5</sup> Väg and GNS järnväg, respectively) aimed at achieving Vision Zero. The groups are convened by the Swedish Transport Administration.

There are two special councils that gather actors in relation to pleasure boating and general aviation traffic: The Maritime Safety Council and the General Aviation Safety Council. The aim of the Maritime Safety Council is to promote safer boating and encourage government agencies, organisations and companies with connections to pleasure boating to participate in making pleasure boating traffic safer and reducing the number of accidents. The General Aviation Safety Council is an arena for cooperation and dialogue among government agencies and civil society organisations in general aviation to contribute to meeting the specifications of the impact objective for air trans-

port safety. The councils are convened and led by the Transport Agency.

Data on accidents and incidents  
Good accident and incident reporting is important, because it creates the conditions for taking effective actions that improve safety.

Accidents and incidents are reported by a wide range of actors. Some reporting is done in accordance with explicit national and international regulations. Most reports are submitted to the Transport Agency. In some cases, the information is forwarded to databases kept by various EU bodies. Of particular interest in this context is the Transport Agency's Swedish Traffic Accident Data Acquisition system (STRADA), which is used to collect data on injuries and accidents in the entire road transport system, as well as some reporting of accidents at sea. The system is unique in that it collects data from both the Swedish Police and hospitals. Transport Analysis is the govern-

ment agency responsible for compiling official transport-related accident and incident statistics based on data from sources such as the Transport Agency. A description of reporting and database keeping linked to traffic accidents is provided in the interim report 'Accident databases and in-depth transport studies' (Olycksregister och djupstudier på transportområdet, SOU 2014:24).

<sup>5</sup> Gruppen för Nationell Samling, GNS.



## 3. Challenges and opportunities

### 3.1 Transport safety trends up to 2016

#### Road transport

Over time, there has been a significant decline in the number of road deaths. Since the turn of the millennium, the number of fatalities in road traffic has decreased from 591 (2000) to 260 (2013) and the number of children killed in road traffic accidents has been halved over the last ten years.

However, the decline in the number of fatalities in road traffic accidents seems to have levelled off in recent years. Two hundred and fifty nine people (201 men and 58 women) died in road traffic accidents in 2015, roughly equal to the number of deaths in the two preceding years. These figures do not include suicides, which account for around 20 additional deaths in road traffic annually.

About 75 per cent of fatalities are men, a figure that has increased by five percentage points over the last 30 years. The high percentage of men among people killed in traffic is partially explained by that men account for more than half, about 59 per cent, of all distance travelled in road traffic environments. However, men are overrepresented among road traffic deaths even when adjusted for distance travelled. Men's risk cal-

culated as the number of fatalities per kilometre travelled in a road traffic environment is more than twice as high as women's.

About 60 per cent of fatalities are motorists<sup>6</sup>, which is also the category in which there has been the greatest decline in the number of fatalities during the last ten years. The trend is not as clear-cut among vulnerable road users.<sup>7</sup>

About 10 per cent of people killed in road traffic accidents are cyclists. About 10-15 per cent of all road traffic deaths are pedestrians killed in collisions with motor vehicles. The number of cyclists and pedestrians killed has declined in the last ten years, but not as much as the number of motorists killed. About 10-15 per cent of all people killed in road traffic are motorcyclists. The number of motorcyclists killed has remained relatively unchanged since the turn of the millennium, at about 30-40 fatalities per year, even though there has been a sharp increase in motorcycle traffic

The number of seriously injured people, at risk of medical impairment of 1 per cent or greater, is about 4,800 annually. Cyclists ac-

count for the largest proportion of serious personal injuries, which have not declined in this group in recent years. On the contrary, projections show<sup>8</sup> that increased cycle traffic may lead to increases in the number of cyclists killed and seriously injured if preventive actions are not taken. The same risk exists for the pedestrian road users.

The Transport Administration publishes an annual report on road safety trends based on ten indicators.<sup>9</sup> Tracking of the indicators shows that the improvement in traffic safety since 2007 is explained mainly by ongoing improvements to the vehicle fleet and infrastructure, as well as reduced speeds. The areas where continued improvement is required are compliance with speed limits and the share of traffic volume with sober drivers. The number of persons fatalities in alcohol-related fatal accidents has increased in the last two years and this group makes up almost one quarter of all people killed in road traffic. Of these, about 80 per cent are men and 20 per cent are women. Certain types of wildli-

6 Persons who travel in passenger cars, buses, or lorries/HGV.

7 Cyclists, moped drivers, motorcyclists and pedestrians are classified as vulnerable road users.

8 Analysis report 'Review of interim targets for road safety in 2020 and 2030 and towards 2050', Transport Administration (2016:109).

9 Analysis of Road Safety Trends 2015, Swedish Transport Administration 2016:077.



fe-related road traffic accidents are increasing, which is another challenge.

The safety specifications for the transport policy impact objective are for the number of fatalities in the road transport area to be halved and the number of serious injuries to be reduced by one quarter between 2007 and 2020. In its target follow-up for 2015, Traffic Analysis concludes that the 2020 target likely to be achieved but that further measures may be required.

### Rail transport

The number of fatalities in rail transport has been roughly the same every year since the turn of the millennium at about 100 people, approximately 70 men and 30 women. Of these, about 1 per cent occur in tram traffic, 8 per cent in underground traffic and the rest in train traffic. Train travel is very safe, however, and there have been no fatalities among train passengers since 2010. The deaths have instead occurred outside the trains, usually in person-train collisions in various circumstances. Suicide is the predominant reason people die in railway traffic, primarily in the train and underground transport segments. Of the people who die every year in connection with Swedish rail transport, at least 70 per cent are determined to have committed suicide. This corresponds to 60-80 suicides on the railways every year, of which 70 per cent of the victims are men.

There are other recurring types of rail accidents. About eight people die each year in accidents at level crossings (intersections of roads and tracks). In addition, one person dies each year, on average, in connection with work in track environments.

The specification of the transport policy impact objective concerning rail safety calls for an ongoing reduction in the number of fatalities in rail transport. In its target follow-up for 2015, Traffic Analysis concludes that the trend is not in line with the 2020 targets.

### Maritime and air transport

There are few fatalities in commercial maritime and air transport. No one has been killed or seriously injured in Swedish scheduled and chartered air service traffic during the last ten years. Four people died in 2015 in commercial maritime transport, the same number as the year before. The people who die in maritime and air transport lose their lives mainly in pleasure boating and general aviation accidents.<sup>10</sup>

Between 25 and 40 people are killed every year in pleasure boating accidents. This corresponds to 80-90 per cent of the total number of fatalities in maritime transport. Many of the people who die in pleasure boating accidents are not wearing life vests, are under the influence of alcohol and are alone in a small boat on a minor waterway. Men account for more than 90 per cent of the fatalities. Few people die in accidents involving high-speed boats or in the archipelagos. There is no good estimate of the number of people seriously injured in pleasure boating accidents, but many of the serious injuries that are reported occur in marinas/ports in connection with embarking and disembarking. Women account for the majority of serious injuries.

A total of 53 people have died in air transport in the last ten years. Of all crashes with a fatal outco-

me, 75 per cent occur in the categories of private aviation, paragliding and ultralight aviation. Men account for the overwhelming majority of fatalities.

The specifications of the transport policy impact objective on maritime safety call for ongoing reduction of the number of fatalities in commercial maritime transport and pleasure boating and for the number of serious personal injuries to be halved between 2007 and 2020. The specification of the transport policy impact objective concerning air transport calls for ongoing reduction in the number of fatalities in air transport. In its target follow-up for 2015, Transport Analysis concludes that the overall trend is moving in the right direction for both maritime and air transport safety.

## 3.2 External factors

A number of factors and measures have indirect impact on transport safety. For example, traffic volume and composition is affected by regulations and steering mechanisms from areas other than transport. The economy, demographic trends and weather conditions also affect traffic and transport safety.

The choice of mode of transport and the risks and consequences of accidents vary depending upon the population category to which the individual traveller belongs. Older women and men are injured more often in traffic than other road users. This is not because they are involved in more accidents, but because older people are frailer and a fall or a collision thus has more serious consequences for an older road user. For this reason, there is risk that the number of people injured in traffic will increase due to the ageing population. In addition to age, so-

<sup>10</sup> General aviation is the segment of air transport that is not either chartered or scheduled air service.



cio-economic factors are significant to the risks that are taken in traffic. Studies<sup>11</sup> show that a strong connection to the labour market - education, employment and income - implies longer distances travelled, but also lower risk of ending up in hospital due to a road traffic accident. Likewise, a strong connection to family is related to longer distances travelled in road traffic environments, but also less likelihood of being involved in an accident.

Social development in general also has impact on the transport system and entails both challenges and opportunities for transport safety work. The ongoing urbanisation and densification in urban environments in Sweden are an example of this. In densely populated environments, many different transport needs must be met, but often in a smaller land area. For example, there is less space for physical separation of different modes of transport. Social planning on the macro level has profound impact on the transport system and transport safety. Ambitions to increase pedestrian and cycle traffic, for instance, are changing the conditions for transport safety work.

An increasing number of components in the transport system are connected and can communicate with each other. This digitalisation is mainly a new phenomenon in road transport, but has existed for a long time in rail, maritime and air transport. The development of road vehicles is increasingly moving towards automation, where drivers are supported in their driving task to varying degrees. It is not only vehicles that are being automated; traffic sur-

veillance and traffic management, for example, are becoming increasingly automated. Road safety cameras (ATC, Automatic Road Safety Control) are an example of automated surveillance. The introduction of remote-controlled vehicles, such as drones (small, sophisticated, unmanned aircraft) is also in progress. Other automation systems that facilitate parking, loading and unloading are also becoming increasingly common.

### 3.3 Transport infrastructure

The Transport Administration is responsible for long-term infrastructure planning for road, rail, maritime and air transport. It is also the infrastructure owner of state-owned roads and railways. The municipalities are the infrastructure owners of municipal road networks. There is also a very extensive network of private roads in Sweden. The Swedish Maritime Administration is the infrastructure manager at sea and is responsible for keeping fairways open, safe and in good condition and for operating and maintaining maritime safety devices.

The principles of Vision Zero have had impact in various transport sectors, but are most clearly apparent in the road segment, where Vision Zero calls for roads to be designed so that accidents do not lead to serious or fatal injuries among road users. Barrier separation of roads is an example of such a measure. The number of road kilometres separated from oncoming traffic lanes was more than doubled between 2002 and 2015. The “2+1 roads” account for the largest proportion of this increase. Further examples of measures in the road environment that have contributed to reducing serious and fatal injuries for pedestrians and cyclists include adapta-

tion of speed limits and establishment of traffic calming measures, such as roundabouts and speed humps, in urban environments.

Although lead-times can be long, there is also development of safety-related measures occurring in the railway and other track infrastructure. The gradual elimination of level crossings has been an important safety measure in the track system. A major transition is occurring in the railway infrastructure to a new signalling system, ERTMS,<sup>12</sup> which has the potential to further improve safety. The Transport Administration has also initiated a project to protect the railways from unauthorised entry using fences and camera surveillance at sites where person-train collisions are common. These measures are assessed as having significant effect on reducing the number of fatalities in the rail transport system. The single most important regulation to advance this effort is the requirement for systematic safety improvement for infrastructure owners and rail operators that was introduced in 2004.

### 3.4 Vehicles

Road vehicle safety has been continuously improved, which has helped reduce fatalities and injuries in road traffic accidents. Today, many passive safety systems, such as seat belts, air bags, crumple zones and underrun protection, are common obligatory standards for all new cars. Several different active safety systems, such as anti-skid systems and anti-lock brakes, have also been introduced in new cars in recent decades and some components of this are standard in the modern

11 'How much does a road traffic accident cost?' SIKÅ  
- Swedish Institute for Transport and Communications Analysis

12 The European Rail Traffic Management System (ERTMS) is a standardised European safety system intended to enhance cross-border interoperability of rail transport.



The number of road kilometres separated from oncoming traffic lanes was more than doubled between 2002 and 2015. The “2+1 roads” account for the largest proportion of this increase. A “2+1 road” is a road type with altering one or two lanes in any given direction.

vehicle fleet. The latest technology is based on more automation and detection and the auto-brake function in vehicles has been shown to generate very large safety gains. In particular, this means that cars have become safer for people who are outside the vehicle, such as passengers/drivers in other motor vehicles, but also for pedestrians and cyclists.

New cars not only generally improve overall safety; environmental performance also improves over time. There is nothing to indicate that latest-generation green cars are less safe than other cars.

The Swedish government and the automotive industry are cooperating to further improve vehicle safety. The Strategic Vehicle Research and Innovation programme (FFI) is one example. FFI is a partnership between the Swedish government and the automotive industry for the joint funding of research, innovation and development focused on the areas of climate and environment and safety. The programme provides

operational funds of about SEK 1 billion per year, of which half is public funding.

### 3.5 Responsibility of road users

Road transport differs from other modes of transport in that individual road users perform a large percentage of transports. People who operate motor vehicles on the roads gain access by holding a driving licence or operator’s permit that can be withdrawn for serious traffic violations or if the individual develops an illness that can have negative impact on his or her capacity to drive. There are no access requirements to the transport system for pedestrians and cyclists. This points to the importance of clear road rules and good support for rule compliance provided by means of traffic environment design, education and information. It is also vital that people use good judgement.

Compliance with the rules varies among road users. Less than half of all road traffic complies with speed limits. On the plus side,

the percentage of traffic volume with sober drivers is very high, but there is still great potential to save many lives and avoid injuries by further improving sobriety in traffic. This is emphasised by the statistic that the number of people killed in alcohol-related fatal accidents account for nearly one quarter of all road deaths. Compliance with the rules is also high in certain other areas, such as the use of protective devices like safety belts and motorcycle helmets. However, there is no reliable data available on compliance with road rules among cyclists and pedestrians.

Traffic safety is not only dependent upon road users following the rules - it is also important that people show good judgement in traffic. Tiredness, lack of attention and various distractions are common causes of road traffic accidents.



## 4. Directions of future transport safety work

Continued transport safety work should proceed from three perspectives.

- Firmly establish and reinforce work that is already delivering results.
- Develop and include new areas in transport safety.
- Adapt transport safety work to new conditions.

Overall, this primarily involves using existing resources and tools more effectively, rather than new initiatives.

### 4.1 Firmly establish and reinforce work that is already delivering results

In the short term, it is important to continue implementing and optimising the measures that have thus far demonstrated good results for transport safety. Several measures and methods have contributed to reducing fatalities and serious injuries in traffic accidents. These initiatives must be firmly established and, in some cases, improved and intensified.

Effective regulation and supervision in air, maritime and rail transport

Regulation and supervision of commercial air and maritime transport has been assessed as effective. The International Civil

Aviation Organization, ICAO, and the European Aviation Safety Agency, EASA, are working towards the implementation of safety management systems by all aviation companies and for all companies to assume greater responsibility for air safety. There have been corresponding international and EU rules in place for a long time that require shipping companies to have approved safety organisations. The results of these efforts and the regulations are good. One current example is that Sweden, as a flag state, came in first on the “White List” for port state control in 2016. This means that ships flying the Swedish flag received the fewest refusals of access (“bans” and recorded deficiencies in port state inspections across large parts of Europe, Canada and Russia

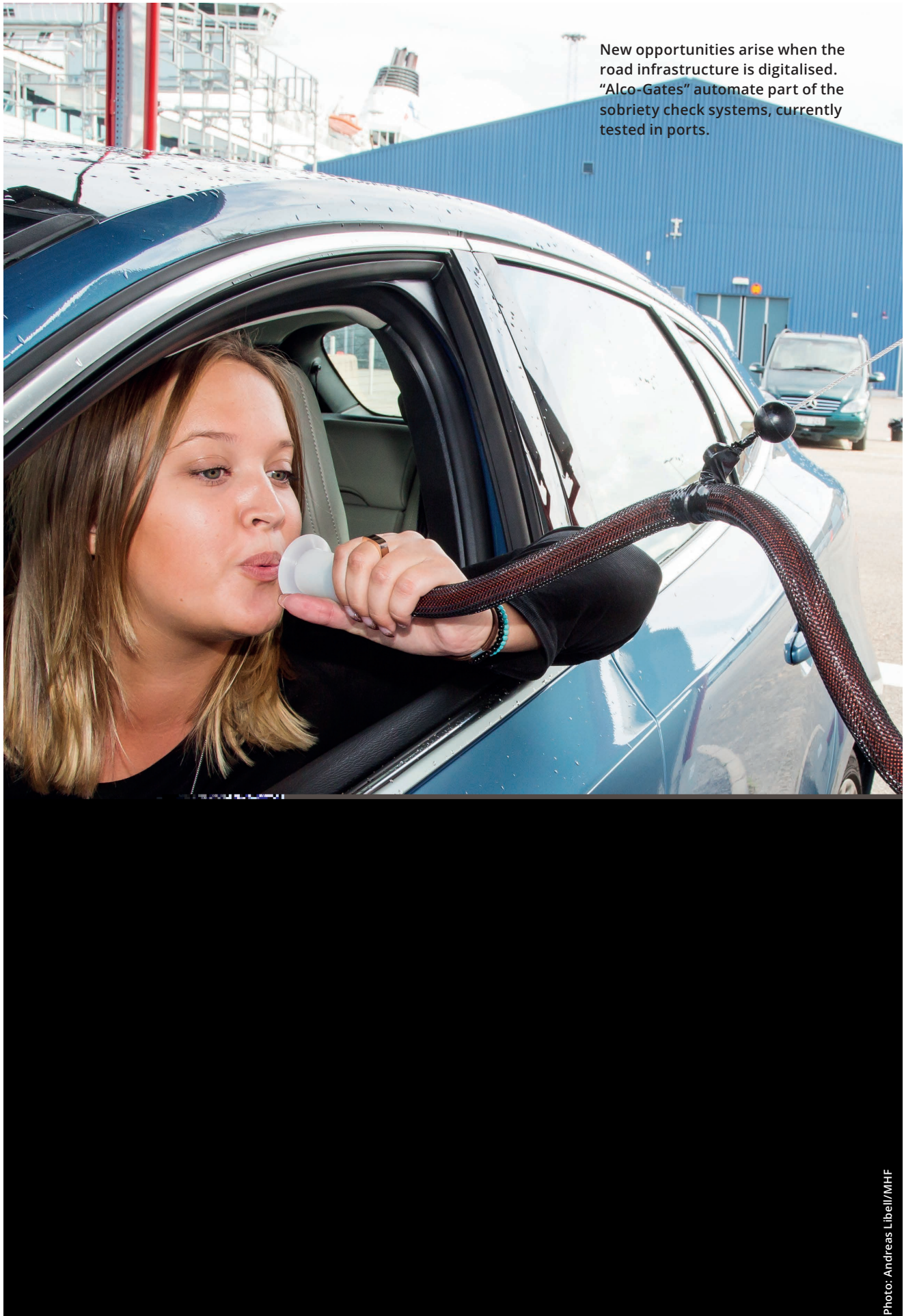
The Government welcomes the current development in which the work of operators to improve safety is an essential component of overall transport safety work and where supervision is adapted accordingly. This approach is also regulated by law in the area of rail transport and the Government supports the effort to secure and improve these activities.

Accessible high-quality data

Many advances have been achieved in transport safety thanks to solid data on accidents and fatalities in the transport system. The information found in the STRADA database is unique of its kind in the world because it links information from the Swedish Police and hospitals. This information is used as a basis for transport safety work on the national, regional and local levels. However, reporting to STRADA has declined in recent years. This is believed to be due to a different interpretation of certain legislation and the workload that reporting to STRADA entails for the health care system.

There is solid data material for air transport, but the data is spottier for commercial maritime transport. There is no complete report on the number of persons injured in pleasure boating traffic or full coverage in the statistics of injuries incurred in general aviation.

The Government finds that reliable injury and accident statistics, as well as incident reporting where relevant, are a key prerequisite for proactive safety work. To the greatest possible extent, the statistics should be categorised by gender.



New opportunities arise when the road infrastructure is digitalised. "Alco-Gates" automate part of the sobriety check systems, currently tested in ports.

Photo: Andreas Libell/MHF



## Safe transport infrastructure

The gradual adaptation of the transport infrastructure should continue towards achieving the objective of zero fatalities or serious injuries in the transport system. However, it is important that any fragmentation and barrier effects that arise from infrastructure - especially when it is fenced off - are effectively managed.

The Government encourages continued systematic initiatives to improve road and railway safety.

The safety of the road infrastructure should be further developed in step with advances in vehicle safety so that initiatives in each component are optimised. The need for parallel development of vehicle and infrastructure systems is exacerbated by rapid developments in digital and automatic functions and the needs these create.

Railway traffic is becoming safer and less vulnerable to disruption through the successive implementation of the ERTMS signalling system. Going forward, level crossings should continue to be systematically eliminated through rebuilding or made safe through effective protective devices adapted to vehicle traffic as well as vulnerable road users crossing the tracks. However, the greatest impact on the number of fatalities in rail transport is achieved through initiatives linked to preventing person-train collisions.

The Government welcomes ongoing efforts to impede unauthorised entry to the railways, which have been assessed as reducing the number of person-train collisions.

## Even safer vehicles

Vehicle safety improvements are making a tremendous contribution to transport safety work, particularly in road transport. For this trend to continue, the industry must continue developing solutions that make vehicles safer, but there must also be demand for safe passenger cars among road users and car buyers, for example. The Euro NCAP<sup>13</sup> new car rating system and information campaigns carried out by insurance companies have been important contributions to increasing demand for safe cars and raising consumer awareness. International legislation to make safety enhancement systems obligatory in new vehicles is also having an effect.

The Government takes the view that further development of driver support systems, digitalisation and automation in cars is important to achieving Vision Zero.

Development of the vehicle system and transport infrastructure should be intertwined to optimise initiatives to improve safety in the respective parts. Regulations should be adapted to promote vehicle automation and digitalisation and thus foster sustainable development of the transport system. The Government has appointed a commission of inquiry into the rules applicable to self-driving vehicles (Dir. 2015:114). The inquiry has thus far submitted an interim report on self-driving vehicle trials, 'The road to self-driving vehicles - trial programmes' (SOU 2016:28) and will later be submitting proposals on the introduction of self-driving vehicles in 2017.

<sup>13</sup> European New Car Assessment Programme: A road safety collaboration among many European countries, car manufacturers and voluntary organisations.

## Continued cooperation

Swedish transport safety has historically been based to a great extent on cooperation among various actors. This is most apparent in the road safety arena, where there are many actors and the largest proportion of transports are carried out by individual road users.

Systematic safety management, including the cooperation necessary to carry it out, is regulated by law in large parts of the maritime, air and rail transport sectors. This does not, however, apply to road safety.

The Government takes the view that comprehensive cooperation among actors in all modes of transport is highly significant to achieving Vision Zero. In this context, it is important that there is a common orientation in operational transport safety work. Accordingly, the Government intends to further strengthen cooperation in the area of transport safety.

More operational cooperation is also important. One example of successful cooperation of this kind is SMADIT (Joint action against alcohol and drugs in traffic), which is a collaborative effort mainly between the Swedish Police and the addiction care system. So that it remains successful, this collaboration should also have a clearly identified lead coordinator.

The Government takes the view that shared objectives are an important tool in the cooperation required to achieve Vision Zero, particularly within the wide group of actors who must work together in the effort to improve road safety.

The Government also wishes to continue the work to prepa-

re for interim targets for road safety after 2020.

## 4.2 Develop and include new areas

In order to further develop transport safety, certain aspects should receive greater attention. For example, measures on behalf of vulnerable road users and action to reduce the high number of suicides in the rail transport system have not been sufficiently distinct elements of earlier transport safety initiatives.

In general, it is important that safety work and its effects are analysed from the perspectives of various groups of transport users. Age, gender, disabilities and socio-economic factors all affect people's choices of mode of transport and the nature and consequences of accidents. Continued transport safety work should more clearly monitor the development of transport safety among different transport user groups and be open to taking measures adapted accordingly. Going forward, transport safety work should also, in an even more distinct way, seek synergies with initiatives taken in the transport system connected to the environment and human health.

### Improve road safety for vulnerable road users

Accident trends have not been as positive for all groups of road users as for motorists. Vulnerable road users, such as pedestrians, cyclists and drivers of two-wheeled motor vehicles, are particularly at risk. Public initiatives aimed at improving opportunities for people to walk and cycle, combined with an ageing population, may also result in an increase in the number of accidents involving vulnerable road users, as well as the seriousness of the

consequences. Particular attention thus needs to be paid to these groups of vulnerable road users. The Government's work with and drafting of a national cycling strategy for increased and safe cycling is one tool in this effort.

Even though road infrastructure safety has been improved, the infrastructure is not always designed to meet the needs of vulnerable road users. Nor does maintenance of the infrastructure always take into the requirements into account necessary to compensate for the fact that two-wheeled vehicles are less stable than ordinary cars. Moreover, the central government, regions and municipalities all have ambitions to increase pedestrian and cycle traffic, as well as housing construction, which imposes new demands on transport safety work.

The Government believes that transport safety work should clearly include efforts to create safe traffic environments for vulnerable road users, especially for men and women who are walking or cycling. Consequently, the design and maintenance of road infrastructure and traffic environments should be better adapted to vulnerable road users. The continued contribution of the municipalities to this effort will be critical to its success.

The Government also intends to further study the issue of speed limits in densely populated areas.

There is potential to improve safety for cyclists through the use of good equipment, such as tyres, brakes and lights. If an accident does occur, wearing a helmet is an effective safety measure. Helmets reduce the seriousness of injuries

and are thus an important safety factor for cyclists.<sup>14</sup>

### Suicide prevention

As suicides are not regarded as intentional events rather than accidents, they have not previously been addressed as part of the overall transport safety problem. It is, however, obvious that the extent of suicide is a social problem and there has been a zero vision for suicide in society since 2008. The Public Health Agency of Sweden has been tasked with coordinating suicide prevention efforts on the national level. Suicides within the transport system account for more than 5 per cent of the total number of suicides in Sweden every year. In addition to the human suffering caused by suicide, these tragedies also cause disruptions and delays in the transport system. The health and safety of train drivers and other professional groups are also affected by suicides in the transport system.

Suicide can be prevented and preventive initiatives taken in society to counteract mental illness and the various public systems for managing suicide risk must be continuously improved.

The Government therefore welcomes initiatives taken to systematically reduce the number of suicides in the transport system and finds the issue may require further analysis to discover whether there are further measures that might be effective.

### Increase compliance with road rules

The divided responsibility between system shapers and road users expressed in Vision Zero puts demands on companies and individual road users to com-

<sup>14</sup> See Bill 2007/08:110.



ply with road rules. Compliance is good in several important areas, such as the use of seat belts, but there are areas where greater focus on the responsibility of road users to follow the rules is needed.

Prioritised areas for increased compliance are the reduction of drink driving and speed limit violations. Initiatives to improve compliance, particularly in commercial transport, also have positive impact on health and safety and fair competition. Safety in the transport industry is an important aspect of the Government's occupational health and safety strategy.<sup>15</sup>

However, it is important to note that demands for compliance with the rules apply to all road users. When the safety of vulnerable road users is emphasised in traffic safety work, demands for compliance among these groups are a logical consequence. Better compliance with road rules reduces the risks of accidents and injuries, improves traffic flow and leads to less conflict among different groups of road users.

Individual road users are responsible for following the rules that exist. The Swedish Police have the important task of ensuring that road users follow the rules as they should. Greater safety and security on the roads also requires preventive initiatives from all of society and there are several other initiatives and actors that can foster improved compliance. One example of how compliance can be improved is when companies and organisations work systematically to assure the quality of their trips and transports so that they are carried out in a legal and high-quality manner.

The Government takes a favourable view on the several quality management systems that are available today to provide support to organisations for systematic quality improvement.

#### Safer recreational traffic

The risks are higher for travel and transport mainly for recreational purposes than they are for other traffic. Some of this traffic occurs partially or entirely off paved roads and marked trails. Examples of this kind of traffic may include pleasure boating and a certain level of traffic in all-terrain/off-road vehicles.

The Government takes the view that recreational traffic that occurs off paved roads and marked trails puts especially high demands on individuals.

Their responsibility lies in following the rules in the relevant area, such as the Maritime Code (1994:1009), which prohibits the operation of certain boats if the operator's blood alcohol content is higher than 0.2 per-mille. Another aspect of this responsibility, in addition to that prescribed by the rules, is to remain particularly vigilant while travelling, with respect to the route and speed, for example.

There are also public initiatives that are important to traffic safety off public roads and marked trails. Examples of this include information about how to avoid accidents and how to mitigate the negative effects of an accident. The work being carried out to create improved mobile phone coverage around Sweden, as well as information about mobile coverage, is another example.

The Government takes a favourable view of the groups conve-

ned by the Transport Agency (the Maritime Safety Council and the General Aviation Safety Council) that are mobilising relevant actors to increase the safety of general and recreational traffic within maritime and air transport. A portion of this traffic is specifically recreational.

### 4.3 Adjust transport safety work to new conditions

The transport safety work ahead will be dependent upon its context and this third area involves adjusting transport safety work to the surrounding trends and transitions of the day. Technical progress is moving swiftly and the work to ensure safe transport must be arranged so that it can take advantage of new advances.

Derive more benefit from automation and digitalisation. Digitalisation and automation have many positive applications. There is great potential here for service providers, Swedish manufacturers and transport users. The development of road vehicles, for example, is increasingly moving towards automation, which generates tremendous opportunities to eliminate many of the human errors made in road traffic every day. The technology is already providing opportunities for advanced driver support that results in safer, more eco-friendly driving. Long term, automated driving could compensate for various types of impaired driving capacity and, over the even longer term, development of totally safe transport services may become a reality.

New opportunities arise when the road infrastructure is also digitalised. "Alco-Gates" automate part of the sobriety check systems at ports and the Government is currently studying the conditions for

<sup>15</sup> See Govt Comm. 2015/16:80.



The development of road vehicles is increasingly moving towards automation where the driver given assistance in the task of driving.

installing the devices in three to five ports. Developments towards further automation are occurring in other activities in the transport system linked to transport safety, such as traffic management.

A transition towards connected and automated transports is ongoing in the entire transport system. In recent years, the use of small, sophisticated unmanned aircraft – drones – has become more common in aviation in recent years. The use of drones is regulated mainly by existing Swedish legislation, but several international processes are in progress to develop common regulations. Generally speaking, it is important that the regulations support technical progress and the opportunities brought by technology. Specifically as regards

drones, it is particularly important to consider issues of privacy, security and use of the airspace. Several parallel processes are ongoing, both nationally and internationally, in relation to self-driving and connected vehicles in road traffic. Sweden is very active in this effort and the commission of inquiry on self-driving cars presented an interim report, 'The road to self-driving vehicles - trial programmes' (SOU 2016: 28) that proposes regulations to enable trials of self-driving vehicles.

The Government sees great potential in the ongoing digitalisation and automation of the transport system for improving transport safety.

The Government takes the view that the potential risks connec-

ted to digitalisation and automation of the transport system must be managed.

As an example, the Government has tasked the Transport Agency with carefully monitoring developments in the use of communications equipment while driving, as this is a risk factor in traffic. Sweden is also active in the ongoing international processes to analyse and manage the risks associated with digitalisation and the development of driverless vehicles and craft.



## 5. Spread Swedish transport safety around the world

Swedish transport safety results and this Renewed Commitment to Vision Zero constitute a contribution to achieving UN global sustainability targets under Agenda 2030.

The Government intends to analyse the conditions for strengthening and systematising the work to further spread the Swedish approach to transport safety around the world.

Sweden's transport safety work is a success. In percentage terms, there has been a sharp reduction in road traffic fatalities since the turn of the millennium, even though the number of road deaths in Sweden was already relatively low. The Vision Zero approach has engendered interest elsewhere in the world and the concept has now been adopted by several other countries and cities outside Sweden. Swedish transport safety work in line with Vision Zero has also been praised by international institutions such as the UN and the EU, and there is substantial international demand for Swedish knowledge and Swedish experience.

The favourable outcomes and Sweden's good reputation in the transport safety field are creating the conditions for spreading Swedish expertise and Swedish goods and services. In turn, this can contribute to both improved transport safety around the world and higher exports for Swedish companies.

No one single factor means as much to safety in road traffic as speed. Automatic Traffic Control (Swedish: ATK) is a system for automatic speed monitoring using road safety cameras. The aim of road safety cameras is to reduce the average speed on our most hazardous roads and in this way decrease the number of fatalities and serious injuries.



Photo: Rikspolisstyrelsen











