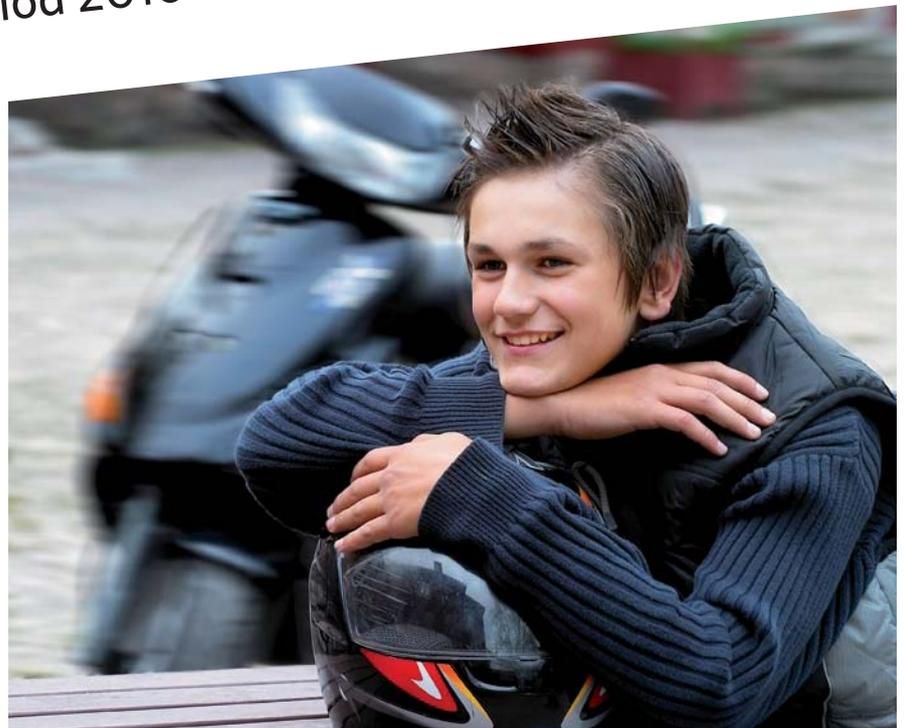




TRAFIKVERKET
SWEDISH TRANSPORT ADMINISTRATION

Improved safety for motorcycle and moped riders

Joint strategy for the period 2010-2020, version 1.0



Swedish Association
of Local Authorities
and Regions



Swedish
Motor
Insurers



SWEDISH
TRANSPORT
AGENCY



TRAFIKVERKET
SWEDISH TRANSPORT ADMINISTRATION

Title: Improved safety for motorcycle and moped riders. Joint strategy for the period 2010-2020, version 1.0

Publication number: 2010:043

Date of publication: 2010-04

Published by: Swedish Transport Administration*

Liaison person: Jörgen Persson, Swedish Transport Administration, jorgen.persson@trafikverket.se

Photo: Honda, Kerstin Ericsson Trafikverket, SMC, McRF, Jörgen Persson Swedish Transport Administration, Arash Atri bildarkivet.se, Garage 24 Motor AB

Layout: Swedish Transport Administration

ISSN Number 978-91-7467-014-1

*On 1 April 2010, the Swedish Transport Administration took over the activities previously undertaken by the Swedish Rail Administration and the Swedish Road Administration as well as sections of the Swedish Maritime Administration, the Swedish Transport Agency and Swedish Institute for Transport and Communications Analysis. At the same time, the Swedish Rail Administration, the Swedish Road Administration and the Swedish Institute for Transport and Communications Analysis were phased out.

Foreword

Motorcycles and mopeds are becoming increasingly popular in Sweden – their numbers have doubled during the past decade. Both motorcycles and mopeds meet important transport needs of their users. Due to the growing congestion and the demand for energy-efficient transport, they may also meet important future needs in society. Hybrid electric vehicles and also all-electric vehicles are already available today.

The major disadvantage associated with motorcycles and mopeds is their shortfall in safety. The motorcycle or moped rider is unprotected in the event of an accident. The objective of this strategy is to demonstrate how the number of motorcycle and moped fatalities could be halved and the number of seriously injured riders reduced by 25 per cent by the year 2020, thus contributing its share to the 2020 interim goal.

The strategy is based on the management by objectives model for road safety based on Vision Zero – the Swedish Parliament's long-term road safety plan. It is aimed principally at organizations and other stakeholders who are active in the field and who are willing and able to contribute.

The prioritized operational areas give us an opportunity to solve safety problems using existing knowledge and known methods. We have also identified knowledge shortcomings, which we intend to systematically reduce. The prioritizing that the strategy yields is an important prerequisite for jointly attaining the road safety goals set up.

Together towards Vision Zero.

April 2010



Per Johansson
Swedish ATV Industry Federation



Jan Sandberg
National Society
for Road Safety



Lena Tysk
National Police Board



Gunilla Glasare
Swedish Association of Local
Authorities and Regions



Jesper Christensen
Swedish Motorcyclist
Association



Mats Olausson
Swedish Motor Insurers



Staffan Widlert
Swedish Transport Agency



Lena Erixon
Swedish Transport
Administration

Contents

- 6 Summary of strategy
- 8 Motorcycles and mopeds in the transport policy
- 10 Together towards Vision Zero - implementation of interim goals for 2020
- 12 Analysis and prioritized operational areas
- 13 Facts concerning motorcyclists and moped riders

Motorcycles

- 17 Fatal accidents involving motorcycles
- 20 Potential of operational areas for improving motorcycle safety
- 26 Prioritized operational areas for motorcycles

Mopeds

- 28 Fatal accidents involving mopeds
- 30 Potential of operational areas for improving moped safety
- 32 Prioritized operational areas for mopeds

-
- 34 Prioritized operational areas for initial work
 - 36 Research, development and demonstration
 - 38 Organization for developing the strategy

Appendices

- 1 Utvecklingsprojekt för säkrare moped- och motorcykelåkning finansierat av Vägverket (Not translated)
- 2 Till Näringsdepartementet inlämnade förslag till ändringar (Not translated)
- 3 Antilock Brakes Systems (ABS) on motorcycles
- 4 Handlingsplan MC på väg 2007-2010 (Not translated)

Summary of strategy

The motorcycle and moped are a natural element in the transport system and thereby also in road safety operations. We are devoting active work towards limiting the outcomes of accidents by identifying measures that are based on research and experience, so that the greatest measurable effect can be achieved. It is of great importance for us to continually improve our knowledge and understanding of the motorcycle and moped in the transport system so that the stakeholders can jointly achieve the goals set up for the year 2020.

The objective of this strategy is to demonstrate how the number of fatalities among motorcyclists and moped riders could be halved and the number of seriously injured riders reduced by 25 per cent by the year 2020.

The strategy is confined to two-wheel motorcycles and mopeds that are used on the roads.

SAFE MOTORCYCLE TRAFFIC

Accident prevention measures are the most important element in making motorcycle traffic safe. The consequences of accidents for motorcyclists are serious, even at legal speeds. The principal measures we will be prioritizing are therefore:

- fitting motorcycles with ABS brakes
- reduced number of speed limit violations

By fitting motorcycles with ABS brakes, the risk of fatality or serious injury in an accident is reduced by around 50 per cent. At intersections alone, the risk is reduced by about 70 per cent.

Analyses of fatal accidents involving motorcyclists demonstrate that the speeds in many accidents were above the permissible limit. Only 4 out of 10 motorcyclists are estimated to have been travelling within the speed limit when involved in a fatal accident (in-depth studies of fatal accidents by the Swedish Transport Administration). Speed limit violation may be a reason that an accident has occurred and may also result in more serious injuries.

SAFE MOPED TRAFFIC

The most important element for safe moped traffic is to limit the consequences of accidents. A moped rider who uses a helmet in the correct manner has a reasonable chance of surviving an accident at speeds not exceeding 45 km/h, and has good chances of survival if the speed is not in excess of 30 km/h. The principal measures that should be prioritized are therefore:

- increased and correct use of helmets
- lower speed by reduced tuning.

Half of the moped rider fatalities are youngsters aged between 14 and 17. Almost half of these had not been using a helmet in the correct manner. Others who are killed while riding a moped are appreciably older and often have alcohol problems.

Technical defects are common in fatal accidents involving mopeds. Tuning is involved in almost half of all fatal moped accidents. Tuning need not be behind the accident, but it definitely affects the seriousness of injuries, since the speed is higher when the accident occurs.

THE WORK MUST BE BASED ON FACTUAL AND SCIENTIFIC GROUNDS

The priorities assigned should be based on factual and scientific grounds. The strategy includes highlighting the need for research, development and demonstration.

COLLABORATION AND JOINT PRIORITIES

The strategy presupposes that stakeholders, either individually or in collaboration, undertake various measures at local, regional, national or international level. The strategy identifies a number of prioritized work areas for the players.

CONTRIBUTIONS BY THE STAKEHOLDERS

The various stakeholders contribute by orienting themselves and their operations onto the prioritized operational areas.

ANNUAL DEVELOPMENT OF THE STRATEGY

The strategy should be developed annually on the basis of the actual results in terms of the number of riders who are injured or killed, the activities that the various stakeholders have undertaken, and also new knowledge. The Swedish Transport Administration will take the initiative in this process, which will be carried out together with the stakeholders.



Motorcycles and mopeds in the Swedish transport policy

VISION ZERO

The Swedish Parliament decided in the autumn of 1997 that the long-term road safety objective should be that no one should be killed or seriously injured as a result of road accidents in the road transport system – Vision Zero. The responsibility for this lies with those who design and maintain the system as well as with road users who are responsible for following the rules. If the road user is unable to follow the rules, the responsibility reverts to the system designers.

The point of departure for Vision Zero is that human errors in traffic must not be allowed to lead to serious injuries.

The risk of a motorcyclist being killed or injured in an accident is very high, even at relatively low speeds. For motorcyclists, the task for system designers is therefore to adopt measures that support the riders in avoiding accidents.

The most important element for safe moped traffic is to limit the consequences of accidents. A moped rider who uses a helmet correctly has a reasonable chance of survival in an accident if the speed is no more than 45 km/h, and has a good chance of survival if the speed is not in excess of 30 km/h.

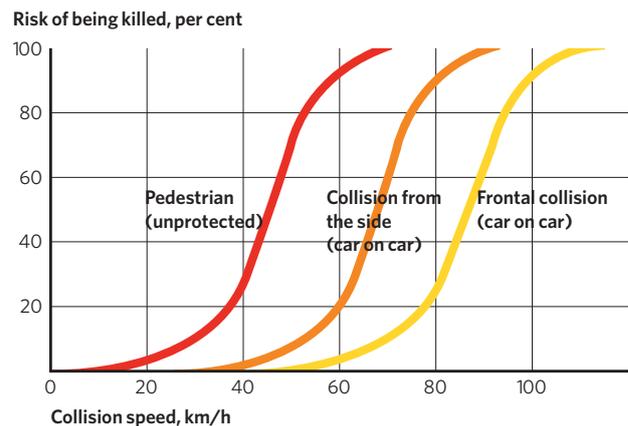


Figure 1: This is how the risks of being killed change with various collision speeds and accident types.

(Source: Swedish Transport Administration)

TRANSPORT POLICY OBJECTIVES

The overall objective of Swedish transport policy is to ensure the provision of transport for people and businesses throughout the country in a manner that is economically efficient and sustainable in the long term.¹

This objective is supported by two main objectives: a functional objective that concerns the accessibility of the journey or transport, and an impact objective that concerns safety, the environment and health. The objectives represent the point of departure for all measures adopted by the Government in the field of transport. The objectives should also serve as support for regional and municipal planning. The objectives comprise all modes of traffic, which means that they also concern transport and journeys made by motorcycle and moped.

¹See the Government homepage <http://www.sweden.gov.se/sb/d/11771>

THE FUNCTIONAL OBJECTIVE OF ACCESSIBILITY

Accessibility is the scope available for minimizing or bridging geographic distances in order to create contact opportunities and proximity to services and social functions. Motorcycles and mopeds may represent an alternative to the car in big cities, where congestion is a problem.

The purposes of a journey by motorcycle or moped may be many, such as leisure, business or commuting to work. Accessibility is different for motorcycles and mopeds, since they are generally used in different traffic environments and are ridden at different speeds. A journey by motorcycle is closer in accessibility to journeys by car, whereas a journey by moped, particularly of Class II, is more akin to the accessibility that cyclists have. The moped or motorcycle is needed by many for running the necessary daily errands or for improved quality of life during leisure hours.

THE IMPACT OBJECTIVE OF SAFETY, ENVIRONMENT AND HEALTH

It is important for all travelling to take place in a safe manner and without contributing to impairment of the environment or a negative impact on health. However, road safety measures can also have good effects on the environment. As an example, lower speeds lead to better air quality, reduced emissions of greenhouse gases and lower sound levels. These improvements can also be assumed to have positive effects on health.

At the present time, moped riders have no natural place in the traffic system. Mixing mopeds with pedestrians creates insecurity and disruption, above all for children, the elderly and the disabled. It is important to create a safe and secure place for both moped riders and pedestrians.

The strategy includes no direct measures for reducing the environmental impact of motorcycles and mopeds. These often have no catalytic converters and are estimated to account for 8 per cent of hydrocarbon emissions from road traffic. The EU is in the course of reviewing the framework directive for type approval of two-wheel and three-wheel vehicles. The review is expected to lead to requirements for methods of measuring emissions of carbon dioxide also for motorcycles, together with stricter exhaust gas and noise requirements. According to the motorcycle industry, motorcycles will meet the same emission requirements as passenger cars by the year 2015.

LEGISLATION ON SAFE ROADS

Directive 2008/96/EC deals with safety on state roads and will probably be introduced for all roads during the period 2010–2013. An annex to this directive describes unprotected road users as pedestrians, cyclists and motorcyclists.

Together towards Vision Zero

- implementation of interim goals for 2020

INTERIM GOALS FOR THE YEAR 2020

In May 2009 the Swedish Parliament decided on new interim goals for road safety for the year 2020. The goal is to achieve a 50 per cent reduction in the number of fatalities by 2020 compared to the period 2006–2008. This means that the number of fatalities on the roads in 2020 will be a maximum of 220. The number of seriously injured persons is to be reduced by a quarter between 2007 and 2020, so that a maximum of 4000 persons will sustain serious injuries in 2020.

MANAGEMENT BY OBJECTIVES FOR ROAD SAFETY

The Swedish Parliament has adopted Government Draft Bill 2008/09:93 as well as the Swedish Road Administration proposal for a system of management by objectives of road safety operations. The Government advocates, among other things, systematic annual follow-up of results as a tool for enabling continual follow-up of developments.

Management by objectives is based on measuring and following up the condition for a number of

prioritized operational areas. Contributions by the stakeholders represent an important part of road safety operations. This also applies to the work on improving safety for motorcyclists and moped riders. This is why we have developed in this strategy the prioritized operational areas to take these road user groups into account.

The following 13 areas have been prioritized for the overall road safety work. All of them, with the exception of number 4, concern motorcycles and/or mopeds.

1. Observance of speed limits – state road network
2. Observance of speed limits – municipal road network
3. Sober drivers/riders
4. Use of seat belts
5. Use of helmets
6. Safe vehicles
7. Safe heavy vehicles
8. Safe state roads
9. Safe municipal streets – PCM passages²
10. Safe municipal streets – intersections
11. Fast and adequate emergency services
12. Rested drivers/riders
13. High valuation of road safety

² Pedestrian, Cycle and Moped passages

HOW THE STRATEGY IS TIED IN WITH OTHER INTERIM GOAL MANAGEMENT

WHO?	WHAT?	WHEN?
Interim goal working group	→ Prioritized operational areas, measurement plan	→ Annual results conference
GNC	→ Orientation	→ Annually, after results conference
Motorcycle and moped working group	→ Strategy	→ Annual revision
Stakeholder	→ Own goals and measurements	→ Annual follow-up

The Interim Goal Working Group develops the model for management by objectives, with its prioritized operational areas and measurement plan. They ensure that measurements are carried out, followed up and analysed. The results are presented at annual results conferences and an international expert panel comments on them.

The Group for National Collaboration (GNC) develops the results further and draws up the focus for the areas that it is particularly important to influence.

A Motorcycle and Moped Working Group will be established and will be given the task of developing the strategy annually.

The stakeholders – organizations, companies, authorities and others – identify the activities where they are willing and able to contribute to the prioritized operational areas on the basis of the strategy and set the goals and measurements for these activities.



Do you want to know more? You can read more in the "Together towards Vision Zero" brochure that you can order from The Swedish Transport Administration web store.

Analysis and prioritized operational areas

The following sections include the basis for prioritizing the operational areas, in the form of facts from in-depth studies of fatal accidents and estimations of the potential of various operational areas aimed at improving the safety of motorcyclists and moped riders. This is followed by prioritizing the operational areas that are assumed to be of greatest importance in the continued work.

The Swedish Transport Administration's in-depth studies of fatal accidents during the period 2005–2008 have been used as the source data for both reporting of facts and calculations of potential. These studies cover all fatal accidents on Swedish roads and include the results of post-mortem examinations, questioning and witness statements from the police, reports from the emergency services, and the examination by the Swedish Transport Administration of the accident site and the vehicles. The in-depth studies therefore represent uniquely detailed and complete material that is well suited for qualitative analyses.

The purpose of the presentation of facts is to provide an objective picture of the problem and some knowledge of how the most important risk factors correlate with one another. The purpose of the calculations of the potential of various operational areas is, in turn, to progress from the problem-oriented presentation of facts to a more solution-oriented picture of the number of lives saved to which the various operational areas could contribute. This can give a picture of the operational areas that are of great or minor importance and, on the basis of this, prioritizing can then be carried out. Known or assumed relationships between a certain measure and the reduction in the number of fatalities are used as the basis for every calculation. Somewhat simplified, it could be said that every fatal accident during the period 2005–2008 has been analysed and the initiating and critical event identified. An assessment is then made of whether certain solutions could have prevented the accident or changed the injury outcome. However,

for natural reasons, the reliability of the assessments varies depending on the problem area. In certain cases, they are very dependable, whereas in other cases they may merely represent assessments of the maximum benefit.

The possibilities of preventing fatal accidents have been assessed in the first place, since the data used was that from in-depth studies of fatal accidents. The measures that are effective in reducing the number of fatalities among motorcyclists and moped riders are probably also appropriate for reducing the number of serious injuries. However, there is a lack of knowledge of how these effect relationships apply to serious injuries.

Facts concerning motorcyclists and moped riders

The number of motorcycles on the roads has doubled in the past ten years and currently amounts to around 300 000. According to official statistics, more than 50 motorcyclists have been killed annually and more than 350 have sustained serious injuries during the past five years. The number of mopeds on the roads has also doubled during the past ten years and now amounts to around 200 000. According to police reports, an average of 11 moped riders have been killed annually and about 300 have sustained serious injuries during the past five years.

Figures 2 and 3 below show the number of killed and seriously injured motorcyclists and moped riders during the rolling 12-month periods since 1997.

MOTORCYCLISTS AND MOPED RIDERS KILLED DURING 1997-2009

From the end of the 1990s up to and including 2003, around 40 motorcyclists were killed every year. The number increased to 68 in the rolling 12-month period to August 2007 and then declined to around 50. The number of moped riders killed has varied with the seasons, fluctuating between 8 and 19, which amounts to an average of around 11 fatalities annually.

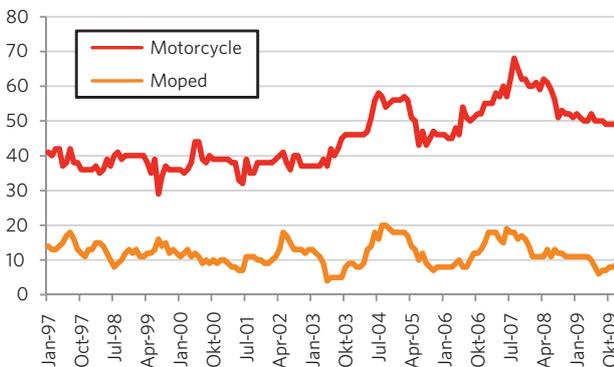


Figure 2: Number of motorcyclists and moped riders killed in road traffic according to official statistics during the rolling 12-month periods since 1997. (Source: Swedish Transport Administration)

SERIOUSLY INJURED MOTORCYCLISTS AND MOPED RIDERS DURING 1997-2009

Road accidents involving injuries are currently recorded in the Swedish Traffic Accident Data Acquisition (STRADA) database. This database draws information from two sources – the police and a large number of accident and emergency (A&E) departments of hospitals. Information from the police covers the entire country, while more than 70 per cent of A&E departments record information in STRADA. However, the number of hospitals that do this has increased rapidly since 2003, which means that the picture gained of the trend in the numbers of those seriously injured could be misleading.

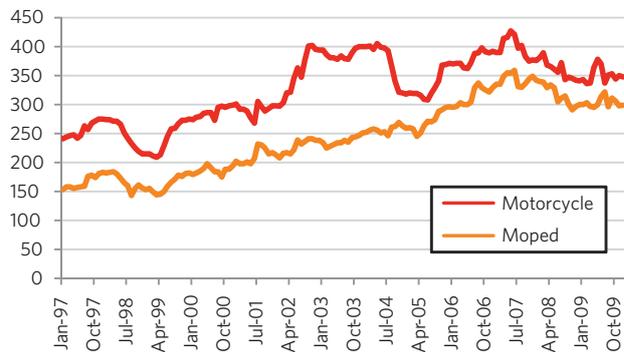


Figure 3: Number of seriously injured motorcyclists and moped riders in road traffic according to information from the police during the rolling 12-month periods since 1997. (Source: Swedish Transport Administration)

On the other hand, a better way at present of reporting the trend is available through the National Board of Health and Welfare patient register (PAR), although the definition of a seriously injured patient differs from that used in STRADA. The concept of “seriously injured” may also have different meanings in different systems, and the information therefore need not necessarily be in agreement. The PAR includes persons who have been hospitalized for at least 24 hours.



According to PAR, the total number of seriously injured motorcyclists and moped riders has increased during the past ten years and has now levelled out at around 2500 annually.

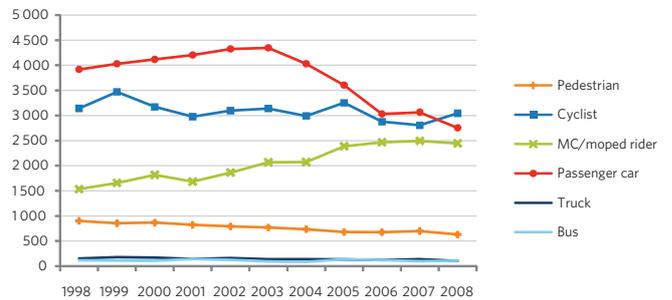


Figure 4: Number of seriously injured persons since 1998 per road user group, according to the National Health Service PAR register. (Source: Swedish Institute for Transport and Communications Analysis (SIKA) statistics 2009:24, Table 1a)

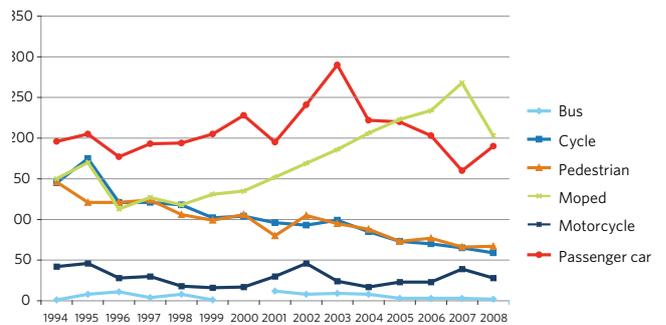


Figure 5: Number of youngsters (up to 17 years old) killed and seriously injured per road user category per year. (Source: Swedish Transport Administration)

According to information received from the police, the number of seriously injured youngsters below the age of 18 has also continued to increase in recent years. Since 2005 the moped has been the mode of transport that gives rise to the largest number of seriously injured youngsters.

REDUCED RISK OF FATALITIES OR SERIOUS INJURIES

Even though the number of motorcycles and mopeds on the roads has doubled in the past ten years, the number of killed or seriously injured motorcyclists and moped riders has not risen at the same rate. This means that the risk of fatalities or serious injuries in terms of number per vehicle has fallen. Since the risk of being killed or seriously injured decreases with increasing age, one explanation may be that the median age of motorcycle owners has increased to around 50, thereby doubling over a 25-year period.

Class I mopeds have been on the roads since 1999. During this period the risk of fatalities or serious injuries has been constant and comparable to that for motorcycles.

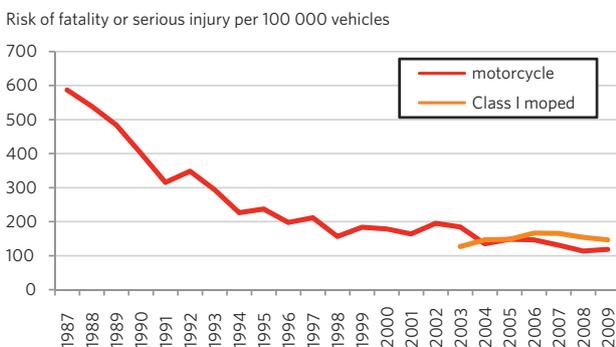


Figure 6: Development in the risk of fatality or serious injury among motorcyclists and moped riders (only Class I) since 1987. (Source: Swedish Transport Administration)

There may be a number of unrecorded accidents, particularly involving unprotected road users. However, the insurance industry keeps statistics that reduce, to some extent, these unrecorded accidents (see Figure 7).

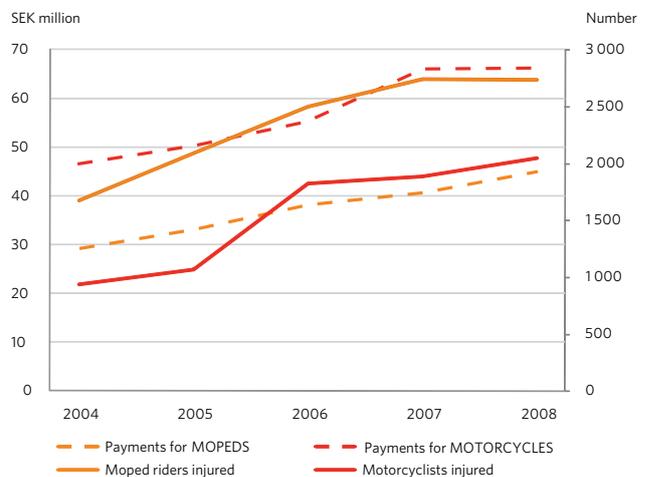


Figure 7: Traffic injury costs paid out and number of traffic injuries in traffic insurance for motorcycles and mopeds. (Source: Swedish Insurance Federation)

MANDATORY RISK AWARENESS TRAINING

A mandatory two-part risk awareness training course was introduced in November 2009 for those who intend to take a motorcycle driving licence.

Part one is theoretical and deals with alcohol, other drugs, fatigue and risky behaviour in general. Part two also includes practical elements focusing on speed, safety and riding under special conditions.



CLASS I MOPED

A moped approved by the EU and designed for riding at a maximum speed of 45 km/h.

The moped must be registered.

From 1 October 2009, a Class I moped rider must be aged at least 15 years and have a category AM driving licence or a licence of some other category. A driving certificate for a Class I moped obtained earlier will continue to be valid, but must be changed for a category AM driving licence. Both the driving licence and the driving certificate can be revoked for a traffic law violation.

Some traffic rules for Class I moped riders:

- You must ride on the road shoulder, if available, but otherwise on the roadway.
- You must not ride on cycle tracks or in cycle lanes.
- You must not ride in lanes reserved for public transport vehicles ("bus lanes")
- You must not ride on a motorway or expressway.
- You must not carry more passengers than the number for which the moped is designed.



CLASS II MOPED

There are two types of Class II moped:

- A moped approved by the EU and designed for riding at a maximum speed of 25 km/h.
- A moped approved in Sweden in accordance with earlier regulations and designed for riding at a maximum speed of 30 km/h.

These mopeds are not registered.

From 1 October 2009, the rider of a Class II moped must be aged at least 15 and have a driving certificate for Class II moped or have a driving licence or tractor licence. The driving certificate can be revoked for a traffic law violation.

Some traffic rules for riders of Class II mopeds:

- You must ride in the cycle lane.
- You must ride on the road shoulder, if available, but otherwise on the roadway.
- You may ride in the lane reserved for public transport vehicles ("bus lane") if the lane is to the right in the direction of traffic flow.
- You must not ride on a motorway or expressway.
- You must not carry more passengers than the number for which the moped is designed.

Fatal accidents involving motorcycles

The types of motorcycles that were involved in fatal accidents have varied in recent years, although supersport motorcycles are still those that are most accident-prone. More than one third of the motorcycles involved in fatal accidents between 2005 and 2008 were in the supersport class. This type of motorcycle accounts for less than 10 per cent of the motorcycles on the roads.

The most common accident type in which motorcyclists were killed is the single accident in which the motorcyclist has collided with an object in the road environment. Natural objects, such as trees or stones, account for around 31 per cent and various types of fences for around 26 per cent of the impact objects. 76 per cent of single accidents occur in curves.

In one third of fatal accidents, the motorcycle speed was estimated to be well above the posted speed limit (by more than 30 km/h). In a further 34 per cent of accidents, the motorcycle speed was considered to have been between 10 and 30 km/h above the posted speed limit. Supersport motorcycles account for more than two thirds of the fatal accidents in which the speed was considered to have been well above the posted speed limit.

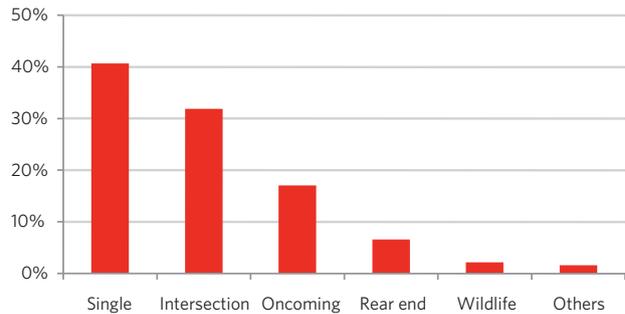


Figure 8: Accident type in fatal accidents involving motorcycles between 2005 and 2008 (n=182). (Source: Swedish Transport Administration in-depth studies of fatal accidents)

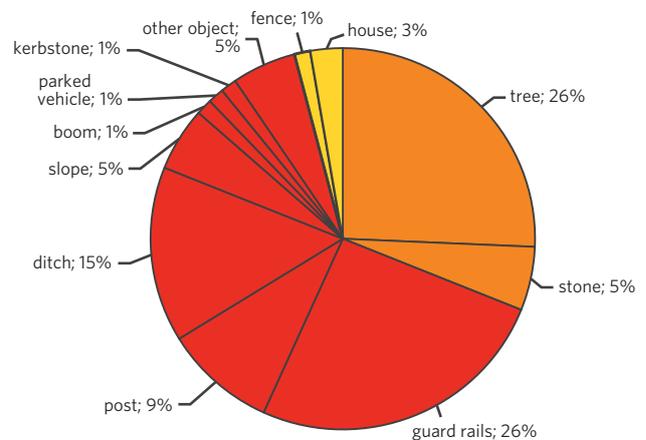


Figure 9: Collision objects in single motorcycle accidents with a fatal outcome between 2005 and 2008 (n=74). (Source: Swedish Transport Administration in-depth studies of fatal accidents)



STANDARD
Proportion in fatal accidents 2005-2008 = 12%



CUSTOM
Proportion in fatal accidents 2005-2008 = 19%



TOURING
Proportion in fatal accidents 2005-2008 = 3%

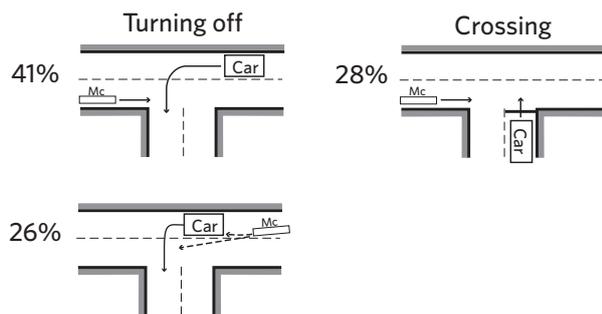


Figure 10: Sequence of events in junction-related accidents with a fatal outcome between 2005 and 2008 (n=58). (Source: Swedish Transport Administration in-depth studies of fatal accidents)

Accidents at junctions were the next most common accident type during the period (around 30 per cent). In about 70 per cent of cases, the opposite party, normally a passenger car, has driven out in front of the motorcycle. In four out of ten such accidents, the motorcyclist was considered to have been travelling well above the posted speed limit.

8 per cent of the motorcyclists who were killed were not wearing a helmet at the time of the accident. All of these were under the influence of alcohol or had no motorcycle driving licence. In addition, in 14 per cent of cases, the helmet of the motorcyclist who was killed came off in the accident.

Being under the influence of alcohol or illegal drugs is somewhat less common among motorcycle and moped riders involved in fatal accidents than among other road users. Around a quarter of the motorcycle riders who were killed were under the influence of alcohol or drugs.

Motorcyclists who had received authorization (up to 1975 inclusive, A authorization was granted without a special test if the applicant had a category B driving licence) for a motorcycle in their driving licence for a passenger car account for around 22 per cent of the fatal accidents. They are clearly underrepresented, since around 45 per cent of the volume of motorcycle traffic comprises riders who have received their authorization in this manner. About 26 per cent of the motorcycle riders who were killed had no authorization to ride a motorcycle.



SPORT TOURING
Proportion in fatal accidents
2005-2008 = 6%



SUPERSPORT
Proportion in fatal accidents
2005-2008 = 36%



SCOOTER
Proportion in fatal accidents
2005-2008 = 4%

CORRELATION BETWEEN DIFFERENT RISK FACTORS

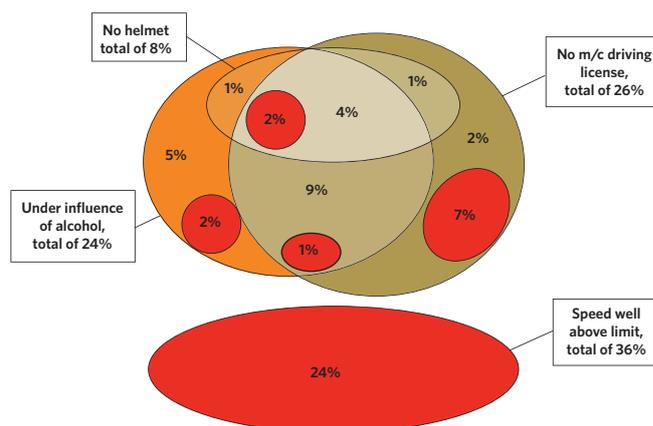


Figure 11: Influence of alcohol, use of helmet, motorcycle driving licence, and estimated speed prior to accident in fatal accidents involving motorcycles between 2005 and 2008 (n=182). (Source: Swedish Transport Administration in-depth studies of fatal accidents)

Some conclusions:

- 58 per cent of all motorcyclists killed were under the influence of alcohol, were not wearing a helmet, had no motorcycle driving licence or were travelling far too fast.
- All motorcyclists who were not wearing a helmet when killed were either under the influence of alcohol and/or had no motorcycle driving licence.
- More than half of the motorcyclists killed who had no motorcycle driving licence were under the influence of alcohol.
- More than one third of the motorcyclists killed were travelling at a speed that was estimated to have been well above the posted speed limit (by more than 30 km/h).
- In two thirds of the cases in which the motorcyclist was travelling much too fast, speed was the only risk factor.
- Only 2 per cent of the cases contained all risk factors (rider under the influence of alcohol, not wearing a helmet, without a category A driving licence, and very high speed). In practice, this means one case per year.



ON/OFF ROAD
Proportion in fatal accidents
2005-2008 = 11%



ENDURO/CROSS
Proportion in fatal accidents
2005-2008 = 6%



SUPERMOTARD
Proportion in fatal accidents
2005-2008 = 3%

Potential of operational areas for improving motorcycle safety

The potential (number of lives saved annually) of various operational areas with a bearing on motorcyclists is shown below. At this stage, the calculations

do not take into account any compensation effects that could conceivably follow from certain measures or correlations between different inputs.

SAFE MOTORCYCLE	Certain effect (effect relationship or certain assessment is available)	Somewhat uncertain effect (effect relationship lacking or assessment is somewhat uncertain)	Uncertain effect (research is needed)
Anti-lock brake system (ABS)	21		
Visibility of motorcycle			6
Traction control (TC)	5		
Airbag			7
Intelligent Speed Adaption system			> 15
Anti-theft device	3		
Alcohol-specific ignition interlock	8		
E-call		4	
Improvement of visibility from other vehicles		3	
Vehicle test approval	2		

The effect of *anti-lock brake systems (ABS)* is estimated to be a 40 per cent reduction in all types of accidents that result in injuries. The assessment is considered to be certain, since several scientific studies, including a study comprising Swedish accident data, have demonstrated that ABS have approximately this effect (see Appendix 3).

Visibility was assessed on the basis of the number of fatalities in accidents in which the critical event was that the other party did not see or detect the motorcyclist. Accidents in which visibility was obstructed due to obstacles in the road environment have not been included. This effect is considered to be uncertain, since it is difficult to distinguish visibility from alertness, i.e. to distinguish between accidents in which the collision was due to the other party actually not seeing the motorcyclist and those in which the attention of the other party was attracted by something else.

Traction Control (TC) is considered to be effective in accidents in which the critical event was rear wheel skid or the rider doing a “wheelie”.

Airbags fitted to motorcycles are considered to be effective in accidents in which the motorcyclist remains seated on the motorcycle during the collision and in which the speed is not in excess of 70 km/h. The effect is considered to be uncertain, since no evaluations of this system have been made following actual accidents.

Intelligent Speed Adaption systems are not common on motorcycles. They have theoretically been considered to have potential in preventing accidents in which speed has been the decisive reason for the accident. However, this assessment is uncertain, possibly even very uncertain, since no evaluations of this system have been made following actual accidents.

Moreover, we cannot assess in current circumstances the probably large potential in the form of injury reduction. Reduced speed also has a considerable injury-reducing effect in all types of accidents, and the effect has therefore been estimated to be a minimum of 15 lives annually.

Anti-theft devices eliminate the risk of accidents involving stolen motorcycles, and alcohol ignition interlock systems reduce the risk of accidents in which motorcyclists who are under the influence of alcohol are killed due to their own mistakes. Both effects are considered to be certain, since the riders in these accidents would not have been on the roads if the motorcycles had anti-theft devices or alcohol ignition interlock systems.

The *e-call* alarm system is considered to be effective in single accidents in which those killed were found more than one hour after the accident and in which a medical practitioner has estimated that they did not die immediately after the accident. However, the effect is somewhat uncertain, since it is difficult to estimate how many of these fatalities could have been avoided if the accident had been discovered earlier.

Visibility improvement from other vehicles has a potential in accidents in which the driver of the other vehicle in the accident has stated that the motorcycle was not visible since it was concealed by the other vehicle itself (such as the A-pillar) or by some other vehicle. This effect is considered to be somewhat uncertain, since it is impossible to guarantee that the accident could have been avoided if the visibility had been good.

Vehicle test approvals are applicable to accidents in which there were significant technical defects in the motorcycle, which could be expected to have been detected in a vehicle test.



SAFE ROAD	Certain effect (effect relationship or certain assessment is available)	Somewhat uncertain effect (effect relationship lacking or assessment is somewhat uncertain)	Uncertain effect (research is needed)
Centre barrier		6	
Visibility-improving road environment		6	
Safe intersections in built-up areas		4	
Safe lateral reserves			6
Side guard rails appropriate to motorcycles		5	
Clean, sound and smooth road surface	2		
Patching work on road	<1		
Safe intersections on rural roads			8

Centre barriers are considered to be effective in preventing accidents with oncoming traffic and on overtaking. Accidents in which the motorcyclist had lost control and collided with oncoming traffic have been excluded, since it is highly unlikely that the centre barrier would have prevented the outcome of the injury. A Swedish study from 2009* has shown that serious and fatal accidents have been substantially reduced on newly built roads with centre barriers, including with cable barriers. However, the effect determined by in-depth studies is considered to be somewhat uncertain, since it is impossible to exclude the possibility that the fatal accident would still have occurred if there had been a centre barrier. If guard rails are used, the choice of guard rail and its location are also important to the outcome of accidents, although the effect cannot be determined.

A *visibility-improving road environment* has the potential for preventing accidents in which impaired visibility due to obstacles in the road environment was a decisive factor. However, the effect is somewhat uncertain, since visibility improvements do not necessarily improve alertness, even though they most probably improve the opportunity for detecting motorcyclists.

*Evaluation of 2+1 roads with cable barrier, Swedish National Road and Transport Research Institute (VTI) report 636A

Conversion of ordinary *intersections in built-up areas* into roundabouts is considered to be able to prevent the vast majority of fatal accidents, other than those involving very high speeds. In certain cases, it is difficult to assess the speed at which the accident could have been prevented, and the effect is therefore somewhat uncertain.

The term *safe lateral reserves* means that the area immediately adjacent to the road is cleared of objects (such as posts, trees and stones) that could be dangerous if a vehicle were to collide with them. The effect of this applies to single accidents, where the risk is reduced of someone being killed in a collision with an object in the lateral reserve. However, it is difficult to determine whether the motorcyclist would have continued out into the terrain and collided with some other object if the lateral reserve had been cleared. The effect is therefore uncertain.

The effect of *side guard rails appropriate to motorcycles* has been considered to apply to accidents in which the guard rail accounts for the primary collision impact. However, in accidents in which the speed was very high, the design of the guard rail is insignificant to the possibility of survival. The effect is somewhat uncertain, since it would be necessary

to carry out a larger number of evaluations based on actual accidents under circumstances that are comparable with those in Sweden.

A sound, clean and smooth road surface is expected to prevent accidents in which the condition of the road surface is decisive for the occurrence of the accident. This also applies to patching work on the road. This effect appraisal is certain.

Safe intersections on rural roads have great potential, since many accidents at intersections occur on rural roads. However, accidents at very high speeds have not been considered, for the same reason as for intersections in built-up areas. The effect is uncertain, principally because there is no good design alternative that has been tested and evaluated with respect to motorcyclists.



SAFE USE	Certain effect (effect relationship or certain assessment is available)	Somewhat uncertain effect (effect relationship lacking or assessment is somewhat uncertain)	Uncertain effect (research is needed)
Speed limit observance			>15
Right competence of motorcycle rider		16	
Correct use of helmet	4		
Sober motorcycle rider		8	
Full-body protective clothing	3		
No lending			9
Medical requirements			7
Right competence of other road-users	2		
Only registered vehicles on the roads	3		
Safe group riding			4
Rested riders		3	
Appropriate driving licence category			13
Visibility of motorcycle riders/ alertness of other road users			6
Alertness of motorcycle riders	5		

A number of measures for safe use have an effect on the same types of injury events as measures concerning a safe motorcycle, and their potential has therefore been assessed in the same manner. This applies to *speed limit observance* versus Intelligent Speed Adaption systems, and *sober riders* versus alcohol ignition interlock system.

Visibility of motorcycle riders/alertness of other road users has been assessed on the basis of the number of fatalities in accidents in which the critical element was that the other party did not see or detect the motorcyclist. Accidents due only to obscured visibility caused by obstacles in the road environment have not been included. The effect is considered to be uncertain, since it is difficult to distinguish visibility from alertness, i.e. to distinguish between accidents in which the collision was due to the other party really not seeing the motorcycle and those due to the

attention of the other party having been attracted by something else.

The effect of the *motorcycle rider having the right competence* applies to accidents in which critical events are linked to the assessment of the traffic situation, risky behaviour or riding knowledge, such as braking technique or cornering. The effect is not certain, since it may be difficult to assess in some cases. In many cases, there are clear links between the above criteria and the occurrence of an accident.

The effect is certain for the *use of a helmet* in cases where a person who has been killed was not wearing a helmet and a medical practitioner has considered that the rider would have survived had he/she been wearing a helmet. This also applies to protective clothing.

There are indications that riders who did not own the motorcycle they were riding are overrepresented in fatal accidents. *Not lending the motorcycle* may therefore have an effect in preventing such accidents, except in the case of accidents in which the motorcycle was stolen. The effect may be certain, since the measure restricts access to the motorcycle in the same way as an alcohol ignition interlock system or anti-theft device. However, this is uncertain, since it may sometimes be difficult to assess in in-depth studies when the motorcycle has been borrowed. Moreover, lending in conjunction with fatal accidents is often combined with alcohol and the absence of protective equipment. As a result, the potential can be regarded as very uncertain.

The effects of *medical requirements* are also difficult to assess. The measure is not actually linked to motorcycle use, but rather to the opportunity for riding the motorcycle on the road. However, it is important to highlight the effects, and their magnitude is based on an assessment of cases in which illness may have been a possible reason for the occurrence of the accident. These assessments are also difficult to make and the effects are therefore considered to be uncertain.

Right competence of other road users is linked to the same accident causes as those for the area of right competence of the motorcyclist. However, some additional reasons apply as regards assessment of the traffic situation, such as misjudgement of the speed and braking distance. The assessment in these cases is also relatively certain.

Only registered vehicles on the roads is a matter of unregistered motorcycles not being ridden in traffic. The effect of this is certain, although there is no known action that could effectively achieve this.

There is a potential for preventing accidents occurring in conjunction with group riding by this being done in a safer manner. The magnitude of the effect is assessed on the basis of the accidents that have occurred in conjunction with *group riding* and in which the occurrence of the accident was due to poor assessment of the traffic situation by the motorcycle rider. However, the effect is uncertain, since it is difficult to assess the extent to which safer group riding could have prevented these accidents.

An assessment of whether *fatigue* has been the cause of the accident is difficult from a purely general standpoint and particularly difficult in the case of motorcycle accidents. The effect of a rested rider is therefore somewhat uncertain, although there are some cases every year in which there is suspicion that the rider had fallen asleep on his motorcycle. Assessment of the effects of an appropriate driving licence category is based on accidents in which the motorcycle rider had no driving licence. Purely hypothetically, the accident could have been avoided if the rider had had the *right driving licence category* and thus better competence. However, the effects are uncertain or even very uncertain, since it is doubtful whether the right driving licence category as such would have been sufficient for creating the right competence for avoiding the accident.

As regards the *alertness of the motorcyclist*, the effect is linked to the accidents in which the alertness of the motorcyclist was considered to have been the critical factor in the occurrence of the accident. This assessment is considered to be fairly certain, since there are often obvious relationships in accidents between lack of alertness and the occurrence of the accident.

Prioritized operational areas for motorcycles

In this section, some of the operational areas have been selected in order to provide a list of prioritized areas. The selection has been done on the basis of the potential in terms of lives saved and on the basis of the certainty of the knowledge of the problem description. The compilation shows that the target of a 50 per cent reduction by 2020 can basically be achieved by these prioritized operational areas, provided that the target level for certain areas is reached.

Since the various operational areas are relevant in some cases to the same type of accident, the risk will be involved in the future of duplication in the summation of the effects. A correction for duplication should therefore be applied, in pace with the effect of several areas being summated.

PRIORITIZED OPERATIONAL AREAS FOR MOTORCYCLES	Potential (number of lives saved per year)	Present situation	Goal level	Effect
Anti-lock brake system (ABS)	21	30 %	98 %	15
Traction Control (TC)	5	?	?	?
Speed limit observance	at least 15	?	80 %	at least 9
Correctly used helmet + full-body protective equipment	4 + 3	-	-	?
Visibility of motorcycle/ alertness of other road users + alertness of motorcycle rider	6 + 5	?	?	?
Sobriety	8	?	?	?
Safe intersections in built-up areas + urban roads	4 + 8	?	50 % + ?	2 + ?
Make existing guard rails appropriate to motorcycles	5	0 %	?	?
Safe lateral reserves	6	?	?	?
Other operational areas	5	-	-	5
Total (lives saved per year)				31
Target: -50% reduction in motorcyclist fatalities by 2020 (lives saved per year)				27

Also among these prioritized operational areas, there is reason to carry out sorting on the basis of suitability for inclusion in the initial work – on the basis of knowledge of whether there are known measures within the area and on the basis of whether the area can be measured and can thus be followed up.

Certain areas are already included in other plans of action and work is in progress in other contexts, namely *safe intersections, visibility improvements in the road environment, centre barriers and other indicators* that have a bearing on other road-user categories (e.g. sober car drivers, anti-skid systems on passenger cars, etc.). However, there are still questions concerning how safety improvements in the road environment can also be adapted to motorcyclists.

The use of *helmet and other protective equipment* has great potential, although failure to use protective equipment is almost always correlated with the rider being under the influence of alcohol. Special measures will therefore be required for this high-risk group, which will not be the first priority in the plan of action.

Some areas require more research and analysis of the measures that would be effective and would produce the required results. This applies to physical measures in the road environment, such as *guard rails that are appropriate to motorcycles and safe lateral reserves*, where a more general system analysis is required for determining their interaction with other road safety systems (e.g. ABS), thus making certain of the effects of various measures. This also applies to the *competence of motorcyclists*, where insufficient knowledge is available of the manner in which the right rider competence could be achieved in order to increase the actual safety.

Visibility/alertness is an area with great potential. However, the present challenge is to define the accident distribution in terms of visibility and alertness and to define the measures that would be effective in each area. Further research is required here. *Traction Control* probably has positive effects, but it has not been possible to evaluate them on the basis of actual accidents in the same statistical manner as ABS in order to exclude compensation effects. It is therefore recommended that such evaluation should be carried out in order to clarify the effects of the system.

The areas that remain as most appropriate to begin with are *speed limit observance and anti-lock brake systems (ABS)*. Both areas have great life-saving potential of at least 15 and 21 lives per year respectively, and it should be possible to summate their potentials, since the effects correlate with one another only to a limited extent.

Fatal accidents involving mopeds

Around 45 per cent of moped riders who were killed either were not wearing helmets or lost their helmet in the accident. Most of those who lost their helmet were below 18 years of age.

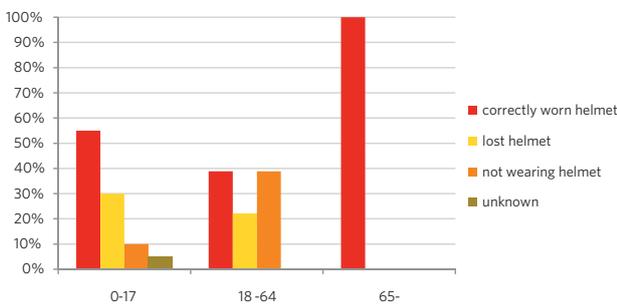


Figure 12: Use of helmet in fatal accidents involving mopeds during 2005-2008, per age group (n=42). (Source: Swedish Transport Administration in-depth studies of fatal accidents)

About one third of the moped riders who were killed were under the influence of alcohol or drugs at the time of the accident. All of those who were under the influence of alcohol or drugs were aged 18 or more.

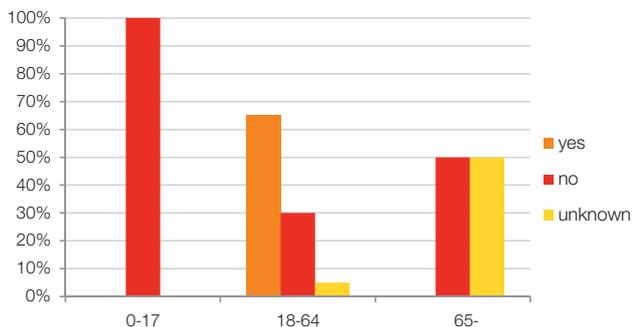


Figure 13: Alcohol or drugs in fatal accidents involving mopeds during 2005-2008, per age group (n=42). (Source: Swedish Transport Administration in depth studies of fatal accidents)

Around 40 per cent of the mopeds that were involved in fatal accidents had been tuned at the time of the accident. In fatal accidents in which the rider was below 18 years of age, 50 per cent of the mopeds had been tuned. However, there are a relatively large number of unrecorded cases, since information on tuning is lacking in 55 per cent of cases. The unrecorded cases are due to the fact that no technical investigation has been carried out, which is particularly common in accidents involving older moped riders. The fact that no technical investigation is carried out is an indication in itself that there was no suspicion of tuning, and most of the unknown cases therefore probably belong to the group not tuned.

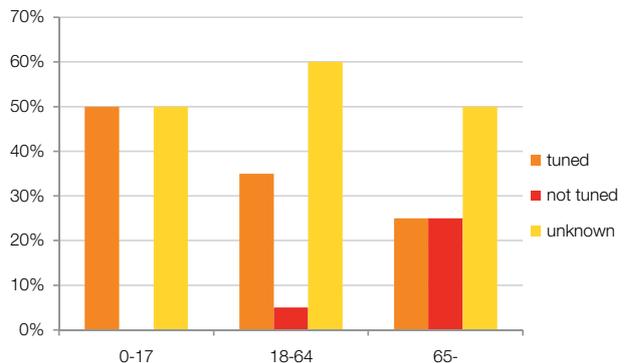


Figure 14: Tuning of mopeds involved in fatal accidents during 2005-2008, per age group (n=42). (Source: Swedish Transport Administration in-depth studies of fatal accidents)

CORRELATION BETWEEN VARIOUS RISK FACTORS

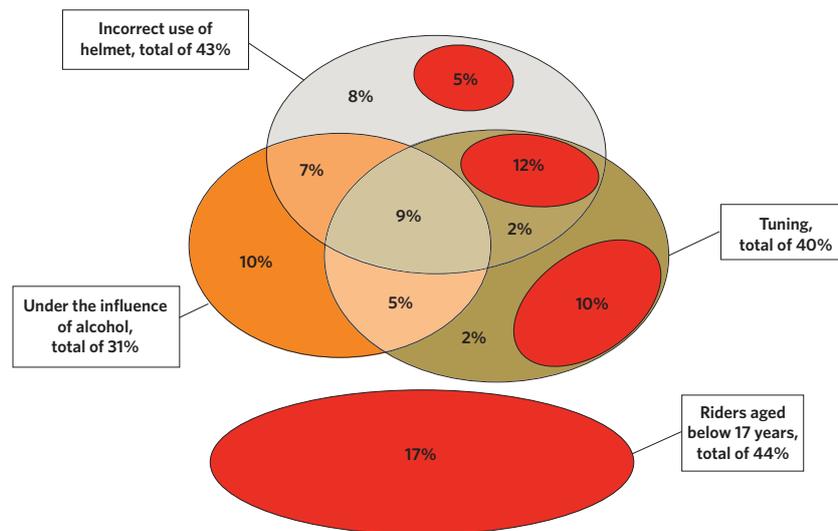


Figure 15: Correlation between influence of alcohol, correct use of helmet, tuning and age in fatal accidents involving mopeds in the period 2005–2008 (n=42). (Source: Swedish Transport Administration in-depth studies of fatal accidents)

Some conclusions:

- In 70 per cent of fatal accidents involving mopeds, at least one of the factors was tuning, alcohol or incorrect use of helmet. In accidents in which none of these factors was involved, the rider was below 18 years of age in around 55 per cent of cases.
- About 40 per cent of moped riders below the age of 18 who were killed were using the helmet correctly, were sober and were riding an untuned moped.
- Most of those who were riding a tuned moped and were not using the helmet correctly were below 18 years of age.
- Around one sixth of all moped riders who were killed were aged below 18, were using the helmet correctly, were sober and were riding an untuned moped.
- In more than half of the fatal accidents involving tuned mopeds, the rider was below the age of 18.
- More than one third of the moped riders who were killed and were not wearing a helmet or were using the helmet incorrectly were under the influence of alcohol.
- 9 per cent involved all of the factors (alcohol+incorrectly used helmet+tuned moped). In practice, this corresponds to one case per year. None of these riders who were killed were below the age of 18.

Potential of operational areas for improving moped safety

SAFE MOPED	Certain effect (effect relationship or certain assessment is available)	Somewhat uncertain effect (effect relationship lacking or assessment is somewhat uncertain)	Uncertain effect (research is needed)
No technical defects		6	
Untuned moped		6	
Visibility of moped			4
Anti-theft device			6
E-call		5	
Alcohol-specific injection interlock	2		

The basis of calculation for many of the effects related to moped safety is the same as that for motorcyclists, and the effects can therefore be read in the tables for motorcycles, with comments. For a safe moped, this applies to *technical defects of the moped* that are comparable with the inspection approval for motorcycles, visibility of moped versus motorcycle, anti-theft protection, e-call and alcohol specific

injection interlock. Technical defects that are of decisive importance may be, for example, defective lighting in accidents in darkness or poor brakes. Tuning has been assessed as being of decisive importance in cases in which the reason for the accident or the outcome of the accident was a moped speed which was so high that it could not have been achieved without the moped having been tuned.

SAFE ROAD	Certain effect (effect relationship or certain assessment is available)	Somewhat uncertain effect (effect relationship lacking or assessment is somewhat uncertain)	Uncertain effect (research is needed)
Visibility improvement in road environment		4	
Moped Class I in cycle lanes (not in built-up area)		3	
Safe intersections, built-up area		3	
Safe intersections, rural road			4
Centre barrier		3	
Safe lateral reserves			3
Clean, sound and smooth road surface	1		
Patching measures on the road	<1		
Safe side guard rails	<1		

The basis of calculation for the effect of safe roads for moped riders has a great deal in common with that for motorcyclists, although the result is somewhat different. The common areas with the same basis for effect calculation are *visibility improvement in the*

road environment, safe intersections in built-up areas and on rural roads, centre barriers, safe lateral reserves, clean, sound and smooth road surfaces, patching measures on the road and safe side guard rails and posts.

Studies show that more than half the volume of traffic is made up of Class I mopeds in pedestrian and cycle lanes, even though this is not allowed. It is not feasible today to allow *Class I mopeds to use cycle lanes*. But where it would be inadvisable for mopeds to use the road, such as on 2+1 roads, the safety of

moped riders could be improved by changing the regulations. This effect is assessed on the basis that cycle lanes that are available outside built-up areas would be opened to use by Class I mopeds. If more cycle lanes were built, the effect would naturally be greater.

SAFE USE	Säker effekt (effektsamband eller säker bedömning finns)	Något osäker effekt (effektsamband saknas eller bedömning något osäker)	Osäker effekt (forskningsbehov föreligger)
Correct competence of moped rider		6	
Sober moped riders		4	
Correct use of helmet	3		
Full-body protective clothing			4
Correct competence of the other party		1	
Pillion riding			4
Alertness of the moped rider	4		
Visibility of moped rider/ alertness of other road users		3	
Medical requirements			2
No lending			2
Speed limit observance			1
Right driving licence competence of moped rider			9

The effects of safe use are assessed on the same grounds for mopeds and motorcycles as regards *correct competence of moped rider and other road users, sober riders, use of helmet and protective equipment, alertness, visibility, medical requirements, no lending, speed limit observance and driving licence competence*.

The effect of protective clothing worn by moped riders is more uncertain, since few assessments have been made by medically competent observers. The basis of calculation for the effect of speed adaptation

on mopeds is not the same as for motorcycles, since high excess speeds on a moped are dependent on mopeds being tuned.

Raising the age limit for carrying a pillion rider to the age of 18 could reduce the accidents in which someone on a moped has been killed in conjunction with pillion riding. However, it is uncertain whether pillion riding was of decisive importance for the occurrence of an accident, and this effect has therefore been classified as uncertain.

Prioritized operational areas for mopeds

At this stage some of the operational areas have been selected to produce a list of prioritized areas. The selection has been made on the basis of the potential in terms of lives saved and on the basis of the reliability of the knowledge of the problem description. The compilation shows that the target of a 50 per cent reduction by 2020 can basically be achieved with these

prioritized operational areas, provided that the target level for certain areas is reached. Since the various operational areas are relevant, in certain cases, to the same type of accident, there is a risk of duplication in the summation of the effects. A correction for duplication should therefore be applied, in pace with the effect of a larger number of areas being summated.

PRIORITIZED OPERATIONAL AREAS FOR MOPEDS	Potential (number of lives saved per year)	Present situation	Goal level	Effect
Untuned mopeds	3	25%?	80%?	2
Mopeds without technical defects	4	20%?	80%?	3
Visibility of moped	3	?	?	?
Correct use of helmet	3	?	-	?
Sobriety	4	?	?	?
Visibility of moped rider/alertness of other road users + alertness of moped rider	3 + 4	?	?	?
Correct competence of moped rider	6	?	?	?
Safe intersections in built-up areas + rural roads	3 + 4	?	50% - ?	1,5 - ?
Visibility improvement in road environment	4	?	?	?
Class I in cycle lane (not in built-up area)	3	0%	?	?
Other indicators	2,5	-	-	2,5
Total (number of lives saved per year)				9
Target: 50% reduction in moped rider fatalities by 2020 (lives saved per year)				7

There are also areas for mopeds in which the work in progress simultaneously improves safety for moped riders and where a moped and motorcycle strategy for these areas is superfluous in the present situation. *Centre barriers, visibility improvements, safe intersections and other indicators* are such areas. The operational areas of *visibility/alertness* and *competence of moped rider* go hand in hand with the same areas for motorcyclists and, as mentioned earlier,

demand knowledge. Moped riders *who are under the influence of alcohol* and are involved in fatal accidents belong exclusively to a special group of middle-aged men, often with earlier driving licence infringements related to alcohol. This group is a known risk group also in other types of road user and is not specific to moped riders. To reach this group, the efforts of a larger number of social players are needed, and not merely of moped players.

Suitable areas on which work can be started are *tuning (lower speed)*, *use of helmet*, *mopeds without technical defects*, and making it possible for road authorities to *allow Class I mopeds to use certain cycle lanes outside built-up areas*. Of these four areas, tuning and the use of helmets are considered to be best suited for initial progress due to their strong effect relationship and large proportion of fatal accidents, particularly among youngsters below 18 years of age (see Figures 12 and 14).



Prioritized operational areas for initial work

The following initial prioritized operational areas are obtained from the section entitled “Analysis and prioritized operational areas” (see pages 26 and 32).

Four areas have been singled out which are considered to have great potential for enhancing the safety of motorcyclists and moped riders and where implementation measures can be started immediately. These measures are:

- to increase the proportion of motorcycles with ABS brakes
- to reduce the number of speed limit infringements by motorcycles
- to increase the use of helmets by moped riders and to ensure their correct use
- to reduce the speeds by reduced tuning of mopeds

In addition to these measures, there are a large number of other conceivable measures that would be able to prevent certain types of accidents. These measures and estimates of their potential for increasing safety are described in the section entitled “Prioritized areas”.

The following describes how the goals for ABS and reduced speed limit infringements by motorcycles, together with the goals for increased use of helmets and reduced tuning of mopeds, can be achieved.

ABS ON MOTORCYCLES

The quickest and most effective way of achieving a very high proportion of motorcycles equipped with ABS on the road is to influence the supply and demand, to stimulate further technical development, and to put other market mechanisms to use. A Swe-

dish study presented in 2009 shows that ABS brakes on motorcycles have very high road safety effects. Publication of these results and, not least, the attention they have received in the trade press have already begun to change both the supply of motorcycles with ABS and the demand for them.

The process of change that can serve as a model is the way in which the proportion of cars equipped with ESC anti-skid systems rose in Sweden from about 20 per cent in 2004 to 98 per cent in 2008. This change took place entirely as a consequence of safety being a sales argument, and without any form of regulation or legislation.

MOTORCYCLE SPEEDS

Motorcyclists are roughly as poor at observing speed limits as other road users. Analyses by the Swedish Road Administration show that in roughly one in three fatal accidents involving a motorcycle, the speed was far too high (more than 30 km/h above the speed limit). Four out of 10 motorcyclists are estimated to observe the speed limit. Six out of 10 motorcyclists who were travelling way above the posted speed limit were riding so-called supersport motorcycles.

Two approaches are suggested for coming to grips with this problem. A national monitoring strategy for speed limit infringements by motorcyclists should be developed, and opinions should be formed concerning motorcyclists and speed.

INCREASED AND CORRECT USE OF HELMETS BY MOPED RIDERS

Half of those who are killed on mopeds are youngsters between the ages of 14 and 17. Three out of four of these were not wearing a helmet or lost their helmet in conjunction with the accident. It is estimated that half of these could have survived if they had been wearing their helmet correctly.

It is suggested that traditional opinion-forming activities should be initiated, in which parents, schools, medical care personnel, police and others could participate in local interaction. In this area too, there is a need to develop a way of working and monitoring methods.

Greater compliance with regulations can be expected if the driving certificate and moped driving licence could be revoked following infringement of helmet regulations.

LOWER SPEED BY REDUCED TUNING OF MOPEDS

Tuning is involved in at least 40 per cent of all fatal moped accidents. Tuning need not be behind the occurrence of the accident, but it definitely affects the degree of seriousness of the injuries, because the speed is higher when the accident occurs.

Work is already in progress on reducing the number of dealers who sell tuning parts for mopeds. This work should continue and, if possible, be evaluated and made more efficient.

Better compliance with regulations can be expected if the driving certificate or moped driving licence could be revoked after a tuning infringement. Local cooperation in which parents, schools, medical care personnel, police and others participate is an important contribution. Methods that allow for effective monitoring should be developed in this area too.

MANY COULD CONTRIBUTE

The strategy presupposes that the stakeholders involved, either individually or jointly, implement various measures at regional, national and international levels. However, many of the actions that need to be taken must be taken locally. A suitable forum for this is the crime prevention work carried out by the police authority and others in many municipalities.



Research, development and demonstration

The Swedish Transport Administration development plan will be expanded during 2010 as regards the need for research, development and demonstration for motorcycles and mopeds, based on the prioritized operational areas.

As mentioned in several places in the section entitled Prioritized operational areas, knowledge is lacking in many cases concerning measures and their relationship with road safety.

Some areas identified for motorcycles are:

- Visibility of motorcycle
- Airbags on motorcycles
- Intelligent Speed Adaption system
- Safe lateral reserves
- Safe intersections on urban roads
- No lending
- Correct competence of motorcycle rider
- Medical requirements
- Correct driving licence category

The corresponding list for a moped is as follows:

- Safe intersections on rural roads
- Safe lateral reserves
- Whole-body protective clothing
- Pillion riding
- Correct driving licence category for moped rider

The debate concerning improved safety for motorcycles and mopeds includes a number of hot issues where knowledge is lacking. These issues will need to be studied. Some examples are given below:

CORRECT COMPETENCE OF MOTORCYCLE RIDER - FURTHER TRAINING OF MOTORCYCLISTS

A number of further training courses are being run today for motorcyclists. Evaluation of the road safety effect in further training identifies a number of positive effects, but often also negative road safety effects, i.e. that the riders run a higher risk of accidents after training than before training. An explanation may be that the course participant is made to practise actions that are considered to be particularly difficult, such as cornering or braking. There is a risk of trainees' faith in their own capability increasing more than their actual capability. A common way of counteracting this effect is to simply avoid competence training in further training and to concentrate the training instead on the knowledge of risks, which is known as risk training.

During 2010, a review of literature that describes the principles and guidelines for how good further training should be arranged and run should be carried out. The emphasis should be on scientific valuation of road safety effects as well as the costs and any other benefits. The review should be concluded with a proposal for continued work.

GUARD RAILS

Around 5 motorcyclists and 5 car drivers are killed annually in accidents in which guard rails are involved. In terms of the overall traffic volume, motorcyclists are therefore overrepresented.

The European guard rail standard does not currently take motorcyclists into account. However, work is in progress on a standard for which testing is mainly carried out on the scope available for underrun protection. The effects of special underrun protection are not clear today. Swedish fatal accidents indicate that in most cases, i.e. 8–9 out of 10, the motorcyclist was sitting on the motorcycle when the collision with the guard rail occurred.

During 2010, The Swedish Transport Administration took the initiative for continued acquisition of knowledge concerning guard rails in order to be able to develop effective measures. This relates both to the design of the guard rail and its location. There are special undertakings by the former Swedish Road Administration. See Appendix 4: Plan of action for motorcycles on the road – an agreement between the Swedish Road Administration and SMC.

LOOSE GRAVEL AND OTHER ROAD SHORTCOMINGS

A sound, clean and smooth road surface can prevent accidents in which the condition of the road surface is of decisive importance for the occurrence of the accident.

It is estimated that up to two lives per year could be saved by avoiding loose gravel and other shortcomings in the road surface. The number of serious injuries attributable to loose gravel and other road shortcomings is uncertain today, as are any compensation effects.

Trials are in progress for developing methodology related to strengthening of roadway edging and repairs to shortcomings in the road surface. When the studies have been completed, a decision will be made concerning suitable measures. There are special undertakings by the former Swedish Road Administration. See Appendix 4, Plan of action for motorcycles on roads – an agreement between the Swedish Road Administration and SMC.

VISIBILITY AND ALERTNESS

This area has great road safety potential. The challenge today is to define the accident distribution between visibility and alertness and to define the measures that are effective in each area. Factors to be taken into account are the vehicle, road environment and user.

An important question is how much of the problem relates to alertness and how much to visibility. Further research that results in proposals for action is needed here.

15 OR 16 YEARS MINIMUM AGE FOR MOPED RIDERS?

It has recently been decided that the minimum age for moped riders in Sweden will continue to be 15. An evaluation of the effects of retaining the 15-year age limit should serve as the basis for a future review of the age requirements.

Appendix 1 reports on the current and concluded projects financed by the Swedish Road Administration and related to research, development and demonstration, contributions from the Skylltfonden Fund and support for non-profit organizations.

Organization for developing the strategy

The strategy has been pursued in project form, starting in 2009, by a working group manned by several organizations (see below). The Swedish Transport Administration has led the working group and participating organizations have contributed through their competence in road safety, analysis work and make-up of the strategy.

The participants have good insight into their own organization as regards motorcycle and moped safety. Moreover, many of the participants in the working group are active motorcyclists or moped riders.

The working group has continually reported to the steering group consisting of decision-makers and responsible persons from a number of organizations (see below). The task of the steering group has been to make decisions on the orientation of the project.

The work has been established in two reference groups:

- Group for national collaboration (GNS), the purpose of which is to exchange knowledge and coordinate the activities among the stakeholders, with the aim of implementing the Vision Zero.
- Swedish Motorcycle and Moped Advisory Board, the purpose of which is to pursue matters that are of current interest in the industry.

WORKING GROUP:

Swedish Moped and Motorcycle Industry Federation, McRF
Per Johansson

National Society for Road Safety, NTF
Nils Petter Gregersen

National Police Board
Thomas Forsberg

Swedish Association of Local Authorities and Regions
Johan Lindberg

Swedish Motorcyclist Association, SMC
Maria Nordqvist

Swedish Motor Insurers, TFF
Maria Wedin

Swedish Transport Agency
Örjan Ellström
Jenny Norén

Swedish Road Administration/
Swedish Transport Administration
Jörgen Persson, Project Management
Helena Höök, Project Management
Roger Johansson
Johan Strandroth, analysis
Matteo Rizzi, Vectura, analysis

STEERING GROUP:

Swedish Moped and Motorcycle Industry Federation,
McRF
Per Johansson

National Police Board
Björn Lidö/Thomas Forsberg

Swedish Motorcyclist Association, SMC
Jesper Christensen

Swedish Transport Agency
Mariann Almgren

Swedish Road Administration/
Swedish Transport Administration
Claes Tingvall,
P-O Grummas Granström,
Ann-Sofie Granberg,
Jonas Lång

REFERENCE GROUPS:

GNS (Group for National Collaboration):

Swedish Work Environment Authority
Folksam Insurance Company
National Society for Road Safety, NTF
Ministry of Enterprise, Energy and Communications
National Police Board
Swedish Association of Local Authorities
and Regions, SKL
Toyota Sweden AB
Swedish Road Administration/
Swedish Transport Administration

Swedish Motorcycle and Moped Advisory Board:

Swedish Retail Organization for Bikes and Sports,
CMS
Folksam Insurance Company
National Federation of Voluntary Motorcycle Corps,
FMCK
Swedish Insurance Federation
Swedish Abstaining Motorists' Association, MHF
Swedish Moped and Motorcycle Industry Federation,
McRF
National Society for Road Safety, NTF
National Police Board
Swedish Motorcyclist Association, SMC
Swedish Motorcycle Dealer Association, SMR
Swedish National Association of Driving Schools,
STR
Swedish Motorcycle and Snowmobile Federation,
SVEMO
Swedish Transport Agency
Swedish National Road and Transport Research
Institute, VTI
Swedish Road Administration/
Swedish Transport Administration

Utvecklingsprojekt för säkrare moped- och motorcykelåkning finansierat av Vägverket

Nedan redovisas de utvecklingsprojekt som Vägverket finansierar genom forskning, utveckling och demonstration (FUD), bidrag ur Skyltfonden och Stöd till ideella organisationer.

FORSKNING, UTVECKLING OCH DEMONSTRATION

Utvecklingsresultaten ska bidra till transportpolitiken och kundnyttan

Vägverket har till uppgift att bidra till att transportsystemet utvecklas i enlighet med de transportpolitiska målen i syfte att bidra till nytta för samhället och Vägverkets kunder. I regeringens instruktion till Vägverket uttrycks det på följande vis: *Vägverket ska särskilt verka för att samhällsmotiverad tillämpad forsknings- utvecklings- och demonstrationsverksamhet inom vägtransportsystemet planeras, initieras, genomförs, dokumenteras och utvärderas samt att resultaten sprids* (SFS 2008:1 380).

Id nr	Namn på projekt
4461	Ökad trafiksäkerhet för moped och mc genom studier av svåra trafikolyckor Jörgen Ryding Projektstatus: påbörjat
4453	Modell och kriterier för säker mc-trafik Johan Strandroth Projektstatus: påbörjat Projektet syftar till att: Inkludera mc och moped i avvikelshantering och etappmålsarbetet genom att utveckla en modell för säker mc-trafik inkl kriterier för en säker/säkrare mc- och mopedtrafik. Dessa kriterier kommer ligga som en gemensam definition av säkerhet för den nationella mc- och mopedstrategin.
4435	Mc - Övervakning och utbildning Roger Johansson Projektstatus: ej beslutat
271	Ungdomars möte med trafiken. Samspelet mellan miljö, mobilitet och skaderisk i olika sociala grupper (doktorand) Lucie Laflamme Projektstatus: avslutad Projektet syftar till att: belysa egenskaper i levnadsmiljön samt individuella förhållanden, vilka är kopplade till en ökad respektive minskad risk för trafikskador.

SKYLTFONDEN

Syftet med Skyltfonden är att ge ekonomiskt stöd för utveckling av goda idéer inom området trafiksäkerhet. Pengarna i Skyltfonden kommer från Transportstyrelsen och utgörs av de avgifter som bilägare betalar för personliga registreringsskyltar. En sådan skylt kostar 6 000 kronor varav 5 400 kronor avsätts till Skyltfonden för trafiksäkerhetens främjande.

Fonden delar ut medel till intressanta trafiksäkerhetsprojekt två gånger per år. En förutsättning för att ett projekt skall få bidrag är att det relativt snabbt ger resultat och kommer trafikanterna till godo. Fonden kan även, med särskilt beslut, ge medel till särskilda initiativ från aktörer som är till nytta för trafiksäkerheten.

Id nr	Namn på projekt
EK50A2000: 25797	Ny MC-skyddsutrustning mot skall-, nack- och ryggskador Mats Kempe Projektstatus: avslutat Projektet syftar till att: Beskriven utrustning är konstruerad och patenterad, bidrag önskas för att tillverka 2 prototyper som sedan skall testas i Autoliv krockcenter Vårgårda eller VTI Linköping Det förväntade resultatet är: Halvera antalet dödade och svårt skadade MC-trafikanter och därmed spara 25 liv/år.
EK 50 A 2005:18971	Utvärdering av fortbildningskurser riktade till förare av Sportmotorcyklar Per Henriksson, VTI Projektstatus: pågår Projektet syftar till att: Utvärdera fortbildningskurser som i SMC regi riktas till förare av sportmotorcyklar i Sverige. Det förväntade resultatet är: Om fortbildningskurserna har positiva trafiksäkerhetseffekter på deltagarna är det viktigt att kunna öka omfattningen så att så många sportmc-förare som möjligt får genomgå utbildningen. Om inga positiva effekter ses så bör man överväga att göra paus i utbildningsverksamheten. Då är det viktigt att se över utbildningens utformning och innehåll så det kan utformas på ett så bra sätt som möjligt ur ett trafiksäkerhetsperspektiv.
07-21698	Motorcyklisters säkerhet Lars Leden, Peter Rosander, Luleå tekniska universitet Projektstatus: pågår Projektet syftar till att: Undersöka förutsättningarna för att minska antalet dödade och svårt skadade motorcyklister. Särskilt grupperna unga och äldre motorcyklister studeras.

08-4713	Olycksreducerande effekter av ABS-bromsar på motorcyklar Matteo Rizzi, Vectura Projektstatus: avslutat Projektet syftar till att: Kartlägga marknaden samt att undersöka olycksförebyggande effekter (svårt skadereducerande effekter) av ABS på motorcyklar. Det förväntade resultatet är: Att en bekräftelse av dessa resultat skulle motivera ett större användande av ABS som i sin tur skulle minska antalet omkomna motorcyklister
08-4678	Undersökning av antal dödade och svårt skadade motorcyklister efter kollision med vägräcke Jan Wenäll, VTI Projektstatus: pågår Projektet syftar till att: VTI och SMC vill tillsammans undersöka ett antal typiska motorcykelolyckor där vägräcke omnäms i polisrapporten, för att därefter kunna fokusera på lämpliga åtgärder som kan reducera antalet dödade och svårt skadade. Det förväntade resultatet är: I Sverige liksom övriga Europa, motsvarar dödade motorcyklister i räckesolyckor omkring 10% av alla dödsfall varje år. Därvid är det också viktigt att veta vad det är som händer vid en olycka och vilka saker på räcket som orsakar skador.
08-4805	Pilotprojekt av MC förarens synbarhet genom användning av reflexväst Helsäker Konsult AB Projektstatus: pågår Projektet syftar till att: I samarbete med Östgöta Brandstodsbolag (Länsförsäkringar) erbjuda deras MC kunder en reflexväst/varselväst gratis för synbarheten bland motorcykelförare i Östergötland. I samband med erbjudandet följer man utvecklingen för samtliga MC olyckor försäkrade hos Östgöta Brandstodsbolag före och efter erbjudandet av reflexvästar i Östergötlands i förhoppningen att dessa skall bli förre med ökad synbarhet. Det förväntade resultatet är: Genom att utrusta en trafikantgrupp med en reflexväst som i detta fall är MC åkare där olyckorna har ökat de sista åren önskas genom detta projekt kunna påvisa att olycksinblandningen av reflexvästar som i förlängningen kommer att leda till färre trafikolyckor.
08-76153	Skadedata i STRADA för motorcyklister Urban Björketun, VTI Projektstatus: pågår Projektet syftar till att: Nyttja de skadedata som finns i STRADA för att mer i detalj belysa motorcyklisternas trafiksäkerhetssituation. Projektet disponeras i tre huvuddelar med separat angreppssätt. A: Syftet med delprojektet är att i detalj analysera de olycksomständigheter som polisen anger i sin beskrivning av vägtrafikolyckor med personskada där minst en motorcykel varit inblandad.

	<p>B: Fullständigt beskriva skadebilden för de motorcyklister som återfinns som sjukhusrapporterade i STRADA.</p> <p>C: Syftet med delprojektet är att följa olycksinblandade motorcykelförare över åren 2003-2007 för att studera om de är inblandade i dels ytterligare motorcykelolyckor, dels fler olyckor men som annan trafikantkategori.</p> <p>Det förväntade resultatet är:</p> <p>A: Delprojektet avser närmare fastställa faktorer i vägmiljön som medför förhöjda risker eller konsekvenser för motorcyklister. En identifiering av sådana faktorer möjliggör förbättringar i syfte att höja säkerheten i första hand för nämnd trafikantkategori, men även för andra som är inblandade i vägtrafikolyckor med motorcykel.</p> <p>B: Ge en komplett skadebild för motorcyklister utifrån skadeuppgifterna i sjukhusdelen av STRADA.</p> <p>C: Projektet avser att identifiera individer bland motorcyklister, främst förare, som varit inblandade i flera polisrapporterade olyckor. Delprojektet är att se som en begränsad förstudie där en fortsättning kan vara att hitta påverkbara faktorer som gett upphov till olyckorna. Kan dessa faktorer förändras eller undanröjas förbättras också situationen för s.k. olycksfåglar och kanske också för andra trafikanter.</p>
09-8429	<p>"Pay as you drive" utifrån motorcyklisters perspektiv</p> <p>Sweco Position AB, Lars Bolling Projektstatus: pågår</p> <p>Projektet syftar till att: Sweco vill säkerställa att motorcyklisternas synsätt tas i beaktande så tidigt som möjligt i införandeprocessen av detta nya förankringssystem i Sverige</p> <p>Det förväntade resultatet är: Motorcyklister betalar idag en jämförelsevis hög försäkringspremie. Sannolikt skulle ett försäkringssystem som ger den motorcyklist som kör säkert en lägre premie, ge större incitament än idag att följa trafikreglerna. En sådan utveckling har möjligheter att förbättra trafiksäkerheten bland motorcyklister.</p>
09-8584	<p>Nytt 3-hjuligt motorcykelkoncept med god säkerhet och miljöprestanda</p> <p>Vehiconomics AB, Shorab Kazemahvazi Projektstatus: avslutat</p> <p>Projektet syftar till att: I samarbete med Autoliv, verifiera säkerheten hos fordonskonceptet genom att utföra krocktester samt att designa utformningen av säkerhetsbälten.</p> <p>Det förväntade resultatet är: Genom att erbjuda ett säkrare alternativ till mopeder, quadricycles och motorcyklar hoppas man kunna sänka antalet allvarliga trafikolyckor bland dessa fordon. Vidare är att tanken att många tunga stadsbilar skall ersättas av denna typ av fordon för att minska antalet allvarliga olyckor mellan personbil-moped, personbil-Mc, personbil-cykel samt personbil-trafikant.</p>
09-8595	<p>MC-OLA på Gotland</p> <p>SMC, Gotland</p>

	<p>Projektet syftar till att: Engagera aktörer att bidra utifrån egna förutsättningar med konkreta och uppföljningsbara avsikter, som leder mot målet.</p> <p>Det förväntade resultatet är att: nå målet med att skapa en säkrare vägtrafik på Gotland för att minska antalet dödade och skadade i motorcykelolyckor.</p>
09-18530	<p>Risikfaktorer för motorcykelolycka med allvarlig personskada - en nationell kohortstudie</p> <p>Michael Fored Projektstatus: pågår</p> <p>Projektet syftar till att: i en kohort av alla ägare av motorcyklar i trafik undersöka risken för motorcykelolycka som inneburit sjukhusvård och/eller död. Att identifiera faktorer hos motorcyklister som påverkar risken att drabbas av allvarlig olycka.</p> <p>Det förväntade resultatet är: Resultaten presenteras för berörda och intresserade myndigheter samt publiceras i internationella vetenskapliga tidskrifter. Projektet kan ge en valid skattning av effekterna av körteknikutbildning och träning i riskmedvetenhet hos motorcyklister som genomförts av SMC sedan ett flertal år tillbaka. Projektet kan ge kunskap om nya möjliga förarrelaterade åtgärder för att förebygga död eller allvarlig skada till följd av en motorcykeltrafikolycka.</p>
	<p>Trafiksäkerhetsaspekter i samspelet mellan gatumiljöns utformning och en mer energieffektiv belysning: Fokus på cyklister, fotgängare och mopedister</p> <p>VTI, Annika Jägerbrand Projektstatus: pågår</p>

STÖD TILL IDEELLA ORGANISATIONER

Vägverket delar ut ekonomiskt stöd på uppdrag av regeringen till ideella organisationer som är demokratiskt uppbyggda och partipolitiskt obundna. Syftet, som ges antingen som projekt- eller verksamhetsstöd, är att öka engagemang, delaktighet och medvetande för frågor inom miljö, trafiksäkerhet, tillgänglighet och hälsa.

Projektstöd: kan sökas till tidsavgränsade projekt inom vägtransportssystemet. Till de grundläggande förutsättningarna hör att organisationen arbetar för att stödja de transportpolitiska målen. Två gånger per år kan man söka om projektstöd.

Verksamhetsstöd: ges till organisationer vars verksamhet syftar till att stödja de transportpolitiska målen, t.ex. bättre hälsa, tillgänglighet, jämställdhet, trafiksäkerhet och miljö inom vägtransportssystemet.

Id nr	Namn på projekt
TR70A 2008:64330	Instruktörsutbildning SMC Projektstatus: avslutad Projektet syftar till att: På central nivå utbilda och vidareutbilda MC-instruktörer som skall jobba med förarutbildning och höjd riskmedvetenhet för motorcyklister med behörighet att köra motorcykel. Det förväntade resultatet är: att stärka instruktörskåren och utbilda nya som tar över arbetet när någon slutar som instruktör. SMC är helt övertygade om att det arbete vi gör på våra kurser har en betydelse för allas mål att öka trafiksäkerheten.
TR70A 2008:63889	Nationell agenda för svensk motorcyklism - en gemensam strategi för ökad säkerhet SMC Projektstatus: pågår Projektet syftar till att: konkretisera vad som ska ske under åren 2010-2020 för att minska antalet dödade motorcyklister och mopedister med 50 % och allvarligt skadade med 25 % till 2020.
TR70A 2009:10606	Mopedinformation till föräldrar NTF Dalarna, Hans Moberg Projektstatus: pågår Projektet syftar till att: Genom NTF-utbildad person hjälpa till att förmedla information till föräldrar om att inte köra trimmat, på fyllan och utan hjälm. För att nå målgruppen så vill vi vara på plats där föräldrarna redan är samlade, på föräldramöten som skolan kallar till vill vi vara med och hålla ett kort informationsprogram. Det förväntade resultatet är: Få ner antalet skadade och dödade mopedförare genom stärkt föräldraansvar.

<p>TR70A 2009:11665</p>	<p>Mopedinformation till föräldrar NTF Västernorrland, Mona-Lill Landström Projektstatus: pågår Projektet syftar till att: Genom NTF-utbildad person hjälpa till att förmedla information till föräldrar om att inte köra trimmat, på fyllan och utan hjälm. För att nå målgruppen så vill vi vara på plats där föräldrarna redan är samlade, på föräldramöten som skolan kallar till vill vi vara med och hålla ett kort informationsprogram. Det förväntade resultatet är: Få ner antalet skadade och dödade mopedförare genom stärkt föräldraansvar.</p>
<p>TR 70-A 2009:36157</p>	<p>Undersökning om motorcyklisters beteende och inställning till trafiksäkerhet NTF Projektstatus: pågår Projektet syftar till att: Öka kunskaperna om motorcyklisters förhållningssätt till trafiksäkerhet och trafiksäkerhetsåtgärder. Det förväntade resultatet är: Undersökningen har trafiksäkerhet som primärt fokus. Strategiarbetets primära mål är att ge förslag på hur antalet dödade mopedister ska kunna halveras fram till 2020. Undersökningen ska bidra till att ta fram sådana åtgärder.</p>
<p>TR 70-A 2009:36158</p>	<p>NTF konsument, projekt "Hur färdas barn i bil 2010" och "Trimning av moped" NTF Projektstatus: pågår Projektet syftar till att: NTF konsumentens uppgift är att skapa en säkrare trafik genom att stimulera efterfrågan på det som är bra och se till att det som är dåligt försvinner. Processen drivs genom är att ge konsumenten kunskap, trygghet och självförtroende att ställa egna krav samt underlätta valet av de trafiksäkraste alternativen vare sig det rör sig om produkter, tjänster eller säker trafikmiljö. Det förväntade resultatet är: NTF konsumentverksamhet är att så långt som möjligt underlätta för konsumenten att leva upp till sin del i nollvisionens kontrakt mellan trafikant och systemutformare. Målet med NTF konsument är att underlätta det säkra valet.</p>

Till Näringsdepartementet inlämnade förslag till ändringar

Registreringsplikt på alla mopeder

Vägverket och Rikspolisstyrelsen har i juni 2004 lämnat förslag till regeringen om registreringsplikt för alla klass II mopeder, utom veteranmopeder. Polisen har erfarenhet av att många mopedister plockar bort registreringsskylten från klass I-mopeden. Den troliga orsaken till detta är att man vill köra mopeden utan körkort eller förarbevis, köra på cykelbanor samt för att försvåra identifieringen av mopeden och föraren.

Moped på cykelbana och skjutsning

Vägverket lämnade i december 2006 in förslag till ändringar i trafikförordningen avseende möjligheten att införa lokala trafikföreskrifter som tillåter moped klass I på cykelbanor i vissa fall, en höjd ålder till 18 år för att skjutsa passagerare på moped och även förslag att ta bort möjligheten att ha extrapassagerare på moped klass II samt att det inte längre ska vara möjligt att koppla cykelkärra till moped klass II.

Vägverket har funnit att trafiksäkerhetshöjande effekter kan uppnås genom att möjliggöra för lokala myndigheter att genom lokala trafikföreskrifter tillåta moped klass I att föras på cykelbana i vissa fall. Detta ger ett vidare mandat för trafikregleringen av mopedtrafiken, från att ha möjligheten till att helt förbjuda mopedtrafik på gång- och cykelbana till att kunna styra all mopedtrafik till gång- och cykelbana. De särskilda fall där liknande regleringar kan vara nödvändiga är framför allt utom tätbebyggt område, till exempel på vajerräckesvägar med alternerande ett och två körfält, där det finns en medlöpande gång- och cykelbana. På dessa platser förekommer redan en stor del av trafiken med moped klass I på cykelvägen trots att det inte är tillåtet.

Vidare kan positiva effekter uppnås genom att höja åldern för möjlighet att skjutsa passagerare på moped till 18 år från nuvarande 15-årsgräns. Detta kommer då även att likställas med regelverket för skjutsning på mc. Idag är det även möjligt att skjutsa extra passagerare¹ på moped. Att på en moped klass II ta med barn utöver den passagerare som mopeden är byggd för, eventuellt placerade i cykelkärra bakom mopeden och utan möjlighet att kommunicera med föraren, kan inte anses vara förenligt med trafiksäkerhet.

¹ 6 kap. 3 § trafikförordningen (1998:1276)

På en cykel eller en moped får inte samtidigt färdas flera personer än cykeln eller mopeden är byggd för. När en cykel eller moped klass II har lämpliga säten och effektivt skydd mot hjulekrarna får dock på fordonet färdas ytterligare

1. ett barn under tio år, om den som styr fordonet har fyllt femton år, eller
2. två barn under sex år, om den som styr fordonet har fyllt arton år.

Antilock Brakes Systems (ABS) on motorcycles

A Swedish study¹ published in 2009 has evaluated the effectiveness of Antilock Brake Systems on motorcycles in reducing real-life crashes and injuries. The statistical method was based on induced exposure, which has been previously used for evaluating the effectiveness of other safety systems on passenger cars (i.e. ESC).

This project was conducted in two steps. Study 1 used in-depth studies of fatal crashes in Sweden between 2005 and 2008 in order to determine under which circumstances ABS would have (or not have) affected the outcome of the crash. This analysis showed that head-on collisions were the least ABS-affected (non-sensitive) crash type. Such findings were then used in Study 2 to estimate the effectiveness of ABS in crash reduction using induced exposure. The material was based on police-reported casualty crashes in Sweden between 2003 and 2008. Using the induced exposure approach, it is assumed that the ratio between the number of crashes in sensitive and non-sensitive situations to ABS should not differ between two groups of vehicles with the same risk of crash involvement. A comparison of injury severity in crashes with, and without, ABS was also undertaken.

The conclusions of this study were:

- The overall effectiveness of ABS in Sweden was 38% on all casualty crashes and 48% on severe and fatal crashes. The minimum effectiveness ranged from 11% to 17%, respectively.
- The effectiveness on severe and fatal crashes in intersections was estimated to be at least 42%.
- Injury severity in crashes with ABS-equipped motorcycles is markedly lower than in similar one with non ABS-equipped motorcycles.
- Head-on motorcycle collisions are not, or only slightly, affected by ABS.



Figure X: the effectiveness of ABS on motorcycles in reducing real-life crashes.

Such results are impressive but still in line with other recent reports regarding ABS on motorcycles, albeit of greater magnitude. A German study (Spornier och Kramlich, 2003) estimated that ABS would reduce real-life crashes by 10%, thus with a “theoretical presupposition for positive influence by ABS in more than 50 percent of all crashes”. Another study in USA (Moore and Yan, 2009) has shown that ABS fitment on motorcycles resulted in 19% lower insurance claims. Furthermore Teoh (2008) has found that ABS-equipped motorcycles had 38% lower involvement in fatal crashes per 10,000 registered vehicles.

The effect of Antilock Brake Systems on motorcycles in terms of crash reduction and injury mitigation may speculatively be explained by the dual function of ABS. Previous studies (Vavryn and Winkelbauer, 2004) have shown that ABS improves the achievable deceleration as well as stability under full braking. Injury severity in a crash may be reduced with ABS as improved stability would reduce the risk of falling and increased deceleration would reduce collision speed. However, stability improvements in critical situations might be the biggest advantage of ABS, as this could allow riders to totally avoid the crash. At the moment, though, very little is known regarding the possible dual effect of ABS on motorcycles.

Finally, this study recommends the fitment of ABS on all new motorcycles as soon as possible and that customers only purchase motorcycles with ABS.

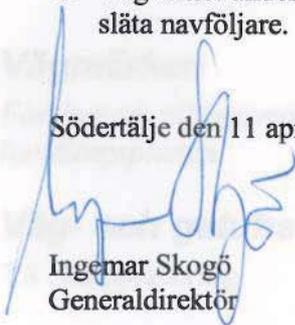
¹ For further details regarding this study and its findings:

Rizzi M., Strandroth J. and Tingvall C. (2009). "The Effectiveness of Antilock Brake Systems on Motorcycles in Reducing Real-Life Crashes and Injuries", *Traffic Injury Prevention*, 10:5, 479 - 487.

Handlingsplan MC på väg 2007 – 2010

1. SMC pekar i samråd med Vägverket ut vägar som är särskilt viktiga för MC och där i första hand åtgärder ska vidtas för ökad MC-säkerhet. Vägar som bör omfatta max. 1000 mil, bedöms ha det största trafikflödet MC och på dessa vägar inträffar många av de allvarliga MC-olyckorna. Karta klar under 2007.
2. SMC inventerar farliga vägvägnitt i första hand på det i punkt 1 utpekade MC-vägar. Inventeringen överlämnas till respektive region varefter förslag till åtgärder och prioriteringsförslag tas fram av Vägverket i samråd med SMC. Som stöd utarbetar Vägverket och SMC en enkel exempelsamling med åtgärdsförslag. Inventering och exempelsamling klar 2007. En preliminär sammanställning av problemtyper tas fram våren 2007 som underlag för den inventering SMC planerar att göra under MC-säsongen 2007.
3. Regelverket Vägar och Gators Utformning omarbetas under 2007 och ändringar ges ut som "VGU-info" så att motorcyklisters säkerhet beaktas i högre grad vid nybyggnad och förbättring av vägar och gator. Ändringarna inarbetas i nästa utgåva av VGU. De avsnitt som främst ska omarbetas redovisas i bilaga. Kommentar: Observera att dessa råd endast gäller vid nybyggnad och förbättring och att befintliga vägar inte åtgärdas med automatik efter dessa råd.
4. Vägverket undersöker i samråd med SMC möjligheterna att genom tilläggstavlor eller andra skyltar utmärka avsnitt som är speciellt farliga för bl a MC. Förslagen inarbetas i lämpligen i den exempelsamling som nämns i punkt 2.
5. En genomgång av övriga regelverk som ATB Väg, VV-AMA, Teknisk beskrivning Väg, Funktions- och standardbeskrivning för driftåtgärder m.m. görs under 2007. Vid behov föreslås revidering.
6. SMC och Vägverket inventerar problem för MC vid vägarbeten som underlag för ev. förändringar i regelverket Arbete på väg.
7. Under 2007 påbörjas utökade försök med förstärkta stödremor på 5 - 10 vägsträckor. En preliminär utvärdering görs under 2007 och en utförligare under hösten 2008 varefter generella rekommendationer ges ut.
8. Ett speciellt MC-vänligt räcke tas fram för kortare vägvägnitt som bedöms särskilt farliga för motorcyklister ("black-spots"). Detta kan ske genom utvärdering av redan framtagna räkestyper eller genom utveckling av ny typ om inte lämplig typ redan finns. En plan för denna utveckling tas fram under 2007. Kriterier tas fram för när sådan räkestyp bör användas.
9. Vägverket undersöker möjligheterna att använda mer MC-vänliga räcken med exempelvis släta navföljare.

Södertälje den 11 april 2007


Ingemar Skogö
Generaldirektör

Södertälje den 11 april 2007


Jesper Christensen
Generalsekreterare, SMC

Mc på väg – en överenskommelse mellan SMC och Vägverket

(9-punktersprogrammet)

Handlingsplanen är resultatet av en avsikt i ett trafiksäkerhetsprojekt bedrivit under åren 2004-2005. Vägverkets dåvarande Generaldirektör Ingemar Skogö och SMC:s generalsekreterare Jesper Christensen undertecknade planen i april 2007. Genomförandet av planen sträcker sig över tidsperioden 2007 t.o.m. 2010. Ansvaret för genomförandet av planen ligger på de båda organisationerna. Planen har ett uttalat fokus på motorcyklism och vägfrågor. I planen berörs olika områden bl.a. hur motorcyklar ska inlemmas som ett fordonslag i frågor som berör vägutformning, vägräcken samt drift och underhåll av vägar. Genomförandet av planen har varit komplext och inte gått i den takt som ursprungligen planerades.

I anslutning till arbetet med den nationella mc- och mopedstrategin har Vägverket lovat att fullfölja sitt åtagande att, i samarbete med SMC, fullfölja planens alla nio punkter. Det återstår en hel del arbete med flera punkter. Här avses framförallt de punkter som har med drift och underhåll av vägar att göra samt de punkter som berör problematiken med mc-åkning och räcken. Att införliva motorcyklism i lämpliga styrdokument som rör vägar och gators utformning samt drift och underhåll kvarstår också. De två inledande punkterna är genomförda. Fortlöpande avstämningar mellan SMC och Vägverket kommer att göras under 2010 för att fullfölja planen.

Swedish Moped and Motorcycle
Industry Federation
+46 8 411 30 15
www.mcrf.se

National Society for Road Safety
+46 8 705 59 00
www.ntf.se

National Police Board
+46 8 401 90 00
www.polisen.se

Swedish Association of Local
Authorities and Regions
+46 8 452 70 00
www.skl.se

Swedish Motorcyclist Association
+46 243-669 70
www.svmc.se

Swedish Motor Insurers
+46 8 522 782 00
www.tff.se

Swedish Transport Agency
+46 771 503 503
www.transportstyrelsen.se

Swedish Transport Administration
+46 771 921 921
www.trafikverket.se



TRAFIKVERKET
SWEDISH TRANSPORT ADMINISTRATION

Swedish Transport Administration, S-781 89 Borlänge, Sweden, Visitor address: Röda vägen 1
Phone: +46 771 921 921, Textphone: +46 243 750 90

www.trafikverket.se