

# THE MOTORCYCLE VISION 2.0



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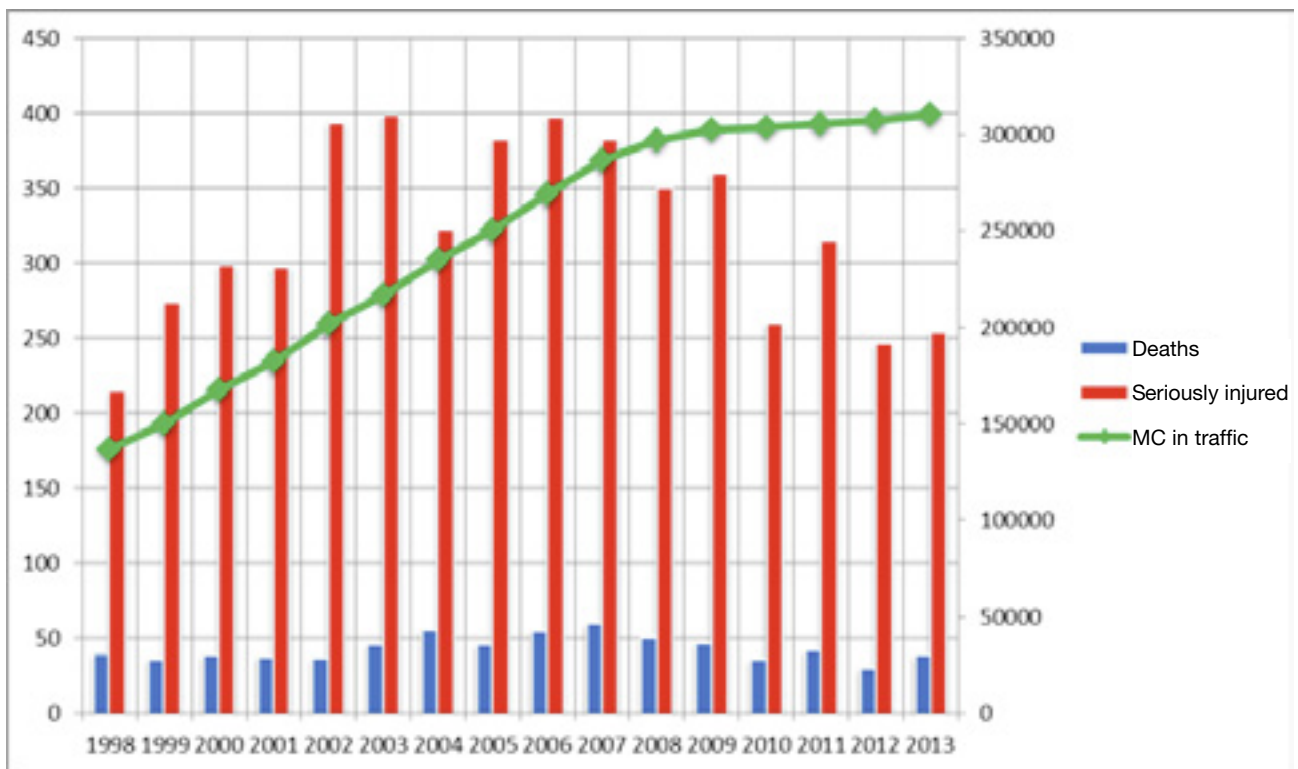
# 1. INTRODUCTION

The Motorcycle Vision 1.0 was presented at the Tylösand Road Safety Conference 2008 for the first time. The aim was to introduce the motorcyclists' views on the targets in Vision Zero and how they should be achieved. Six years later SMC releases the Motorcycle Vision version 2.0, updated on the basis of statistics, research, new knowledge and experiences.

The Swedish Motorcyclists Association, SMC was formed in 1963. Early in our history the members started to realize the importance of working with road safety, the need to educate members, authorities and decision makers in order to influence decisions and gain focus on our needs. SMC has for example requested a helmet law, compulsory dipped headlights and a separate motorcycle license. As early as 1973 SMC began offering voluntary advanced training for motorcyclists. Thus, SMC has for over 50 years pursued a Vision Zero - with our own goals, in our own way and with our own methods.

The number of motorcycles in traffic has tripled since 1990, the number is about 315 000. The number of accidents for those who travel on a two-wheel motorcycle in the past five years varies between 30-40 killed and 250-300 seriously injured. The average age of the Swedish motorcycle owners has risen and was 53 years at the end of June 2014.

## Fatalities and serious injuries on motorcycle in relation to motorcycles in traffic 2000-2013



**Source:** The Swedish Transport Administration and the Swedish Transport Agency. Fatal quad accidents have been excluded for the years 2010-2013. Seriously injured in quad accidents are included in the statistics for all years.

### 1.1 Vision Zero - Background information

All road safety work in Sweden is based on Vision Zero. The work to reach the set targets are led by the Swedish Transport Administration. They say: "Vision Zero is the picture of a future where people are not killed or injured for life in road traffic. Vision Zero is an ethical approach, but is also a strategy to shape safer road transport system. Vision Zero states that it is unacceptable that road traffic claims human lives. Road safety in the spirit of Vision Zero means that roads, streets and vehicles should be more closely adapted to human needs. The responsibility for road safety is shared between those who design and those who use the road transport system.

Road safety work according to Vision Zero assumes that everything that can be done should be done to prevent people from being killed or seriously injured. While measures are taken to prevent accidents, roads must be designed with the basic conception that people make mistakes and that accidents cannot be avoided completely. The perfect human does not exist. Vision Zero accept accidents happening, but not that they lead to serious injuries" (1).



## 1.2 Where are the motorcyclists in Vision Zero?

There were heated discussions in 1997 when Vision Zero was adopted. Was the vision even consistent with the existence of motorcyclists on the roads? Today, there is unanimous agreement that motorcyclists are a natural part of the transportation system. The Swedish Transport Administration in co-operation with a wide range of actors, including SMC, developed a joint strategy for increased safety for motorcycles and mopeds. Version 2.0 was presented in September 2012 (2). New targets have been formulated where vulnerable road users are especially highlighted (3). When new standards for roads and street design were adopted in 2012, riders and passengers on motorcycles and scooters were included in the group “vulnerable road users” for the first time.

Despite good intentions – when designing roads, motorcyclists as a user group are taken into very limited account. There are few initiatives of adapting the road environment to other users than those traveling by car. This is the foundation of SMC’s Motorcycle Vision 2.0, with suggestions on how the number of motorcyclists killed or injured can be reduced to reach the set targets in 2020.

## 1.3 Preventing accidents or injuries?

The Government Bill on Vision Zero stated 1997 that “the human physical capacity to withstand external impact in traffic accidents will be the norm in the design of various parts of the transport system”.

Collision curves confirm that the risk for a pedestrian to be killed in a collision with a car at 30 km/hour is 10 percent. This conclusion has formed the policy of reduced speeds from 50 to 30 km/hour in urban areas. Collision curves have also been taken into account when constructing roads for pedestrians, bicyclists and those traveling in cars. The collision curve is called “the model for safe traffic” (4). There is no equivalent curve for motorcycles.

The starting point of the model for safe road traffic - human error in traffic shall not result in serious injuries – are thereby not working for motorcyclists traveling at speeds up to 120 km/hour. Motorcyclists are vulnerable road users with completely different needs than, for example, those travelling by car. SMC’s Motorcycle Vision 2.0 therefore concentrates mainly on the prevention of accidents happening, as every accident can mean a serious injury or death. All parts of the vision aim to minimize the risk of a serious injury.

Today all road safety efforts are based on studies of those who are killed in motorcycle accidents. This forms only part of the truth about motorcycle accidents and why they happen. SMC recommends that, in addition to in depth studies of fatal accidents, statistics from insurance companies should be collected and used since they are handling all type of claims reported by motorcycle owners.

## 1.4 Shared responsibility for improving road safety

SMC sees four parts of the road transport system that needs to interact to improve road safety for motorcyclists and to reach the targets. The Motorcycle Vision is based on these four elements, together with knowledge about how accidents can be prevented and how the risk of injury can be minimized. The Motorcycle Vision is based on riders of and passengers on motorcycles. The four parts are:

1. The riders themselves
2. Other road users
3. The road environment
4. The motorcycle

## 2. RESPONSIBILITY OF THE MOTORCYCLISTS

The driver /rider of a vehicle always has the ultimate responsibility when he/she is traveling on the road. Most accidents are due to human error - the motorcyclists or another road users. With regards to motorcyclists the responsibility weighs even higher – the rider of a motorbike is always the loser in an accident, regardless of who caused it. The motorcycle is a quite demanding vehicle to ride because it usually only has two wheels and thus requires more of the rider compared to a car. It is the rider of the motorcycle who has the greatest potential to prevent both injuries and accidents, and he/she must avoid getting into situations that could lead to an accident. Motorcyclists are well aware of the risks associated with riding a motorcycle and they are as concerned for their safety as other road users (5).

Actually, one could say that the motorcyclists’ best prevent injuries before even getting on the motorcycle. The motorcyclist must prepare their riding to minimize damage during an accident.

## 2.1 Protective equipment

The only protective equipment required in Sweden for riding a motorcycle is a helmet (the helmet law was issued 1975). The usage of helmet among Swedish motorcyclists is 100 percent (5). People killed without having worn a helmet, or using it incorrectly, were all without a valid driver license for motorbikes as well as, in several cases, under the influence of alcohol and/or drugs (6).

There are a number of different helmet standards in the world. In Europe it's called the ECE 22.05. The standard and test method have been criticized by motorcycle press in Sweden and the rest of Europe. A five-star system (Sharp) is implemented in the UK by the government (Department of Transport) as their own test for helmets. The results of Sharp are distributed to dealers and motorcyclists and describes the helmets protection level in the event of an accident. The aim is to reduce the number of deaths and serious injuries. In Sweden there is no agency with supervisory responsibility for motorcycle helmets. The current Swedish regulation for motorcycle helmets is from 1987 (TSVFS 1987: 10). No review of the existing standard ECE 22.05 is underway to include, for example, rotational force although results from research from use of equestrian helmets exists.

SMC has for three consecutive years issued Medical Cards for all members. The members receive a sticker to put on the helmet to show that a Medical Card is inserted in the helmet. The Medical Card lists name, next of kin and medical history. The aim is to provide prompt and appropriate care in the event of an accident. The response has been extremely positive from both rescuers and members.

Although no law requires additional protection, most motorcyclists use full protective gear; full protective suit, gloves and boots. Virtually all safety equipment sold in the market today have CEN-approved protectors on the most vulnerable points. Many motorcyclists also use complementary protection, for example back protectors to prevent back injuries. Neck and chest protections are increasingly used (5). Full protection gear and back protection are required during the riding test for a motorcycle license. Motorcyclists spend large sums on protective equipment in order to increase their own security. Protective equipment are mandatory for being eligible for a motorcycle insurance. An Australian study of motorcycle drivers involved in accidents clearly indicates that serious injuries are reduced by the use of protective equipment for motorcycles (7). A review of existing directives of protective equipment and the standard for protective equipment are in progress. SMC participates in the standardization work in Sweden.

*SMC believes that a supervisory authority responsible for motorcycle helmets must be appointed immediately who can revise existing regulations, initiate a review of current standards and carry out market surveillance of motorcycle helmets on the Swedish market.*

*SMC believes that the current legislation on personal protective equipment for motorcyclists is sufficient, but it can be supplemented by information campaigns aimed at motorcyclists and motorcycle dealerships.*

**Objective:** *More information can increase knowledge about quality, approved protectors and utilization of the same and the need to regularly replace protective equipment. A review of the existing helmet standard and enhanced market surveillance of helmets can provide fewer injuries and fatalities among motorcyclists.*

## 2.2 Visibility

In two questionnaire studies among motorcyclists over half responded that they had almost collided with another vehicle one or more times in the past year– the reason being the other road user hadn't seen the motorcycle. Of these, 84 percent responded their own speed had no impact in them not being noticed. Against this background it's not surprising that awareness campaigns aimed at other road users ranks very high as a road safety measure (5, 8).



It is important to be noticed in traffic. For almost half of all motorcyclists killed or injured, the cause was collisions with other road users. The motorcyclists' visibility can be improved by using colourful protective clothing with reflective areas. One can also use safety colors on jacket, vest or helmet. However, there are no studies to show which of these measures makes motorcyclists more visible in all contexts. All available research suggests it's the lights on the motorcycle which has the greatest effect on increased visibility for motorcycle riders. There is a wide selection of lighting, while there is great ignorance in which type of lighting that is approved. There are newer motorcycles on the market whose front section is designed so the lights are not visible from the side. The Swedish National Road and Transport Research Institute VTI is currently conducting a study on the effects of yellow light on the motorcycle.

When it comes to speed the Swedish Transport Administration in depth studies of fatal accidents shows that only 30 percent of motorcyclists in intersection accidents were judged to be riding at lawful speed. Statistics from insurance companies reveal that in motorcycle accidents involving more than one type of vehicle the other party are usually the one causing the accident. Motorcyclists can reduce the risk of collisions by placing themselves in the middle of the road, slow down before intersections, not overtake, keep a distance to the vehicle ahead of them and be prepared for anything. On SMC's website you find more information: [www.seoss.nu](http://www.seoss.nu)

The visibility problem is addressed in the mandatory risk education included in the motorcycle license, but not in any other driving license. Foreign studies shows such education have a positive effect (17).

*SMC believes the current legislation is sufficient, except with regards to the parts about three point lighting which is only allowed in daylight. There is a need for information to motorcyclists about the type of lighting that is permitted. There is also a need for research in this area, such as the significance of the colour and reflective patches of the protective clothing; the effect of use of vest, jacket and helmet in safety colors; the effect of different types of lighting; the effects of three point lighting; and the effects of daytime high beam usage on motorcycle.*

**Objective:** *Research would provide knowledge and new legislation which could lead to increased visibility and safety for motorcyclists, all to reduce injuries and fatalities. Three point lighting should be allowed at all times. If daytime yellow light provides increased visibility motorcycle owners should receive an exemption for daytime yellow lighting and change of current legislation should begin immediately.*

## 2.3 Other users of the motorcycle

The Swedish Transport Administration in depth studies of fatal accidents involving motorcycles 2009-2011 shows that one out of three of killed motorcyclists rode a vehicle they did not own (9). In 14% of the cases the ownership was unknown. Of those without a valid A license who were killed 2011-2012 not even half owned the motorcycle and a majority of the motorcycles was decommissioned/unregistered/uninsured (6). These statistics clearly show that untrained and inexperienced motorcycle riders are a great risk when riding a vehicle they are not capable of handling.

The motorcycle owners are well aware of the risks when riding a motorcycle belonging to someone else. In a study about attitudes to road safety, nearly every rider said that they should never lend their motorbike and if they do, only to someone they completely trust (5).

There are accidents on stolen motorcycles that are fatal or cause serious injuries. It's possible to prevent theft by locking the motorcycle with both the vehicle's existing locks and approved extra locks. SMC believes motorcycle parking should be provided where the motorcycle can be chained to a solid object. Manufacturers are developing alarms and more and more motorcycles have electronic immobilizers which makes them more difficult to steal. Insurance companies require two locks and, in some cases, even garage storage for insurance subscription.

*SMC believes the current law is adequate but need targeted information to dealers, motorcyclists and insurance companies. The campaign should highlight the risks of theft and lending of motorcycles.*

*SMC believes more motorcycle parking with solid objects that motorcycles can be chained to should be available.*

**Objective:** *through information campaigns reduce thefts and highlight the risks associated with lending motorcycles to inexperienced drivers, and get more dedicated motorcycle parkings with special locking devices.*

## 2.4 Alcohol and drugs

Motorcycles combined with alcohol or drugs are a deadly combination – this is a known fact among motorcyclists. A study among SMC members showed that motorcyclists have a better attitude to alcohol and drugs in traffic compared to car drivers (5). Most riders are careful not to drink alcohol in connection with motorcycle riding, few use other drugs. Many motorcycle rallies provide breathalyzers to avoid riding intoxicated the day after a party. Alcohol and drugs are highlighted in the risk education but are perceived by prospective motorcyclists as a matter of course since most everyone already have a driver license for car and they know the law.

At the same time the Swedish Transport Administration in depth studies of fatal accidents involving motorcycles 2009-2011 show that in almost a third of fatalities, the motorcyclists were under the influence of alcohol and/or drugs. Most of these accidents occurred on evenings, nights and early morning unlike other motorcycle accidents which mainly takes place in daylight (9). SMC have looked at those who were killed 2011-2012, noting that 82 percent of the affected drivers killed on motorcycles did not had a valid driver's license for motorcycles. In the group who didn't have a valid motorbike driver license, not even half owned the motorbike they were killed on. Almost all were male and the average age was 31.5 years (6). The risk training given when applying for a motorbike driver license do not reach those without licenses.

Alcohol interlocks on motorcycles could prevent many unnecessary accidents. But alcohol interlocks is an accessory used by a few who are offered alcohol interlocks instead of having their driver's license invoked after being caught drunk driving. A majority of the persons killed on motorbikes when under the influence of alcohol and/or drugs had no driver's license, did not own the motorcycle and drove a motorbike which was banned for road use. They are therefore not included in the group who are offered alcohol interlocks. Before there is a technology making it impossible to operate a motorcycle when the rider is under the influence of alcohol and/or drugs, there is a need for other measures, such as more police on the roads and improved detection technologies.

The proportion of intoxicated drivers are higher among people killed on motorcycles compared to car drivers. However, it is not clear whether, and to what extent, this contributed to the fatal accident.

*SMC believes that the current law is adequate. One possible solution is more police conducting breath analysis tests at the time of day when most fatal accidents involving alcohol and/or drug impaired drivers occur.*

*SMC believes that specific information efforts are needed aimed at risk groups most commonly involved in this type of accident.*

*SMC sees it as a matter of course that all parties involved in a traffic accident are tested for alcohol and/or other drugs, which is not the case today.*

*SMC believes that the police need detection technology to detect drivers under the influence of drugs.*

*SMC believes research is needed to clarify the limit for when a person who used drugs is inappropriate as a driver/ rider, in the same way as the limit of the influence of alcohol.*

**Objective:** *That no motorcyclist is killed or sever injured because of use of alcohol or other drugs.*

## 2.5 Driving without a license

A third of those killed in motorcycle accidents 2011-2012 lacked a motorcycle driver license. The average for the period 2005-2013 was 27.1 percent. SMC have conducted two studies to members and motorcyclists, asking about driving license. Both studies show that 100 percent of the motorcycle riders have a valid motorcycle license. One sees it as a matter of course and take for granted that all in the group have valid license when you are out on motorcycle tours (5, 8).

Almost everyone who dies in motorcycle accidents and lack driving licenses are men. A majority of those killed in motorbike accidents without a license didn't own the motorcycle they were riding. Two-thirds of those lacking a valid driver license drove a motorcycle that was prohibited for road use and/or unregistered and/or uninsured, in other words, a motorcycle that was illegal to use on streets and roads. SMC concludes that no similarities exist between Swedish motorcyclists in general and the group of drivers lacking valid driver licenses.

Statistics for seriously injured in motorcycle accidents show that riding without a license is an important factor not only among the fatalities, but also among seriously injured motorcyclists. During the period 2010-2012, the police reported 760 seriously injured in two-wheel motorcycle accidents to STRADA (Swedish Traffic Accident Data Acquisition). 117 of those did not have a motorcycle license, which is equivalent to 15 percent. In addition to these, there are no information of the drivers driving license in 7 percent of the reported accidents, which means that there are probably more than 15 percent without an A license who sustained severe injuries (6).

*SMC cannot see the riders without a license as motorcyclists. They do not meet any of the basic characteristics required to be seen as a rider: that you have a valid driving license and own a motorcycle.*

*SMC believes that driving licenses for all drivers of motor vehicles must become a priority in the Vision Zero targets in order to halve the number of fatalities and reduce serious injuries with 25% by 2020. If everyone riding a motorcycle from 2011 to 2012 had had a driving license, the target regarding deaths and seriously injured among motorcyclists would be largely achieved already.*

*SMC believes the group without license that are killed on motorcycles should be separately reported in all accident statistics, since this group has few similarities with Swedish motorcyclists in general.*



*SMC calls for annual statistics of drivers with/without driving license for all vehicle accidents leading to someone being killed or seriously injured, to be provided by the Swedish Transport Agency and The Swedish Transport Administration. No one knows how large the proportion is, and there is a need for a global view of the problem. Just as in other countries, Sweden should be able to compare the fatalities with the police criminal records.*

*SMC believes the problem must be made visible to raise awareness amongst various stakeholders - insurance companies, organizations, driving schools, government agencies, courts, politicians, family and friends. If the knowledge is spread, we create an opportunity for everyone to both inform and take action.*

*SMC believes the police should have the mandate to prioritize the group without driver license that obviously are putting themselves on the side of the law, often not just in terms of driving without a license. From the articles SMC have collected on the website it is clear that persons are rarely prosecuted and convicted for one offense only.*

*SMC believes in a concentrated effort to change attitudes in the community. That so many people are killed or injured without a valid drivers' license indicates that it's acceptable in some groups to drive illegally. SMC believes that a road user education should begin at school age, long before the driver license is of interest.*

*SMC do not believe that increased demands and costs for obtaining a license is the way to solve the problem. On the contrary, all parties must work together in order to give as many people as possible access to a cost-effective license training.*

**Objective:** *none killed in a motorcycle accident without a valid driver license.*

## 2.6 Basic education

SMC share the view of the world's leading experts in the field: the single most important factor to ensure safety for motorcyclists is to give them a good basic education (10). Sweden has a high standard of education, but there is a large potential for improvement. An education based on the bike's unique features, an integrated training with theoretical and practical elements where the focus is riding in traffic, an education not based on to handle the bike in slow manouver tests and training where risk education are natural elements are a few examples that should be reviewed. A majority of the motorcycle accidents occur in curves, often in combination with high speed and incorrect cornering technique. Cornering technique deserve to be an important part of the basic education. In a survey about drivers' license, there was a demand for making SMC's basic cornering education (held at go-cart tracks) a mandatory part of driver training (11).

According to motorcyclists, experience is a very important factor for personal safety. Stepped access to motorcycle licenses in three classes are costly for youths and discourage them to start their riding carriers on a less powerful motorcycle. Stepped access should be encouraged by removing the examination between the different license classes.

Women, who represent less risk than men in motorcycle accidents, fail more often in the riding test and this is not acceptable, especially as women spend more time and money on training both in driving school and through private practice (11). A VTI study shows that women fail more often in the low speed manoeuvre test. Women are often older than men when they take their driver's license and the VTI study show that older age and long experience of driving a car have a negative impact on the rate of approval (12).

Sweden has the highest known proportion of killed motorcycle riders without license in Europe - this is a non-desirable record needing attention and rectification by all concerned parties.

*SMC believes that the whole A-license system in Sweden should be reviewed and based on the unique characteristics of the motorcycle. Sweden should apply to become a test country in the EU/EEA for an alternative driver license system.*

*SMC believes that Sweden should invest in a coherent basic education with mandatory theory and practice where risk education form a natural part of the training.*

*SMC believes that all concerned parties should join forces to reduce the number and proportion of deaths in motorcycle accidents without a valid license.*

**Objective:** *A cost-effective basic education for motorcycle driver license with secure, risk-aware riders. No person should be killed in motorcycle accidents without a license, neither as a rider nor as a passenger.*

## 2.7 Advanced training

SMC have conducted advanced training for motorcyclists since 1973. The content has evolved and today SMC is one of the largest organizers of advanced training for motorcyclists in the world. Advanced training is seen as a natural feature to increase safety among motorcyclists. Advanced training provides increased knowledge, skills and awareness of risk. The content of the training is different depending on the types of riders who are attending. No



matter which type of motorcycle or type of motorcyclist, the motorcyclists believe that further training increases skill, improves handling of difficult situations and increase awareness of and focus on the traffic situation (13). One common objection towards advanced training is that the participants are increasing their speed after taking part in advanced training. In a study of attitudes to speed however, 63 percent responded they had become better at adapting speed to the traffic situations after advanced training (8). SMC has invested substantial resources in increasing element of risk awareness in all training in recent years.

Over 70 percent of the fatal single motorcycle accidents occur in curves when the driver lose control (9). A number of accidents are due to improper braking and curve technique. SMC believes that virtually all motorcyclists can improve their braking and cornering technique. SMC offers all new license holders a one year free membership in SMC. One important aim is to provide inexperienced motorcycle riders with advanced training. Unfortunately SMC can't reach all new license holders as the law regarding the Road Traffic Directory do not allow access to new license holders. Another problem is the lack of areas where both the initial and the continuing training of motorcyclists can be conducted. One major problem is the regulation regarding noise emissions. Motorcycles legal for road use that passed periodic inspection are not allowed on race courses due to higher track requirements for noise emissions. SMC, Svemo and Bilsportförbundet work together to get reasonable track requirements thereby enabling road legal motorcycles to be used for road safety training on tracks.

*SMC considers that relevant authorities should include cornering technique in basic training for motorcyclists.*

*SMC believes that there is no reason to require mandatory continuing training, as long as it is possible to improve basic education.*

*SMC believes that some form of training should be required for those who commit serious traffic offenses – aiming to change the riders' attitude and the ability to perceive risks and dangers in traffic.*

*SMC needs assistance in reaching all Swedish motorcyclists with information about training, which could provide safer and more risk-conscious riders. One possibility is to change the law regarding the road traffic directory allowing access to driver license information for purposes of increasing road safety.*

*SMC believes that there are needs of training areas for motorbikes where motorcyclists can conduct basic training, risk education and advanced training. SMC also believes that all agencies involved in road safety, along with the Environmental Protection Agency, should create conditions to enable road safety training on tracks.*

**Objective:** *That SMC can offer safety courses for all motorcyclists and that information is sent annually to all motorcycle owners and new motorcycle driving license holders about when, where and how this training takes place. There should be appropriate training areas for motorbikes in each county. Within ten years, we hope that 50 percent of Swedish motorcyclists voluntarily participate in an annual advanced training, resulting in less injured and killed motorcyclists.*

## 2.8 Experience and risk awareness

In two studies where the motorcyclists were asked about what was most important for their own safety, experience was ranked very high. According to the Swedish Transport Administration in depth studies, 70 percent of those killed 2009-2011 had had a driving license for four years or longer. However, those without a license were not included – a large group that is unlikely to have had a long experience of motorcycle riding. A national cohort study compared the motorcycle stock 2003-2009 where the owner had a valid license with patient registries. The study showed no significant difference between riders who had a driving license for less than three years compared with those who had a driving license for 15 to 20 years. Again, those without a valid license are missing (14).

The safety culture is generally high in the motorcycle community. Motorcyclists share knowledge and experiences with each other through forums, videos, motorcycle magazines, websites, and when they meet in different contexts. Many participate in voluntary advanced training. The publications Full Control and Good Thinking are in constant demand from riders, traffic schools, educators and others in the motorcycle community. A study of attitudes to road safety among riders showed that the main sources of safety information comes from within the motorcycle community itself (5). Different platforms where motorcyclists can share information are important. SMC reach mainly members and need help to get in contact with all the Swedish motorcyclists. SMC would like to once again emphasize the importance of gaining access to the addresses of new motorcycle license holders because they are the most important target group. SMC have limited funds to provide information and channels for distribution.

*SMC believes that exchange of experience in the motorcycle community is important, and the responsibility for providing platforms for the dissemination of information should be shared with all parties involved in road safety.*

**Objective:** *The Swedish motorcyclists are aware of the most common accidents and how to avoid them, as well as having a platform where information increasing motorcycle safety is shared.*

## 2.9 Speed

Speed is one of five priority areas for reduction in accidents in the strategy for increased safety for motorcyclists (2). In the Swedish Transport Administration in depth studies from 2009-2011 it's estimated that 40 percent of those who were killed rode much over the legal speed limit (+30 km/h) when the accident occurred. Only three out of ten killed motorcyclists are considered to have kept the legal speed (9). Riders on super sport motorcycles are most prevalent among fatalities riding much too fast, 30 km/hour or more. Speed matters for the degree of injury if an accident occurs. However, legal speed on a motorcycle is no guarantee that a fatal accident will not occur, since the road environment is designed for those who are traveling in cars.

Motorcyclists are a heterogeneous group. There are many who love speed but there is also a large group where motorcycle riding is all about cruising and they rarely ride over 90 km/h. The speed is very important for motorcyclists in how to handle an emergency situation, an unexpected obstacle, a sharp curve that require heavy braking and/or evasive maneuvers. The higher the speed, the longer the stopping distance.

Speed limits apply to all road users, including motorcyclists. Measurements taken on low-traffic 70-roads shows motorcyclists are worse at riding in lawful speed compared to motorists. At the same time motorcyclists love to ride on the roads where the speed limit is 70km/h. Most motorcyclists are also killed or injured on 70-roads (9). Measurements on the major roads show motorcyclists and motorists have about the same average speed and have the same proportion of speeders. The higher the speed limit is, the better motorcyclists are at speed adaptation (15).

The former National Road Administration conducted measurements in 2007, 2008 and 2010 at different locations around Sweden which showed large variations in speed adjustment. In some places nearly all cars and motorcycles drove too fast, while virtually all was well below the speed limit at other measuring points. There is a reason to reconsider whether the legal speed limits are correct if they are not respected by the road users. It is important that you can see the relation between road standard and the speed limit. Experiments in Denmark show that increased legal speed can lead to fewer accidents if investments simultaneously are made to improve the road environment for all road users.

SMC have conducted several studies showing that reduced speed as a safety measure is ranked low by motorcyclists. Regardless of the legal speed limit, few people accept or keep the current limit. A majority believe it's more important to follow the traffic flow than the speed limit. A majority have at some point been riding more than 30 km/h over the legal limit. However motorcyclists decrease the speed when there is a clear connection to safety; on streets with many vulnerable road users, in rain, when you have passengers and when you see warning signs of slippery roads(8).

*SMC believes speed limits on the roads should apply to all who travel there.*

*SMC believes speed limits need to be reviewed, especially in locations where few road users follow the legal speed limit.*

*SMC believes road maintenance should not be replaced by reduced speed limits. When assessing the correct legal speed for a road, the road authority should consider all vulnerable road users, including motorcyclists.*

*SMC believes increased traditional police controls on the roads is the best way to increase all road users' compliance with speed limits.*

**Objective:** *To increase the proportion of motorcyclists who respect speed limits and to decrease speed considerably in the group that rides fastest, should lead to a reduction of fatalities and injuries of motorcyclists in the risk group.*

## 2.10 Children on motorcycles

Very few children are killed or injured on motorcycles. This is probably due to responsible parents who are motorcyclists themselves and realize the problem of a young passenger. There is no Swedish law with a minimum age for pillion riding of a two-wheel motorcycle or to ride in a sidecar. SMC recommend that a child riding on the back of a PTW should be able to hold her-/himself, reach the foot pegs and be able to sit behind the rider. Small children riding in a sidecar should be restrained in a child seat, while larger children should wear seat belts where available. Of course, children should always wear full protective equipment when they ride on the back of a motorcycle.

*SMC believes the current legislation is sufficient and the statistics show that Swedish parents take responsibility for both their own and their children's safety in the context of motorcycle riding.*

**Objective:** *Motorcyclists should continue to be aware of the risks when transporting a child and take steps to reduce injuries and prevent accidents.*

## 3 INTERACTION WITH OTHER ROAD USERS



### 3.1 From a motorcyclist perspective

About half of all fatal motorcycle accidents in the Swedish Transport Administration in depth studies occur in a collision with another vehicle, often cars. The most common type of accident in the in depth studies is a left-turning car, the most common place for collisions are intersections. Insurance statistics from If and Trygg-Hansa for the period 2009-2011, show that the other party caused the accident in 62 - 90 percent of the crashes where more vehicles than a motorcycle was involved. The most common reason was that the driver misjudged the distance to the motorcyclist in a left turn or that the motorist missed the obligation to give way (16).

In two studies where motorcyclists responded to surveys, more than half said they one or more times in the past year had been close to a collision with another vehicle where the other road user had not seen the motorcycle. 84 percent said the speed had not had any significance for not having attracted attention (5, 8).

When it comes to speed, the Swedish Transport Administration in depth studies shows that only 30 percent of motorcyclists were judged to have ridden at a legal speed in the intersection accidents. Motorcyclists can reduce the risk of collisions by placing themselves in the middle of the road, slow down before intersections, not overtake before intersections, keep a safe distance to the vehicle ahead of them and to be prepared for anything. On SMC's website you find more information: [www.seoss.nu](http://www.seoss.nu)

The conspicuity problem is part of the mandatory risk training for motorcycle licenses.

Regardless of who caused the accident, the motorcyclists are the losers in a collision with another vehicle. The statistics indicate that there is a significant need for better interaction between motorcyclists and other road users. SMC have created a website: [www.seoss.nu](http://www.seoss.nu) . There you find advise for motorcycle riders, other road users, road planners as well as statistics and research. Every day SMC add articles from media describing accidents between motorcycles and other vehicles and legal action after collisions - a common year there are 3-400 articles. The number of accidents are constant over the entire motorcycle season, which shows that this is not only an early spring problem when the motorcycles comes back on the roads after the winter break.

*SMC believes that motorcyclists can improve the interaction with other road users by speed adaptation, risk education, information and targeted campaigns.*

**Objective:** *To reduce the number of collisions with other vehicles.*



## 3.2 Other road users

Too many motorcyclists are killed or injured each year because of careless road users, especially by cars. Research show many explanations for why motorists do not see motorcyclists. One is that they simply do not look for them. The motorcycles are relatively few in number compared to cars. In addition, the brain perceives that small vehicles are running at a lower speed than they actually are. You don't perceive a small vehicle as a threat. In a traffic environment with lots of information and impressions, motorcyclists may simply be overlooked. Cars have been made safer by wider A-pillars that can obstruct the view of a motorcyclist for 2-4 seconds. A driver who does not have the ability to see a two-wheeled motor vehicle should get their driver license revoked immediately.

All research points to the need for information and education of other road users - motorcyclists cannot solely be responsible (17). The visibility problem is a mandatory part in the risk education for motorcycle licenses, but not for car licenses. It should be a natural part of the driving education for all types of vehicle, which is already the case in other EU countries. For all types of driver licenses it would be desirable with an hour in a motorcycle simulator, to let everyone experience ride on a motorcycle or moped in a risk-free environment.

Many countries are implementing national campaigns in the media, via billboards and through targeted information, to draw attention to the problem and create acceptance for all kinds of vehicles, including motorcycles (18). Unfortunately, SMC is the only party in Sweden that highlights the problem and SMC do not reach other road users.

Virtually all vehicle manufacturers are working with the issue of the Intelligent Transport System, ITS. Car manufacturers are far ahead of the motorcycle industry. There are various technology solutions that can enhance security, even for motorcyclists. It's about systems informing and systems assisting. It may be systems that communicate between vehicles, and eCall which sends an alarm signal if an accident occurs. All technical systems catering to the specific characteristics of a motorcycle which doesn't increase the risk for any road user group are positive for motorcycle safety.

Unfortunately, SMC annually see examples of cases where motorists kill a motorcyclist and where the fatal accident did not even go to trial. Often the motorist don't have to perform an alcohol breath analyze test. Even before the preliminary investigation is done prosecutors are deciding not to press charges. A common justification is that the motorcyclist was driving too fast anyway. This do not create an understanding of why citizens should obey the traffic rules. A reasonable requirement is that all accidents with a fatality or seriously injured motorcyclist should result in a thorough police investigation where the prosecutor get an objective basis before deciding whether charges should be pressed or not.

*SMC believes that attention to motorcyclists should be included as an element in all driving license training.*

*SMC believes that the police should make targeted efforts concerning use of turn signals during lane changes, obligation to stop or give way and similar situations.*

*SMC believes that ITS is a technology that can reduce the number of injured and killed motorcyclists.*

*SMC believes that attention campaigns illustrating the problems should take place annually, especially targeting motorists.*

*SMC believes that every accident killing or seriously injuring a motorcyclist should be investigated thoroughly and objectively.*

**Objective:** *Increased knowledge and awareness of motorcycles in traffic coupled with targeted efforts by the police should lead to fewer killed and injured motorcyclists.*

## 3.3 Queues, buslanes and advanced stoplines

A motorcyclist rides a vehicle which can pass between the lanes and/or in the same lane as a car in the event of queues. As long as the motorcyclist is riding on the correct side, in a reasonable speed and with a safe distance from other vehicles, this is allowed under Swedish law. SMC publish advises for safe riding in traffic jams on the website. Unfortunately, many motorists refuse to accept that another vehicle can move faster and position themselves so that no one can pass. The Netherlands has therefore created a code of honor with common rules of consideration when riding in queues, in order to increase the safety of motorcyclists. This should be viable in Sweden as well.

In Sweden, the motorcyclists have the right to travel in certain bus lanes within Stockholm City. It started as an experiment in the 1980s. The result was increased safety and reduced number of accidents which made the experiment permanent. Many European countries open more and more bus lanes to motorcyclists – all for a single reason; it's easier for other drivers to see motorcyclists, it reduces accidents and the accessibility is improved. In several countries, all bus lanes are open to motorcyclists by law. The right to use the bus lanes is seen by the motorcyclists in Stockholm as the single most important issue for increased road safety. SMC have for years sought to extend and include more bus lanes in Stockholm but all attempts have been rejected, even though safety and mobility is increased and the queues are reduced. The reason given is that motorcycles are not a vehicle in service. SMC have developed guidelines for motorcycles riding in the bus lane. Motorcyclists in a growing number of Swedish cities calls for the ability to use the bus lanes in order to travel more secure and comfortable.

Some European cities have moved the stop line forward a few meters for all two-wheelers; cyclists, moped riders and motorcyclists. Through this action, vulnerable road users on two wheels will not have to jostle with other road users when the traffic signal turns green. In Sweden this is discussed only for bicycles.

*SMC believes that allowing motorcycles in bus lanes is a simple and inexpensive solution which increases safety, accessibility and visibility of motorcyclists and should therefore be implemented.*

*SMC informs, without cost to other parties, the motorcyclists about guidelines for riding a motorcycle in bus lanes and riding in queues.*

*SMC believes that all bus lanes in the country, where local bus companies or police do not have any objections, should be made available to motorcyclists.*

*SMC believes that separate stop lines is a strategy that should be used for motorcycles, mopeds and bicycles.*

**Objective:** *With better interaction between different road user groups in queues, and open more bus lanes to motorcycles, we can reduce accidents related to congestion and queuing.*

## 4 A MORE MOTORCYCLE FRIENDLY TRANSPORT SYSTEM

### 4.1 Policies and traffic strategies

At the OECD Conference on motorcycle safety in Lillehammer in 2008 it was clarified that a fundamental requirement for motorcyclists' safety is that they are included in all transport and infrastructure policies. Since then, the Swedish Transport Administration and the Swedish Association of Local Authorities and Regions have revised various policy documents in this area, such as Roads and Street Design, VGU. The problem for motorcyclists unfortunately remain as the whole road environment are based on those traveling in cars.

An important difference in the new VGU is that riders and passengers on motorcycles and mopeds are seen as vulnerable road users. Unfortunately this is rarely reflected in the planning and design documentation, neither in the case of state nor municipal roads. There is no national transport plan including motorcyclists. Out of the 290 Swedish municipalities SMC knows of only one where the motorcycles and mopeds are a part of the local traffic plan and traffic strategy (Västerås stad). Although the Road Safety Act (2010: 1362) and TSFS 2010: 183 requires that motorcyclists should be especially considered at TENT-roads, for example in the choice of barriers, nothing happens in reality.

It is obvious to SMC that all road users must be taken into account in all aspects of road transport. This should be the case in everything from planning to the finished road, in road works and for operation and maintenance of existing roads. Obviously, funds must be allocated by both the Swedish Transport Administration and the Swedish municipalities to increase road safety for those traveling on a motorcycle.

*SMC believes that motorcyclists and their special needs should urgently be incorporated in Swedish Transport Policies and in all governing documents concerning roads built and managed by the Transport Administration and the Swedish municipalities and county councils.*

*SMC believes that funding is needed to increase the safety for all who travel on streets and highways, including motorcyclists.*

**Objective:** *The Swedish transport system takes motorcyclists into account in all types of traffic environments and allocate funds.*

### 4.2 Motorcycle - a smart vehicle

Throughout EU, different solutions to reduce congestion are discussed, while the queues are growing. Alternatives to the car are discussed from both congestion and environment standpoints. SMC have conducted three mobility tests in Stockholm. The tests showed clearly the advantages of powered two-wheels over cars, in terms of time and cost. Despite the obvious advantages, motorcycles and mopeds are often forgotten and the only drawback, safety, is highlighted. Instead of looking at the powered two-wheelers, PTWs, as a part of the solution to reduce congestions, the PTWs are seen as a problem or completely overlooked.

*SMC believes that much more can be done to encourage the use of PTWs. Some examples are allowing motorcycles in bus lanes, providing free parking for motorcycles/scooters and to exempt motorcycles from congestion and bridge tolls as is done in Sweden.*

**Objective:** *motorcycles and mopeds are seen as an integrated part of the transportation system in the cities, as an integral part of the solution to the congestion problem and that all Swedish municipalities provide free dedicated parking for motorcycles and scooters.*

### 4.3 Guardrails

According to the Swedish Transport Administration in depth studies, the most common impact force in a fatal single vehicle accident with motorcycles are guardrails. In a third of all single fatal accidents, the rider collided with a guardrail. During the period 1st January 2000- 1st October 2014, 62 motorcycle riders/passengers have been killed and hundreds injured for life when they collided with guardrails. The significant overrepresentation among motorcyclists in guardrail accidents is the reason why SMC have been demanding safer guardrails for motorcyclists since 1997. For SMC road safety measures are not acceptable if they unilaterally are chosen at the expense of one group of road users.



A survey conducted by SMC and NTF shows that motorcyclists feel unsafe on roads with median cable barriers and choose alternate routes to avoid riding there. Meanwhile, motorcyclists were very positive to guardrails which are designed and positioned with motorcyclists in mind. (5).

SMC have nothing against guardrails protecting motorcyclists and all road users against oncoming vehicles. But, SMC believes that the installed guardrails should be safe for everyone who drives on the road. To SMC it is obvious that the road authorities should choose guardrails which minimize the risk of injury for crashes with the guardrail itself – not only protect the road users against oncoming traffic. The guardrail should be placed giving the road users a recovery zone. A median guardrail can be mounted as close as 0.35 m from the road which is not enough for a motorcyclist if something unexpected happens.

Side guardrails should not be used if the guardrail itself are more dangerous than whatever the guardrail is supposed to protect you from. Forgiving roadside areas are always preferable for a motorcyclist. The former Swedish minister for infrastructure, Catharina Elmsäter Svärd, has on several occasion underlined that side barriers should not be installed if they are not needed. Unfortunately Swedish regulations state that guardrails should be used instead of forgiving roadside areas, for cost reasons. Side barriers are also recommended in places where the risk is greatest for a motorcycle accident, namely in outer curves. The reason is simply that the rules of VGU are based on road users traveling in cars. The side barriers can be installed 0.5 meters from the road which is a narrow space if something unexpected happens. By unilaterally choosing guardrails as a safety precaution, the road authority creates a safe road environment for those traveling in car while at the same time, the risk of injuries increases for motorcyclists. This is not consistent with the road authorities responsibility in Vision Zero.

There are several barrier types to choose from. Unfortunately, guardrails have been synonymous with cable barriers in Sweden. Cable barriers are not healthy for motorcyclists to run into as they have unprotected poles with sharp edges and, at worst, protruding hooks. No tests with motorcyclists and cable barriers have been done. A study made by VTI shows that cable- and w-beam rails do not slice motorcyclists, but they do tear off body parts. The same results are found in several international studies (20).

SMC have for over 15 years complained to the Swedish Transport Administration about guardrails and their effects. While waiting for a standard applying to motorcyclists SMC have declared to the Swedish Transport Administration which existing guardrails in Sweden that can be considered motorcycle friendly, without being preceded by tests with a motorcycle dummy. Since we are lacking a standard, all road owners have to take responsibility for making the road environment safer when choosing guardrails; in requirements for new constructions, as repairs are done and after accidents have occurred. In places where the risk for motorcyclists are the greatest, in outer curves, forgiving road sides areas should be used instead of guardrails. If a guardrail is necessary, it shall be equipped with a motorcycle protection system, MPS. When older guardrails are replaced, they should be replaced with smooth guardrails, even if the cost is higher.

A study of guardrails with MPS is underway at five locations in Sweden and will be evaluated by 2015.

The new VGU contains no requirement for safe guardrails considering motorcyclists, leaving the responsibility to the designer and later to the contractor. The new VGU contain no requirement to select forgiving side areas instead of side rails. By choosing neither to demand any requirements about forgiving roadside areas, nor smooth guardrails or guardrails with protection, road authorities contributes to an increased risk of killed or injured motorcyclists.

The same problem applies to posts that are designed to yield on impact with cars, but not on impact with motorcycles or mopeds.



*SMC believes that the needs of motorcyclists should be considered regarding all sorts of obstacles in the road environment.*

*SMC believes that road authorities are to put requirements into place regarding choice of guardrails.*

*SMC believes that forgiving road sides should be used instead of the side guardrails to increase the safety for motorcyclists.*

**Objective:** *All who plan, build and maintain roads in Sweden can see the relation between action and consequences for motorcyclists in the event of an accident. This will provide safer roads for all road users and reduce accidents. In addition, funds must be allocated to increase the safety for motorcyclists in road traffic environment.*

#### **4.4 Friction, paving, gravel, markings and manhole covers**

As motorcyclists travel on two wheels the need of good friction is more important than for motorists. According to STRADA, lack of friction is a contributing factor in ten percent of all motorcycle accidents on dry roads. The most common problem was gravel. According to the insurance company Bilspport & MC Specialförsäkring twelve percent of their motorcycle accidents yearly are caused by gravel.

The Swedish Transport Administration and SMC have worked together in different ways to reduce the occurrence of gravel on paved roads - excess gravel after repair should be removed within 24 hours, warning signs should always be displayed when there is a risk of slippery surface due to gravel and support strips should be mixed with a binder to stay in place. Despite clear rules and guidelines the contractors do as they please. Alternative methods of repairing holes and cracks which do not risk creating slippery surfaces for motorbike and mopeds should be developed.

A survey in 2013 showed nearly 100 percent of all motorcycle riders slow down if they see warning signs for slippery surface (8). Despite such warning signs being a requirement for contractors, and knowledge about the correlation between slippery surface and motorcycle accidents, it does not work in practice. SMC can't reach local governments who for various reasons choose not to advertise warnings for minor repair works. There is a great need for quality assurance controls regarding road work, which can be done by the purchaser or any other party. SMC suggest the Swedish Transport Administration patrol all state roads all year round using their own squads.



Due to environmental reasons dust binding are conducted on certain streets in major cities. This leads to lower friction, especially when the dust binding is carried on for long periods. Nonetheless, it seems that no road authorities are aware of the problem concerning motorcycles and mopeds since no warning signs are displayed. Every year a number of dust binding related motorcycle accidents occurs.

The last few years some fatalities in particular have caught the attention of SMC in the media. Brand new pavement on the motorway E4 caused two fatal accidents when the sliding motorcyclists collided with the median crash barriers. The Swedish Transport Administration has launched an ambitious action plan against low friction on summer roads when it comes to resurfacing in 2014. Roads where the maximum speed is 100-120 km/hour usually have guardrails in the road center and sides which means a very high risk of injury if the friction is poor.

SMC helps many motorcyclists who crashed due to deficiencies in the roadway to apply for compensation. SMC believes that the road authorities, not the insurance companies, should bear the cost for injuries and damages when the road authority is causing the accident. However, few claims are reimbursed by the state and local governments. This is the reason for SMC asking for increased cooperation with the insurance companies.

For SMC, it is obvious that it should be possible to hold a department or a company accountable for deficiencies in the road environment leading to death or lifelong suffering. This could include fines and compensation to victims and their families. Responsibility Legislation exist in Norway and the UK but not in Sweden.

*SMC believes that there is a great need for information to both contractors and road authorities concerning the need for friction among riders of motorcycles and mopeds.*

*SMC believes that the Transport Administration and SKL should develop alternative mending and maintenance methods for holes, cracks and support strips, to increase the safety for motorcyclists.*

*SMC believes that the Swedish Transport Administration's efforts to reduce slippery summer roads is essential to avoid serious accidents on roads with new pavement and slippery coating.*

*SMC believes that the control function of both the state and municipal road authorities need to be strengthened.*

*SMC believes that accidents caused by fault or negligence by the road authority and/or entrepreneur should be reimbursed by the road authority and/or entrepreneur.*

*SMC believes that a liability legislation should be investigated.*

**Objective:** *Reduce the number of killed or seriously injured motorcyclists through improvements in maintenance of roads, better control and clearer accountability.*

## 4.5 Intersections and curves

Most motorcycle fatalities occur in curves. There are various explanations for this, but for road authorities who want to improve the safety of motorcyclists, the focus should be on reviewing curves where motorcycle accidents occur. A predictable path is extremely important for a motorcycle rider. It is mainly about friction and radius of curvature relative to the speed limit. For SMC, it is obvious that all kinds of obstacles in the outer curves should be avoided or adapted based on motorcyclists needs. Side guardrails should always be avoided, and if they must be installed, always provided with motorcycle protection because of the high risk of accident and injury. Warning signs showing "pinching curve" is used at some places in Sweden, even though they are not approved under the sign regulation. In other countries the sign "motorcycle" are displayed in addition to normal signs to specifically warn motorcyclists of accident risks when approaching curves.

Many motorcycle fatalities occur in intersections, the most common situations are motorists turning left without observing approaching motorcyclists. Road authorities can and should minimize the occurrence of signs and poles obstructing the view of road users, draw attention to upcoming intersections by road markings and use only poles or other obstacles that are motorcyclist compliant.

*SMC believes the warning sign "pinching curve" should be included in the Traffic Sign Regulations and used.*

*SMC believes the additional sign "motorcycle" should be used to a much greater extent, to get motorcyclists attention prior to curves and other risks.*

*SMC believes the design of intersections and installations of fixed obstacles in intersections should be reviewed from a motorcycle perspective.*

**Objective:** *Reduce the number of killed and seriously injured motorcyclists in curves and intersections, where most motorcycle accidents happen.*



## 5 Safer vehicles

### 5.1 Technology, ABS and accidents

The Swedish Transport Administrations in depth study and European in depth studies of motorcycle accidents show that few accidents are caused by technical problems in the bike itself. Statistics from Bilprovningen show year after year motorcycles are the vehicles most often passing periodic technical inspection, probably because the owners spend the winter months on vehicle maintenance.

There is a considerable knowledge of how car accidents occur and the car manufacturers have created a variety of systems to reduce accidents and the risk of injuries in case of an accident. This knowledge does not exist about motorcycle accidents, where almost each accident is unique. In most motorcycle accidents the rider and passenger are separated from the vehicle. The personal protection equipment are infinitely more important than the design of the vehicle. The motorcyclists have no protective shell and are therefore their own crumple zone - regardless of speed.

The Swedish Transport Administration in depth studies show that incorrect and/or poor braking technique are common when accidents occur and also for the outcome of the accident. ABS brakes can help to avoid the accident or to mitigate the consequences. A Swedish study on the effects of ABS brakes published 2009 showed that ABS would have had an accident reducing effect of 38% in all accidents resulting in injury in Sweden, and 48% in severe or fatal accidents. All other studies show ABS brakes reduce the risk of accidents (19). An overwhelming majority of Swedish motorcycle owners have responded in several studies that they want ABS when purchasing a new motorcycle.

The EU has adopted a new regulation governing the future of motorcycles. From 2016 ABS is a legal requirement for all bikes over 125cc. Mopeds and motorcycles below 125cc must have CBS, combined brakes.

There is a rapid development of various security systems for motorcycles in order to increase safety and comfort, thus contributing to reduced accident rates. Some examples include traction control, tire pressure monitor and adaptive headlights. Airbags are available on one motorcycle model. Manufacturers are developing ITS systems such as eCall, and communication systems with other vehicles. It is likely that a variety of new systems will be presented in the coming years from the manufacturers, which SMC look forward to.

There are also smaller details causing a number of injured riders and damaged motorcycles each year. New tires have a slick coating making the bike lose grip and the driver to crash. If the tire dealer or producer remove the coating, the problem is eliminated.

*SMC believes that since manufacturers are developing motorcycle technology in demand by consumers, no legislation is required.*

*In order to increase consumer demand, discounts on insurance for motorcycles with ABS could be offered.*

*SMC believes that coating of all new motorcycle tires should be removed prior to sales.*

*SMC believe that motorcyclists' conspicuity could be increased by developing the lights on motorcycles.*

*SMC believes that there are opportunities in the field of ITS to make motorcycles safer, but that the motorcyclist always should have control over the vehicle.*

**Objective:** *New technology from manufacturers can reduce the number of killed and injured motorcyclists.*



### 5.3 Diesel and oil spills from other vehicles

A fairly common problem affecting motorcycles and mopeds are leakage of oil or diesel from trucks and buses leading to the accidents. This is most common in roundabouts, at entrances and exits as well as near bus garages and petrol stations. The vehicles leak diesel because the fuel filler cap isn't closed or the tank is overfilled. Oil spills due to deficiencies in vehicle maintenance have been highlighted several times by traffic police and inspection bodies in the Tylösand Seminar.

One step in assuring the quality of transport in Sweden are that the clients requiring safe vehicles to be used and refueled in a safe manner. It would be easy for the manufacturers to make it impossible to start a vehicle if the fuel cap is not correctly mounted and to make overfilling impossible. The haulage industry can mention this to their businesses. Road authorities must warn road users of spill until spill and clean-up materials are removed and friction is back to normal – this is not always the case today.

**Objective:** *no motorcyclist should be killed or injured because of oil or diesel spills.*



## 6. FINAL REMARKS

Motorcycles have been a legal vehicle for more than a hundred years. There are currently around 315, 000 motorcycles on our roads and the number is increasing steadily each year. The motorcycle stock has tripled since 1990, thus motorcyclists and their specific needs must be taken seriously at all levels in the traffic environment, by all road authorities, and by society at large. This is not the case today. Too often SMC argue against opinions based on prejudice, lack of knowledge or simply an unwillingness to do anything to improve the traffic environment for those who ride motorcycles and mopeds.

SMC is a unique organization because we represent users of all types of motorcycles. SMC is a non-profit organization and are funded almost solely by member revenue. SMC, through its members and networks in Sweden, Europe and the rest of the world have a unique knowledge of motorcycles and motorcyclists.

Based on 51 years of experience, global research and statistics SMC believe that road safety must be based on the motorcyclists and implemented in collaboration with relevant government agencies and other parties as manufacturers, insurance companies and retailers. This is a view shared by the OECD and presented in their report published in the autumn of 2014.

## 7. The SMC Index - killed motorcyclists in relation to motorcycles in traffic

SMC have analysed the development of motorcyclists killed in proportion to the number of motorcycles in use since 1997 when Vision Zero was adopted. SMC have on that basis calculated an index showing the development of motorcyclists killed in relation to the vehicle stock. As the stock has more than doubled SMC believes an index is more accurate. When the Motorcycle Vision for was presented in 2008 the goal was to receive an index of 1.5 in 2014. This goal was achieved already in 2010.

Since 2009, the increase of motorcycles in traffic has slowed down, in recent years the increase has been about 3,000 vehicles per year. SMC estimates that the number of motorcycles will be 330,000 in 2020. To reach the target of 19 killed on a motorcycle 2020, the requirement is a SMC Index of 0.57. This target cannot be achieved without great effort by everyone involved, including SMC.

### SMC index, motorcyclists killed in relation to motorcycles in traffic

| Year        | Motorcycles in traffic | Killed    | SMC Index   |
|-------------|------------------------|-----------|-------------|
| 1996        | 121950                 | 42        | 3,44        |
| 1997        | 130041                 | 36        | 2,77        |
| 1998        | 137466                 | 40        | 2,91        |
| 1999        | 149970                 | 36        | 2,4         |
| 2000        | 167346                 | 39        | 2,33        |
| 2001        | 182092                 | 38        | 2,09        |
| 2002        | 201526                 | 37        | 1,84        |
| 2003        | 217015                 | 45        | 2,07        |
| 2004        | 235196                 | 56        | 2,38        |
| 2005        | 250000                 | 46        | 1,84        |
| 2006        | 268793                 | 56        | 2,08        |
| 2007        | 286867                 | 61        | 2,13        |
| <b>2008</b> | <b>296774</b>          | <b>51</b> | <b>1,71</b> |
| 2009        | 302671                 | 47        | 1,55        |
| 2010        | 303790                 | 36        | 1,18        |
| 2011        | 305323                 | 42        | 1,38        |
| 2012        | 307229                 | 30        | 0,98        |
| 2013        | 310047                 | 39        | 1,26        |
| 2020        | 330000                 | 19        | 0,57        |

**Source:** The Transport Authority, SCB. During the year 2010-2013 the persons killed on quads have been excluded.

**"It's not dangerous to ride a motorcycle. But, it will never be risk free"**

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