Motorcycle Safety

In Northern Ireland

The Rider's Perspective 2009

Revised September 2009 **Right To Ride**

Contents

Foreword

Motorcycle Safety in Northern Ireland – The Rider's Perspective aims to provide legislators, decision makers and motorcyclists with a document that collates the expertise of motorcyclists, based on years of experience, consultation and lobbying.

It also aims to be a starting point for discussion and debate to develop a strategy for motorcycle safety in Northern Ireland by encompassing all stakeholders including the motorcycle community, individual riders, clubs, groups and associations.

The issues within this document are linked to the priorities for motorcycle safety identified during the International Transport Forum/OECD workshop on Motorcycling, held in Lillehammer, Norway in June 2008. The twentieth priority summarized the importance of collaboration amongst all stakeholders: 'working together to achieve common objectives'.

Road safety has become a priority within the UK and targets set by the European Union drive policy for national governments and local authorities. While the objective to reduce road casualties is honourable and important and there are many within the motorcycling community who strive to find solutions to reduce casualties, the whole business of safety has become an industry which has taken on a life of its own. The measures and solutions that are put on the table are not necessarily the right ones because of the vested interests of the various stakeholders.

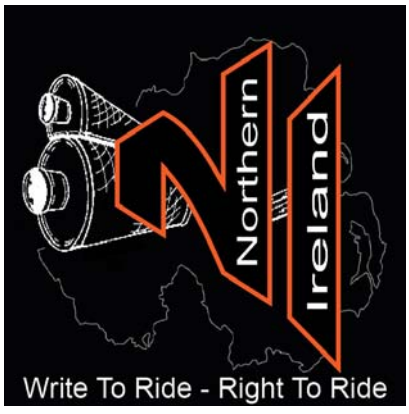
The most important piece of safety equipment on a motorcycle is the grey matter between the rider's ears.

For example research institutes receive millions of Euros from EU funding, with some projects that aim to find solutions, such as warning devices and other 'life-saving' gadgets, mainly set by political pressure and commercial targets.

Basic training for motorcyclists focuses on the machine, not on the rider, but, human behaviour is recognised as the greatest cause of road casualties. The motorcycle industry maintains that the market drives production and continues to advertise power, speed and a racetrack image of motorcycling.

Yet motorcycling is complex, there are many aspects of this mode of transport that are not understood, not only by decision makers and legislators, but even within the motorcycle community. There is a constant debate on issues such as survival skills and protective clothing, age of access and risk, but in Northern Ireland, basic training, could best be described as a pick and mix sweet jar.

The debate about motorcycling as a mode of personal transport needs to be based on evidence and facts for the benefit of the people of Northern Ireland.



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Executive Summary

➢ The number of motorcycles[1] on Northern Ireland roads has increased from 9,000 to over 31,000 in the last twelve years. Motorcycling offers an inexpensive, environmentally friendly and an effective means of transport.

➢ The Department for Transport (GB) and the Scottish Executive have recently compiled motorcycle strategies to find the most appropriate solutions to improve motorcycle safety. These examples show that the best way forward is to involve all stakeholders from End-users to National Transport authorities and local road safety experts. ***Now is the time for a motorcycle strategy in Northern Ireland.***

➢ No road safety initiative can ever make motorcycling risk-free, which is true for any activity. However, educating riders[2] - either novice or returning to motorcycling, how to tackle these risks and how to adapt and live comfortably in our modern society would unquestionably have an important impact in reducing injuries and accidents. No person should start riding a motorcycle without having undertaken basic training which must consider avoidance and evasion strategies and attitude.

➢ Fair and accessible insurance especially for younger riders would help to ensure that they are able to afford newer and better quality motorcycles. The present insurance regime stifles choice and access to motorcycling due to the unique method of classifying risk that is used by insurers in the United Kingdom and Ireland.

➢ Studies indicate that the vast majority of collisions between cars and motorcycles are caused by car drivers. Therefore in order to reduce fatalities and injuries resulting from collisions between cars and motorcycles it is important to develop campaigns to promote driver awareness *and* rider collision avoidance strategies.

➢ While personal protective equipment and clothing can be useful in crashes to prevent more severe injuries, this must always be balanced against the cost of buying a quality helmet, jacket, trousers, gloves etc which can be considerable and frequently driven by commercial advertising rather than reliability.

➢ The design of motorcycles has made them increasingly more specialised and increasingly safer. However, certain motorcycles are manufactured with race tracks in mind which can create problems both in terms of injuries and attitude as highlighted by accident causation studies in Sweden, the U.S. and the U.K.

➢ The Third EU Driving Licence Directive offers no improvements for motorcycle safety: the increase of the age of access to the different motorcycle licence categories will restrict motorcycling. This highlights the car industry's lobbying power in Europe. Within this Directive there is no mention of training and/or testing for car drivers or stepped access for young car drivers.

[1] The term 'motorcycle/s' includes scooters and mopeds also known at Powered Two Wheelers (PTWs)
[2] The term 'rider' is used to describe a motorcyclist, in the same way the term 'motorist' is used to describe a car driver.

- Conspicuity, or the ability of car drivers to see motorcyclists, is a key issue for motorcycle safety. One of the proposed solutions is dedicated running lights for all vehicles. This solution presumes that road casualties will diminish as a result, but statistical evidence proves this to be untrue.

- Traffic management applications of Intelligent Transport Systems (ITS) should be developed to include motorcycles. However, the Northern Ireland Assembly should exempt motorcycles from any planned road pricing scheme as part of the solution to traffic problems that may exist throughout Northern Ireland.

- Road authorities should ensure that traffic regulations include the needs of motorcyclists (continued access to bus lanes, filtering, advanced stop lines, etc.) as part of a strategic approach to resolve the problem of urban mobility.

- Some public road authorities have done little to improve road design with regards to motorcycle safety. The Institute of Highway Incorporated Engineers (IHIE) in the U.K. has, in consultation with motorcyclists, produced road infrastructure guidelines for motorcycle safety, for personnel working on road construction and maintenance.

OECD/ITF Workshop on Motorcycling Safety

Representatives of Motorcyclists Associations and Government Agencies in Europe actively participated in the ITF/OECD workshop which took place in June 2008 in Norway and had an important role in deciding the top twenty priorities identified in the workshop. This document on Motorcycle Safety in Northern Ireland includes references to the workshop and the priorities that resulted from the two day discussions.

These priorities, aimed at improving conditions for motorcyclists throughout the world are overwhelmingly, in harmony with the views of riders. In the cases where they are not, (Speed Warning Systems, Hard Wiring of Headlights and Global Technical Regulations) we will explain our position.

Summary of the Workshop[3]

The Norwegian Public Roads Administration, in co-operation with the Joint Transport Research Centre of the OECD and the International Transport Forum, hosted a Workshop on Motorcycling safety in Lillehammer (Norway) on 10-11 June 2008. The objectives of the workshop were to identify the real problems of motorcyclist safety, discuss practical solutions to these problems, and propose a set of measures to improve safety. Nearly 100 expert participants from 21 countries, representing the main stakeholders involved in motorcycling safety met in Lillehammer.

The workshop was one of the rare events at international level where high-profile stakeholders had the occasion to meet and exchange their ideas and views on motorcycle safety. The focus of the workshop was mainly on the 50 countries of the International Transport Forum, but safety issues at the global level were also considered.

Opening Session

The workshop was officially opened by the Norwegian Minister of Transport and Communication, Ms. Liv Signe Navarsete, along with Mr. Jack Short, the Secretary General of the International Transport Forum. During her opening remarks, the Minister underlined that motorcycles have a natural place in the transport system. At the same time, the vulnerability of motorcyclists requires a range of policy responses including increased training and awareness as well as responsible behaviour from the individual road users.

Mr. Short pointed out that motorcyclist fatalities were rising in many countries and that the problem needed urgent attention. Motorcyclists are paying a heavy price on the roads of many ITF/OECD countries, with the situation in most countries worsening in recent years. To attain the ambitious safety targets that have been set, there is an urgent need to address the problem of motorcyclist safety, and implement counter measures that are known to be effective. In developing solutions it is essential to consult and set up a dialogue process with all stakeholders, including the motorcyclists themselves.

[3] Workshop on Motorcycling Safety held in Lillehammer (Norway) on 10-11 June 2008, published 9th July, 2008

1. Training programmes
Countries have different training needs, based on their vehicle fleet and training resources. Motorcycle training should therefore build on existing standards, focus on risk awareness and risk avoidance, and develop an understanding of the rider/motorcycle capacities and limitations.

2. Transport and infrastructure policy
It is a fundamental motorcycle safety requirement that, by default, PTWs should have a place in overall transport policy and infrastructure policy/management.

3. Research and evaluation
Counter measures need to be based on scientific research into driver and rider behaviour and before-and-after evaluations should be conducted.

4. General driver training
A component on awareness and acceptance of motorcyclists should be included in the general training for all drivers, with a particular emphasis on the need for appropriate traffic scanning strategies.

5. Braking systems
Manufacturers should continue to introduce advanced (better) braking systems, such as combined brake system and anti-lock-brake systems.

6. Getting safety messages to the riders
Safety messages to riders should be developed in partnership with rider groups, in order to use the effectiveness of peer advice in communicating key issues to riders on issues that will impact their communities.

7. Integrated awareness campaigns
There should be regular, targeted campaigns addressing both motorcyclists and other road users, where necessary supported by other action e.g. enforcement, on safety-related subjects that include, mutual respect, protective equipment, speed, alcohol and drug issues.

8. Guidelines for the development of road infrastructure
Each level of government should include in their infrastructure guidelines, measures for accommodating PTWs, developed with input from relevant stakeholders. The guidelines should be relevant to the needs of the jurisdiction concerned and coordinated with other jurisdictions and levels of government. An international transfer of best practices is also recommended.

9. Portrayal of responsible riding
Codes of practice should be developed in order to promote and market motorcycling responsibly; the motorcycling press and rider organisations should also promote responsible behaviour codes.

10. Other Vehicle Driver awareness
To develop an awareness of PTWs and mutual respect between road users, education activities and campaigns should be set up from childhood, to emphasise that ”road safety means road sharing”.

11. Training for road designers
The needs of PTWs should be included in the basic training for road designers, highway and traffic engineers.

12. Protective equipment for riders
Where standards for protective equipment exist, they should be promoted; and where they do not, they should be developed, taking into account their safety performance, rider comfort, the ergonomics of their use, costs and the climate/regions where they will be used.

13. Policy dialogue
To enable communication and build mutual confidence, meetings between motorcycle stakeholders and policy makers\road authorities (e.g. forums, councils,) should be established, in order to exchange views, discuss needs and secure the necessary financing\resources for safety counter measures.

14. Roadway design
Identification and resolution of roadway design problems (e.g. accident black spots & “corridor” analysis of a sequence in the road structure) should include input from rider organizations & relevant experts**.**

15. Motorcycles in ITS
Enhanced awareness of motorcycles should be incorporated into the development of all vehicle ITS projects.

16. Innovation
Where proposed counter-measures are not based on objective research, but are supported by all stakeholders, policy makers should test and evaluate the proposal in a pilot scheme.

17. Speed warning systems
The safe management of vehicle speeds in the road network is improved by the use of speed warning systems, which may be on the vehicle or part of the road infrastructure; such systems should be encouraged as the technology is developed**.**

18. Global Technical Regulations
The minimum safety performance of PTWs should be based on Global Technical Regulations.

19. Headlamps in daytime
To improve rider/motorcycle conspicuity; for new motorcycles, headlamps should come on automatically when the engine is started; for other motorcycles, riders should switch on their headlamps before they start their journey.

20. Cooperation
Working together to achieve common objectives.

Introduction to Motorcycling

Northern Ireland has over 31,000 motorcycles in use, including mopeds and scooters, which range from 50cc to over 1000cc in engine size. The document "Northern Ireland's Road Safety Strategy", comments that in recent years there has been a significant increase in motorcycle ownership (from 9,000 in 1995 to over 31,000 in 2008).

According to the authors, *"This suggests that the increase in casualties has been considerably less than the increase in ownership"* and continues to comment that *"However, as there is a range of motorcycle user groups, whose frequency of usage can vary notably, ownership levels may not be an appropriate indicator of the degree of increased risk or vulnerability"*.

Within the transport planning of local and national authorities, this form of mobility offers positive solutions to problems of traffic congestion, parking space and opportunities for personal transport for those living in rural areas and young people seeking employment. However, the safety debate is sometimes used to minimize the more positive aspects of motorcycling.

The Road Transport Strategy (RTS) for Northern Ireland comments that *"the movement of people and goods is equally important and we recognize the economic consequences of increasing road congestion and long-term under-investment in public transport. We want to develop an effective, safe and reliable road network and a quality public transport system that can benefit society, provide real transportation choice for those living in both rural and urban communities and help us grow our economy in a sustainable way. The 10-year regional transportation strategy will identify a strategic approach to meeting our transport needs and enable us to identify the necessary improvements."* Yet within this 178 page document, there is no mention of the inclusion of motorcycles as part of this strategy.

There is recognition by the NI Government that *"The socio-economic breakdown of rural communities indicates that, especially in the west and south of the region, it includes a higher proportion of people in social need. Rural areas, in general, also include a higher proportion of younger people".* Furthermore *"The problem of poverty in rural areas is compounded by longer average travel distances and lack of public transport services resulting in an increase in the need for a car".* Also, "*Rural transport initiatives might help to improve access to employment, training and other services".* None of the objectives of 'New Targeting Social Need' have considered two wheeled transport as the most economic, affordable and reliable means of personal transport. This must be addressed.

Riders in Northern Ireland

There are different types and styles of motorcycles, (see annex 1) and in general terms, motorcycle use can be divided in two categories: 1) for employment: either commuting to and from or during work, 2) for social purposes. The typical rider is often regarded as an independent, freedom loving individual and while this may be true, there are many categories of motorcyclists using their motorcycles for a variety of reasons.

These range from the ***social rider***, who prefers the company of those who are like-minded - riding together, often members of a motorcycle club. Other categories include ***leisure riders***, who tend to be long-term and returning riders and own larger-capacity machines. The presence of leisure riders on roads dramatically increases during summer months.

Commuters are those who ride to and back from work, who use their motorcycle in all weather or combine it with other modes of transport, although many use their motorcycles for leisure purposes as well. ***Off-road motorcyclists*** ride road legal motorcycles on surfaced and un-surfaced public country roads for recreational enjoyment. Off road motorcycling is also a competitive sport and attracts riders of all ages. However riders may not simply slot into these separate categories because they use their motorcycles for different reasons.

Another category of rider involves motorcycle racing – ranging from race tracks and road racing events for ***amateur*** and ***professional racers*** who race on classic or modern motorcycles attracting thousands of spectators and motorcycle enthusiasts, whether they ride motorcycles or not, both from within and outside Northern Ireland. Motorcyclists attend a large number of motorcycle events - from rallies, which provide musical entertainment - to organised charity events raising thousands of pounds.

Businesses and government rely on a wide range of ***professionals*** using this mode of transport. For instance, couriers are frequently used to transport vital documents around the country. Police motorcyclists are a crucial part of law enforcement, not only in their capacity to arrive at crash scenes quickly or deal with law breakers, but they also play an important role in public celebrations, state functions and motorcycle events. Paramedics can cut through traffic in response to emergency calls and deliver vital medicine to save lives[4].

Advantages of Motorcycling

The current road infrastructure is under stress with the demands placed upon it by heavy and constant traffic flows, while maintenance budgets struggle to keep up with the level of repairs generated on the roads. Equally, the situation for public transport is very mixed. While networks exist in the cities, rural areas are frequently cut off from access to public transport. Many people who live in urban areas have to walk before they can take advantage of a public transport system which many see as too inconvenient and sometimes too expensive to use. This has led to an increased reliance on the car, leading to a further decline in public transport and an increase in traffic congestion.

..as highlighted in the second of the ITF/OECD report's top twenty list of priorities (2008), "it is a fundamental motorcycle safety requirement that, by default, PTWs should have a place in overall transport policy and infrastructure policy/management".

- Average motorcycles can consume up to 81% less fuel than cars on the same journey and require fewer resources to manufacture (1/7th) and take far less time to cover the same journey[5].
- Motorcycles cause a fraction of the damage to roads compared to other motorised transport, and thus are responsible for only a small percentage of the maintenance costs.
- Land given over to car parking space can be used more efficiently, providing a sustainable alternative to cars in many aspects of modern life and this (less cars) can have a positive impact on safety and the environment[6].

[4] Ref: European Agenda for Motorcycle Safety, 2007, FEMA
[5] European Commission Motor Vehicles Emissions Group
[6] Ref: European Agenda for Motorcycle Safety, 2007, FEMA

Emissions[7]

From April 2010 anyone buying a new car in the UK will pay a different rate of Vehicle Tax based on CO_2 emissions. However, motorcycles will not be included in these rates, because the CO_2 emissions for motorcycles (and mopeds) are not known. This is because the motorcycle manufacturers refuse to supply this information. This means that any potential savings on road tax will not be passed on to motorcyclists.

At the EU Commission's "MVEG Motorcycle Working Group" meetings in Brussels (2005)[8] the Swedish Environmental Protection Agency[9] submitted a paper to the working group proposing that the motorcycle manufacturers take responsibility by declaring the emissions for motorcycles at the point of manufacture. They point out that the declaration of emissions should be based on a test called "In Use Compliance". The substance of these two papers is that the authors believe the onus is on the motorcycle manufacturers to apply "In Use Compliance" which means that the manufacturer must test for emissions and declare them. It also means that if there are any faults, the manufacturer is obliged to recall the vehicle and repair it and the manufacturer would effectively be responsible for the emissions of the vehicle for a period of time after the sale of the vehicle.

In their response to the Swedish report, ACEM[10] state that they don't want the responsibility of declaring emissions (with the eventual problem of recalls) and they cite the following reasons:

- High variety of model and engine types, in most cases produced in low production volumes compared to other vehicle categories.
- Wide geographic distribution.
- Very high proportion of in-use vehicles being unsuitable for audit.
- Frequent changes of ownership making tracing difficult.

As part of the emissions debate, cycling has been promoted as an alternative to cars and motorcycles, however, cycle traffic on public roads fell dramatically from 23 billion passenger kilometres in 1952 to around 4 billion kilometres in the early 1970s in the U.K. Despite rising to 6 billion passenger kilometres in the early 1980s it was back at 4 billion kilometres in 1998. Walking and cycling are restrictive means of transport, in order to travel to work, the alternative is public or motorised personal transport.

Table one: Comparison of average trip length by transport mode **Miles/percentage**

	Average trip length					
	1989/19 91	**1992/ 1994**	**1995/ 1997**	**1998/ 2000**	**2002/ 2003**	**% change 1992/94-2002/03**
Walk	0.6	0.6	0.6	0.6	0.7	25
Bicycle	1.9	2.0	2.3	2.4	2.2	11
Car/van driver	8.0	8.2	8.5	8.6	8.5	4
Car/van passenger	8.6	8.9	8.6	8.8	9.0	1
Motorcycle	**6.1**	**7.0**	**8.6**	**9.3**	**10.4**	**47**
Other private	14.1	14.5	16.5	17.3	18.6	28
Bus in London	3.5	3.4	3.2	3.4	3.7	8
Other local bus	3.9	4.1	4.3	4.5	4.6	12
Non-local bus	63.7	60.0	59.5	61.2	91.0	52
LT underground	7.4	8.7	7.7	7.8	8.6	-1
Surface rail	33.4	31.2	30.9	34.2	34.1	9
Taxi/minicab	3.4	3.8	3.8	4.5	4.2	11
Other public	56.6	31.0	65.0	29.4	40.8	31
All modes	5.9	6.1	6.3	6.6	6.9	12

Source: http://www.statistics.gov.uk/StatBase/xsdataset.asp?More=Y

[7] Revised 5th September, 2009
[8] http://ec.europa.eu/enterprise/automotive/mveg_meetings/motos/meeting8/
[9] "In-Use Compliance for Motorcycles Draft Regulation Text Supporting Document (2005)"; "Principles and Elements Emissions Durability and In-Use Compliance for MC (2003)" http://www.naturvardsverket.se/sv
[10] http://ec.europa.eu/enterprise/automotive/mveg_meetings/motos/meeting8/moto_108.pdf

While environmentalists promote walking and cycling as an alternative to cars, reality and economics suggests that these means of transport are not considered by the vast majority of consumers, because distance and time matters.

As highlighted in the previous table, the percentage increase for motorcycle usage is the highest of all modes of personal transport and second to highest for ALL forms of transport. This confirms that the alternative to cars is motorcycles as the chosen mode of personal transport. Therefore it is the responsibility of the motorcycle industry to declare emissions to ensure that motorcycles can be accepted as an environmental alternative as well.

Social and Economic Issues

The economical and social role that motorcycles can play is important. Motorcycles are a cheap and effective means of private transport and provide social integration by supplementing public transport, ensuring independence and mobility. The wide range available offers a variety of choice in terms of motorcycle, scooter and mopeds and in terms of cost.

Motorcycles play a vital role in modern society. Companies, organizations and individuals place motorcycles at the heart of their business. Couriers, deliverers of small goods and/or food, health care services and the police take advantage of the incomparable cost/efficiency ratio offered by motorcycles.

Insurance[11]

In terms of compulsory motor insurance, public welfare is an important aspect of governance because mobility and social inclusion are dependent on the ability to have an affordable means of transport. This is especially the case for two wheeled transport.

Motor insurers in Northern Ireland are left to decide tariffs and rates with little or no interference from government, but with the added bonus (for insurers) of compulsion.

Within Europe there are variations to motor insurance which are dependent on the application of the (so-called) 'no –fault' schemes, and; 'liability-based' (or tort-based) systems.

What is apparent is that the practices of motor insurers in Northern Ireland have made motor insurance inaccessible for those most in need of cheap and efficient transport. Reasonably priced third party insurance for mopeds, scooters and motorcycles could address issues of youth employment and even resolve problems of anti-social behaviour by allowing young people the opportunity of movement and social inclusion.

The report 'on the Economics and Regulation of Insurance, March 2005, published by the Competition Authority in Ireland', found that the UK (and Ireland) is unusual in that there is no system of strict liability associated with the operation of motor vehicles, but one based on negligence which at least nominally, places the burden of proof of such negligence on the accident victim.

[11] Excerpt from The Fear Industry (2006); E.Hardy, PhD; www.fearofcrime.co.uk

Accordingly, the report finds that the claimant must in every case prove fault on the part of the alleged wrongdoer. The latter will generally be the driver of a vehicle involved in the accident, but may exceptionally be another person (e.g. a passenger or user of the vehicle who was not driving).

There is no restriction in the amount of compensation that may be claimed or the types of loss or injury in respect to which damages may be sought (e.g. no restriction of claim material losses only). Damages are reduced proportionately where the victim is partly to blame (contributory negligence).

In countries like Japan and Australia, however there is a fairer system of third party insurance which is strictly regulated by government and only includes limited risk factors: type of vehicle, engine size and location of domicile, therefore allowing an equal distribution of the cost of premiums for drivers and riders[12], in other words, there is no discrimination. For example in South Australia (2009), the highest cost of insuring a moped (50cc) is £31 ($65) and £171 ($360) per year for a motorcycle with an engine size of more than 660cc.

In Europe, the Netherlands seems to have the fairest insurance system, the calculation of third party motor insurance rates the vehicle only, which means that any person with the appropriate licence and permission of the owner can drive/ride the vehicle.

The Dutch regulating authority intervenes only to a limited extent in the establishment of rates by third party motor insurers. There are no prohibited rating factors. However, the prohibition of discrimination laid down by the Dutch basic law calls for equal treatment of everybody seeking insurance coverage.

Employment

With more than 31,000 riders in Northern Ireland, the financial impact of motorcycling in terms of cost-savings on industry, employment, tourism, tax revenues or congestion is considerable. Especially in recent months with the surge in the price of petrol, motorcycles became the only economically viable alternative to cars as a means of personal transport.

According to the 2001 Census of Northern Ireland, the total number of motorcycles, scooters or mopeds used by persons aged between 16 and 24 in employment who usually travel to work, was 5,527. In the same year there were 17,873 motorcycles (presumed to include scooters and mopeds) licensed by body type in Northern Ireland. This suggests that in 2001, 31% of two wheeled vehicles were used for commuting to work.

The average age of the Northern Ireland motorcyclist is increasing and men and women from all walks of life have taken up motorcycling for leisure and work. Motorcycles are ideally placed to be part of an integrated transport strategy, providing a transport solution for many who live too far from work to cycle and who have little or no access to the current public transport system.

In order to resolve problems of mobility for young people living in rural areas, in Great Britain there are over 50 ‘Wheels 2 Work’ schemes to help these young people travel to their place of employment. These schemes operate over 2000 mopeds, the National Wheels 2 Work team has forged a strong relationship with the Community Transport Association (CTA) in Great Britain. In a

[12] Downloaded 21st March 2009 http://www.transport.sa.gov.au/pdfs/ctpi_schedule_mr85.pdf

keynote speech to a CTA Conference, the Minister, Rosie Winterton described Wheels 2 Work as a *"dynamic form of Community Transport"*.

The website www.wheels2work.co.uk offers advice for young people on how to apply and local authorities on how to start up these schemes. Typical case studies are highlighted on the website:

Case Study

This 16 year old young man was offered an apprenticeship in a nearby town. One of the contributing factors to him being offered the apprenticeship was that he was able to say that he had applied to 'Wheels 2 Work' for a moped. This was in response to being asked how he would get to the placement. The young man heard about the scheme whilst still at school and was referred by his teacher. He lives 14 miles from where he will do his apprenticeship and has no other suitable means of transport. The fact that he had been offered this placement was influential when he was assessed as to whether he was eligible for a 'Wheels 2 Work' moped. He is now 2 months into his placement commuting each day the 28 mile round trip on his moped.

Education

In June 2006 the Motor Cycle Industry Association (MCIA)[13] issued "Links: connecting citizenship with road safety education", teaching materials for the key stage 4 citizenship syllabus, and distributed copies to all secondary schools.

Included are safety and lifestyle topics and discussion points that will support teacher's work with children to help them achieve an active life and develop a broader educational experience. The CD-Rom based resource incorporates road user education with the Key Stage 4 Citizenship syllabus and offers teachers and students the opportunity to explore issues such as Human Rights, Consumer Rights and Responsibilities and Crime, using road user education as the main focus.

There is a teacher's guide and also included are facts, opinions, useful websites and a number of puzzles and articles of interest which help students to understand that the issues being discussed are relevant to real life. The product is not motorcycle specific, but it encourages teachers to talk about mopeds, scooters and motorcycles as well as cars and other modes of transport. However, it looks at issues including safety clothing and CBT.

On June 18th 2009, Sammy Wilson, the (then) Minister of the Environment, officially handed over a new moped to Lagan College to help students taking the GCSE Motor Vehicle and Road User Studies. The moped is one of 29 new vehicles purchased with the backing of the Department of Finance to update the fleet across Northern Ireland schools. Motor Vehicle and Road Users GCSE was introduced into the curriculum in Lagan College in 2006 and has proved a popular choice for students at Key Stage 4.

Mr Wilson explained: "My Department's Road Safety Education Officers actively promote the timetabling of GCSE Motor Vehicle and Road User Studies in all post-primary schools and provides all of the teaching resources including a moped for the practical skill training element".

[13] www.mcia.co.uk

"This GCSE was designed to prepare students in Northern Ireland to become better and more informed users. It has the added benefit of providing a qualification accepted by employers and universities".

The subject content of GCSE Motor Vehicle and Road User Studies covers:

- vehicle control and road user behaviour;
- legal requirements;
- road transport and its effects on society;
- motoring mathematics;
- accident procedures; and
- motor vehicle technology

The section on vehicle control and road user behaviour includes practical moped skills training. Full details about the subject can be obtained at the Council for Curriculum Examinations and Assessment website[14].

[14] http://www.rewardinglearning.org.uk/microsites/mvrus/index.asp There is also information about the subject on the Department of the Environment's road safety website. Around 85 post-primary schools offer the subject to pupils. The Department of the Environment provides teacher training, teaching resources and the moped to schools teaching the subject.

Motorcycle Safety Initiatives

The success of any road safety action programme is dependent on 'Shared Responsibility'. Small contributions in many different areas can offer significant reductions in motorcycle crashes, injuries, and deaths.

Safety Strategies

The Department for Transport (GB) compiled a motorcycle strategy with the objective of finding the most appropriate solutions to improve motorcycle safety. This example demonstrates that the best way forward is to involve all motorcycle stakeholders including the industry, the consumer, transport authorities and local road safety experts.

In fact, the ITF/OECD workshop on motorcycle safety encourages policy dialogue in order "to enable communication and build mutual confidence, meetings between motorcycle stakeholders and policy makers\road authorities (e.g. forums, councils,) should be established, in order to exchange views, discuss needs and secure the necessary financing\resources for safety counter measures"[15].

Case Study

In 2004, a profile of the London rider was identified in a survey carried out by the University of Leeds[16]: The results found that London motorcyclists are three times as likely to ride for commuting or as part of work. They report - choosing to ride a motorcycle mainly to avoid congestion compared to the UK sample's general 'love of motorcycling'. They also commonly cite financial reasons for running a motorcycle. They use their machines, for commuting trips (or as part of their work), approximately twice as much as the remaining UK population.

Changing the behaviour of car drivers is as important as educating motorcyclists how to avoid crashes. Transport for London (TfL) commissioned a series of advertisements showing simulated crashes as a way of bringing the attention of drivers to the problem of 'not seeing' the motorcyclist and for motorcyclists to ride defensively. These were shown on television and in cinemas.

The combination of a surge of motorcycle usage in tandem with a modal shift from other forms of transport was helped by the fact that motorcycles are not being charged to enter the Congestion Charging zone in London.

In fact as a direct result of congestion charging, there was a significant decrease of killed and seriously injured between 2002 and 2005.

However, this was also true for all road users including pedestrians, which suggests that the reduction in car usage had a direct impact on the decrease of casualties in London.

[15] ITF/OECD Priority No.13
[16] Differences between London motorcyclists and those from the rest of the UK, Institute for Transport Studies, University of Leeds (2004)

Motorcycles in Bus lanes

In Great Britain, the Government's Motorcycling Strategy published in February 2005 seeks to facilitate motorcycling as a choice of travel within a safe and sustainable transport framework.

The strategy recognises that motorcycling has become increasingly popular and offers a number of benefits, by:

- offering a cheaper alternative to the car;
- providing independence and mobility;
- widening employment opportunities, especially where public transport is limited;
- providing a shorter journey time in congested traffic conditions; and
- reducing overall congestion as motorcycles occupy less space than cars.

Since 1995, several authorities have made permanent a number of experimental Traffic Regulation Orders allowing motorcyclists to use bus lanes. Various monitoring and research projects have been carried out to determine the effects of these schemes on both motorcyclists and other road users.

An experimental scheme, allowing motorcycles to use the majority of bus lanes in Northern Ireland, came into effect on 1 June 2004.

In London, after years of debate and trials, as from the 5th January 2009, motorcyclists are allowed to ride in the majority of 'with flow' red route bus lanes in London. Guidance to London motorcyclists to minimise the impact of sharing the road space with other vulnerable road users is offered as follows:

- 'Motorcycles In Bus Lanes' only refers to those bus lanes clearly marked with a motorcycle picture on the signs marking out the bus lane and does not apply to **ALL** bus lanes. In particular, motorcycles are not allowed into contra flow bus lanes.
- Motorcyclists are not permitted to stop or park in bus lanes during its period of operation unless in a designated parking space or in case of an emergency or breakdown.

Motorcycle Parking

Dedicated motorcycle parking in Northern Ireland does not appear to be a priority for most local authorities. Motorcycle parking in Belfast relies on "dead space" areas for motorcycles to park and one specific area at the "Black Man" has been used for decades by riders to park, utilising the barriers in place to secure their machines.

In some circumstances, the initiative to include motorcycle parking in towns in NI has come from the motorcycle community itself.

A recent example has been the inclusion of secure and dedicated motorcycle parking facilities in Newtownards, County Down.

According to the Scottish Guidance for Road Authorities on Motorcycles (2007), security of motorcycles at journey's end is an important policy consideration, due to the problems of motorcycle theft. Often all that is needed is an area that is in clear view and equipped with some fixed rail or other solid device to which the motorcycle can be locked.

The Scottish Guidance lists good practice in motorcycle parking which can be summarised as 'Near and Clear, Secure and safe to use and Useful':

- Near – Motorcycle users will naturally look for parking opportunities close to their destination because the relatively small-size and flexibility of the motorcycle allows easy progress through traffic and the exploitation of marginal parking opportunities without causing obstruction. (consideration of carrying of protective clothing and helmets will also mitigate against more remote parking);

- Clear – While the first consideration is especially true of very short stops, any difficulty in finding a suitable formal parking area will tend to negate the natural advantages of motorcycle use, if riders looking to park for any length of time are to use formal facilities, they need to be able to find them;

- Secure – Physical security measures will be a strong attraction for most riders needing to park for more than a few minutes. Casual users, motorcycle-tourists, etc. unfamiliar with an area are likely to find the prospect of secure parking very attractive. Physical security need not be difficult or expensive to provide, and inclusion of fixed robust features such as rails, hoops or posts designed to provide a simple locking-point for securing motorcycles is often all that is required;

- Safe to use – Personal safety considerations when using a parking area start with the surface on which the machine has to be manoeuvred, mounted/dismounted, which should be level (Slopes greater than 5% can cause reduced stability of parked machines) and be on suitable hard-standing. (Motorcycle side and centre stands can exert considerable loads, 100psi would not be unusual for larger machines). Secondary security feature such as lighting, seclusion, whether the scheme is covered by CCTV and the amount of passing pedestrians traffic all need to be considered when planning a facility. Where motorcycle-parking facilities are provided on the carriageway, sufficient space and visibility must be present to allow manoeuvring without significant risk of coming into conflict with other traffic; and

- Useful – where possible, in new developments where parking is provided, lockers and changing facilities should be provided for cyclists and motorcyclists. PTW parking should also be provided as close to the building access points as possible.

Standards for motorcycle parking are specified by the Northern Ireland Planning Service as follows:

- Parking provision for motorcycles will be assessed on demand. The number of motorcycles in use in Northern Ireland is approximately 2% of the total number of cars. Where provided or required the location of motorcycle bays within a development should take account of the requirements of users and recognize that they are vulnerable in tight or enclosed space.

- Motorcycle theft is also a problem that concerns most riders. The provision of carefully planned, secure parking facilities which provide for natural surveillance can help to reduce this concern. Additional security can be afforded through the provision of security bollards or in-ground motorcycle clamps to which motorcycles can be chained. Purpose built security systems are also available which clamp the front wheel of a motorcycle and include combined storage facilities for clothes and accessories.

Filtering and Lane Splitting

In broad terms, filtering by motorcyclists is defined as moving between traffic when other surrounding traffic is stationary. This is standard motorcycle practice and necessary for safe motorcycle travel. Lane splitting is defined as moving through traffic when other traffic is in motion. It can also refer to overtaking within the same marked lane in moving traffic.

The primary advantage of motorcycle transportation is the narrowness and acceleration capacity of a motorcycle which allows a rider to overtake and filter past other traffic.

Filtering is useful in heavy traffic flow conditions and facilitates road space management and mobility policy through use of road space which cannot be occupied by vehicles such as passenger cars. Thus, filtering contributes to road safety as it can increase the road space between motorcyclists and other mixed traffic. Furthermore, filtering is a defensive driving measure that increases motorcyclist visibility to car drivers and prevents 'rear end' motorcycle collisions[17].

Personal Protective Equipment

Riders in Northern Ireland recognise that personal protective equipment may help to reduce injuries and death. However, in terms of mitigating factors for injuries, the On The Spot (OTS) study carried out in Great Britain on behalf of the Department for Transport, (Feb. 2008) reports that protective clothing including helmets had no effect on the severity of the injuries incurred by riders. Table three shows a range of countermeasures for motorcyclists (behaviour). There were no significant effects of countermeasure on the accident severity rating.

Table two: The effect of countermeasures on ISI

Countermeasure	Mitigating factor	Relative effect on severity (difference from baseline)	Total Frequency	
			Present	Not present
Road user behaviour	Helmet worn	No effect	166	14
	Reflective clothing worn	No effect	174	28
	Dedicated motorcycle clothing worn	No effect	83	119

Source On The Spot study, DfT 2008, page 52 Table 4.39; (ISI: Injury severity index)

The ITF/OECD workshop on motorcycle safety (2008) addressed the issue of protective equipment for riders and recommended that "Where standards for protective equipment exist, they should be promoted; and where they do not, they should be developed, taking into account their safety performance, rider comfort, the ergonomics of their use, costs and the climate/regions where they will be used[18]".

[17] Victorian Automotive Chamber of Commerce (VACC) http://www.bikeraware.com/images/scen_docs/Terms%20Defined%20by%20VACC_Lane%20Splitting.doc Downloaded 15th August, 2007

[18] ITF/OECD Priority No.12

The Northern Ireland motorcycling community is safety conscious and riders have purchased protective clothing worth hundreds of thousands of pounds, therefore the use of personal protective equipment should not be made compulsory.

In fact the response to a questionnaire by BikeSafe Northern Ireland, demonstrates that the overwhelming majority of motorcyclists use correct protective clothing.

Table three: Protective Clothing

	% of respondents
Jacket with reinforced padding/armour on the elbow, shoulders or back	96.2%
Boots with reinforced padding/armour on the ankle, knee or shin	87.8%
Trousers with reinforced padding/armour on the knee, outer knee or hip	87.6%
Gloves with knuckle/palm guard	80.5%

There is some confusion with regards to the standards for protective clothing. The European Standards for protective clothing set minimum levels for various characteristics that should ensure that all clothing which claims to conform to the standards will provide a reasonable level of protection. Clothing, gloves and boots which are subjected to testing and carry an independent and recognisable mark of reliability are a less risky purchase than unmarked clothing.

Motorcycle clothing can be divided into three groups:

- Non-protective. Outer clothing which constitute a barrier to the elements: heat, cold, wind and rain. Claims for any other form of protection breach the PPE Regulations, UK law, and industry and riders' groups' agreements with the European Commission.
- Non-protective supplied with CE impact protectors. A non-protective outer garment, as above, fitted with for example accredited shoulder, elbow, knee and back protectors bearing CE marking.
- Protective. Jackets, trousers, one-piece or two-piece suits, boots and gloves which are claimed by the manufacturer to be protective. Tested according to the European Standard (or the Cambridge or SATRA standards) and bearing CE marking. Garments must be fitted with CE marked protectors.

Where CE marked protectors are fitted to a non-protective garment (for example a textile jacket, or leather jacket, trousers and suits), this is misinforming consumers, because it claims that the whole garment is approved, but it is not. Some garments feature a "CE" label which is sewn to the lining, but this refers only to the status of the fitted protectors[19].

Helmets

Helmets are designed to prevent head injuries and helmet use is widely accepted in the motorcycling community. The most important issue with helmets is that helmet brands are frequently driven by commercial advertising rather than reliability. In certain cases, helmets can actually be the cause of serious injuries, especially at the base of the neck in a head on collision.

The Department for Transport (GB) has issued guidelines for helmets. The scheme is called SHARP and is the Safety Helmet Assessment and Rating

[19] There is an excellent description of the issues surrounding personal protective equipment on the following website: http://www.pva-ppe.org.uk/standards.htm#EuropeanStandardsformotorcyclists

Programme for motorcyclists. SHARP enables riders to more easily select a helmet which matches their needs. It provides consumers with an independent assessment of the safety performance of helmets sold in the UK. The SHARP RATING reflects the performance of each helmet model following a series of advanced laboratory tests and rates helmets from 1-5 stars. SHARP now offers a single, easy to understand rating for helmet models available within the UK. The website: http://sharp.direct.gov.uk allows riders to rate the quality of their helmet of choice. The objective advice will help riders to choose the safest helmet suitable for them. The SHARP tests - which award ratings of between one and five stars - showed that the safety performance of helmets can vary by as much as 70%.

All helmets must meet minimum legal safety standards but the SHARP scheme uses a wider range of tests to provide riders with more information on how much protection a helmet can provide in a crash. However, Dr Nigel Mills, safety engineer from Birmingham University believes the European helmet testing system is flawed. During an intensive six-month study, Dr Mills found areas of concern, which has prompted the scientist to ask for SHARP ratings to be scrapped. Dr Mills feels that the British and European helmet standards could be amended to include tests for oblique impact protection, based on scientific consensus, with the design consequences considered[20].

The SHARP scheme only tests CE standard helmets, so if as Dr Mills implies, CE standards are flawed, then there is a major problem and this begs the question, are any of the helmets that riders wear in Europe fit for purpose? Irrespective of Dr Mills' findings, what the SHARP testing has highlighted is that the price of the helmet is not a measure for better protection. A helmet costing less than £100 may offer better protection than one that costs twice that amount.

Alcohol/Substance Impairment

An analysis of data from the Department for Transport's Road Accident Statistics in Great Britain showed that the percentage of motorcyclists who failed breathalyser tests in 2004 was lower than for all road users[21].

The 'On The Spot' Study (OTS) carried out for the Department for Transport in Great Britain compares the alcohol abuse of motorcyclists in relation to accidents with other road users. As highlighted in the following table, the percentage of motorcyclists involved in accidents was lower (with the exception of goods vehicle drivers) than other road users.

However, what is also true is that the severity of the injuries was far greater than other road users, (with the exception of pedestrians).

Table four: Alcohol and drug impairment

Cause	Vehicle Type	Frequency of accident-involved persons	Percentage of all persons for that vehicle type	Average ISI	% persons with severity of ISI five or higher
Impairment due to alcohol/drugs	Bus	2	4.3	0.00	0.0
	Car	227	5.8	0.78	4.5
	Goods	6	1.3	0.87	16.7
	Motorcycle	**5**	**2.5**	**3.28**	**40.0**
	Pedal cycle	2	2.8	1.97	0.0
	Pedestrian	9	6.3	4.92	66.7

Source OTS Study, page 38; ISI : Injury Severity Index scale of 1 to 8

[20] http://perg.bham.ac.uk/pdf/motorcycle_crash_invest.pdf
[21] Of the 26,857 motorcyclists involved in injury accidents, about 46 per cent were tested and there were 423 failures (1.6% compared to 2% for all road users). Failure rates were highest among 20 to 24 year-olds, mirroring the situation for all road users.

Though alcoholic beverages are frequently available and promoted at events targeted at motorcyclists, the effects of alcohol on judgement and vehicle operation skills are well known among motorcyclists and the vast majority of motorcyclists are cautious about drinking alcohol before riding, which is why most motorcycle events (or rallies) include camping facilities so that riders have the opportunity to stay overnight to 'sleep it off'.

Driver Awareness[22]

Collisions between cars and motorcycles can constitute more than 50% of all motorcycle accidents. Studies indicate that 8 of 10 collisions between cars and motorcycles are caused by inattentive car drivers, usually violating the motorcyclist's right-of-way. [23].

Several factors have been put forward, trying to explain why car drivers tend to overlook motorcyclists:

- Motorcycles and their riders are a relatively small component of total traffic and therefore the ability to recognise them is reduced. Many drivers do not have routine encounters with motorcyclists in traffic.
- Drivers tend to scan for large rectangular objects with their main axis being horizontal (cars) rather than smaller objects with their main axis being vertical (motorcycles).
- Cars have blind spots, such as door pillars, that can hide a motorcycle and rider.
- Objects and environmental factors, including other vehicles, roadside objects and light patterns can make it more difficult for drivers to identify motorcyclists in traffic.
- Distractions for drivers, such as eating, smoking, managing audio systems and operating mobile phones or GPS systems.

The most effective way to reduce fatalities and injuries resulting from collisions between cars and motorcycles is to focus on driver awareness and rider collision-avoidance strategies. Awareness of motorcycles and mopeds should become a compulsory element in initial driver training and licensing[24].

Priority number seven of the ITF/OECD workshop (2008) indicates that there should be integrated awareness campaigns, there should be regular, targeted campaigns addressing both motorcyclists and other road users, where necessary supported by other action e.g. enforcement, on safety-related subjects that include, mutual respect, protective equipment, speed, alcohol and drug issues.

In support of these recommendations, awareness campaigns should be implemented, especially to encourage car drivers to recognise the issues about 'inattentional blindness'.

[22] Ref: European Agenda for Motorcycle Safety, 2007, FEMA
[23] Data in the UK Department for Transport (DfT) report (2003) relating to collisions with other road users, highlights that 43% of motorcycle serious injuries are due to collisions with cars. The data from DfT Road Casualties report (2003) show that serious injuries are proportionately 3 times higher (24.5%) for motorcycles than for cars (8.2%)
[24] The EU Transport Commission has recently now decided to consult stakeholders about harmonizing driver training in Europe http://ec.europa.eu/transport/road_safety/consultations/doc/2009_06_22_training_education_consultation_paper.pdf .

Promotion of road safety should include:

- Motorcycle awareness campaigns.
- Driver awareness campaigns.
- Road hazard awareness campaigns.
- Educational programmes.

Enforcement should be used in extreme cases such as high speed and alcohol and/or drug use when driving. However the involvement of the police in issues such as mutual respect and protective equipment is highly subjective and is still open to debate as to the usefulness of some protective equipment in saving lives. Therefore this is not an area that law enforcement should enter.

Motorcycle Industry Advertising and Marketing Strategies

Motorcycle manufacturers advertise irresponsible behaviour such as encouraging riders to use the public roads like a race track and promoting stunts. However the industry is also involved at UN and European level, jumping on the safety band wagon by claiming that they want to reduce motorcycle casualties.

The incitement to take risks can be due to the marketing strategies of the motorcycle industry. With sales videos and websites[25] that encourage riders to do stunts like 'knee down', 'wheelies' or 'stoppies' or sliding the bike - these are the sort of actions that risk takers tend to enjoy -all those things that create an image of risk.

Advertising is important for the whole motorcycle industry and their products require an emotional acceptance by consumers.

Source: http://replica.yme.com/aerox-team-replica

Twenty years ago, the car industry realised that selling speed and power was detrimental to the safety of car drivers and stopped using this type of marketing strategy. Perhaps the time has now come for the motorcycle industry to "grow up" and realise that mobility for all, should not include advertising that promotes "Action Man" imagery i.e. stunts, speed and power.

The question to ask is: do people buy a type of motorcycle because the industry advertises them, or because there is a market for these motorcycles? There needs to be a debate that includes the industry, regulators and the motorcycle community.

Motorcycle Magazines

Overwhelmingly, motorcycle magazines are an important commercial part of motorcycling and cover issues from classic motorcycles, racing, maintenance, owner groups and so forth. However *some* motorcycle magazines can and do give messages that are overtly irresponsible: features relating to 'doughnuts' (spinning wheels), reckless riding on the back wheel, encouraging high speeds on public roads and a high risk mentality are not uncommon.

[25] http://www.youtube.com/watch?v=JHw2BpcImZE
http://www.harley-davidson.com/wcm/Content/Pages/2006_Campaigns/XR1200_minisite/XR1200.jsp?locale=en_GB&swfxrdna=1
http://www.streetfighter.ducati.com/main_en.html

These publishers are effectively doing motorcycling a great disservice and giving motorcyclists a bad name.

On the one hand they encourage bad habits and on the other complain about unfair legislation against motorcyclists.

Are these publishers giving the motorcycle public what they want or are they giving them what they think will sell their magazines?

These publishers need to think very carefully about the consequences of the mixed messages they give to young riders.

Peer Pressure

Discussions about attitude and rider performance are important to pass on information to encourage better riding techniques.

Experienced riders can bring novice riders 'back to reality' when showing off puts them at risk.

When motorcyclists meet at a clubhouse, at events, or ride together in groups, riding techniques are often the subject of debate.

More recently these meetings take place on the internet on motorcycle web forums where the issues have moved from the physical to the virtual world.

In fact many web forums have sections on skills, technical issues and general discussions about riding – what to do and what not to do.

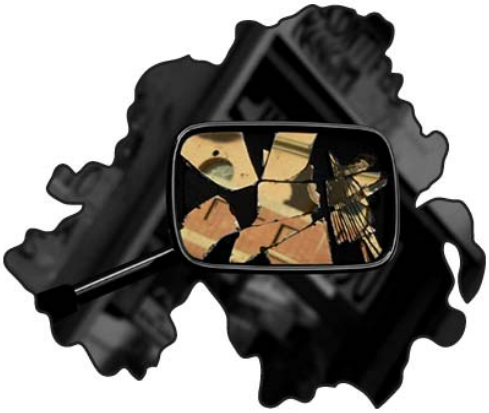
Young riders who strut their bravado on these forums are generally ridiculed for their boasts about risk taking, but also encouraged to ride sensibly (or in Northern Ireland terms, told to "wise up") by the more experienced and older riders.

According to the ITF/OECD report on motorcycle safety (2008), "safety messages to riders should be developed in partnership with rider groups, in order to use the effectiveness of peer advice in communicating key issues to riders on issues that will impact their communities"[26].

[26] ITF/OECD Priority number 6

Accident Causation

Riders support actions that are aimed at improving conditions for motorcyclists on Northern Ireland's roads. For the debate to have meaning, it is a fundamental prerequisite to look into the causes of motorcycle accidents in order to identify valid solutions.



Risk

Motorcyclists have more serious injuries than car drivers and occupants. This is because the rider is subjected to greater risk when an accident takes place. A minor collision between two cars usually causes material damage only, while a similar collision between a car and a motorcycle often results in an injured rider.

The ***experienced rider*** is also at risk, a rider may be faced with a situation that he/she has never encountered before and the reaction or non reaction may result in a collision. Riding a motorcycle is a never ending experience and clever riders of whatever age will continue to develop their skills and awareness well beyond any initial training to pass a motorcycle test.

Ultimately, no road safety initiative can ever make motorcycling risk-free, but this is true for any road user. However, educating young (and older) riders how to tackle these risks and how to adapt and live comfortably in our modern society would unquestionably have an important impact to reduce injuries and accidents, which remain part of everyday life.

Safety Awareness

Most riders are fully aware of the fact that they are vulnerable road users and that motorcycling requires specific skills and a positive, focussed frame of mind and in the United Kingdom, the motorcycling community has managed to substantially reduce the accident involvement rate over the last 20 years.

The fact that riders in Northern Ireland have purchased protective equipment worth hundreds of thousands of pounds indicates that motorcyclists are safety conscious. The motorcycling community also organises voluntary post-licence training courses/assessments such as BikeSafe and first aid courses, riders frequently participate in these courses at their own expense.

High Risk Takers

As in any sector of society, there are those beyond help and in motorcycling there are examples of foolishness that the average rider does not comprehend or support but recognises as a serious problem. Typically sports bike riders - and what is called the 'Weekend Warrior' - are a major problem for motorcycling, not only in terms of image i.e. sports bikes emulating the sound of a race bike and attitude but also in terms of injuries and death as highlighted by research which has demonstrated over the years that sports bike riders especially in rural areas have a higher percentage of crashes than other motorcyclists.

In Cheshire, England, the Infamous Cat and Fiddle Road to Buxton is frequently used by motorcyclists. The technical, twisting nature of the road offers a demanding challenge to bike enthusiasts but despite numerous safety initiatives over the years, 21 people were either killed or

seriously injured on this road in 2008. In 1998 an analysis of crashes in this area[27] found that 67% were due to errors by the rider and of these, 43% were sports bike riders. Other research in Sweden (2003), the U.K. (2004), Europe (2008) and in the U.S (2009) all highlight the same issues of casualties and sports bikes[28].

There is a whole culture of road behaviour which is fuelled by magazines, advertising of specific types of motorcycles, clothes, testosterone etc. Generally, these riders do not have the survival skills required to avoid crashing, but try to copy their race track heroes on public roads: things like 'knee down' or riding the bike on the back wheel or sliding the bike - these are the sort of actions that risk takers tend to enjoy - all those things that create an image of risk.

There is perhaps another aspect to be considered in terms of risk - and that is aggression – which is not only found amongst motorcyclists – however accidents and injuries caused by this human factor can be compounded when riding a motorcycle due to the vulnerability of this type of vehicle. The only possible solution to this type of behaviour is law enforcement, education and re-training, or perhaps the realisation at some point in time, that this rider's own mortality is fragile.

Ultimately, if there is to be an open debate about risk behaviour and how this may or may not affect the accident statistics, then it stands to reason that there should at least be a link between where and why the vast majority of accidents happen in relation to risk behaviour in order to identify "the problem" and not only of motorcyclists.

Accident Analysis

As previously mentioned, there has been a marked increase in the number of motorcycles, scooters and mopeds licensed in Northern Ireland in the last decade, from 9,000 in 1995 to over 31,000 in 2007. Not only are there more motorcycles on the roads, but there has also been a growth in motorcycles with an engine capacity of 500cc or more. The increase in motorcycle traffic is in turn reflected in proportion to an increase in the number of motorcyclist casualties in injury road traffic collisions.

According to a study by BikeSafe Northern Ireland, in which motorcyclists were asked: "How many collisions they had had while riding a motorcycle in the last three years", nineteen of the 58 respondents that reported having a collision during that time period, indicated that this collision was as a result of their bike being hit by another vehicle when both were moving.

Thirteen respondents reported having come off their bike while they were in motion, while 12 lost control of their vehicle due to a deposit on the road (e.g. oil, mud etc.). Nineteen of the 58 respondents reported that the collision they were involved in led to them or someone else sustaining a serious injury (i.e. a fracture or worse).

When casualty statistics are cited, the figures are generally absolute (total number) and by observing relative figures or rates (as a comparison to registered vehicles in circulation) a different story emerges (see Annex 4). In fact by observing rates of casualties in Northern Ireland, trends for killed have remained constant and decreased for seriously injured between 2003 and 2007. For this reason, it is important to monitor the outcome of road safety initiatives more rigorously. For example, when a motorist violates a give way sign and hits a motorcyclist, a common explanation is that the rider was speeding, or that the rider was impossible to see, which is now recognised as 'inattentional blindness' (see Annex 3), while in single vehicle crashes, when a rider loses control on a curve, a common explanation is that he was speeding.

[27] Rural Leisure Motorcycling – Addressing Accidents. John Moss MBE, Chief Road Safety Officer (Retired), Cheshire County Council
[28] Studies include the Swedish Vägverket SRA in-depth study (2003); DfT Indepth study of Motorcycling page 28 and 29, Road Safety Research Report No.54, Nov. 2004; European Road Safety Observatory (2006) Powered Two Wheelers, page 29, retrieved August 1, 2008 from www.erso.eu;
Motorcycle Crashes (2009): Insurance Information Institute. http://www.iii.org/media/hottopics/insurance/motorcycle ;
(SSB) Statistics Norway on behalf of the MC-Council: The Council consists of representatives from the Motorcycle Wholesaler's Association (MGF), Safe Traffic, Police, Vegdirektoratet and NMCU (Norsk Motorcykkel Union) – see page 37 this report.

However, in both rural and urban areas, motorcycle casualties are caused by a variety of factors that also revolve around road engineering and planning, coupled with behaviour, skills and attitudes between motorcyclists and other road users.

Statistics

Statistical information is problematic as a point of discussion regarding motorcycle safety. Different types of data are essential: data before and after the implementation of new safety policies and devices, along with impact assessment of new technology on other road users (e.g. A-pillar and daytime/dedicated running lights for cars, new ITS systems, etc).

Research

Effective initiatives preventing motorcycle accidents require an understanding of why accidents happen. Thus, there is a need for focused research, involving researchers with motorcycle expertise. In fact, in the NI Road Safety Strategy (page 24, 2.31) There is recognition that *"despite the significant increase in motorcycle ownership and KSIs[29], the DOE has not, to date, commissioned research on the composition of the motorcycling population in NI"* and the PSNI (Police Service of Northern Ireland)[30] has acknowledged that *"definitive figures on the number of motorcyclists are not available".*

The analysis carried out found that KSI levels for motorcycles over 125cc were proportionately twice those for lower capacity machines in 2003 and 2004. The authors of the report acknowledge that *"more definitive research on the motorcycling population and associated road safety risk is necessary in order to assist stakeholders in determining whether current strategy measures aims at motorcyclists are appropriately directed towards the key problem groups"* (page 24,2.32).

In fact, number three of the top twenty priorities of the ITF/OECD report (2008) highlights that counter measures need to be based on scientific research into driver and rider behaviour and before-and-after evaluations should be conducted.

In an interview with an American magazine[31], Prof. Harry Hurt argued that *"motorcycle safety and crashes are poorly understood"*. Hurt passionately believes that is because many investigators do not understand the difference between single-track and dual-track vehicles and they approach the subject with a car-centric bias instead of 'looking to find what's there' rather than what seems to have happened. He insists that 'investigators' also need to be riders themselves'. He said, *"If they aren't motorcyclists, they cannot accurately evaluate motorcycle accident cause factors".* Another example given by Hurt was that *"other studies have looked at 'characteristics' of motorcycle operators that make them dangerous. But, he asked, "Compared to what? They aren't doing any comparison to other populations."* He believes that this faulty approach leads to self-determining results.

The ITF/OECD workshop on motorcycle safety (2008)[32] recommends that "Where proposed counter-measures are not based on objective research, but are supported by all stakeholders, policy makers should test and evaluate the proposal in a pilot scheme".

[29] KSI = Killed and Seriously Injured

[30] PSNI Research Series No3 – Motorcyclist Collisions and Casualties in NI 2000-2004

[31] Motorcycle Consumer News, February 2005

[32] Priority number sixteen on Innovation

Motorcycle Accident Studies

The mid-term review of the European Road Safety Action Programme (RSAP) states that there is more potential for improving the protection of vulnerable road users in the event of a collision with a motor vehicle. Research (see annex 4) highlights that human factors play a major role in accidents involving motorcycles, and major in-depth motorcycle accident causation studies show that the basic problem is the issue of limited attention and perception of car drivers towards motorcycles and scooters[33].

Motorcycle collisions with other vehicles:

- There is a problem with other road users observing motorcyclists;
- Intersections are a well known location for motorcycle accidents, these accidents known as "SMIDYs" (Sorry Mate I Didn't See You) are generally due to cars violating the right-of-way;
- The majority of accidents occur in urban areas;
- Research has identified motorcyclists as the primary cause factor in less than 1% of all cases while car drivers were identified as the primary cause factor in over 50% of all cases[34].

Single vehicle crashes:

- While human behaviour has an important influence, the cause of the accident can be due to loss of traction, the inability of the rider to understand the capability of his machine, or simply due to bad road conditions;
- In the case of speeding or going too fast for the conditions of the road, lack of experience is often an important factor;

However, poor road design and maintenance can contribute to motorcycle crashes, injuries, and fatalities.

Road conditions and design factors can be hazardous for motorcyclists. Debris on the road can also cause a motorcycle to crash. In addition, roadside furniture may add to a greater risk for motorcyclists:

- Potholes can cause motorcycle crashes.
- Paint can interfere with traction. A motorcycle's traction can be seriously compromised by bituminous rubberized asphalt sealers which are used for crack repairs and plasticised adhesive pavement-marking tape.
- Diesel (and other liquid) spills can cause loss of traction and cause the rider to crash.
- Road debris poses a greater hazard to motorcycles than to larger vehicles. It can cause a motorcycle to lose traction.
- Metallic manhole or service covers, offer almost no traction, and are slippery when wet.

- Many roadside barriers designed to retain cars and reduce injuries to the occupants can be fatal to motorcyclists in the case of a collision.
- Other roadside fixtures, such as signage, which may yield when struck by a car, can injure a motorcyclist.
- Current work-zone signage practices may not adequately address the safety needs of motorcyclists[35].

[33] Ref: European Agenda for Motorcycle Safety 2007, FEMA
[34] MAIDS, 2004
[35] U.S. National Agenda for Motorcycle Safety

MAIDS and the On The Spot (OTS) Study

Between 1999 and 2000, the Motorcycle Industry collaborated with universities in France, Italy, Netherlands and Germany to undertake an accident causation study of motorcycles. The results were published in 2004. At that time, there were concerns that this study might not be relevant to the UK due to the differences in the structure of the PTW parc in those European countries compared to the UK.

Commencing in 2000, the TRL (Transport Research Laboratory) covering the Thames Valley area, and VSRC (Vehicle Safety Research Centre, attached to Loughborough University), covering the Midlands, provided expert investigators to attend the scene of an accident usually within 15 minutes of the incident occurring, using dedicated response vehicles and equipment.

The results of these investigations have provided over 200 motorcycle cases in the OTS database which can be analysed and compared to the MAIDS results. The results of the OTS study found that there were considerable differences between the accident populations of OTS and MAIDS data (See Annex 3).

The importance of these results is that there is no one “fit all” solution for the whole of Europe. Each individual country and even region has its own characteristics in terms of legislation, geography, weather, road infrastructure, training, type of vehicle (as the comparison between MAIDS and the OTS study has highlighted) and even the attitude of riders due to cultural differences.

Near Miss Research

While within the aviation, maritime and railway sectors, near miss – or pre-crash - studies have been an important part of safety research, neither the automotive nor the motorcycling sector has carried out any worthwhile research of near miss crashes.

A near miss is effectively an accident that did not happen but had the potential to do so.

A Near Miss Study of Motorcyclists in Northern Ireland, Southern Ireland and Great Britain

During the months of May through to July 2009, a survey of 257 motorcyclists in Ireland (Northern and Southern) and Great Britain was carried out through the internet. The purpose of the survey was to find out from motorcyclists, whether they had experienced situations in which they believed they could have crashed and/or been injured (but were able to keep control of their motorcycle) as well as the type of situations they had experienced.

Two approaches were used in the study. The first was a quantitative survey of motorcyclists in Northern Ireland, Southern Ireland and Great Britain (England, Scotland and Wales).

The questionnaire was developed using web based survey software, designed specifically for the internet. The survey was divided into three sections. The first section requested information about the rider, including age, sex, location of residence, type of licence and testing/training. The second section asked questions about the motorcycle: category, type and make of motorcycle, mileage, years riding and seasons.

The third section asked the respondent whether he/she had been involved in a collision either with another vehicle or a single vehicle crash, with or without injuries as well as whether the rider had had a “near miss accident”.

The “near miss” questions gave a selection of 26 potential answers divided into four categories: skidding, loss of traction, loss of control and braking or swerving. A further question asked the respondent to comment on any other “near miss” experience

From the findings from this survey, 75 riders indicated that their motorcycle skidded and of these 34.7% (n.26) indicated that this was due to “to slippery or loose road surface (e.g. paint or worn asphalt), loose gravel” while 28% (n.21) indicated that this was “due to oil spillage on the road”

53 riders replied that they had lost the grip of their motorcycle and 45.3% (n.24) of these stated that this was due to potholes or grooves in the road; in equal measure 17% (n.9) commented that their loss of grip was due to lack of focus and travelling too fast for the conditions.

56 riders replied that they had nearly lost control of their motorcycle and of these, 32.1% (n.18) stated that this was due to road markings or over-banding), a further 30.4% (n.17) indicated that this occurred at a curve and a further 26.8% (n.15) indicated that this occurred at a junction.

165 of the 201 (82.1%) riders that replied to these questions answered that they had to either swerve and/or brake because of another vehicle or pedestrian entering into their space. In fact 40.6% (n.67) answered that they had to swerve and/or brake because another vehicle had entered their path from either a side road, private driveway or opposite direction. This was followed by 15.2% (n.25) who stated that the other vehicle had changed lanes on the motorway in front of them and 13.9% (n.23) indicated that the other vehicle had crossed over into the rider’s lane and was coming towards them.

In September 2009, a focus group of expert motorcyclists including trainers, police, road safety officers and user group representatives was held to discuss the outcome of the study.

The topics for the focus group were divided into five areas:

1. Comments on the findings of the survey
2. Training for motorcyclists and car drivers
3. Road infrastructure, design
4. Policy, regulation, legislation and enforcement
5. Advertising campaigns for safety and motorcycle manufacturer/magazine advertising

The focus group considered training: both basic and advanced and identified strengths and weaknesses in the implementation of the 2nd European Driving Licence Directive as well as the problems of cost and interest for advanced training. Finally the focus group identified the importance of communication to riders as well as improving relationships between the motorcycling community and government authorities in order to reduce casualties.

The findings of the survey and focus group aim to support and compare to analysis of accident causation and prevention, in order to find solutions to reduce motorcycle casualties by identifying from the motorcyclists’ perspective, what are the more common points of collision and the causation of the collision between motorcycles and other vehicles as well as collisions between motorcycles and road furniture/infrastructure.

Training

Nobody should start riding a motorcycle without having undertaken structured, relevant and cost-effective basic training.

Unfortunately, this structure does not exist in Northern Ireland.

Furthermore, anecdotal evidence suggests that when a young person is given the option of choosing either free motorcycle clothing e.g. a helmet with their purchase of the bike, or a free training lesson, they will tend to choose the clothing.

...in fact, the first priority identified in the ITF/OECD report on motorcycle safety (2008) is training: "Countries have different training needs, based on their vehicle fleet and training resources. Motorcycle training should therefore build on existing standards, focus on risk awareness and risk avoidance, and develop an understanding of the rider/motorcycle capacities and limitations".

The Driver and Vehicle Agency undertook a consultation - Introduction of Compulsory Basic Training for Learner Motorcyclists and a Motorcycle Instructor Register in September 2007 although no report has been produced the replies have been coordinated.

The Department of the Environment (DOE) has produced a list of Instructors willing to train prospective motorcyclists for qualifying examinations.

This list is not a recommendation by the Department, it is for information only[36]. This can be seen as a slow start as initial rider training (CBT Compulsory Basic Training[37]) and direct access and the variance of training and testing with the remainder of the UK, has been in discussion for over a decade.

In Europe, most initial rider training schemes are influenced by the existing licence test. Thus, the quality of training inevitably reflects the quality of the licence test. Some rider training programmes just teach the skills needed to pass the licence test, instead of teaching the essential skills and knowledge needed to survive on the road.

At present, many initial rider training arrangements in the rest of the U.K. only address machine control skills. They usually focus on the exercises of the national licence test rather than the rider's needs to control a motorcycle on the road. Rarely do national initial rider training arrangements address the crucial areas of hazard awareness and avoidance or rider attitudes and behaviour.

It is important to identify the key factors in basic training that effectively make the novice rider capable of safely operating a motorcycle in normal traffic conditions on public roads.

[36] It should be noted that there is no legal requirement, for anyone who wishes to charge for giving instruction on riding a motorcycle, to be an Approved Motorcycle Instructor.
[37] A basic level of training before being permitted to ride unaccompanied on public roads.

1. Learning and understanding the intentions of laws and regulations aiming to promote and maintain road safety.

2. Learning basic rider traffic strategies, such as rider attitude and behaviour, interaction with other road users, speed choice, lane positioning, visual directional control, active hazard search, perception and anticipation.

3. Learning precise and effective machine control skills, based on the laws of physics, enabling the rider to be in control of the motorcycle when accelerating, cornering and braking.

The motorcycling community can provide essential input in developing and implementing training programmes. An impediment to a cost-effective initial rider training scheme is lack of consensus by various private companies and organisations offering rider training throughout Northern Ireland and the consultation of riders by authorities is often insufficient.

Awareness Strategies

Priority number four of the ITF/OECD report on motorcycle safety (2008) identifies the importance of general driver training and recommends that "a component on awareness and acceptance of motorcyclists should be included in the general training for all drivers, with a particular emphasis on the need for appropriate traffic scanning strategies. Motorcyclists cannot passively wait for the future impact of awareness campaigns and better driver education".

Generally experienced riders are less likely to be involved in collisions with cars. This is due to the fact that they have developed strategies for recognizing and avoiding collisions with inattentive drivers.

Key factors in a collision-avoidance strategy are:

- lane positioning, maximizing the rider's view on the traffic ahead and making the rider more visible to other road-users, such as car drivers waiting at or approaching a stop sign;
- observing techniques that enable the rider to predict the actions of others;
- speed adaptation and braking readiness;
- attitude, understanding defensive riding and good road manners.

These key factors in a collision-avoidance strategy should be emphasized in initial rider training programmes and disseminated amongst the motorcycling community.

Collision-Avoidance Skills[38]

Under certain circumstances, motorcyclists are able to avoid a collision if they have learnt to master effective collision avoidance techniques, such as emergency braking and swerving.

The retrospective amendments to the 2nd EC Driving Licence Directive require braking and swerving exercises to be included in motorcycle licence test (see section on testing).

In real life, effective emergency collision-avoidance manoeuvres are amongst the most demanding tasks a motorcyclist can perform, especially in wet conditions, which requires considerable practice and experience. Therefore collision avoidance techniques should be part of basic rider training.

[38] Initial Rider Training Project www.initialridingtraining.eu

Evaluation of crash avoidance skills training should include the following elements:

- Braking effectiveness in real-world traffic situations with the various existing and future braking systems.
- Cornering skills and strategies on the road.
- Swerving effectiveness on the road.
- Development of essential mental strategies for safe riding judgement, including visual directional control and an active hazard search, and anticipation.

However, experienced based knowledge shows that such manoeuvres are extremely difficult to carry out in real-life situations, particularly for inexperienced, novice riders. It requires skills and experience to be able to apply the correct braking force to the two systems. It is also one of the most critical operations, especially in panic situations.

A typical error in a panic situation is generally the incorrect use of the brakes, causing the wheels to lock and the tyres to lose grip. Riders often fail to avoid collisions through insufficient use of braking force because of the fear of over-braking and losing control.

According to Duncan MacKillop, a motorcycle instructor in Great Britain, in an accident scenario the rider is confronted to a fundamental surprise, where the instinctive reaction is to try to stop rather than to take avoiding action. Because the rider is looking at the car, the result of this reaction is to collide with the car. One of the co existing conditions during fundamental surprise situations is most often that of fear.

In a fundamental surprise situation only those actions that are instinctive or which can be performed without command will be used (in an emergency, you will only do what you know), any strategies that need any conscious thought processes will immediately be abandoned. Hence, just knowing about a strategy will not be sufficient for that strategy to be implemented in an emergency. [39]

Instructors

The quality and effectiveness of training is also highly dependent upon the instructor's competence. No one should be allowed to offer training without having participated in a recognised instructors training programme.

As previously mentioned, the Driver and Vehicle Agency undertook a consultation - Introduction of Compulsory Basic Training for Learner Motorcyclists and a Motorcycle Instructor Register in September 2007.

It would appear that the majority of responses were in favour of this introduction. However, the introduction of such schemes in Northern Ireland will require a considerable amount of preparatory work. Basic Training is a Great Britain initiative and is not essential in other European Member States. Whilst there is agreement that CBT is a worthwhile scheme, Great Britain has decided to review and improve their scheme and, in preparing for CBT in Northern Ireland, the DVA will take account of the improvements being considered by Great Britain.

From a road safety and consumer perspective, if basic rider training is comprised of a specific syllabus and methodology as well as competent instructors, the community at large would benefit from a better trained, safer rider and the rider would get a better deal having received quality instruction.

[39] Baird T, Hardy E (2006): How Close is Too Close: Concerning collisions with Cars (MAG UK)

Voluntary Post-Licence Training

There are a variety of voluntary post-licence training courses available: from simple, free refresher courses organised by motorcycle clubs, to highly advanced, track based courses.

Voluntary post-licence training is extremely useful for those attending, but at present such courses are insignificant in the overall motorcycle safety picture, simply because only a minority of motorcyclists make use of the offers.

The need for voluntary post-licence training is closely connected to the quality of basic rider training: If basic rider training is insufficient, there may be a greater need for voluntary post-licence training as a remedy.

If such courses are to be effective, instructors must be competent and recognised through official registration schemes.

Licensing

The main purpose of the licence test is quality assurance of the candidate's basic skills and knowledge, which are the minimum skills and knowledge required to operate a motorcycle safely on public roads.

For this reason, it is important that the licence test is designed to do exactly that.

Unfortunately, many initial rider tests still expose candidates to exercises with absolutely no relevance to real-life road safety.

The retrospective amendments to the 2nd EC Driving Licence Directive are an attempt to address this problem.

However there are concerns as to whether they will actually improve the candidates' competence[40].

All initial rider training schemes are influenced/steered by the existing licence test and the quality of training inevitably reflects the quality of the licence test.

The task of evaluating 'A' licence candidates requires competency.

It is unlikely that a person who does not have extensive motorcycle experience would be able to do the job effectively.

Therefore, basic guidelines for a quality assured motorcycle licence test would be help tremendously in developing future riders in Northern Ireland.

[40] Ref European Agenda for Motorcycle Safety, 2007, FEMA

2nd European Driving Licence Directive

Northern Ireland was the first region in the UK to introduce the retrospective amendments to the 2nd European Driving Licence Directive on the 8th December 2008 [41]. The test introduces a series of exercises to be assessed as part of a motorcycle manoeuvres test.

Accordingly, the motorcycle manoeuvres test is intended to ensure that motorcycle test candidates can demonstrate that they are competent in the control of their machines at a more demanding level than is currently the case. The aim of the test is to improve the standard of road safety for motorcycle and moped riders and ultimately all road users.

The motorcycle test for categories A, A1 & P will be split into 2 separate tests:

- Motorcycle manoeuvres test; and
- The on-road test

This means that there will be three tests, which must be taken and passed in the following order:

1. Theory test;
2. Motorcycle manoeuvres test; and
3. The on-road test.

In December 2006 the European Parliament voted in favour of the 3rd European Driving Licence Directive. (Annex 5). The UK Government is in consultation with all stakeholders to deliver the motorcycle aspects of the directive in the UK. As defined in the directive, this should be implemented by 2013.

3rd European Driving Licence Directive

This Directive will introduce an overly complex licence structure for young and new riders. It seeks to harmonize motorcycle licences across Europe but introduces various age ranges for access to motorcycles and mopeds that each EU country may introduce (see Annex 5).

At this stage there has not been an agreement within the directive as to whether there will be another test or training "a test or at least seven hours of training" between A2 and A licence categories. The Directive was voted on by the EU parliament without any guidance for a structure in terms of testing. For example there is no indication of what each test should involve, only that there must testing.

There is progressive access with categories and depending where the rider wants to commence (which is related to age), there must be a test. Before moving between categories (A2 and A), the rider must complete a further test (or training), but this has been left to a committee (somewhere within the bowels of the European Union legislative structure), to decide whether this should be training or testing and what this should entail.

[41] http://www.dvtani.gov.uk/practicaldrivingtest/testcategoriesmotorcycle.asp#MotorcycleManoeuvresTest

The problem is that these legislators put together the structure for this Directive without listening to the advice of motorcycle experts, therefore the category (engine size/output) of motorcycles to be used in the training/testing is now being decided retrospectively by the above mentioned committee.

In other words, legislation has been introduced without a clear understanding of the issues, and now there is a rush to consult experts in order to make the directive operative.

What is possibly the most unfortunate outcome of this directive is that there is no guarantee that it will have the slightest affect on road safety although undoubtedly, the costs for governments to implement it will be eye-watering.

In the case of Southern Ireland, there is another issue which compounds the debate regarding motorcycle safety and the pressure to increase training for motorcyclists. Until recent changes in legislation, car drivers with provisional licences did not even have to be accompanied, which according to the Road Safety Authority, was a cause of numerous motorcycle casualties (14% of all motorcycle casualties).

As of June 2008, fines will be imposed on learner drivers who are not accompanied by a driver with at least 2 years' experience.

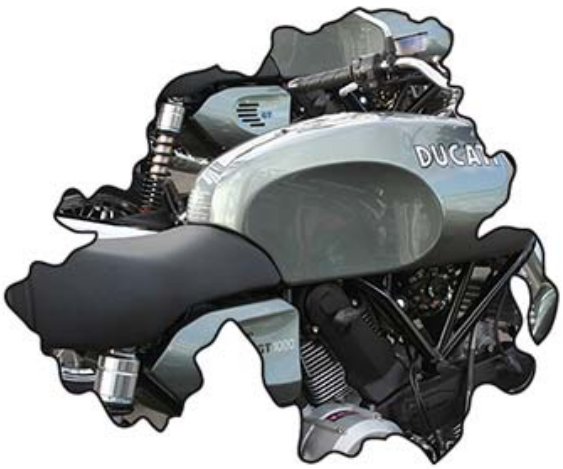
Analysis revealed that the trend in the number of motorcyclists injured each year in collisions involving unaccompanied learner drivers of other vehicles is decreasing (possibly due to the change in legislation). In 2006, 59 motorcyclists were injured by unaccompanied learner drivers compared to 157 in 2002.

At the end of 2007, there are 427,724 drivers with provisional licences of which 65,523 are aged 40 years and over (9,054 are aged over 60 years). The total number of provisional licence holders in the Republic of Ireland represents more than 20% of total licence holders.

While this may be an issue for the authorities in Southern Ireland, the implications of this situation on road safety in Northern Ireland must be taken into consideration as there are many citizens who travel back and forward over both sides of the border.

According to the ITF/OECD report on the workshop for motorcycle safety (2008) priority number eighteen recommends that "The minimum safety performance of PTWs should be based on Global Technical Regulations".

This is contentious, as the World Forum for Harmonization of Vehicle Regulations (WP.29) and its various working parties at the UNECE (United Nations Economic Commission for Europe) depends on the strength of lobbying, thus the influence of motorcycle manufacturers which are strongly represented, as well as the car lobby that has its own vested interests, is a major problem for the motorcycling community in this arena.



This is compounded by governments with their strength and agendas that tend to recommend only technical regulations as a solution. The representation of consumer interests is highly limited in challenging preconceived views and industry positions in this forum.

It is true that the design of motorcycles has made them increasingly more proficient and specialised and generally reflects a greater emphasis on safety. Current motorcycles have better brakes, greater stability, more responsive steering, more effective controls, improved ergonomics for reduced fatigue and improved reliability in all systems, than those of even a decade ago.

However, according to Prof. Harry Hurt[42], Sport bikes with raised gas tanks can be a problem. He argues that this design is perfect for racing, as a rider can tuck-in, resting his torso on the shape, to maximize straight-line speed. But *"there aren't many frontal collisions on the track. In real-life, though, frontal collisions are the most common form of crash".*

Based on 70 in-depth evaluations of specific cases that Prof Hurt's team of experts has already done, they discovered that the racing gas tank design results in far more serious pelvic and groin injuries, including the so-called 'Open Book Fracture' of the pelvis'.

Vehicle Equipment

Because motorcyclists are usually separated from the motorcycle at some time during a crash, protective equipment attached to the motorcycle, e.g. so called 'leg protectors' or airbags, is less likely to be effective than protective clothing and should not warrant serious attention[43].

Tyres

Tyres have advanced significantly, contributing to the performance, reliability and safety of the motorcycle. Modern tyres offer better traction for turning and stopping, particularly in wet conditions. However, more awareness about tyre pressure and the depth of the tread of the tyres is extremely important, because low pressure or bald tyres can cause serious accidents.

[42] Motorcycle Consumer News, February 2005
[43] as highlighted in both the Hurt report (1981) and the MAIDS report (2004) – see Annex 4

Brakes

Brakes are significantly more powerful, and most motorcycles now have hydraulically actuated disc brakes. The majority of motorcycles still have two separate brake-control systems, one for the front wheel and one for the rear wheel.

Priority number five of the ITF OECD report on motorcycle safety (2008) recommends that manufacturers should continue to introduce advanced (better) braking systems, such as combined brake system and anti-lock-brake systems.

To compensate for the tendency of riders to over-brake the motorcycle in a panic-situation, several motorcycle producers have developed anti-lock braking systems (ABS) or linked front and rear applications (Combined Braking Systems).

Although the progressive introduction of affordable advanced braking systems (anti-lock braking systems and/or combined braking systems) on all new motorcycles and scooters may help to reduce certain types of crashes, there still needs to be more research to understand the consequences of braking with ABS or Combined systems, whether these brakes may effectively create different dynamics when braking suddenly.

Power Limitation

However with regards to 74Kw Power limitation (100bhp) for motorcycles, the results of the 1997 study[44] completed by the TNO, carried out on behalf of the European Commission are still binding. The study identified that, *"there is no scientific evidence that engine size is a major factor in motorcycle accidents; engine size does not emerge as a separate risk factor".*

The study indicates that *"For most scenarios where the engine power has been or could been a factor there is no evidence that a restriction in engine power, to e.g. 74 kW, would have avoided the occurrence of the accident."* It also identifies that, *"A risk exists that 74 kW motorcycles will be constructed with extreme low weights introducing unnecessary stability or failure risks."*

The study does not just concentrate on the BHP/kW issue and the relation to accidents it reports that, *"The riders' age, experience, annual mileage and attitude, but also the situation at the accident site, the weather, etc., are some of the many other factors which influence the occurrence of motorcycle accidents".*

France is the only EU Member State to have opted to limit L3 vehicles to 74 kW. However, an official report published recently considers withdrawing this ban *"because it has not been seen as making a significant impact on motorcycle road safety".*

This report[45] questioned the usefulness of the law which restricts motorcycles to the maximum of 100bhp. This feasibility study of the technical inspection of motorcycles, recognizes the lack of benefits in terms of safety of the 100bhp limitation to the power of motorcycles.

Another study from the Transport Research Laboratory in the UK (TRL) produced a report in 2004 entitled 'The Accident Risk of Motorcyclists' which concluded that there was no link between engine size and accident risk[46].

[44] Motorcycle power 74kW study Phase B Report prepared by TNO for European Commission DG 11, Industry. Report No. 97.OR.VD.056.1//PR
[45] http://www.ladocumentationfrancaise.fr/catalogue/9782110069795/
[46] The authors were B Sexton, C Baughan, M Elliott, and G Maycock.

Sports bikes that tend to attract high risk takers do not necessarily have the most powerful engines or the highest power-to-weight ratio: they can be as low as 125cc. Therefore, restrictive legislation based on engine capacity, power output or high power-to weight ratio would not solve the problem at all. The problem is attitude, largely encouraged by the marketing strategies of motorcycle manufacturers.

Norwegian Surveys - 74 KW Power Limit for Motorcycles

(SSB) Statistics Norway on behalf of the MC-Council[47] conducted an analysis of motorcycle accidents in 1999. Similarly analysis was also made of accidents in 1993, 1995 and 1997[48]. SSB concluded that the results for 1999 are at least as clear as for previous years; some of the models with a "fierce image" are almost three times more often involved in accidents than other models with a "kinder image" this despite the fact that motorcycles with a "kinder image" in several cases have significantly more power.

The report comments that the most striking comparison is with the two models from the manufacturer Kawasaki. According to the report, “both model ZX-7R and model ZZ-R 1100 must be described as powerful Super Sport motorcycles”. However, the authors argue that, the smaller ZX-7R (750cc/122hk) has an accident involvement of 46.7 per 1000, while the ZZ-R 1100 (1100cc/147hk) only has an accident involvement of 4.5 per 1000 which illustrates the fact that the motorcycle community understands and buys ZX-7R as a "hasty" street racer while ZZ-R 1100 is seen and purchased as a "good" "mild" image touring bike.”

The report continues, by highlighting that technical limitations would not resolve the problem of accidents because there is no connection with motorcycle characteristics such as volume, power or a correlation between weight and power. Finally, the report points out that Supersport motorcycles have a number of safety characteristics such as brakes to support the rider, but ultimately the motorcycle is not the problem, but “the setting, competence and decisions of the riders are”.

Swedish Study - 74 KW Power Limit for Motorcycles

In 2003 the Institute of Transport Economics, published the “Motorcycle safety - a literature review and meta-analysis”[49] The following headings contained in the summary refer to power and risk of accident.

Measures Aimed at the Motorcycle

The studies that were analysed, found no link between power and risk of accidents. In this context, it was concluded that there was no guarantee that banning the largest heavy motorcycle or regulating the use of these more stringently would be effective. The evidence suggests that the driver and driver behaviour is the main cause of accidents, not the engine size of the motorcycle.

[47] The Council consists of representatives from the Motorcycle Wholesaler's Association (MGF), Safe Traffic, Police, Vegdirektoratet and NMCU (Norsk Motorcykkel Union)
[48] (In Norwegian only) http://arkiv.nmcu.org/publ/ssb_1995/index.html; http://arkiv.nmcu.org/publ/ssb_1997/index.html; http://arkiv.nmcu.org/publ/ssb_1999/index.html
[49] http://www.vv.se/filer/27656/2_motorcykelsakerhet_en_litteraturstudie_och_meta_analys.pdf

Countermeasures Aimed at the Rider

Combining power restriction of motorcycles with age limitations (graduated licensing) does not seem to have any effect on safety. Although the number of accidents with powerful motorcycles has decreased after the introduction of power restrictions, this positive effect is outnumbered by an increase in accidents with light motorcycles.

Countermeasures Aimed at the Motorcycle

There is no evidence of a relationship between accident risk and motorcycle engine size/effect. On this basis, it is concluded that banning or restricting the use of the most powerful motorcycles will probably not make any effect upon safety. The "image" of the motorcycle (especially the "super sport image") seems to be of more relevance concerning accident involvement.

In the review, there is reference to the regulation of engine power. The review highlights that there has been a series of studies on the relationship between the volume of motor scooters and motorcycles and the risk of accidents with these vehicles[50].

Results from these studies vary quite a lot and demonstrate that the well-controlled studies found a significantly weaker link between the engine and the risk of accidents than in poorly controlled studies. Well controlled studies meant surveys that take into account the largest number possible of the other factors, in addition to the engine, affect the risk of accidents.

According to the review, the best-controlled study was Ingebrigtsen (1990), because this study controlled for gender, age, experience, motorcycle make, model, annual mileage and a target of risk appetite and linked to these factors was the difference between the engine volume of heavy motorcycles and the relative risk of accidents.

The review concluded that there are no guaranteed benefits by banning the largest heavy motorcycles or by regulating the use of these more stringently.

Conspicuity[51]

The problem of the lack of perception of motorcycles by car drivers is a key-area for motorcycle safety.

Blind spots on cars and trucks make it harder for drivers to see motorcyclists, while mirror design may compromise the ability of drivers to detect oncoming motorcycles. In fact, while there have been improvements in the design and safety of cars in relation to vulnerable road users, this does not always include testing for the safety of cars in relation to motorcycles.

An ongoing issue is the improved car structure by using thicker, more steeply angled *A-Pillars*. A-pillars have been thickened in recent years to stop the main structure crumpling in crashes and to accommodate airbags. Manufacturers have also lengthened the pillars to produce sleeker designs. The problem however is that the front field of vision for drivers is being greatly impaired.

[50] Kraus, Riggins and Franti 1975 (USA); Nordic Trafícksäkerhetsråd 1975 (Sweden); Hurt, Ouellet and Thom 1981 (USA); Lekander 1983 (Sweden); Källberg 1986 (Finland); Carstensen 1987 (Denmark); Koch 1987 (Germany); Broughton 1988 (UK); Ingebrigtsen 1989 (Norway); Mayhew and Simpson 1989 (Canada); Ingebrigtsen 1990 (Norway); Taylor and Lockwood 1990 (UK); Rogerson, Lambert and Allan 1992 (Australia); Hayworth, Smitj, Brum and Pronk 1997 (Australia); Nilsson 2002 (Sweden)

[51] Ref: European Agenda for Motorcycle Safety, 2007, FEMA

While drivers pulling out at junctions without seeing an approaching vehicle - is recognised as the major cause of motorcycle collisions, the new thicker designed *A-pillar* aggravates the situation, by creating an additional blind-spot.

A loophole in European safety rules on visibility allows longer pillars to be thicker. Because these rules are based on an average-sized person, they may affect conspicuity[52].

Daytime/Dedicated Running Lights[53]

The European Road Safety Action Programme (RSAP) addresses the problem but at the same time calls for the mandatory use of Daytime Running Lights (DRL) for all vehicles.

The European Commission has now opted for 'dedicated' daytime running lights (diode lights) rather than dipped-beam headlights, in order to reduce road casualties. However, in spite of more than fifty studies on daytime lighting over thirty years, the case in favour of daytime running lights – of any type - is politically driven and still lacks sufficient evidence, due to the difficulties in achieving a reliable measurement of the effect of DRL [54].

By examining casualty data for all road users over a 15 year period in countries that have compulsory DRL with countries that do not, the results give a very clear picture of the effectiveness of DRL.

Table five: Percentage change in fatalities 199-2005

	Austria	Belgium	Finland	G.B.	Ireland	NL	Norway	Sweden
1990	1558	1976	**649**	5217	478	1376	**332**	**772**
2005	768	1089	**379**	3201	400	750	**224**	**440**
	-50.7%	**-44.9%**	**-41.6%**	**-38.6%**	**-16.3%**	**-45.5%**	**-32.5%**	**-43.0%**

Table six demonstrates that Austria had a 50.7% reduction in fatalities between 1990 and 2005 - prior to the introduction of DRL in 2006; Belgium and Netherlands had similar results in fatality reductions, respectively 44.9% and 45.5% less fatalities in 2005 compared to 1990.

Sweden (a DRL country) had a 43% reduction in fatalities, while Great Britain had a reduction of 38.6% over the same period. Finland (a DRL country) had a 41.6% reduction followed by Norway (a DRL country) with a reduction of 32.5% over the same period.

Finally Ireland had the lowest reduction in fatalities between 1990 and 2005, of only 16.3%. In the event, three non DRL countries (Austria, Belgium and the Netherlands) had a higher overall reduction in fatalities compared to the DRL countries during the same period.

According to the Irish National Road Authority (NRA)[55], the most important factor contributing to a large extent to road fatalities in this country (92%) is the behaviour of the road user and the behaviour of drivers contributes to 76.9% of road fatalities. The NRA document highlights two principle causes as excessive and inappropriate speed and driving while intoxicated, whether through drugs or alcohol.

[52] A report from the Transport Research Laboratory (March 2006) confirmed that smaller drivers have a particular problem in seeing around the pillars because they sit closer to them and their line of sight intersects with the thicker base. The researchers reconstructed ten crashes in which a driver claimed not to have seen a vehicle before colliding with it. It concludes that the pillars could obscure the view of approaching vehicles for several seconds, meaning The report highlights that car A-pillar obscuration could be a contributory factor in some road traffic crashes. Collisions potentially associated with A pillars were significantly more likely to occur at T-junctions and are more likely to involve car drivers failing to see vulnerable road users (motorcyclists, pedal cyclists and pedestrians).'

[53] MAG Response to European Commission Daytime Running Lights Consultation September 2006 pdf 204kb

[54] Prower, S., Research officer of the British Motorcyclists Federation.

[55] PRESENTATION TO THE JOINT COMMITTEE ON TRANSPORT Wednesday 8th February 2006 By Noel Brett, Acting Chief Executive, National Safety Council.

Indeed such is the concern of the Irish government that a series of initiatives have been announced by the Minister for Transport:

- to extend the number of offences attracting Penalty Points to 35 and
- the drafting of legislation for the introduction of Random Breath Testing are to be greatly welcomed.
- the Garda (police) fixed charge payment system will be fully computerised and the pulse system linked to the courts for the roll out of the extended penalty points system on 1st April 2006.

In relation to the justification of mandatory DRL to reduce casualties in Ireland, how effective could DRL be to a person who is intoxicated? If drink driving is a major factor in fatalities in Ireland, how would the introduction of DRL make a difference?

An intoxicated driver would not improve their ability to drive carefully, because this type of driver would not be in full control of the vehicle.

Also in Norway, similar issues of those identified as the cause of fatalities in Ireland (speeding and drink driving) are amongst the major reasons for road accidents[56]

We accept that the data presented here may not provide concrete evidence that DRL has any effect one way or the other, but then nor have the EU Commission's 'experts'. What we offer however is another point of view based on statistical analysis. The choice of these four countries is due to the similarities in trends as highlighted in the previous table and offers a snapshot from 2004.

Table six - Comparison of collision statistics in 2004 from four countries

	Car occupants	PTWs	Pedestrians	Cyclists	Total
Sweden	**68**	**31**	**50**	**14**	**163**
Norway	**41**	**20**	**10**	**2**	**73**
Ireland	43	14	30	4	91
Great Britain	494	227	388	61	1170

In terms of percentage differences, the following figure demonstrates that Sweden and Great Britain have very similar collision data. Norway and Ireland both have small populations, however what is evident from the following figure is that Norway – a DRL country has a higher proportion of fatalities between vehicle users – i.e. cars and cars (56.2%); cars and motorcycles (27.4%) (which all have head lights), though a lower proportion of fatalities due to collisions between cars and pedestrians (13.7%) and cars and cyclists (2.7%).

Norway also has a higher proportion of fatalities between vehicle users in comparison to Sweden – another DRL country - where the fatalities due to car collisions is 41.7% and 19% for collisions between cars and motorcycles.

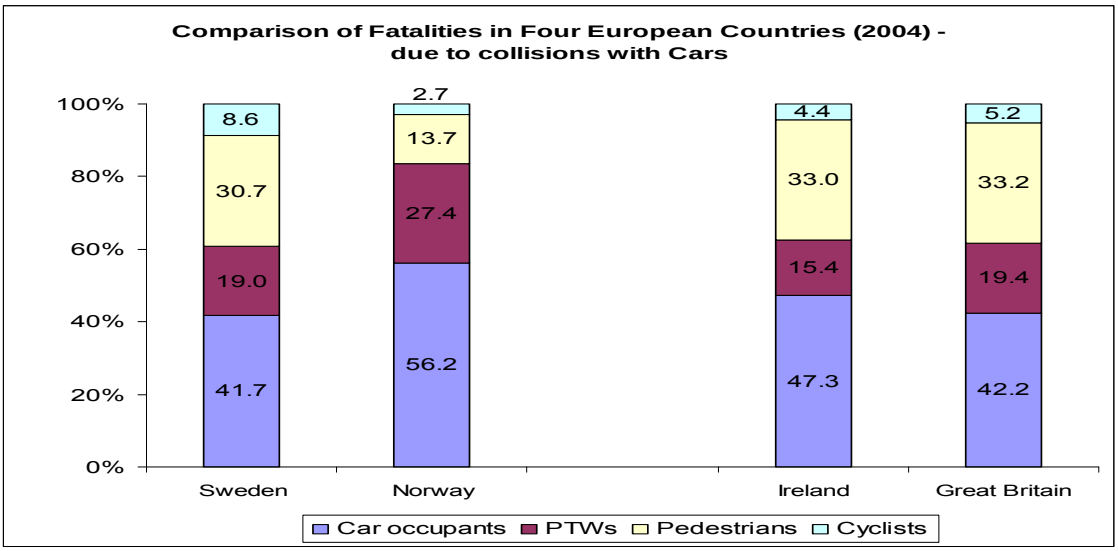
What can be observed in Figure one is that there is a significantly higher proportion of pedestrians killed by cars in Ireland (33%), Great Britain (33.2%) but ALSO in Sweden (30.7%) compared to other 'so called' vulnerable road users.

In fact in Sweden 8.6% of cyclists are killed by cars compared to only 4.4% in Ireland and 5.2% in Great Britain.

However, as mentioned previously, in Norway the proportion of motorcyclists killed by cars is significantly higher than the countries not adopting mandatory DRL (27.4% compared to 15.4% in Ireland and 19.4% in Great Britain).

[56] Joint Oecd / Ecmt Transport Research Centre Country Reports On Road Safety Performance

Figure one: Comparison of collisions by road user in 2004 from four countries



In consideration of the comments from the EU Commission consultation paper that:

- Road users not having daytime lighting devices, i.e. pedestrians and cyclists do not become less conspicuous if all vehicles use DRL;
- A negative effect of DRL on the visibility of motorcyclists cannot be ascertained.

The data in figure one suggest that these assumptions are not necessarily the case. In fact, the two questions that arise from these data are:

1) Do car drivers 'see' pedestrians or cyclists?

2) Are motorcycles conspicuous in all the four countries analysed? (consider that in the non DRL countries the vast majority of motorcycles are hard wired (AHO) so that the head lights turn on automatically).

The answer appears to be no – which is supported by the results of the Danish document presented to the United Nations Inland Transport Committee Working Party on Road Traffic Safety in 2001.

The common denominator in these four countries may be due to the fact that there is no specific testing or training for car drivers in terms of road awareness for vulnerable road users including motorcycles, with the exception of Norway, but this was introduced in 2005.

EU Compromise[57]

According to a German document[58], in July 2001, the European Commission informed the Council and the European Parliament that *"ACEA, the European Automobile Manufacturers Association, had offered to accept a voluntary agreement in order to prevent the far progressed project of a directive on an improved pedestrian protection by imposing strict requirements for the design of the front parts of motor vehicles. Part of this voluntary agreement was also a paragraph containing the offer to immediately equip new vehicles with daytime running lights"*.

[57] Source: Summary Of The Discussion Concerning Daytime Running Lights In Germany Transmitted By The Experts From Germany Informal Document No.1 (50th GRE, 7-11 April 2003, Agenda Item 6.5.)
[58] Document COM(2001)389, final of 11 July 2001

"These lights should be in compliance with the requirements of the ECE Regulation No. 87 and should be activated automatically. Thus, the discussion on daytime running lights had new dynamics".

Implications

By releasing the automotive industry from the financial burden of redesigning the front of cars to improve pedestrian protection or rather, by opting for a cheaper way of 'reducing' casualties, this creates other implications. The most obvious and most worrying, is that of displacing the responsibility from car drivers to look out for other road users onto other road users to become responsible to look out for cars.

This may affect insurance claims – whereby the insurer may not pay out damages to other road users – with the caveat that they should have 'seen' the lights of the vehicle. It may also have a 'moral hazard' effect, which means that car drivers feel less inclined to take due care when driving for the reasons explained previously.

The ITF/OECD report on motorcycle safety (2008) priority number nineteen recommends that "to improve rider/motorcycle conspicuity; for new motorcycles, headlamps should come on automatically when the engine is started; for other motorcycles, riders should switch on their headlamps before they start their journey".

Therefore, this priority identified by the ITF/OECD report is in any case unnecessary, due to the fact that a voluntary agreement by the motorcycle industry in 2001, ensured that motorcycles would be hard-wired (i.e. switch on automatically) but more to the point, there is still no evidence that daytime running lights reduce road casualties.

In the event, too much focus on DRL (and brightly coloured clothing) removes attention away from far more important factors that can prevent collisions between cars and motorcycles, namely:

- **Better awareness:** theoretical and practical hazard perception tests must identify motorcycle awareness as a fundamental part of the testing regime of car drivers;
- **Better training:** extend the testing and training of car drivers to look for vulnerable road users, including motorcyclists; training and awareness techniques for motorcycle riders;
- **Improvement of data collection:** preventative information, casualty and accident statistics, accurate data and realistic definitions;
- **Further research:** the impact of DRL (Dedicated Running Lights) needs further investigation.

Vehicle Modifications and Tampering[59]

The relatively simple design of a motorcycle and the availability of "bolt-on" replacement or accessory components make it easy and popular to modify. The quality and safety of "bolt on" aftermarket components have steadily improved and are in some cases, significantly superior to equivalent standard components.

Some skilled motorcycle owners take modification even further and design and produce the

[59] Ref: European Agenda for Motorcycle Safety, FEMA

components themselves. This creative approach has brought about innovative, highly functional designs, sometimes adopted by the motorcycle industry and used on standard, mass-produced motorcycles.

Modifications favoured by motorcyclists change with technology, fashion, and other factors, which make more specific regulation not only unrealistic, but also unjustifiable, most of the time

Accordingly, anti-tampering measures such as those implemented in Germany (which require that any modification must be tested or certified prior to the sale of motorcycles) have produced negative side-effects such as limiting the access of riders to superior tyres, brakes, suspension, and other components. There are no road safety benefits from restricting the historic tradition of modifying motorcycles, because the strict Single Vehicle Approval testing that is required by government, ensures the safety of these vehicles.

Maintenance

Many motorcyclists spare a lot of time and effort and money to keep their motorcycles in immaculate condition. Enthusiasm for riding is closely linked to the technical condition of the motorcycle, which means that riding is less enjoyable if the motorcycle is not in good mechanical condition. The Hurt report (1981) and other studies have demonstrated that very few motorcycle accidents are caused by mechanical failure as a result of poor maintenance.

Noise and illegal Exhausts

According to the ACEM Guidelines for PTW Safer Roads in Europe (2006), readings taken from a variety of car and motorcycle types lead to the discovery that both types of vehicle perform far below the values set as the statutory limit under the given circumstances. They do not represent a significant source of traffic noise. The main noise produced by cars is caused by the tyres. This noise increases almost linearly with the speed, whereas the engine and transmission are less noticeable due to their effective containment.

However, the noise of a motorcycle is predominantly brought about by the engine and drive train, whereas the noise produced by the tyres plays a less significant role. This is why motorcycles are marginally louder than cars at speeds below 60 km/h, whereas at speeds from 80 km/h and up they may even be quieter than cars. The report suggests that the noise produced by motorcycles under normal traffic conditions is identical to that produced by passenger cars and much lower than that produced by heavy trucks.

The report argues that *"the perception of noise from motorcycles is mainly due to its high acoustic potential when it accelerates very fast in a quiet environment. This is why noise disturbance from motorcycles, is generally associated with single events and at peak noise levels. Very often nuisance arises from vehicles equipped with illegal exhaust systems. Educating motorcyclists in matters of environmental protection therefore offers a reasonable potential for reducing the overall noise level. The overall effect of this can be estimated at 5 to 10 dB(A) on a long-term basis".*

Noise is not always negative - the National Federation of the Blind has been voicing concerns about the unintended side effect of silence.

"*If cars don't make noise, blind people can't safely navigate streets. This really is a problem,*" said John Paré, the U.S. National Federation of the Blind's director of public relations.

Several blind people have described minor injuries or near misses to the National Federation of the Blind, though the organization hasn't kept detailed records of the complaints. The group forecasts even worse accidents ahead, as hybrid cars become more prevalent, unless automakers develop

some sort of noisemaker for these vehicles[60].What this means is that it is important to get the balance right. Too much can create misery for those subjected to constant loud noise; not enough noise can be dangerous for the visually impaired and distracted pedestrians, especially children.

The motorcycle community recognises that there is an issue with too much noise from certain types of motorcycles, which is mainly due to the fact that there is an availability of exhaust pipes that are manufactured to create noise well beyond the legal decibel limits or in other cases, where the exhaust pipes have been tampered with by the owner of the motorcycle. This is ultimately a law enforcement issue.

Intelligent Transport Systems

Amongst the recommendations (priority number fifteen) from the ITF/OECD workshop on motorcycle safety (2008) was the recognition that "enhanced awareness of motorcycles should be incorporated into the development of all vehicle ITS projects".

Development of ITS systems for cars is well advanced, although car warning systems to identify vulnerable road users is still in the early stages of research.

A Monash University report[61] concluded that *"ITS applications currently in existence, and being developed, have tremendous potential to reduce the incidence and severity of road crashes. To do so, however, human factor principles and knowledge must be incorporated into the design of these systems and they need to cater for the special needs of various road user groups. Failure to do so could seriously compromise the safety of the entire road transport system".*

Another Monash report published in 2006[62] commented that *"motorcycling groups have expressed concern about the potential for ITS technologies to automate aspects of the riding task to compromise motorcycle rider safety. It is critical that the views of the motorcycling community be properly reached and understood, and that this knowledge is used to inform the design and deployment of technologies which are acceptable to them".*

An EU Commission funded project in which advanced driver automated systems (ADAS) and In Vehicle Information systems (IVIS) are being developed for motorcycles in order to make motorcycles "safer" will include the use of Human Machine Interface (HMI) technology in order to warn the rider of a potential crash or collision. HMI systems may include vibration (seat or handlebar), pulsation (throttle), flashing lights on the display panel (dashboard), head-up displays on helmet visors and/or audio systems to act as an alarm to "warn" the rider.

However, in his presentation to the UNECE WP.29 ITS Informal Group, Peter Burns[63] highlighted that *"there are more effective and reliable ways to protect people and property than warnings:*

1. Eliminate the hazard through improved design, or
2. Offer some form of protection to limit damage.
3. If that does not work then – Warn"

[60] http://www.nfb.org/images/nfb/Publications/bm/bm07/bm0707/bm070704.htm
[61] Regan M, Oxley J, Godley S and Tingvall C: (2005) Intelligent Transport Systems: Safety and Human Factors Issues Royal Automobile Club of Victoria (RACV) Ltd – Report 01/01
[62] Bayley M, Regan M, Hosking S (2006) Intelligent Systems and Motorcycle Safety, Monash University Accident Centre Research. No. 260
[63] Guidelines for Safety Critical Warnings; Peter Burns IHRA-ITS Informal Document No. ITS-15-09; 15th ITS informal group, 16 November 2007, agenda item 5.

Studies such as one carried out by Bliss and Acton[64], indicated that their experiment participants (70) *"reacted poorly to alarm urgency, becoming distracted and confused. Urgent, reliable alarms evoked responses that, while appropriate, led to a greater number of collisions. For this reason, advocating quick, reflexive reactions to automated alarm systems may not be a wise course of action. Furthermore, the negative impact of such reflexive behaviour may well be compounded in situations where task workload is heightened, or where there are a number of collateral alarm systems".* (2003:507).

An NHTSA report (2006) on distractions highlighted that *"glances totalling more than 2 seconds for any purpose increase near-crash/crash risk by at least two times that of normal, baseline driving"*[65]*.* According to Burns (2007) A signal informing the driver of a hazardous situation, which if not corrected by an immediate action (0 to 3 seconds), will result in equipment damage and/or personal injury.

According to Dingus et al, *"The relation between advisory and collision warnings is conceptually similar to that between preventative medicine and disease treatment. An advisory warning may provide information and draw a driver's attention early in the consequence chain for the prevention of an emergency situation, but a collision warning follows a chain of events close to a crash or to a near-crash that needs immediate treatment. Thus the potential value of some advisory warnings might be the avoidance of the very need for collision warnings"* (1998:73) [66]. NB: an advisory warning system could be simply a warning sign on the side of the road.

Dingus et al also argued that *"Long term use of the systems and their effect on driver behaviour will have to be closely monitored. It is possible that behaviours such as driver over-reliance could result in a crash rate increase for particular designs. Technology has given system designers an opportunity to make great strides in crash reduction and improvements in transportation safety. However it must never be forgotten that technology in this application is a double-edged sword that must be wielded with care" (C.3:91)*

There are a number of other factors that need consideration, such as the accuracy of GNSS and GPS maps which are fundamental to the design of some warning systems. Furthermore, there are concerns about the reliability of hardware and software, the propensity for malfunction and the potential to go into a dangerous and/or unanticipated safety mode.

In a scenario where the rider has all these warning systems available but still crashes, who would be liable: the rider, the vehicle manufacturer, the ITS developer, the government, or the insurance company?

The ITF/OECD report on motorcycle safety (2008) recommends (priority number seventeen) the use of Speed warning systems "The safe management of vehicle speeds in the road network is improved by the use of speed warning systems, which may be on the vehicle or part of the road infrastructure; such systems should be encouraged as the technology is developed".

From a presentation of motorcycle fatalities and speed limits (PSNI Central Statistics Unit)[67], of 53 fatalities recorded between 2005 and 2007, 42 occurred in a speed limit of 60 mph. (It is not clear

[64] Bliss J.P, Acton S.A.(2003): Alarm mistrust in automobiles: how collision alarm reliability affects driving; Applied Ergonomics 34 pp 499–509
[65] Report No. DOT HS 810 594 The Impact of Driver Inattention on Near-Crash/Crash Risk: An Analysis Using the 100-Car Naturalistic Driving Study Data; 2006:V
[66] Dingus T.A, et al. Human Factors Design Issues for Crash Avoidance (Chapter 3) Systems in Barfield and Dingus (1998) Human Factors in Intelligent Transport Systems
[67] Road Safety Council of Northern Ireland "Understanding The Risks from a motorcyclist's perspective" 24 October 2008 DAMIAN COLL

whether the fatalities occurred within the speed limit or whether the motorcyclists were exceeding the speed limit).

The 'On The Spot' (OTS) study on accident causation, carried out in Great Britain for the Department for Transport, reports that the majority of motorcycle accidents (52.9%) occurred at posted speeds of 30 m.p.h. Table eight below, considers the 'type of vehicle/object hit' by all accidents where the precipitating factor was attributable to a motorcycle: most motorcycle accidents occurred at a posted speed limit of 30 mph.

Table seven: Posted speed in motorcycle accidents

Posted Speed	Frequency
<30 mph (excluded from model)	2
30 mph	109
40-50 mph	37
60 mph	39
70 mph	15
Missing (excluded from model)	4

Source: OTS Study 2008, Department for Transport

External speed warning systems such as speed signs already exist and they are there to warn or advise road users of the appropriate speed limits; electronic speed detection systems (cameras) are becoming used more widely throughout the country. They should be an effective deterrent due to the consequences of fines and penalties including bans from driving. Even so, road users continue to ignore signs and cameras and risk having their licences revoked.

Crashes can and do occur at low speeds as highlighted in the OTS study, thus ITS speed limiters may not be appropriate in many situations whereby the cause of the crash could be due to *inappropriate* speed for that particular circumstance.

Most motorcyclists respect speed limits and ride sensibly, but as mentioned on pages 24-25, evidence suggests that the correlation between "inappropriate" speed and single vehicle casualties is overwhelmingly due to a minority of riders, while collisions with other vehicles are mainly the responsibility of the driver of the other vehicle (see MAIDS report 2004). Ironically, no government, authority or safety organization has addressed the issue of motorcycle manufacturers advertising speed and prompting riders to race on the roads like their heroes.

There is a call by national governments, the European Union, OECD, World Health Organization (WHO), United Nations Economic Commission for Europe (UNECE), to reduce motorcycle fatalities (especially those caused by speed). But the jury is still out about using active warning systems as a replacement for human judgement to solve the problems of road traffic accidents, indeed, they may well compound them.

Road accident causation research starting with the Hurt Report (1981), have all identified that the greatest cause of accidents is human behaviour. Riders have been insisting for years to have:

- appropriate basic rider training with special focus on attitude and risk awareness[68]
- awareness of motorcycles included in car driver training.

Focussing on the human element could be a far more cost effective and longer lasting solution than relying on Intelligent Transport Systems to save lives.

[68] See http://www.writetoride.co.uk/virtual_library_-_rider_safety.html for more information about rider safety research

Motorcycles and Road Infrastructure

Riding defensively is important for motorcyclists. Riders need to concentrate on the traffic environment rather than on the quality of the road surface. In fact, infrastructure is the primary or contributing factor in many motorcycle accidents.

Road design, maintenance and construction are generally directed towards the needs of multi-track vehicles, with the needs of motorcycles often not taken into consideration. A possible explanation could be a lack of experience or awareness by engineers and maintenance personnel.

The ITF/OECD workshop on motorcycle safety (2008) highlighted the importance of Roadway design and priority fourteen highlighted that the "Identification and resolution of roadway design problems (e.g. accident black spots & "corridor" analysis of a sequence in the road structure) should include input from rider organizations & relevant experts".

Road design and maintenance contribute to motorcycle accidents, particularly single vehicle accidents. Basic motorcycle needs for the best type of road network include:

- good adhesion whatever the weather conditions;
- clear signage that riders can see and understand;
- good visibility;
- minimal risk of impact against obstacles[69].

In Northern Ireland public road authorities have done little to improve roads with regard to motorcycle safety.

Standards need to be revised and developed to reflect the needs of motorcyclists, by encouraging motorcycle-friendly design, construction and maintenance procedures.

It follows that road design and maintenance personnel must be educated about conditions posing hazards to motorcyclists.

Above all there is a need for quality audits to be undertaken on a regular basis, in which the needs of motorcyclists are included.

In 2008, the Norwegian Government created a 15 kilometre 'Vision Zero' road which focussed on road environment issues in order to create a "motorcycle friendly" road[70].

Further literature on these issues is available (See Annex 2).

[69] Ref: European Agenda for Motorcycle Safety, 2007, FEMA
[70] http://www.writetoride.co.uk/NPRA_Vision_Zero_Motorcycle_Road_2008.pdf "Vision Zero Motorcycle Road" Before & After Bjørn Richard Kirste – Norwegian Public Roads Administration

Road Networks

The European Parliament's 2005 report on road safety commented that "*Infrastructure in particular, must be thought and developed considering the needs of all road users including the more vulnerable ones namely motorcyclists, cyclists and pedestrians. Roads should be upgraded to accommodate the current traffic levels. Driver errors can be avoided and their consequences mitigated by means of a systematic inclusion of road safety issues at any stage of the design, construction and operation of roads*"[71].

The ITF/OECD report on motorcycle safety (2008) recommends Guidelines for the development of road infrastructure. Priority number eight highlights that "Each level of government should include in their infrastructure guidelines, measures for accommodating PTWs, developed with input from relevant stakeholders. The guidelines should be relevant to the needs of the jurisdiction concerned and coordinated with other jurisdictions and levels of government. An international transfer of best practices is also recommended".

The report from the European Parliament commented that *"Roads should be built according to standards which take into account the needs of all road users."* The report also recognised that driver errors could be avoided and their consequences mitigated by means of a systematic inclusion of road safety issues at any stage of the design, construction and operation of roads.

Infrastructure requirements for motorcycles would not lead to a substantial increase in public expenditure. It could however make a sizeable contribution to the sustainability of urban traffic.

Road Restraint Systems

A recently published discussion paper by The European Union Road Federation (ERF), the Brussels Programme Centre of the International Road Federation (IRF) (2009) considers different studies on road restraint systems and highlights a particular study carried out by BAST in 2004 and the prevalence of impacts with road restraint systems when the rider is still on the motorcycle.

The BAST study considers the types of injuries when the rider is projected forward over and above the barriers which are extremely difficult to determine as each case depends on a number of factors which include other conditions such as the design of the road and the roadside furniture.

The next most frequent condition for motorcyclists impacting with crash barriers is when the rider is separated from the motorcycle and slides into the barrier.

According to the study, the severity of the impact increases if the road restraint system (when present) is not designed for the protection of motorcyclists.

[71] Ref: the European Parliament's own initiative Report on Road Safety - 2005.

The discussion paper calls for improvements to 1) understand the causes that enable a motorcyclist to lose control and 2) to have an infrastructure that is "forgiving", so that if the rider loses control, there is sufficient space and time to cope with the consequences of a potential crash.

Some European countries have already created a national standard for motorcyclist protection, with several others in the process of doing so. The authors recommend that it is of utmost importance that all parties contribute towards the drafting of a common and harmonized European Norm (hEN) which will have a single set of criteria valid throughout Europe and that the existing European standards are implemented in all member states to ensure that road infrastructure includes the safety of motorcyclists.

The ERF/IRF discussion paper points out that the Committee of European Normalization (CEN) has mandated the drafting of a new part to the European Standard for road restraint systems (EN1317-8), so that in the near future motorcyclists will benefit from roadside barriers studies, designed and tested with their specific safety in mind.

There is however, debate regarding motorcyclists and the EN1317-8 standard due to the fact that some pressure groups would like immediate recognition of motorcyclists based on the Spanish guidelines which only tests motorcycle friendly barrier systems with a sliding dummy (30 degree angle) in their standard (one of the issues with this is that the dummy is not a "motorcycle dummy" but is an adaptation of a car dummy).

Other road safety technicians would prefer to include more specific crash scenarios, including riding the motorcycle with rider sitting on it, as well as different collision angles and so forth. This view considers in-depth studies such as the German In Depth Accident Study data which develop crash scenarios focusing on the real world.

According to Swedish Road Safety technicians, studies had shown that 51% of riders were sitting upright on the motorcycle while hitting the barrier and about 47% were on the ground, sliding towards the barrier. So implicitly the Spanish standard only covers less than half the problem.

Ultimately the various European countries need to work together to ensure that crash barriers are fit for purpose, especially with regards to vulnerable road users.

So yes, a standard to include motorcyclists must be a priority, but not at any price.

In Great Britain forward thinking road authorities in conjunction with crash barrier manufacturers e.g. The Highway Care Ltd - BikeGuard system[72] are fitting retrospective motorcycle friendly guardrails in locations which are prone to or identified as high risk.

At present, EU funded projects such as Smart RRS (Road Restraint Systems) [73] are investigating crash barriers with motorcyclists in mind. The Smart RRS project aims to develop a system whereby the crash barrier is activated in the case of collisions in order to send signals to emergency response agencies e.g. ambulance or police.

The project also aims to develop an "energy absorbing" crash barrier, taking into consideration all the criteria for the protection of motorcyclists. The development of energy absorbing restraint systems will hopefully replace dangerous stone posts and other metal barriers made of products that do not absorb energy and break on impact including wooden restraint systems that can skewer the rider (or car occupant).

[72] http://www.highwaycare.co.uk/product_info/18/motorcycle-safety-barrier---bikeguard

[73] http://smartrrs.unizar.es/home.php

EuroRAP – Motorcycle Safety Review Panel

In December 2008 EuroRAP published a document – "Barriers to change: designing safe roads for motorcyclists"[74] position paper on motorcycles and crash barriers.

The work of the EuroRAP Motorcycle Safety Review Panel was financially supported by the IAM Motoring Trust. The panel consisted of users, authorities and experts, including representatives from the Department for Regional Development Northern Ireland (DRDNI) and National Roads Authority (NRA) Ireland[75].

In general, the recommendations and summary of issues surrounding crash barriers in the position paper are positive, which include comments such as:

- Motorcycle-friendly systems have been shown to halve fatalities and offer high rates of return.
- There is sufficient evidence to justify new and immediate interim guidance on crash barrier design to give road engineers clear guidance on where motorcycle-friendly systems should be incorporated at new sites, and to be able to review motorcyclist risk at existing sites. The Netherlands is commended for its 'decision tree' approach.
- Barrier support posts are particularly aggressive, irrespective of the barriers' other components, causing a five-fold increase in injury severity compared to the average motorcycle crash.
- The decision in July 2008 to develop a new European testing standard for crash barriers that incorporates the needs of dismounted riders is commended – but concerns remain that testing should take place for riders striking the barrier whilst mounted and for protective equipment added to existing barriers (NB: see previous comments regarding EN1317-8)
- Introduce a cultural change to the way in which risk is viewed by a road authority.

However, the panel's position on wire rope barriers must be challenged. The panel concluded that, *"despite the amount of high profile coverage that wire rope barriers have attracted, limited research does not warrant the inference that they are more or less dangerous than other types of barrier on the market."* This is misleading. There is evidence to refute this statement and most relevant is a study by DEKRA (Germany) and the University of Monash (Australia) carried out in 2005[76]. The authors found that:

"In all simulations the motorcycle slides along the wires until it hits a post, squeezing and trapping the rider's leg against the wires as it does so. The post contact causes the motorcycle's front wheel to snag lifting the front of the motorcycle up and throwing the rider's torso and head forward. Because the rider's leg is trapped between the motorcycle and the wire ropes and the foot snags in the ropes, the head and torso slap into the front of the rising motorcycle. Eventually the leg becomes free as the motorcycle rotates and the rider is then catapulted over the barrier" (page 11).

Northern Ireland has not suffered the proliferation of the fitment of wire rope barriers as seen in Great Britain, Europe and Australia. However we are aware that wire rope barriers are situated in Belfast at the junction of Tescos at Newtownbreda, also, stretches of wirerope barriers have been and are now being fitted on the A1 Dual Carriageway between Belfast and Newry.

[74] http://www.writetoride.co.uk/eurorapbarries.pdf
[75] Trevor Baird from Write To Ride – Right To Ride, was at the time, a representative of the MAG UK (Motorcycle Action Group) and a panel member representing the Federation of Europe Motorcyclists Associations (FEMA) in this panel.
[76] MOTORCYCLE IMPACTS INTO ROADSIDE BARRIERS – REAL-WORLD ACCIDENT STUDIES, CRASH TESTS AND SIMULATIONS CARRIED OUT IN GERMANY AND AUSTRALIA http://www-nrd.nhtsa.dot.gov/pdf/nrd-01/esv/esv19/05-0095-O.pdf

Understandably road authorities and engineers have constraints and budgets to work within for the placement of crash barriers or vehicle restraint systems on Northern Ireland roads, but there does not appear to be any statistics that present data for motorcycles impacting these systems.

Road authorities in Northern Ireland, responsible for the fitment of crash barriers, should be encouraged not to be influenced solely by short term “commercial” cost benefit analysis which may exclude motorcycles, simply because they represent a minority of road users.

While engineering solutions may strive to protect the majority (i.e. cars), the long term impact may be far more costly due to the lack of consideration of motorcyclists and their injuries.

Motorcycle Friendly Barriers that are added to barriers in place should be considered and fitted where there is a risk to motorcyclists hitting barriers and consideration to the placement of new barriers and a review/audit of barriers already in place.

There should be a reconsideration of the use of Wirerope Barriers in Northern Ireland.

Terminal Ends

One engineering solution that has seen a proliferation in Northern Ireland is the fitting on new and the retrofitting of terminal ends to existing crash barrier systems.

A Terminal or “end treatment” is a vehicle restraint system placed at the point where a crash barrier commences or ends.

The terminal is designed to attenuate the violence of a head on or side impact crash. These are replacing the “slope down” ends of crash barriers where the end is buried into the ground.

Similar to wire rope barriers and their inclusion in standards, these can be seen to present a risk to motorcyclists impacting them.

There are variants in the design that seem to be more motorcycle friendly and protective “cushions” are available to lessen impacts.

Overall

Understandably road authorities and engineers have constraints and budgets to work within for the placement of crash barriers or vehicle restraint systems on Northern Ireland roads, but there does not appear to be any statistics that present data for motorcycles impacting these systems.

Road authorities in Northern Ireland, responsible for the fitment of crash barriers, should be encouraged not to be influenced solely by short term “commercial” cost benefit analysis which may exclude motorcycles, simply because they represent a minority of road users.

While engineering solutions may strive to protect the majority (i.e. cars), the long term impact may be far more costly due to the lack of consideration of vulnerable road users and their injuries.

Road Maintenance

The Institute of Highway Incorporated Engineers (IHIE) Guidelines for Motorcycling[77] sets out practical guidance for transportation professionals to provide a safer environment for motorcycles, mopeds and scooters.

The guidelines state that, *"In view of their vulnerability, the specific safety needs of motorcyclists need to be carefully considered by road designers and traffic engineers in the design, implementation and maintenance of any works on public roads."*

"However, it is unlikely that professionals on the operational side of road infrastructure provision will make a step change in their approach to catering for motorcyclists if the lead has not been set by policymakers at local, regional and national level."

The guidelines reflect that the role of the maintenance engineer is critical to this (motorcycle) mode of travel specifically regarding:

- In providing a consistent road surface with suitable skid resistance
- In keeping roads clear of contamination and debris
- In maintaining visibility, especially at bends and junctions
- In ensuring best practice in maintaining road signs, road studs and markings
- In setting up efficient, well-publicised systems so that members of the public can report road defects that receive prompt attention
- In implementing maintenance policies that focus on preventative action
- In designing winter maintenance regimes that keep the needs of riders in mind
- In ensuring that road works are safe for all road users

In Europe the ACEM report "Guidelines for PTW-Safer Road Design in Europe"[78], identifies road maintenance as an important aspect of motorcycle safety and lists specific issues for this purpose:

- a consistent road surface with proper skid-resistance;
- that the roads are kept clear of refuse and rubbish;
- that visibility is maintained, especially at curves and junctions;
- that the road-signs, studs and markings are maintained.
- that roadway defects are noticed and repaired quickly.

Road Cleaning

The report also considers road cleaning in order to clear dirt or debris from the road as well as diesel spillage from vehicles which can be extremely dangerous for motorcycles.

[77] http://www.motorcyclingguidelines.org.uk
[78] http://www.acem.eu/media/d_ACEMinfrastructurehandbookv2_74670.pdf

Road Works

In terms of repairs to road, there are a number of factors that can cause a motorcyclist to lose control such as:

- Dirt and clay may be dragged onto the road open to traffic while being reconstructed. In wet weather conditions the road may become so slippery that riders could encounter serious problems.
- Tools and equipment on the road may represent a collision hazard
- Insufficient signing, road marking, illumination and reflection increase the risk of accidents.
- Specific signage for motorcyclists should be considered at hazard spots
- Badly maintained roads exposing motorcyclists to potholes, cracks and ruts.
- Transition to a gravel surface or spilled gravel on the asphalt

The common practice of laying a surface dressing consisting of stone chippings spread over tar on the road, which is then bedded in by traffic is not acceptable for motorcyclists.

This practice is risk assessed and warning signs are present (mostly inadequate and lacking in advance warning), however there is no doubt that this practice is a serious hazard for motorcycles, even at the posted recommended speed limit of 20mph.

When confronted with a stretch of road that has received this dressing, motorcyclists will inherently slow down because of the risk involved, but the same cannot be said for other vehicles.

The risk of crashing is compounded by braking or altering position to avoid deep gravel on the road surface. There is risk of injury to riders and damage to the motorcycle from stone chippings thrown up by other vehicles.

Excess stone chippings are not removed by Roads Service or the contractor.

Halfway Solution: Stone chippings should be properly rolled in.The excess stone chippings are removed promptly. Enforcement of other vehicle drivers.

The Solution: The practice should be stopped and roads that require resurfacing must be resurfaced correctly. This is probably not achievable as it is common practice, it is probably cost effective and it only affects a minority of road users, in this case vulnerable motorcyclists and cyclists.

..For this reason the ITF/OECD report on motorcycle safety (2008) recommendation (priority number eleven) highlights the need for training for road designers "The needs of PTWs should be included in the basic training for road designers, highway and traffic engineers".

The public road authorities of some European countries have produced handbooks for motorcycle safety (See Annex 2), in cooperation with rider organisations, with guidelines for all personnel who work on road construction and maintenance.

Road Hazards and Black Spot Management

Specific road sections can be notorious for causing motorcycle accidents. However, road conditions posing hazards to motorcyclists are not always signposted, because these conditions are not necessarily hazardous to the majority of road-users.

Specific signposting (a combination of existing traffic signs), aimed at warning motorcyclists of hazards (also known as Black Spots) - would be a cost-effective road safety initiative as motorcyclists normally react to signposting.

A Road Hazard reporting system for Northern Ireland is available at the following site:

http://www.roadsni.gov.uk/index/complaints-procedure/report_a_fault.htm

Traffic Management

At present, traffic management using telematic systems is still in its infancy, but as these systems develop they will become more prevalent in big cities in order to improve traffic flow and allegedly, to save time, reduce accidents and emissions.

The experience of London has demonstrated that with the reduction of car usage due to congestion charging, there have been benefits for all road users including motorcyclists which are exempt from this charge.

Within the context of traffic management systems as part of a new strategic approach to the problem of urban mobility, the use of motorcycles could be encouraged by:

- giving motorcycles access to bus lanes and high occupancy lanes;
- giving motorcycles free and unrestricted access to city centres such as in London;
- providing advanced stop lines for motorcycles;
- providing free, secure parking for motorcycles.

Conclusion

Motorcycling has many faces, as this report has set out to explain. What is apparent is that this form of transport is increasing because of the low cost of running and maintenance, but also because motorcycles are a formidable congestion buster.

The quality of motorcycles in terms of emissions is far better than cars simply because of size, but also the lower consumption of petrol means that cost savings for owners and lower pollution levels for government can be considerable.

Many parts of Northern Ireland are inaccessible by public transport and for some journeys private transport is the most practical modal choice. There is a recognised problem of youth unemployment in rural areas, partly due to the lack of accessibility to transport. Two wheeled transport can offer solutions to get young people who live in rural areas into work.

For this reason, the ITF/OECD Workshop on Motorcycling Safety has been a giant step forward in recognising the fundamental right of motorcycles to be part of road transport.

The ITF/OECD workshop recognised the importance of motorcycling as a component of road transport and also recognised that the stakeholders i.e. legislators, decisions makers, agencies, manufacturers and most importantly the representatives of motorcyclists, must work together to find solutions to issues of safety (including car safety) so that this mode of transport can take its rightful place in the development of road transport policies in Europe and this includes Northern Ireland.

This document has aimed to provide evidence that motorcycles are a convenient, economical and environmentally friendly form of personal powered transport and that the issues of safety for riders can be resolved if there is a united effort to recognise the underlying causes of road accidents.

The Road Safety Authority (RSA) Ireland has sought the public's views on proposals to cut motorcyclist deaths by half by obtaining the input and views of a broad range of stakeholders on the enhancement of motorcycle safety on Irish roads, through the development of a fully integrated Motorcycle Safety Action Plan.

Any motorcycle strategy in Northern Ireland must involve riders, not just at initial meetings, not at the end of the decision making process from agencies but throughout the whole process.

We understand that the DOE (Department of the Environment) Road Safety Branch is currently initiating a new road safety strategy in Northern Ireland. Motorcycle safety has been identified as one of the key issues in the problem profile and they will be seeking measures to address this.

What is evident is that there is no coherent motorcycle strategy in Northern Ireland. The examples of the United States and the Department for Transport in Great Britain that have developed specific motorcycle strategies with the participation of all stakeholders, has demonstrated the power of working together to improve conditions for motorcycles.

Now is the time for a motorcycle strategy in Northern Ireland.

Right to Ride

Right-To-Ride is a non profit organisation established to promote the advantages of motorcycling in Northern Ireland.

The Issues

The voice of motorcycling in Northern Ireland is muffled by apathy and there is a vacuum that has left riders vulnerable to anyone who believes that we have no right to be on the road.

This is a fact and the constant changes in laws from Europe and Westminster make it harder for riders to enjoy the simple pleasure of motorcycling.

The greatest risk that riders' organisations face is forgetting their grass root members and by getting too close to industry, too close to the orthodox views of government agencies and research institutes that think they know better.

With years of fighting for riders' rights in Westminster and in Brussels, riders have learnt that knowledge is power and understanding how to walk in the corridors of power without compromise is an art form that takes years of skill and learning.

How should riders' rights be promoted in Northern Ireland?

By giving riders a voice, using a fresh and alternative approach with the backing of individual riders, clubs, trainers and anybody else who cares enough.

No deals of insurance, travel or cheap clothing.

No membership fees, nothing but the support of riders, to put the case for riders in the corridors of power.

Write to Ride: This web site now hosts a reference section on issues that affect riders - a Virtual Library.
This section provides information to riders.

It can be used to inform politicians - decision makers - authorities and anybody who needs convincing, that we, the riders are the experts.

Right to Ride: A Not for Profit Company, consulting with riders in Northern Ireland, to find out from riders what issues are important.

Trevor Baird and Elaine Hardy, PhD,
Directors

www.writetoride.co.uk

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Annex 1

Type of motorcycles

Motorcycle Registration Information System (MCRIS) Definitions[79]

Vehicle Types

Mopeds: In law, a motorised two-wheeled vehicle with an engine capacity of less than 50cc and a maximum speed capability of 30mph, riders must be aged 16 years or over. Mopeds are available in Motorcycle and Scooter styles.

Motorcycle: In law, a motorised two-wheeled vehicle that is not a moped, riders must be aged 17 years or over.

Tricycle - All 3 wheeled motor vehicles.

Vehicle Styles

Adventure (including Supermoto) - These bikes are similar in style to enduro motorcycles but are predominantly designed for and capable of, on-road use. Often they will have features similar to machines included in the Touring category e.g. fairings, luggage carrying capacity etc.

Adventure

Custom - These machines include 'cruisers' and 'choppers'. They typically feature high handlebars, low seat height and forward footrests. Body panels and fittings contain high polished chrome content.

Custom

Sport/Touring - Machines that fit between Supersport and Touring bikes categories. Typical features include full or partial fairings and practical rider and pillion seating with low to medium ride handlebars. Tend to have medium to large capacity engines.

Sport/Touring

[79] Motorcycle Industry Association fact sheet

Supersport - These machines are designed to mimic or directly replicate racing bikes. They normally have full fairings and low handlebars and are sometimes referred to as race replicas.

Supersport

Scooters - Have an engine as an integral part of the rear suspension or the chassis, is a step-through type, irrespective of cc or wheel size and include all types of transmission.

Scooter

Touring - Bikes generally have large engines and are designed for long-distance riding. Typical features include a more comfortable seating position for rider and pillion, luggage carrying capability and weather protection, such as fairings with a fixed or adjustable windscreen.

Touring

Naked - Machines are built to a basic specification with no fairing (or only a small handlebar fairing) and an upright riding position. Engines are large to medium and often called retro.

Naked

Trail/Enduro - These bikes encompass trials, endure and trail bikes with an off-road or cross-country capability.

Trail - Enduro

Mini motorcycles[80]: - Also known as a mini moto or pocket bike, is a miniaturized version of a motorcycle replicating dirt and racing motorcycles. They generally have an engine size of <50cc. and can go as fast as 55 kilometres per hour, but can be only 55cms high. The two stroke engines typically produce between 2.5 and 3.5 horse power (hp). All are air-cooled. These bikes are not street legal, but ridden within a safe and legal environment, can be used to introduce young people to motorcycling and many local authorities have set up designated areas to encourage the use of these bikes for competition and sport for young riders.

Mini Moto

Sidecars[81] **-** A third wheel can be added to the side of a motorcycle to create a motorcycle/sidecar combination. These devices attach to the frame of the host motorcycle and provide additional passenger or cargo capacity. These accessories strongly affect all aspects of handling and control by essentially creating an entirely different kind of vehicle, which in some ways is more like an automobile than a motorcycle.

Sidecar

Trikes[82] - These machines are created by either grafting the front of a motorcycle to the back of an automobile or adding an automobile-type rear axle to the rear of a motorcycle to create a three-wheeled vehicle. These vehicles are dramatically different in many ways and do not handle or steer like motorcycles.

Trike

Variations - Customising

Apart from the adaption of motorcycles by fitting a sidecar or the grafting of a motorcycle to create a three-wheeled vehicle there are a wide range of changes that motorcyclists, amateur and professional make to standard motorcycle types and styles.

These range from the fitting of non standard parts or ” bolt-on” accessories such as a different seat, handlebar grip, exhausts/silencers to engine tuning, wheels, brakes or special paint work.

Many of these modifications that alter the appearance of a motorcycle are aimed at making the machine safer or more comfortable.

Specialists companies and individuals will take an engine and build e.g. a new frame to construct a completely new bike either as a one off or a relatively small run of Specials.

[80] From www.minimotosandmore.com downloaded 9th August, 2007
[81] National Agenda for Motorcycle Safety US Department of Transport NHTSA; Motorcycle Safety Foundation
[82] National Agenda for Motorcycle Safety US Department of Transport NHTSA; Motorcycle Safety Foundation

Within this customising of types of motorcycles there are variations of style and it is difficult to mention these styles without touching on the “lifestyles” that accompany the styles of bikes.

Customised - The highly customised bike is usually based on the custom bike style, the custom bike itself being a watered down style of the **Chopper** that originally evolved from standard motorcycles. The majority are based around the vee-twin engine of the American Harley Davidson or Japanese alternatives. Customisation can run into tens of thousands of pounds and a “lifestyle” has grown up around these bikes with a specialised motorcycle press promoting and showcasing the bikes and lifestyle.

Highly - Customised

Streetfighter – Originally usually a Supersport motorcycle that had been crashed and was put back on the road without its body work and fitted with motocross type handle bars. Now a highly specialised style usually with a distinctive paint scheme and so highly customised that the Streetfighter outstrips the original cost of repairs.

Streetfighter

Rat/Survival Bikes – The Rat Bike in appearance seems to the eye to have fallen apart through use. They have been kept on the road and maintained for next to no cost. Often using parts from other bikes or home made parts, they are usually painted matt black. **Survival Bikes** look similar to Rat Bikes but are usually for stylistic reasons.

Rat Bike

Classic – Vintage – Antique - Combines all types and styles of motorcycle that may be British, American, Japanese and other continental motorcycles anywhere in the world. The Vintage BMW group defines the terms as, “Classic (1970-on, at least 25 years old), Vintage (1948-1969) and Antique (1923-1945). There are International Associations of National Clubs, National Federations of Clubs, National Associations, National Clubs, museums and individual collectors and owners.[83] These groups and individual enthusiasts will restore or keep and use these motorcycles in a roadworthy condition.

British - Classic

[83] http://www.virginiawind.com/byways/vintage_vs_classic.asp

Scooters – Classic and Customised – These are the 1960's classic and vintage Italian Vespa and Lambretta scooters as opposed to the updated classic styled scooter now being made to mimic these classics. Similar to Classic bikes there are International Associations of National Clubs, National Federations of Clubs, National Associations, National Clubs, museums and individual collectors and owners, restoring, keeping and using them in a roadworthy condition. Again similar to motorcycles, scooter enthusiasts customise their scooters with the main theme harking back to the "good old days" of the sixties and the true Mod style and like motorcycles there is a world of events and meetings for these enthusiasts.

Scooter- Classic - Customised

Others

There will always be those motorcycles that do not fit any type or style and individual riders who do not subscribe to the "biker" lifestyle, but one common bond is the use of a motorcycle or motorcycle based mode of vehicle and safety will always be an issue that each rider must face.

Out On Its Own

Annex 2
Road Infrastructure handbooks[84]

 Belgium	*Aandacht voor motorrijders in de weginfrastructuur* 2005 BIVV (Belgisch instituut voor verkeersveiligheid)
 France	*Prise en compte des motocyclistes dans l'aménagement et la Gestion des infrastructures* 2000 SETRA – CERTU
 Germany	*Motorradfreundlicher Straßenbau. Motorradfreundlicher Anforderungen an Planung, Bau und Betrieb von Straßen.* 2003 IfZ (Institut fűr Zweiradsicherheit e.V.)
 The Netherlands	*Handboek gemotoriseerde tweewielers. Een handreiking voor veilig wegontwerp, wegonderhoud en beheer. 2003* *CROW*
 Norway	*MC Safety. Design and Operation of Roads and Traffic Systems* 2004, Norway Public Roads Administration Vision Zero Motorcycle Road" Before & After Bjørn Richard Kirste – Norwegian Public Roads Administration, 2008
 United Kingdom	*Guidelines for motorcycling. Improving safety through engineering and integration* 2005 IHIE (Institute of Highway Engineers)
 ACEM	ACEM has published a compilation of these documents called "Guidelines for PTW-safer road design in Europe"

[84] Ref: European Agenda for Motorcycle Safety, 2007, FEMA

Annex 3

Motorcycle Accident Research Studies

Motorcycle casualties are often the focus of research, with many reports highlighting the perceived risk-taking of motorcyclists and the dangerousness of motorcycles. What is apparent from these reports is a lack of understanding of motorcycles and motorcyclists, which is mainly due to the fact that the majority of researchers do not ride motorcycles and therefore do not understand the social issues surrounding two wheeled transport. There are few motorcycle accident research studies have the support of riders amongst which are:

The Hurt Report (1981 – US)

The most influential accident causation study was the report *'Motorcycle Accident Cause Factors and Identification of Countermeasure', also known as the 'Hurt Report', January 1981*. It was a study conducted by the University of Southern California (USC). Using funds from the National Highway Traffic Safety Administration, researcher Harry Hurt investigated almost every aspect of 900 motorcycle accidents in the Los Angeles area. Additionally, Hurt and his staff analyzed 3,600 motorcycle traffic accident reports in the same geographic area.

Major findings are summarized as follows:

- Approximately three-fourths of these motorcycle accidents involved collision with another vehicle, which was most usually a passenger automobile.
- Approximately one-fourth of these motorcycle accidents were single vehicle accidents involving the motorcycle colliding with the road or some fixed object in the environment.
- Vehicle failure accounted for less than 3% of these motorcycle accidents, and most of those were single vehicle accidents where control was lost due to a puncture flat.
- In the single vehicle accidents, motorcycle rider error was the accident precipitating factor in about two-thirds of the cases with the typical error being a slide out and fall, due to over braking or running wide on a curve due to excess speed or under-cornering.
- Road defects (pavement ridges, potholes, etc.) were the accident cause in 2% of the accidents; animal involvement was 1% of the accidents.
- In the multiple vehicle accidents, the driver of the other vehicle violated the motorcycle right-of-way and caused the accident in two-thirds of those accidents.
- The failure of motorists to detect and recognize motorcycles in traffic is the predominating cause of motorcycle accidents. The driver of the other vehicle involved in collision with the motorcycle did not see the motorcycle before the collision, or did not see the motorcycle until too late to avoid the collision.
- Intersections are the most likely place for the motorcycle accident, with the other vehicle violating the motorcycle right-of-way, and often violating traffic controls.
- Most motorcycle accidents involve a short trip associated with shopping, errands, friends, entertainment or recreation, and the accident is likely to happen in a very short time close to the trip origin.

- The median pre-crash speed was 29.8 mph [48.0 Kph], and the median crash speed was 21.5 mph [34.6 Kph], and the one-in-a-thousand crash speed is approximately 86 mph [138 Kph].

- The typical motorcycle pre-crash lines-of-sight to the traffic hazard portray no contribution of the limits of peripheral vision; more than three-fourths of all accident hazards are within 45 degrees of either side of straight ahead.

- Conspicuity of the motorcycle is most critical for the frontal surfaces of the motorcycle and rider.

- Vehicle defects related to accident causation are rare and likely to be due to deficient or defective maintenance.

- The motorcycle riders involved in accidents are essentially without training; 92% were self-taught or learned from family or friends. Motorcycle rider training experience reduces accident involvement and is related to reduced injuries in the event of accidents.

- More than half of the accident-involved motorcycle riders had less than 5 months experience on the accident motorcycle, although the total street riding experience was almost 3 years. Motorcycle riders with dirt bike experience are significantly underrepresented in the accident data.

- Motorcycle riders in these accidents showed significant collision avoidance problems. Most riders would over brake and skid the rear wheel, and under brake the front wheel greatly reducing collision avoidance deceleration. The ability to counter steer and swerve was essentially absent.

- The typical motorcycle accident allows the motorcyclist just less than 2 seconds to complete all collision avoidance action.

- The driver of the other vehicles involved in collision with the motorcycle is not distinguished from other accident populations except that the ages of 20 to 29 and beyond 65 are overrepresented. Also, these drivers are generally unfamiliar with motorcycles.

Behavioural Research in Road Safety (DfT, 2004)[85]

In November 2004, the Department for Transport in Great Britain published a report called 'Behavioural Research in Road Safety'. The report covers a variety of studies which focus on specific causes to road accidents.

One of these studies is called 'An in-depth case study of motorcycle accidents using police road accident files' by the authors DD Clarke, P Ward, W Truman and C Bartle. This study considers accidents 'involving motorcyclists (and their blameworthiness) and the problem surrounding other road users' perception of motorcycles, particularly at junctions' (page 5).

The report considers factors such as 'drivers with relatively high levels of driving experience who nonetheless seem to have problems detecting approaching motorcycles' (ibid).
The study examined 1,790 motorcycle accidents from the West Midlands police reports with follow up questionnaires. However, the authors concentrated on c.1000 of these accident reports identified as 'A' class' which provided more detail of the accidents.

Accordingly, of the total cases, 681 (38%) involve ROWVs[86]. However, less than 20% of these involve a motorcyclist who rated as either fully or partly to blame for the accident. The majority of motorcycle ROWV accidents have been found to be primarily the fault of other motorists. This is an

[85] Ref: Baird, T and Hardy E, How Close is Too Close, 2006
[86] ROWVs – Right of Way Violations

even higher level of *"non-blameworthiness' in ROWV accidents than that observed in other in-depth studies, e.g. Hurt et al 1981.* (op. cit.)".

The study supports the DfT 2004 casualty data by identifying that "*The majority of ROWVs occur at T-junctions, which are three times as common as roundabouts or crossroads. This finding is in accordance with the work of Hole et al. (1996), who found that the majority of such accidents occurred at 'uncontrolled' (i.e. no stop light or sign with only give-way markings and/or signs present) T-junctions in urban environments*" (page 7).

The report highlights that "*Over 65% of ROWV accidents where the motorcyclist is not regarded as to blame involve a driver who somehow fails to see a motorcyclist who should be in clear view, and indeed frequently is in view of witnesses or other road users in the area. Failures of observation that involve drivers failing to take account of restricted views of one kind or another, and failing to judge the approach speed and/or distance of a motorcyclist are not included in this category*" (Ibid).

The most significant finding of this study with regards to right of way violation (ROWV) accidents, suggests that in particular, there is a marked problem with other road users observing motorcyclists. This is the phenomenon whereby drivers overlook a motorcyclist in the immediate foreground seems to be in agreement with the work of Mack and Rock (op. cit.), whose theory of 'inattentional blindness' showed that subjects may be *less* likely to perceive an object if they are looking at it directly than if it falls outside the centre of the visual field. 'Inattentional blindness' is suggested by research to be affected by four main factors: conspicuity, expectation, mental workload, and capacity (page 8).

"*Some results would seem to permit the discussion of conspicuity and expectation. The fact that many motorcyclists in our sample appear to be trying to make themselves more conspicuous but are not seen* (however the report does not indicate what methods were used – i.e. whether this conspicuity included bright clothing, headlights on etc)*, nevertheless lends credence to the idea that there is something amiss in the cognitive processes of the other involved driver. The 'expectation' factor, in particular, raises the possibility that some road users have a poor perceptual 'schema'*[87] *for motorcycles in the traffic scene, and therefore do not process the information fast enough when motorcyclists are observed*" (page 14).

Furthermore, the research shows that "*the average age of drivers in 'at fault' ROWV accidents involving motorcycles, 41 years, is significantly higher than the equivalent group in non-ROWV accidents, 36 years (t = 3.45, p < 0.05)*" (page 15).

The study continues "*For right of way accidents that involve other drivers pulling out in front of motorcyclists who are perhaps further away, it could also be that more global visual failings are contributing to the age effect. The proportion of visual error compared with other 'at fault' errors rises with age. The change in ratio occurs at too greater an age (65' years plus) to be related purely to driver skill factors, and suggests an age-related deficit*" (p. 16).

According to the study, "*reasons for such an increase in global visual failings with age are many. Isler et al. (1997) found, in an analysis of the effect of reduced head movement and other deteriorations in the visual system on the useful field of view for the drivers aged 60 years' plus, that there was an evident restriction on the distances at which approaching traffic could be brought into the central, stationary field. Even at maximum head rotation plus one saccadic eye movement*[88]*, approaching vehicles would not be clearly perceived beyond a distance of 50 metres*" (Ibid).

[87] A mental representation that consists of general knowledge about events, objects or actions
[88] Very rapid, ballistic eye movement (with speeds up to 800 degrees per second)

MAIDS and the On The Spot (OTS) Study

Summary of Results [89]

There are considerable differences between the accident populations of OTS and MAIDS data:

- Engine sizes: compared with the MAIDS data (57%) the OTS data contained higher proportions (80%) of powered two wheelers with larger engines (L3 vehicles). The magnitude of this difference, and its statistical significance, indicates a difference in the distribution of engine sizes of vehicles in accidents which suggest an underlying difference in the fleet make-up between OTS and MAIDS sampling areas. This difference is likely to be linked to many other factors such as journey purpose, length and environment. These factors are, in turn, likely to affect accident types, severity and perhaps also causation within the sampling regions.

- Protective Equipment: the proportions of motorcyclists wearing protective equipment were statistically different, between OTS and MAIDS samples, at the 99% confidence level; the types of equipment worn were also different: higher proportions of leathers and full face helmets were worn in the OTS sample. Protective equipment choices are influenced by factors including climate, bike style, engine capacity, trip purpose and trip length. These differed between sampling region.

- Accident factors: accident type (e.g. junction, bend) and accident environment (e.g. rural or urban) data from MAIDS do not reflect UK circumstances. This is not surprising given the different countries sampled and methodologies used. The MAIDS study was based on a case-control methodology and focussed on determining accident causation and accident risk, so the study was not designed to compare with the national statistics of the countries.

- Severity: accident severity data is recorded in MAIDS using the Abbreviated Injury Scale (AIS). PTW injuries recorded in OTS and MAIDS data were compared using this scale and showed that a higher proportion of higher severity injuries (AIS>2) were reported in OTS (49%) compared to MAIDS data (41%). There is a higher proportion of high severity motorcycle accidents recorded in OTS data. This is considered to be a result of the OTS sampling - investigators are called to a higher proportion of more severe accidents in general.

- Injuries: significant differences are found between the accidents in OTS and MAIDS in terms of the injuries recorded. OTS data reports higher proportions of neck, thorax and abdomen injuries than MAIDS. MAIDS data shows significantly higher proportions of head and lower extremity injuries.

- Conspicuity: this is an important consideration with respect to the interaction of motorcycles with other road traffic. OTS data collected at the time of the accident shows that motorcycle headlights were off in 40% of cases whereas for the exposure data this proportion was 23%. This suggests that the use of motorcycle headlights appears to be beneficial in terms of alerting other road users to the presence of a powered two-wheeler. A significantly higher proportion of PTWs had headlights in operation at the time of the accident in the MAIDS study.

Some similarities exist in the accident populations of OTS and MAIDS data:

- Collision partner: both OTS and MAIDS show that the major collision partner in motorcycle accidents are passenger cars, accounting for approximately two-thirds of accidents. This is the case regardless of whether the accident occurred in a rural or urban setting.

[89] http://www.dft.gov.uk/rmd/project.asp?intProjectID=12565

- Junction accidents: the proportions of accidents which occur away from a junction are similar between the studies (38% for MAIDS and 42% for OTS).

- Causation: a traffic scan error by the motorcycle rider contributed to the accident in 28% of MAIDS records and 22% of OTS records. Traffic scan errors by other vehicles users in the collision accounted for 64% of accidents in MAIDS and 67% of accidents in OTS.

Annex 4[90]

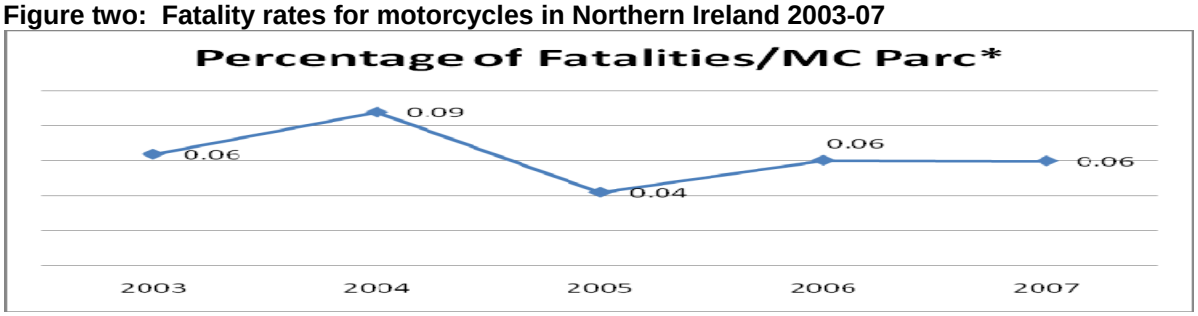
Motorcycle Use & Accident Statistics in Northern Ireland and in Europe

Table eight: Northern Ireland – Motorcycles (including mopeds and scooters) licensed. Total fatalities, serious injuries and slight injuries for 2003 - 2007[91]

	2003	2004	2005	2006	2007
Motorcycles	26,682	27,326	28,689	29,922	31,763
Fatalities	17	24	12	18	19
Percentage	0.06	0.09	0.04	0.06	0.06
	2003	2004	2005	2006	2007
Motorcycles	26,682	27,326	28,689	29,922	31,763
Serious injuries	145	151	126	135	135
Percentage	0.54	0.55	0.44	0.45	0.43
	2003	2004	2005	2006	2007
Motorcycles	26,682	27,326	28,689	29,922	31,763
Slight injuries	305	292	257	259	316
Percentage	1.14	1.07	0.90	0.87	0.99

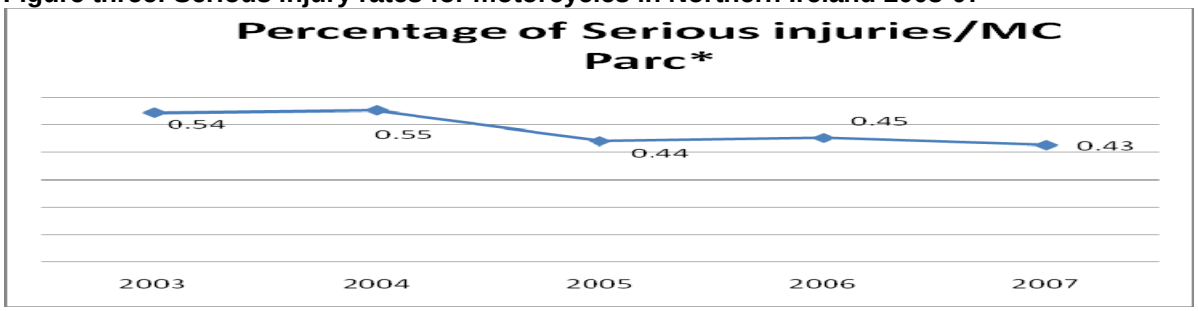
N.B. Motorcycles include Motorcycles, Scooters and Mopeds

Figure two: Fatality rates for motorcycles in Northern Ireland 2003-07



In comparison to Southern Ireland (0.16%) in 2003, the fatality rates of Northern Ireland are around two thirds less (37.5%).

Figure three: Serious injury rates for motorcycles in Northern Ireland 2003-07

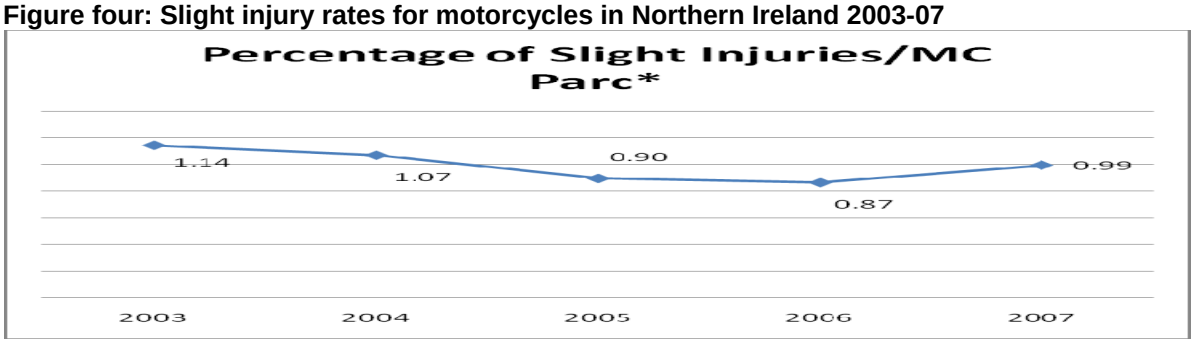


The rates of serious injuries show a gradual decline over the period 2003 (0.54%) to 2007 (0.43%)

[90] Annex 4 (Motorcycle Use & Accident Statistics in Northern Ireland and in Europe) is the compilation of data analysis by Elaine M Hardy.

[91] Table 6.8: Injury Road Traffic Collision Casualties by Severity of Injury and Type of Road User 2003/04 – 2007/08 (PSNI Statistics: Annual Statistical Report Statistical Report No. 6 INJURY ROAD TRAFFIC COLLISIONS AND CASUALTIES 1ST APRIL 2007 – 31ST MARCH 2008) Table 1.7 Vehicles currently licensed by body type: 2003-2007 (Northern Ireland Transport Statistics 2007-08)

Figure four: Slight injury rates for motorcycles in Northern Ireland 2003-07



While there has been an overall decline in slight injuries in terms of rates, there has been an increase between 2006 and 2007, although the trend is a decline in slight injuries.

Table nine (a): PSNI fatality data for all road users between 2004 and 2009 (April to March)

	2004/05	2005/06	2006/07	2007/08	2008/09	% +/-
Pedestrians	24	25	23	18	21	12.5
Drivers of motor vehicles	62	63	47	43	44	29
Motorcyclists	24	12	18	19	16	33.3
Passengers of motor vehicles	26	30	38	25	21	19.2
Pedal cyclists	2	4	1	2	2	0
Pillion passengers	1	0	0	2	0	100
	139	134	127	109	104	25.2

The PSNI fatality data for all road users between 2004 and 2009 (April to March) highlight that overall there has been an decline of fatalities of 25.2% from 2004/05 (n. 139) compared to 2008/09 (n.104) for all road users, however in terms of reductions for different road users, motorcyclists have had the highest reduction 33.3% (2004/05 n.24 compared to 2008/09 n.16) (except pillion passengers which had a baseline of one).

Table nine (b): PSNI fatality data for all road users between 2004 and 2009 (April to March)

	2004/05	2005/06	2006/07	2007/08	2008/09
Pedestrians	33.4	33.5	29.2	19.6	21.8
Drivers of motor vehicles	86.2	84.4	59.7	46.9	45.8
Motorcyclists	33.4	16.1	22.9	20.7	16.6
Passengers of motor vehicles	36.1	40.2	48.3	27.3	21.8
Pedal cyclists	2.8	5.4	1.3	2.2	2.1
Pillion passengers	1.4	0.0	0.0	2.2	0.0

In terms of proportions of overall fatalities, vulnerable road users (pedestrians, motorcyclists and pedal cyclists) have seen a reduction of 28.9% - from 69.5% of total fatalities in 2004/05 to 40.6% in 2008/09.

Table ten: Motorcycle usage and injuries in EU 15 Countries between 2001 and 2005

	PTW parc (1)	Motorcycle parc (2)	Moped parc (3)	Car parc (4)	% PTW/ Car parc	Motor cycle Deaths (5)	Moped Deaths (6)	Total PTW Deaths (7)	Total Road Deaths (8)	% PTW/ Total Road Deaths	% PTW Death /PTW parc
Austria											
2001	636,888	294,843	342,045	4,182,027	15.2	107	37	144	958	15.0	0.02
2002	595,259	292,569	302,690	3,987,093	14.9	89	46	135	956	14.1	0.02
2003	605,405	305,481	299,924	4,054,308	14.9	109	47	156	956	16.3	0.03
2004	610,835	315,638	295,197	4,109,129	14.9	98	44	142	878	16.2	0.02
2005	612,000		n/a	4,156,743	14.7	98	41	139	768	18.1	0.02
Belgium											
2001	*639,813*	289,813	n/a	4,684,504	13.7	147	63	210	1,486	14.1	0.03
2002	*651,217*	301,217	n/a	4,724,856	13.8	158	68	226	1,213	18.6	0.03
2003	*605,405*	315,422	n/a	4,772,584	12.7	124	45	169	1,213	13.9	0.03
2004	*628,617*	328,617	n/a	4,818,571	13.0	120	33	153	1,162	13.2	0.02
2005	n/a		n/a	4,861,352		123	30	153	1,089	14.0	
Denmark											
2001	146,365	78,390	67,975	1,875,252	7.8	12	43	55	431	12.8	0.04
2002	151,322	82,731	68,591	1,889,979	8.0	24	38	62	432	14.4	0.04
2003	155,740	87,779	67,961	1,894,209	8.2	25	43	68	432	15.7	0.04
2004	162,128	94,815	67,313	1,914,370	8.5	23	46	69	369	18.7	0.04
2005	n/a	n/a	n/a	1,961,162		16	29	45	331	13.6	
Finland											
2001	206,235	102,811	103,424	2,331,000	4.4	16	7	23	433	5.3	0.01
2002	223,577	116,021	107,556	2,146,243	5.4	22	7	29	415	7.0	0.01
2003	245,382	129,670	115,712	2,180,025	5.9	23	12	35	379	9.2	0.01
2004	271,720	142,703	129,017	2,259,383	6.3	22	14	36	375	9.6	0.01
2005	272,000	n/a	n/a	2,414,477	11.3	32	4	36	379	9.5	0.01
France											
2001	2,440,000	1,019,000	1,421,000	28,700,000	8.5	1,092	450	1,542	8,160	18.9	0.06
2002	2,441,000	1,054,000	1,387,000	29,160,000	8.4	1,063	387	1,450	7,655	18.9	0.06
2003	2,448,000	1,091,000	1,357,000	29,560,000	8.3	883	393	1,276	5,731	22.3	0.05
2004	2,462,000	1,131,000	1,331,000	29,900,000	8.2	866	339	1,205	5,530	21.8	0.05
2005	n/a	n/a	n/a	30,100,000		892	356	1,248	5,318	23.5	
Germany											
2001	5,152,109	3,410,480	1,594,749	44,383,323	11.6	964	138	1,102	6,977	15.8	0.02
2002	5,339,396	3,557,360	1,682,523	44,657,303	12.0	913	131	1,044	6,842	15.3	0.02
2003	5,328,680	3,656,873	1,583,917	45,022,926	11.8	946	134	1,080	6,613	16.3	0.02
2004	4,565,277	3,744,763	1,662,765	45,375,526	10.1	858	122	980	5,842	16.8	0.02
2005	5,630,000	2,902,512	1,785,620	46,090,303	12.2	875	107	982	5,361	18.3	0.02

Greece

2001	847,732	679,817	167,915	3,242,204	26.1	426	77	503	1,880	26.8	0.06
2002	869,047	703,682	165,365	3,477,059	25.0	341	55	396	1,634	24.2	0.05
2003	881,382	707,369	174,013	3,696,944	23.8	310	53	363	1,615	22.5	0.04
2004	893,186	714,549	178,637	3,960,189	22.6	379	55	434	1,670	26.0	0.05
2005	n/a	n/a	n/a	4,204,463		399	58	457	1,658	27.6	

Ireland

2001	32,913	n/a	n/a	1,384,704	2.4	50	n/a	50	412	12.1	0.15
2002	33,147	n/a	n/a	1,447,908	2.3	44	n/a	44	378	11.6	0.13
2003	35,094	n/a	n/a	1,507,106	2.3	55	n/a	55	337	16.3	0.16
2004	37,000	n/a	n/a	1,582,833	2.3	n/a	n/a	n/a	374		
2005	n/a	n/a	n/a	1,664,868		n/a	n/a	n/a	396		

Italy

2001	9,979,890	3,729,890	6,250,000	33,239,029	30.0	807	508	1,315	6,691	19.7	0.01
2002	10,149,540	4,049,540	6,100,000	33,706,153	30.1	869	420	1,289	6,739	19.1	0.01
2003	10,295,449	4,370,449	5,925,000	34,310,446	30.0	980	461	1,441	6,065	23.8	0.01
2004	10,224,644	4,574,644	5,650,000	33,973,147	30.1	1,070	388	1,458	5,625	25.9	0.01
2005	n/a	n/a	n/a	34,667,485		1,143	409	1,552	5,700	27.2	

Luxembourg

2001	33,576	11,961	21,615	n/a		6	0	6	70	8.6	0.02
2002	34,701	12,671	22,030	213,177	16.3	0	0	0	64	0.0	0.00
2003	35,959	13,380	22,579	212,472	16.9	13	0	13	52	25.0	0.04
2004	36,909	13,901	23,008	212,063	17.4	n/a	n/a	n/a	48		
2005	37,739	14,268	23,471	211,567	17.8	n/a	n/a	n/a	46		

Netherlands

2001	964,822	460,822	504,000	6,539,000	14.8	76	78	154	993	15.5	0.02
2002	1,002,450	494,450	508,000	6,710,000	14.9	93	98	191	987	19.4	0.02
2003	1,015,567	516,567	499,000	6,855,000	14.8	95	94	189	1,028	18.4	0.02
2004	1,038,934	536,934	502,000	7,151,000	14.5	91	87	178	804	22.1	0.02
2005	n/a	552,949	n/a	7,299,000		95	94	94	750	12.5	

Portugal

2001	709,000	158,000	551,000	3,746,000	18.9	229	184	413	1,671	24.7	0.06
2002	604,000	149,000	455,000	3,885,000	15.5	225	145	370	1,675	22.1	0.06
2003	633,000	153,000	480,000	3,966,000	16.0	213	157	370	1,356	27.3	0.06
2004	611,000	159,000	452,000	4,100,000	14.9	181	121	302	1,294	23.3	0.05
2005	n/a	n/a	n/a	4,200,000		188	106	294	1,247	23.6	

Spain

2001	3,596,045	1,483,442	2,112,603	18,150,880	19.8	370	461	831	5,516	15.1	0.02
2002	3,561,450	1,517,208	2,044,242	18,732,632	19.0	401	383	784	5,347	14.7	0.02
2003	3,657,119	1,513,526	2,143,593	18,688,320	19.6	367	391	758	5,399	14.0	0.02
2004	3,854,128	1,612,082	2,242,046	19,541,918	19.7	399	361	760	4,741	16.0	0.02
2005	4,118,000	n/a	n/a	20,250,377	20.3	472	312	784	4,442	17.6	0.02

Sweden

2001	328,838	182,092	146,746	4,018,533	8.2	38	9	47	583	8.1	0.01
2002	351,526	201,526	150,000	4,042,792	8.7	37	12	49	560	8.8	0.01
2003	367,015	217,015	150,000	4,075,414	9.0	47	9	56	529	10.6	0.02
2004	385,137	235,196	149,941	4,113,424	9.4	56	18	74	480	15.4	0.02
2005	395,000	250,000	145,000	4,153,674	9.5	46	8	54	440	12.3	0.01

United Kingdom

2001	1,212,000	1,033,200	178,800	28,604,238	4.2	n/a	n/a	583	3,450	16.9	0.05
2002	1,255,800	1,077,000	178,807	29,320,899	4.3	n/a	n/a	609	3,431	17.7	0.05
2003	1,314,000	1,131,500	182,476	29,895,832	4.4	669	24	693	3,508	19.8	0.05
2004	1,338,300	1,160,900	177,448	30,267,204	4.4	560	25	585	3,221	18.2	0.04
2005	1,367,100	1,193,500	173,600	30,674,000	4.5	547	22	569	3,201	17.8	0.04

Parc and Casualty data refer to Great Britain (England, Wales and Scotland); http://ec.europa.eu/transport/roadsafety_library/care/doc/annual_statistics

(1) (Source: ACEM (NL:Bovag; GB:MCIA; BAST: DK); (2) (Source: ACEM (NL:Bovag; GB:MCIA; Sweden: Finland; BAST: Germany)

(3) (Source: ACEM (NL:Bovag; GB:MCIA; Sweden: Finland; BAST: Germany); (4) Source: ACEA (GB:SMMT; NL:Bovag; LU:Statec; BAST: Germany)

(5) Source: ACEM; CARE (includes passengers)(BAST: Germany); (6) Source: ACEM; CARE (includes passengers)1(BAST: Germany)

(7) Source: ACEM; CARE (includes passengers)1; (BAST: Germany 2001-05)

(8) Source: International Road Traffic and Accident Database (OECD), ECMT and CARE (EU road accidents database) (Ireland: Garda Siochana 2004-05; BAST: Germany; GB:DfT; Luxembourg-Ministère des Transports 2001-03)

Annex 5

Motorcycle Access - 3rd European Driving Licence Directive

AM Licence (Mopeds)

The age limit for category AM is 16 years
Access age may be from 14 years
Having effect on national territory only
Or elevated to 18 years

Theory test - Practical test is optional

A1 Licence (Light Motorcycles)

Cylinder capacity not exceeding 125 cubic centimetres.
Of a power not exceeding 11 kW and with a power/weight ratio not exceeding 0.1 kW/kg
All Member States have to introduce this category of licence which did not exist in all Member States

Direct Access
Age limit 16 years
Age limit may be elevated up to 17 or 18 years
Theory and practical test

A2 Licence (Motorcycles)

Motorcycles, with or without a sidecar, of a power not exceeding 35 kW
A power/weight ratio not exceeding 0.2 kW/kg
And not derived from a vehicle of more than double its power

Direct Access
Minimum age is fixed at 18 years.
If minimum age for category A1 Licence is at 17 or 18 years
The minimum age for category A2 will be 19 or 20 years
Theory and Practical Test

Progressive Access
There must be 2 years between
the minimum age for A1 Licence and minimum age for A2 Licence
If a rider is a holder of a A1 Licence for 2 years
Pass a practical test or complete training
No Theory Test

A Licence (Motorcycles)

Motorcycles with or without sidecar.

Direct Access
Minimum age limit has been raised from the previous 21 years to 24 years
Theory and practical test

Progressive Access
Acquire two years experience on a motorcycle of A2 Licence
Pass a practical test or complete training
No Theory Test

Entitled to ride A Licence category motorcycles
From the age of 20 (or possibly 21 or 22 depending on the minimum age for A2)

Motorcycle Licence Scenario for UK

AM Licence (Mopeds)

16 years

Compulsory Basic Training

Moped 50cc

A1 Licence (Light Motorcycles)

Direct Access
18 years
Theory and practical test

125cc

A2 Licence (Motorcycles)

Direct Access
20 years
Theory and Practical Test

Progressive Access
20 years
Pass a practical test or complete training
No Theory Test

Restricted

A Licence (Motorcycles)

Direct Access
24 years
Theory and practical test

Progressive Access
22 years
Pass a practical test or complete training
No Theory Test

Unrestricted