

IHIE GUIDELINES FOR MOTORCYCLING

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The Institute of Highway Incorporated Engineers (IHIE) Guidelines For Motorcycling, subtitled '*Improving safety through engineering and integration*' will be launched on the 14th April 2005 at a conference in London at the Institute of Physics. Their purpose is to demonstrate the role motorcycling can play in an integrated transport system and to assist highway and traffic engineers in developing a safer and more motorcycle friendly road environment.

Throughout the Guideline we refer to the term 'Motorcycles' but this covers all forms from mopeds, through Scooters to the largest sports and touring machines. And if nothing else 'Motorcycles' is easier to say than Powered Two Wheelers (or PTW's)!

The IHIE celebrates its 40th year this year. It has approx. 3000 members, Engineers and Technicians, working in Central and Local Government, consultant engineers and supplying contractors.

Incorporated Engineers and Technicians are the 'day to day' Highway Engineers designing, installing, operating and maintaining the highway network. As such our members deal with all aspects of highway design and management including Highway design, Traffic engineering and management, Materials & Soils engineering, Traffic control, Transportation & Highway maintenance.

Highway Engineering is now more than ever more than just about building roads. Today's Highway professionals need to be more prepared to engage the public and work with colleagues in other disciplines, to challenge and promote alternative forms of travel, to address social deprivation and to question existing designs and innovate other solutions.

The IHIE by representing its members, providing courses and conferences and publishing guidelines hopes to be able to equip engineers with the skills and tools they need.

So why do we need guidelines for Motorcycling now? Well, although we started out on the guidelines nearly two years ago at the present there is a lot of interest (both wanted and unwanted) in motorcycling.

The 2005 EuroRAP study has again focused on another year of increased motorcycle casualties; The Motorcycle Accident in Depth Study (or MAIDS) study of nearly 1000 accidents across Europe has been completed and has vindicated many of us who point out its not all the riders fault. The Government Advisory Group on Motorcycling originally formed in 1999 published their final report and The 3-year review of *'tomorrow's roads safer for everyone'* again identified motorcycle casualties as an area of concern and specifically highlighted the gap in advice on how to provide for safer motorcycling on the road network.

And now building on the work of the Government Advisory Group the Government's motorcycling strategy (the first such national strategy in Europe) has been published. The Strategy's central theme being -

' to Facilitate motorcycling as a choice of travel within a safe and sustainable transport framework'

It addresses safety, integration and security. The role that engineering can play in delivering these and other goals, and the IHIE guidelines in particular, feature in the strategy.

Motorcycling has always been an inexpensive, environmentally friendly and effective means of transport especially so on today's congested highway networks. At a time when Central and Local Government is wrestling with the problems of increased private car ownership and increased congestion Motorcycles can provide a viable means of congestion and pollution busting transport to many, especially on journeys over, say 5 miles.

Motorcycling also provides, as it has for decades, many with immense pleasure as a leisure activity. It is not a minority interest there are nearly 12 million motorcycle riders across Europe, over 1½ million of them in the UK, and it makes a significant contribution financially in Industry, jobs, tourism and tax revenues.

There has been a significant increase in the registration of motorcycles over the last 5-10 years Especially in the 500cc+ class unfortunately we have also seen a significant increase in the numbers of motorcycle riders killed and seriously injured. Central governments headline targets for casualty reductions of a 40% in killed and seriously injured over ten years are on course for all other categories except those for motorcycles, which are increasing. It's important to recognise, however, that a key measure of safety, casualty rates – rider exposure to risk, has show year on year improvement, falling by 26.7% since 1993.

There are no current targets for casualty rates, but if we use the 94-98 baseline we can see that had they existed, PTW rates would have fallen by 18.1%. The casualty rate fell by 14.6% between 2002 and 2003 alone. It should be noted, however, that fatality rates have remained essentially constant since 1993 at approx 12%.

Highway engineers are just like the public they probably labour under the idea that motorcycles (and in particular mopeds and scooters) should be treated as fast bicycles or two wheeled cars! As we are all aware motorcycles are neither like bicycles motorcycles are extremely vulnerable to other road users actions and the road environment but they handle very differently and use different parts of the highway from cars. Many of my engineering colleagues will also hold the view, held by the general public, that most crashes are the riders fault caused by riding far too powerful bikes to fast with no care for our own or others safety and the actions of a minority of riders don't help dispel such a view. Study after Study has shown, however, that in the urban environment in particular nearly 2/3rds of accidents involve another vehicle the driver of which is often to blame and although the road environment itself is rarely the principle factor in an accident, recent studies suggest that the motorcycle riders interaction with the environment is implicated in around 30% of cases where a rider dies.

New Highway design and construction largely relies on technical design manuals which in turn are often based on rules set out in statute.

Such technical guidelines help engineers focus on specific areas of design and allows them to develop further solutions. A point ably demonstrated, I believe, if we consider the provision for another vulnerable group of road users, cyclists. Cycle provision is now well covered by such technical guidelines and this has, I would suggest, gone some way to the almost uniform consideration of cyclists in the design and maintenance of highways and the significant increase in provision.

There is, however, very little published material for Motorcycle provision for highway engineers to go on. Obviously there is there was the excellent MCI A Smart Guide, which I would commend to all of you, and the previously unpublished 1999 TRL report 581 'Motorcycle Safety a scoping Study' and we are starting to see more such work coming out of the lab.

In addition, and perhaps surprising to some, there has been published work on the subject of motorcycle safety in France (The 'SETRA' Guidelines), Norway ('NPRA' Manual) and Australia (The 'AUSTROAD' Guidelines and the subsequent Motorcycle Notes by the state highway authority for Victoria, Vicroads).

But few of these documents are likely to be known to mainstream engineers and they are unlikely to hunt them out, so if we are to address the subject there is a need for such guidelines!

So who's involved in the Guidelines? An editorial group was established for the guidelines with backing being received from Department for Transport; British Motorcyclists Federation; County Surveyors Society; Transport for London; The Highway Agency and the MCI A. In addition the Editorial group calls on the expertise of representatives from TRL; TMS Consultancy and the managing consultants for the Guidelines Scott Wilson.

As a first stage a scoping study for the guidelines was undertaken by the TRL. This involved a literature search of the TRL database and a web based questionnaire to establish target audience and preferred content. This gave us a number of subjects that we could combine under common headings and I'd like to very briefly look at these subject headings.

Chapter 1 Introduction

This highlights the significant contribution that motorcycles can make in reducing traffic congestion. It covers how they can provide mobility for those at a social disadvantage not served by public transport.

As we are all aware there has been an increase in accidents involving motorcycles but we need to put the number of motorcycle accidents into context against increased registrations. We also need to give an indication of the causes for such accidents. This will lead into

Chapter 2 Policy

Central Government has previously highlighted the role that motorcycles can make in local transport plans. The first full guidance for local transport plans in 2000 (the main source of funding for local authorities) made significant steps on including motorcycles. Unfortunately the advice for 2nd addition for the full Guidance on Local Transport Plans (LTP2), which covers Local Transport Plans from 2006, in keeping with less target specific measures has lost much valuable detail. It does, however, acknowledge the increase in motorcycle and the part that motorcycles can play in delivering 3 of the 4 key targets for LTP2; *Congestion; Accessibility* and *Air Quality* . But thus far whilst most local authority Local Transport Plans make mention of motorcycling, usually by focusing on the 4th LTP2 Key Target *Road Safety*, only a small number have written specific strategies for motorcyclists or set up motorcycle forums to discuss local issues. The guidelines will encourage local authorities to involve users and establish such strategies.

As an example of how policy for motorcycling can address other local authorities concerns I'd like to look at the *Wheels 2 Work* Scheme.

This seeks to provide a solution to transport barriers, with schemes offering individuals their own transport solutions for a short period, until a longer term solution can be found. Solutions offered include loan of mopeds, power assisted bikes and in some cases help to meet car running costs. It provides access to independent affordable transport for those living in areas where public transport links are poor and breaks the transport chain where without a job someone (especially the young) cannot afford to buy a car or motorcycle and without a vehicle of their own they cannot travel to work or take part in working life. There are now more than 50 *Wheels 2 Work* schemes in the UK.

A *Wheels 2 work* toolkit to help more local authorities set up such schemes has been devised and will hopefully be launched at the same time as the guidelines.

Chapter 3 Travel Plans

These are now often required by local authorities as part of planning process to encourage development that has less dependence on the use of the private motorcar.

Subsidised public transport, Car sharing and cycle facilities are often promoted in such travel plans yet Motorcycles can offer similar benefits to cycle usage but for greater distance of travel >5 miles. When including motorcycles (and indeed cycles) in travel plans items to consider should include Safe, secure parking; Changing Facilities; Accessibility to the site and Safety. Successful Motorcycle Travel Planners include Orange in Bristol; Pfizer in Kent; Vodafone in West Berks and Gatwick Airport.

As a specific example of a successful travel plan I'd like to consider GCHQ, Cheltenham. In September 2003, GCHQ moved to new headquarters that replaced more than 50 buildings in and around Cheltenham. As part of its travel plan GCHQ is encouraging more staff to use others forms of transport other than the single occupied private motorcar. Even when finished the new site will see a significant reduction in parking spaces (about 15%) and the centralising of so many offices on one site has, inevitably, led to some traffic delays. Approx 15% of its 4 ½ thousand employees cycle and at least 5% use motorbikes (This is increasing as the benefits of motorcycles become more widely known) In association with Gloucester County Council motorcycle safety co-ordinator, Nigel Murray, *Bikesafe* has been promoted at the site and those cycling and motorcycling benefit from secure, preferential parking; Lockers and showers and the option of an interest free loan to purchase machines and equipment. All of this work has led to GCHQ wining Ride to work day Motorcycle Friendly Employer award 2004.

Chapter 4 Highway and Traffic Engineering

Motorcycles, like cycles, are highly susceptible to road conditions and positioning of inspection covers, doubly so when such iron work is poorly maintained. Contrary to the view of some motorcyclists Highway Engineers don't deliberately position inspection covers on the 'natural line' for motorcyclist, you can find just as many in the wheel tracks of cars, its just that they don't understand the positioning that motorcycles take up on the road (especially for bends) nor the effect that such iron work or defects in the highway has. In addition the policy decisions covered in chapter 2 need designing and installation in a consistent manor with more local authorities now allowing motorcycles to use bus lanes and trials which are currently taking place for use of advance stoplines (currently used by cyclists only).

As another example of the effect that road environment can have on Motorcycle lets consider the issue of guardrailing. Motorcyclists are particularly vulnerable to impacting with street furniture; after all it's not the falling off that generally hurts but the coming to a rapid stop! And significant life threatening injuries can occur following impacts with such guardrailing.

Riders groups have concerns with guardrail and in particular wire rope safety fence and although much has been made of the 'cheese grater' effect of such fencing the main concerns should, I believe, center around the posts onto which the safety fencing is attached which is common to both types of fence.

Its should also be worth noting that we may see an increase in the installation of guard railing as local Highway Authorities rather than install, ' passively safe' (I.e. collapsible) posts, to reduce injuries to car occupants, take the less expensive option of 'protecting' them with barrier.

In response to lobbying by motorcycle representative groups, several studies have been carried out internationally on the treatment of guardrailing, and the support posts in particular, and several solutions proposed; a number of which are in use on sections of highway in Europe. Solutions proposed range from a change in their profile of the support post; the use of energy absorbing covering to the addition of a second section of rail below the guardrailing thus reducing the section of posts available to impact against.

It is the use of an additional barrier rail system that is currently under trail by the Highways Agency in Kent. Marketed in this country as '*BikeGuard*' it has been used in Europe for many years and can be fixed to existing barrier with specially shaped brackets that attach to the rear of the barrier rail thus allowing it to perform independently of the barrier during impact. The system utilises slotted holes and a hanging bracket to enable horizontal and vertical adjustment. Obviously such works could never be undertaken at all sites where guardrailing is present but in areas when riders are vulnerable, bends etc or where large numbers congregate then such measurers should be considered.

Chapter 5 ~ Parking

An area for concern for many motorcyclists and it would have been hoped that with increase in the number of motorcycle registrations the provision of safe useable parking would have kept pace but unfortunately not, with some local authorities in London even seeking to remove motorcycle parking as a form of restraint on motorcycle use. A number of other authorities have started to produce maps showing motorcycle bays but my own belief is that whilst well intentioned this largely misses the point even setting aside the difficulty of using such maps on a motorbike. Car drivers and cyclist don't need such maps there being an expectation that there will be facilities available for them at or near their destination. What is needed is an increase in clearly signed, well-designed parking but such an argument will often be countered by the claim that there is 'no demand' for such plentiful dedicated parking whilst accepting the argument of 'suppressed demand' when providing for secure cycle parking. Good, well designed motorcycle parking as part of planning approval or travel plan, will lead to responsible usage and a demand for more of the same.

Chapter 6 ~ Highway Maintenance

Highway Maintenance is more often than not dealt with by completely different teams to those dealing with the design and installation of highway works. The guidelines need to draw to the attention of maintenance engineers, who will often be the main contact with public utilities (who do most of the digging up of the UK's roads!) the effect of poor patching and sealing of joints have on motorcycles; the effects of contamination of the road surface and the importance of good drainage and winter maintenance.

Chapter 7 ~ Road Safety Campaigns

The traditional approach to motorcycle accidents by both Central and Local Government has for many years been to undertake Road Safety Campaigns principally aimed at riders. The continued sponsoring by the THINK! Campaign of the British Superbike championships, where local police force *BikeSafe* attending, is to be applauded. Such sponsorship allows access to a significant target audience (attendance at events is often in excess of 20,000).

In addition a number of Safety Camera Partnerships have started to tackle the problem of motorcycle casualties in their advertising campaigns and Local Authorities continue to undertake a variety of campaigns often themed around central government campaigns.

But these campaigns often works in isolation and much time is spent on duplicating good ideas and 're-inventing the wheel'. The guidelines will hopefully establish the need to bring campaigns into a compendium highlighting target audiences successes (and failures) an initiative that *LARSOA* are to launch to tie into the guidelines.

Chapter 8 Traffic Calming

Little has been written about the effect of traffic calming on motorcycles and contrary to the wishes of some such calming devices shouldn't be removed because they slow traffic, motorcycles included, down. But equally they should be sited far enough away from junctions and bends so that they can be approached with the motorcycle vertical. They also need to be well maintained and visible under all lighting and weather conditions.

Chapter 9 Road Safety Audit

Many of us will be aware of Road Safety Audits as a systematic process for checking safety of new works on roads by experienced, qualified safety engineers. It should consider all road users and in particular vulnerable road users; Pedestrians; cycles AND motorcycles. However few auditors have experience of Motorcycles and motorcycling. The Guidelines will encourage Auditors to consider the vulnerability of Motorcycles when undertaking Road Safety Audits.

Where next after the Guidelines?

Local Authorities and Central Government need to start building on the National Motorcycling Strategy and the IHIE Guidelines. Lets be honest if the work leading up to the guidelines showed me anything it s that there is an absence of innovation by Engineers when it comes to dealing with motorcycles. Those engineers now have to be bold and inventive with the designs supported, but not constrained, with before and after data.

Central Government needs to support such work by funding trails and carrying out research, feeding into the next edition of the guidelines to be published on the web.

BikeSafe needs to be expanded to all police forces and fully supported financially by central government and local authorities alike (What better use of safety camera revenue?).

Local Authorities, if they are serious about tackling the problem need to consider establishing Motorcycle Officers, in the same way as many of them appointed cycle officers in the 80's and pedestrian officers in the 90's.

Lets not forget though, that when all's said and done despite our best efforts there will always be times when motorcyclists, no matter how highly trained, have trouble interfacing with the road environment.



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The IHIE Guidelines for Motorcycling '*Improving safety through engineering and integration*' will be launched on the 14th April at a conference at the Institute of Physics

Costs of the conference including a copy of the guidelines is £130 (£110 IHIE/IHT members) and includes a free copy of the Guidelines and accompanying CD-Rom

Copies of the Guidelines will be available after the launch priced at £45 (plus P&P)

Details can be found on the IHIE website www.ihie.org.uk