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**INSTITUTE OF HIGHWAY
INCORPORATED ENGINEERS**



IHIE GUIDELINES FOR MOTORCYCLING

**improving safety through
engineering and integration**

version 1.1

6.1 Key Points

6.1.1 It is clear from other chapters of this guidance that policy changes and design improvements can make a big difference to motorcyclists' experience and safety when using the road network. However, the role of the maintenance engineer is critical to this mode of travel:

- ▼ 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.

6.2 Context

6.2.1 Many of the problems faced by road users have root causes that can be traced back to decisions made at an early stage in the process of infrastructure provision. Basic policy decisions can have a powerful influence on the kind of road environment people have to deal with. At a more obvious level, design-stage decisions can have immediate impact on the road environment and lead to road infrastructure that causes difficulties for some road users. Solutions lie in expanding the knowledge base so policy makers and designers are better informed to make better decisions in the future. Much of this document focuses on providing policy makers and designers with better information on the needs and vulnerabilities of motorcyclists, but motorcycling is arguably more vulnerable than most to the possible shortcomings of another element of infrastructure provision: road maintenance.

6.3 Road Maintenance

General

6.3.1 A good quality surface gives a safer, more pleasant experience for all road users; it is an essential requirement for motorcyclists. Factors affecting motorcyclists include: skid resistance, surface contamination and debris, drainage gullies, service covers, road markings and road studs. Over-banding materials with low wet skidding resistance and poor reinstatement works are common causes of problems for motorcyclists. A focus on planned maintenance that accounts for the needs of motorcyclists will always be more desirable than even the best reactive fault reporting system.

Pavement condition surveys and skid resistance

6.3.2 The development of the TRACS (Traffic speed Road Assessment Condition Survey) network condition monitoring equipment used on trunk roads into the Surface Condition Assessment of the National Network of Roads (SCANNER) specification will mean changes to the systems and methods used to monitor local roads in England. Scotland already has a system - Scottish Road Maintenance Condition Survey (SRMCS) and Wales and Northern Ireland are co-operating with the development process to aim for a consistent approach in all four countries (Wilmington and Gallagher 2004). One of the capabilities of the system is to assess surface texture. It is hoped that the outputs from these systems will, among other things, enable maintenance engineers to target more efficiently their other tools to monitor road condition, including SCRIM (Sideways force Coefficient Routine Investigation Machine).

6.3.3 The current standards for monitoring the skid resistance of road surfaces using the SCRIM procedure appear to be adequate for motorcycle interests. One difference for motorcyclists is that the majority of SCRIM tests follow the nearside wheel track. On many bends the rider's line is not the same, so it is important to bear in mind that the test result might not reflect the skid resistance of the surface the motorcyclist is riding on. There are two significant areas for improvement relating to the use of SCRIM:

- ▼ Although this procedure is standard for trunk roads and motorways it is not universally used on local roads. It would be a major benefit to the safety of all road users to expand the use of the machines, or to target them better using information from the new network condition monitoring systems mentioned above.
- ▼ Combining data on accidents involving skidding in wet conditions with a graphical representation of lengths of SCRIM at or below investigatory levels can form a powerful analysis tool in identifying places where road users, particularly motorcyclists, would benefit by targeted surface maintenance. This is a relatively simple technique using Geographical Information Systems, which often form the basis of asset and pavement management software.

Surface contamination and debris

6.3.4 The consequences of loss of grip are usually more severe for motorcycle riders. Loose grit and gravel are a major concern for riders and routine maintenance should be planned to reduce the amount of this debris left on the road. The following action points are worth adopting:

- ▼ During the surface-dressing season storage of granular material at the roadside, which could then spill into the carriageway, should be avoided.
- ▼ Before re-opening a surface-dressed site to normal traffic excess material should be completely removed; failure to do this can lead to skidding and serious abrasive injuries to riders.
- ▼ Prompt removal of mud and animal slurry. Cleansing operations need to be properly managed. Simply hosing a road with water may just compound the problem, especially in winter.



Detritus on outside of bend at junction.
Keith Sharples Photography.



Detritus on roundabout.
Keith Sharples Photography.

- ▼ Roads should be kept clear of debris which collects in areas not normally used by twin track vehicles, such as the middle of a road near traffic islands, or the outside edges of roundabouts. As well as compromising surface grip, these areas can collect metal debris which can cause punctures.
- ▼ Establish relations with local rider user groups and adopt reporting systems to enable prompt reaction to spillages.
- ▼ The Code of Practice for Maintenance Management ~ Well Maintained Highways (DfT 2005), addresses 'Safety' & 'Surface' inspections. These should be carried out regularly and the opportunity should be used to locate areas of unused carriageway where loose road material accumulates. Motorcycles can use any area of the carriageway and methods of eliminating this loose grit could be determined possibly by realignment but certainly by priority sweeping pending any other action.
- ▼ Obviously the spillage of diesel, oil and other similar substances on the road surface is of great concern to the motorcyclist. Even the use of absorbent granules to remove these spills can be a hazard. At sites where this is known to be a regular problem consider warning signing. Devon County Council promotes a "Spiller Killer" campaign to reduce this problem (Chapter 7).
- ▼ To give all motorists clear warning of the commencement of roadworks, it is important that signing in accordance with chapter 8 of the Traffic Signs Manual is used and maintained. Loose chipping warning signs need to be prominent.

Visibility

6.3.5 "Looked but did not see" is a common contributory factor in accidents involving motorcycles and other motor vehicles. This puts "see and be seen" at the top of the motorcycling agenda. Unfortunately this can become a problem at sites, particularly priority junctions and small roundabouts, where planted areas and hedges can completely mask a motorcyclist. Problems caused by poorly maintained vegetation restricting visibility should be addressed by an enhanced maintenance regime or modifying the type of planting.

Road markings and road studs

6.3.6 The use of road markings needs to be carefully examined from a motorcyclist-inclusive viewpoint. The position and skid resistance value of edge lining, rumble strips, large arrows and hatched centre line marking can all catch out the unwary motorcyclist, especially in the wet. Laying new markings on top of old ones can create areas where water collects without draining away; where layering makes road markings over 6mm high, they would in most cases, be unlawful. It is a false economy to avoid relining a maintenance scheme; the remaining road markings may constitute a standing water hazard. Blacking-out redundant markings rather than burning or planing them off creates a higher up-stand with the added hazard of reduced skid resistance. The issue of road markings is discussed further in a Road Safety Audit context in Chapter 9.



Rutted surface on bend.
Keith Sharples Photography.



Potholes present a particular hazard to motorcycles.
Keith Sharples Photography.

6.3.7 Many different types of road studs are now available. Newer types have higher retro-reflectivity and may be more suited to routes well used by motorcyclists. Motorcycle headlamps give a lower level of illumination and the lean of a motorcycle going into a bend can take the headlight beam away from hazards.

Rutting

6.3.8 Badly rutted surfaces cause particular problems in wet conditions. In addition to the rapid change in level and sharp ridges, they retain water and increase the risk of aquaplaning. Use warning signs as an interim measure while a programmed maintenance scheme can be designed.

Re-texturing

6.3.9 The various techniques of surface roughening such as grooving which are used to give a texture or help drain the carriageway must be carefully considered and when used should be adequately signed to give the motorcyclist ample warning of what is ahead.

Potholes and reporting systems

6.3.10.1 Potholes can be one of the most dangerous hazards for motorcyclists and cyclists. Adequate inspection and repair regimes should deal with the vast majority but local authorities should encourage the public to report ones they encounter. The British Motorcyclists' Federation (BMF) and the Motorcycle Action Group (MAG), along with a number of local authorities distribute fault-reporting postcards. The Highways Agency are piloting a 'REPORT A ROAD' facility which allows riders to pinpoint faults and e-mail local highway authorities details. Motorcycle riders are more likely than other road users to make use of such facilities, although the outcomes benefit other road users. Many local authorities have one-stop shops with a single phone number contact to report all kind of road-related problems. These laudable arrangements need to be widely publicised and perhaps augmented by the use of SMS text messaging, a convenient medium well used by riders.

Traffic calming schemes

6.3.11 Poorly maintained traffic calming can present problems with difficult level and wheel path changes and trapping surface water. The use of block paving or stone setts as entrance features can cause problems because this is usually an area where riders need to make turns. A further problem can be carriageway break-up adjacent to new vertical features (Chapter 8).

Materials

6.3.12 It would be worthwhile when planning maintenance schemes to consider using specialist materials on routes known to carry significant numbers of motorcycles or locations with high numbers of rider casualties. An example would be using accident records to select sites for high friction dressing. Avoid using excessively wide bitumen over-banding to seal cracks and prevent

water entering the road construction; bitumen can be less than adequate in terms of grip, especially in wet conditions and can contribute to loss of control accidents involving motorcyclists. There are alternatives reported to have better grip properties (FEMA 2004).

Drainage

6.3.13 Inadequate or compromised drainage creates wet patches and water pools causing slippery surfaces and increasing the possibility of aquaplaning. A particular hazard is where non-carriageway water runs across the road - often in between gully positions. Gullies blocked due to lack of maintenance or leaf fall in wooded areas are hazardous, and should be inspected and cleaned regularly. The design of traffic calming features needs to take account of drainage paths to ensure water does not pool in front of or behind the feature. It is important to remember that not all motorcyclists are fair weather leisure riders. Many people use their machines for commuting in winter. Ice can have serious consequences for all road users, but the price paid by a dismantled motorcyclist can be fatal.



Broken and patched surface near to traffic calming.
Keith Sharples Photography.

Lighting

6.3.14 The dynamics of motorcycling mean that it is critical for the rider to be able to see the detail of the road surface. At night consistent road lighting helps to enable any standing water, potholes or uneven service covers to be seen in time to take evasive action. Effective and well maintained lighting at traffic calming features is important, especially at vertical features such as road humps and speed tables, as motorcycle stability is particularly sensitive to abrupt changes in vertical alignment. Therefore the local authority needs a thorough and timely inspection and repair regime for road lighting.



Poorly lit traffic calming presents a hazard to *all* users, but in particular motorcycles.
Keith Sharples Photography.

Roadside trees

6.3.15 Roadside trees obscuring lighting or giving a high risk of causing serious injuries from collision or which cause continual problems with leaf fall on the road should be considered for branch lopping or enhanced carriageway maintenance to avoid leaves remaining on the road.

Service Covers



Numerous service covers.
Keith Sharples Photography.

6.3.16 One of the most regular problems raised by motorcyclists is that of service covers. Designers and maintenance engineers should take every opportunity to assess the use of steel service covers in the carriageway and, where relocation is impossible, consider replacement with high skid resistance covers. The most difficult sites are those where the cover lies on the riding line during a change of direction, either turning a corner, rounding a bend or at roundabouts. Proposals to position new covers within the carriageway, especially at roundabouts, should be discouraged.

6.3.17 The British and European Standard on service covers is under review with the intention of including a requirement for enhanced skid resistance. Anti-skid surfaces can be retro-fitted to covers that cannot be relocated. Where utility companies intend renewal of apparatus in the road it should be suggested to them that new covers should be a “skid proof” type.

6.3.18 In new developments the local authority should advise on the location of covers and perhaps specify that they are located in service strips in the verge/footway as opposed to the carriageway.

6.4 Winter Maintenance

6.4.1 Motorcycle use diminishes during the winter. However the risk and the severity of hazard increase. Excess salt residues can cause skidding problems for motorcyclists; therefore modern techniques using pre-wetted salt, reducing the quantity and granularity of road salt, may be beneficial to the rider.

6.5 Road Works

6.5.1 The positioning of temporary road signs can create a hazard for the motorcyclist when negotiating roadworks, as can overspill from materials stored on coned-off areas.

6.5.2 Poor re-instatement of road surfaces, temporary or otherwise, can pose severe stability problems to riders, especially at low speed. Local authorities should use their powers under the New Roads and Street Works Act (1992) and the Traffic Management Act (2004) to ensure work conforms to the associated code of practice.

6.5.3 Areas of substandard road lighting can pose an even bigger risk during roadworks. Missing or defective lighting should be repaired before work commences.



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