



Motorcycle Notes

No. 4 July 2000

Road Markings and Slippery Surfaces

This is the fourth in a series of VicRoads MOTORCYCLE NOTES. The purpose of MOTORCYCLE NOTES is to provide regular practical advice on motorcycle-specific aspects of road design, maintenance and safety for VicRoads, Local Government, Government Agency and Consultant engineers and planners. MOTORCYCLE NOTES should be read in conjunction with: 'Guide to Traffic Engineering Practice Part 15 – Motorcycle Safety', (GTEP Part 15) Austroads. Sydney 1999.

The Need

Compared to other vehicles, motorcycles are vulnerable to slippery surfaces and unexpected changes in road friction. Practical examples of areas where this can occur include:

- Road markings, especially in the form of raised white lines.
- Slippery surfaces, such as steel plates.
- Melted bitumen.
- Loose surfaces.
- Highly polished road surfaces at intersections.

In such situations, any special attention paid to motorcycle requirements will have broader beneficial impacts on other road users.

Oil and grease build-up on the middle of traffic lanes is an example of a potential road surface hazard largely restricted to motorcycles.

Single track vehicles tend to operate in the centre of traffic lanes to avoid encroachment by larger vehicles. This is precisely where such oil and other slippery droppings build up and reduce available traction and stopping power.

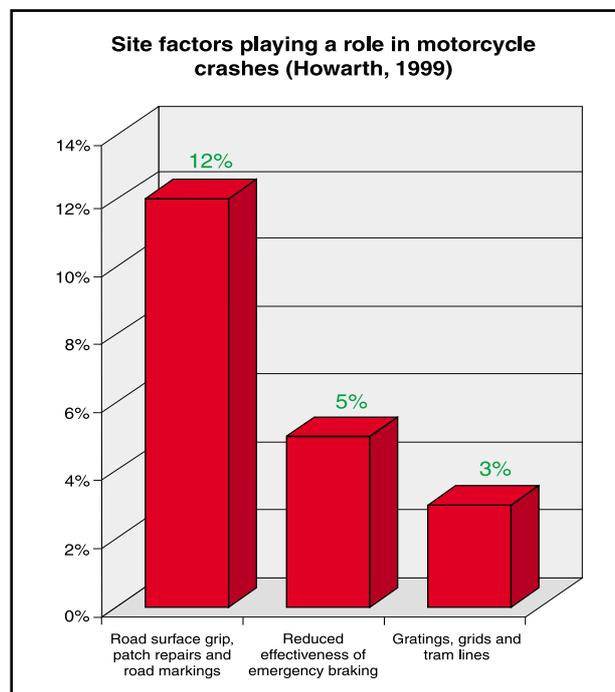
Significance of the Issue

Motorcyclists are vulnerable road users, and the severity of their crashes justifies close attention to

preventive design and monitoring action in the road environment. Haworth (1999) reported that the road surface actively contributed to the occurrence of the crash in 15% of cases in the Victorian Motorcycle Case Control Study.

A range of different site factors were covered, and the road surface friction levels were the most important (see the diagram opposite).

A third of all 1991-92 NSW motorcycle crashes did not involve any other vehicle (Austroads, 1999). Road surface friction factors can play a significant role in addressing such crashes.



Current Guidance

AUSTROADS GTEP Part 15 discusses a number of specific areas where the road surface friction variations are not adequately covered by current general practice, and recommends "Ensuring adequate and consistent surface roughness and skid resistance" as a design principle.

Specific areas identified as requiring attention beyond normal practice include:

- ❑ Some pavement markings offering inadequate skid resistance.
- ❑ Crack sealing without some form of friction treatment can be extremely slippery.
- ❑ Parallel grooving can reduce motorcycle stability.
- ❑ The use of smooth steel plates over trenches can be particularly hazardous.
- ❑ Sections of road with poor drainage due to their design.
- ❑ Uneven cobblestone treatments in the turning and braking areas at entrances to local street precincts.

This is not a complete list, but summarises several of the examples covered in Austroads GTEP Part 15.



very different. The UK requires the highest levels of friction on tight bends, and on the approaches to roundabouts, traffic signals, pedestrian and railway crossings and minor junctions.

Some Specific Responses

In heavily trafficked areas, a build-up of oil and grease deposits can occur in the centre of the traffic lane. This can be observed in many roads in major cities, and was first noted on UK motorways. This deposit reduces surface friction, and can become very slippery when wet.

This part of the road is used only by single track vehicles such as motorcycles - which are particularly vulnerable to oil or grease deposits on the road surface. Such deposits are particularly noticeable at traffic

lights on major city routes and should be treated when a build-up becomes evident.

Steel plates placed over temporary trenches on the road can become very slippery in the wet. So too can tram tracks and steel bridge joints. Judicious placement and warnings of such potential hazards are desirable.

Decorative bluestone and cobblestone treatments also offer particular hazards to motorcyclists, especially when placed at the entrance to a precinct where vehicles are braking and turning. Advice from motorcyclists at the design stage could be constructive in minimising potential hazards.

Motorcycles share with other vehicles a need for appropriate and consistent road surface friction levels. They use different sections of the road and are more vulnerable to sudden or unexpected changes in friction on curves, intersections or braking areas. Special care is needed in road maintenance and design to ensure that their greater vulnerability to these factors is properly addressed.

Surface Friction Levels

The VicRoads standard specifications for routine maintenance require treatment of patches where there has been extensive seeping of bitumen through the surface or loss of aggregate. This arises when at least half of the aggregate has been lost, if there has been bleeding over five square metres or more, or when there is extensive 'crocodile' cracking. The illustration (GeoPave, 1998) shows an area on a curve appropriate for treatment.

Some forms of crack repair can lead to slippery surfaces. Water ponding can also arise from some of the methods used to repair crocodile cracking. These treatments can represent a hazard to motorcycles, especially if located on a curve.

Surface friction standards have slowly been developed for use on UK roads (Rogers, 1991) and have some broad lessons for Australia, where conditions are often

Information resources:

AustRoads Pavement Research Group (1998). Treatment of cracks in flexible pavements. No 8.
Rogers, M.P. & Gargett, T. (1991). *A skidding resistance standard for the national road network*. Highways and Transportation (April). pp. 10-16.
GeoPave (1998). *Surfacing chat*. Edition 37, VicRoads
Haworth, N. (1999). *Road Factors in Motorcycle Crashes*. VMAC Workshop: Motorcycling and the Road Environment. VicRoads, Kew June.

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