



# **Motorcycle Notes**

## No. 12 September 2006

## **Road Maintenance Practices**

This is the twelfth 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.

## Motorcycles are very sensitive to road conditions

The dynamic stability characteristics of motorcycles make them very sensitive to the condition of the road surface. Motorcycles:

- have only two points of contact with the road surface
- have no protective body and their riders are vulnerable to injury in the event of a crash
- predominantly brake and steer through the front tyre
- rely upon consistency of tyre grip
- may travel anywhere in the traffic lane and do not always follow car, truck or bus wheel paths
- balance by rider weight shift and throttle control, necessarily leaning into curves
- usually adopt a maximum radius line through curves
- are weather and puddle susceptible
- have a small frontal profile, which reduces their visibility to other road users
- have high power to mass ratio and greater acceleration

Motorcyclists also have a reduced field of vision due to helmet and visor constraints and their riding position. In most situations, they have a higher rider eye level than most car drivers.

Motorcycles require consistent road surface and good tyre contact. Irregularities or inconsistencies in the shape, texture or skid resistance of the road surface, or the presence of water or debris can destabilise a motorcycle and contribute to a crash. This is particularly important in situations where the motorcyclist is turning or braking, such as on bends and at intersections.

## High Risk Defects for Motorcyclists

Motorcyclists workshops organised with the Victorian Motorcycle Advisory Council and Community Road Safety Councils in 2005 and 2006 identified the motorcyclists' key issues of concern.

#### Potholes

Unexpected potholes are very dangerous hazards for destabilising motorcyclists. Prompt repair in response to inspections or public reports is a high priority, particularly on curves, intersections and braking areas.

#### • Debris, gravel and loose stones

Gravel and loose materials can break the grip of the motorcycle tyre with the road surface, causing loss of steering and braking control. There are many sources: spillages from trucks; loose material from unsealed side roads, entrances, shoulders, wayside stops; excess aggregateafter resealing, and loose gravel from patching works. Loose stones flicked up by passing vehicles can also create a projectile at a rider's face. In urban areas, attention should be paid to removing the accumulation of loose material between dual track vehicle wheel-paths, around traffic islands and on the outer edges of roundabouts. Mud from construction sites and animal waste can significantly reduce rider safety and should be removed promptly.

#### • Slippery road markings

The area of road markings should be minimised in braking and turning locations. The skid resistance of new markings can be improved by the use of suitable angular particles in painted lines. Old road markings should be removed rather than blacked out.

#### • Metal plates and utility covers

The slippery surface of steel utility covers for service valves and access manholes is often compounded by the bump caused by the fitting being above or below the road surface. Adjustment of levels should be co-ordinated with road resurfacing programs. The change in surface friction further adds to the possibility of loss of control. In liaison with the relevant service authorities, unused access points may be closed and the pavement reinstated, some facilities may be relocated off the roadway, and remaining pits and lids replaced with modern fittings with textured surface and/or skid resistant coating. Large steel plates are often used as temporary covers during road trenching works. Advance warning signs and the use of skid resistant coating on large metal plates will reduce the hazard for motorcyclists.

#### • Reinstatement of services trenches

Overfilled or subsiding trenches across a road can destabilise motorcycles. It is essential that such road works are inspected to ensure properly backfilling to line and level using the specified materials and compaction to achieve strength and stability. Subsided trenches should be regulated to match the road surface.

#### • Liquid spillages

Fuel, lubricant, paint and other liquid spillages can reduce motorcycle traction and stability. A fast response is essential. Signs warning of the hazard should be in place and quick action taken to remove the spillage. Close attention is required to ensure the complete removal of the spillage and the cleaning medium.

#### • Broken pavement at tram and rail crossings

Defects should be brought to the attention of the public transport operators who are responsible for maintaining the condition of pavement between, and immediately each side of, the tracks in accordance with the Road Management Act 2004.

#### • Crack sealing

Large areas of excess crack sealant create a slippery hazard for motorcyclists. This can be minimised by using grit additive and avoiding excessively wide sealant application.

#### • Rutting and corrugation

Deep ruts along vehicle wheel-paths can capture motorcycle wheels and destabilise the rider. Water in ruts can lead to aquaplaning. Warning signs can alert motorcyclists to the hazard pending programmed repairs.

#### Road grooving

Grooving of smooth road surfaces may improve its texture or drainage and benefit some vehicles, however it can adversely affect motorcycle steering. Longitudinal grooving should be avoided if possible. Warning signs may be installed for motorcyclists.

#### • Water, flooding, frost on road

Water and frost can cause slipperiness and aquaplaning. Attention is required to keep side drains and pits clean to minimise water flow and debris across roads. Permanent warning signs should be considered at sites of frequent flooding or frost.

#### • Inadequate warning signs

Not all hazards can be removed. However, clear, well-placed signs can warn motorcyclists approaching a hazard. Speed and road positioning can then be adjusted to suit the conditions. Symbolic motorcyclist warning signs with appropriate text (rough surface, loose surface, grooving, bridge joints, frosty, slippery when wet, etc) may be used if the hazard is a continuing problem for motorcyclists. Caution must be exercised to avoid excess signage which may result in information overload and an excess of hazardous roadside poles. Consideration should also be given to the safe travel of motorcyclists through construction and maintenance work sites. It is important that signage should be maintained to warn of conditions until the works are complete and no hazard (including loose aggregate) remains. The use of frangible sign supports should also be encouraged.

#### • Overhanging roadside vegetation

Overhanging roadside vegetation may present a physical hazard to motorcyclists, be it on a straight or curve. It may obstruct the motorcyclists' line of sight and also the visibility of motorcycles to other road users. It is important that close attention is paid to clean up all debris from the roadway after roadside vegetation cutting or inclement weather.

#### Edge drop offs and shoulder condition

Road shoulders provide a safe recovery area for vehicles leaving the sealed roadway. However, loose gravel surfaces, broken seal edges and eroded shoulders make recovery difficult for motorcyclists straying onto the shoulder. Shoulders should be maintained to the standard required for the roads classification.

#### • End of Resurfacing Treatments

It is important for motorcyclists that skid resistance or surface texture should not change on curves or in an intersection. Resurfacing treatments, particularly high skid-resistant treatments should end on straight sections and transition to match the existing surface.

#### • Bleeding bitumen / flushing seals

The presence of excess bitumen on the road surface provides a slippery hazard for motorcyclists in wet and dry conditions and should be avoided. Warning signs should be placed pending resurfacing or removal.

### **Road Maintenance Management**

Roads maintenance standards are published in the *Road Management Plan* of the responsible road authority (VicRoads or municipality). VicRoads has assigned a *Road Maintenance Category* to each road section according to an assessment of risk, taking into account factors such as road classifications, road type and volume and type of traffic.

For each road category, a minimum *Hazard Inspection Frequency* is specified for inspection of the road for safety related defects. An *Intervention Criteria* is specified for each type of defect. This is the size of defect at which it is mandatory to take action.

A *Response Time* is also specified. This is the time, within which VicRoads undertakes to take action to make the road safe.

Most municipal councils have similar arrangements.

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