

# **Road Safety Audit Issues for P2Ws**

Phil Cook

**Are issues for P2Ws taken seriously?**

# Common P2W uses

- ❑ Leisure and enjoyment
  - ❑ Thrill seeking including deliberate risk taking
- ❑ Commuting
  - ❑ Cheap transport
  - ❑ Journey time saving
  - ❑ Mopeds at 16
- ❑ Business
  - ❑ Courier
  - ❑ Fast food delivery



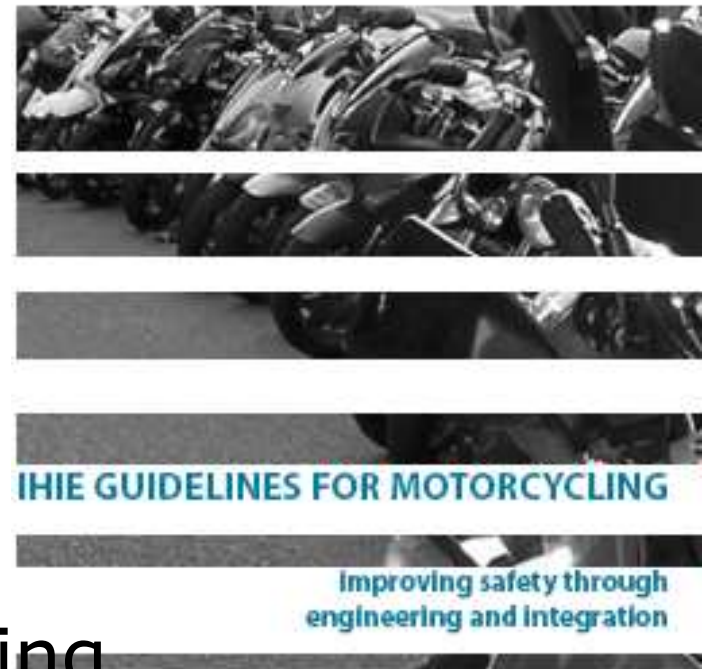
# Attitudes to P2Ws

- Dangerous?
- Kawasaki or kamikaze?
- Vulnerable road users?
- Traditionally seen mainly as an Education, Publicity and Training challenge
- How can engineering help?

# IHIE Guidelines for Motorcycling

A UK first covering all aspects of Highway Engineering

- Policy
- Travel Plans
- Road Design & Traffic Engineering
- Motorcycle parking
- Road Maintenance
- Road Safety Campaigns
- Motorcycles & Traffic Calming
- Motorcycles & Road Safety Audit

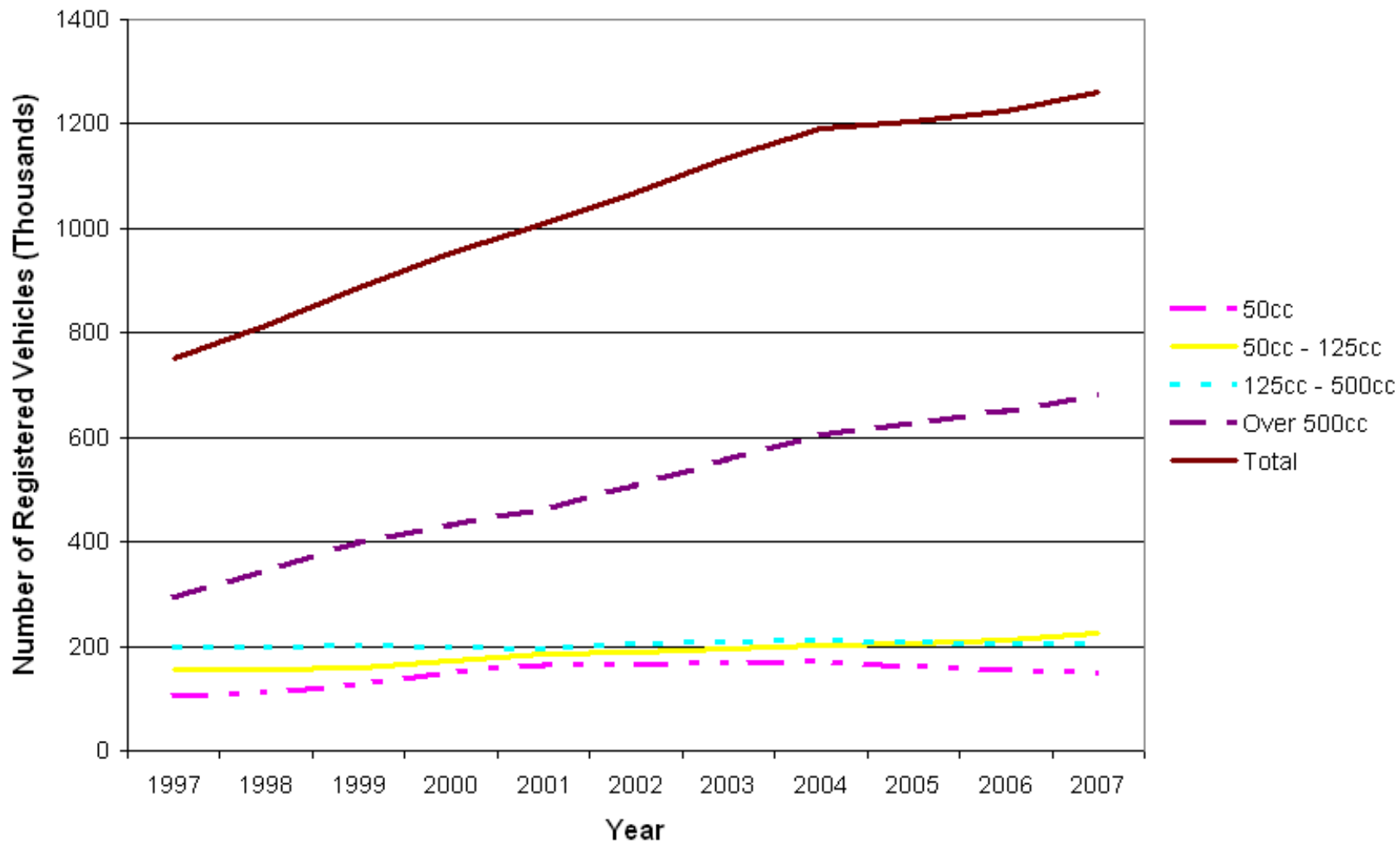


April 2005



# Trends in P2W usage

P2W Ownership (1997 to 2007)



**What are the casualty  
problems for P2Ws?**

## **P2W Casualties 2007**

- ❑ 561 (19%) fatal
- ❑ 5,815 (21%) serious
- ❑ 15,903 (7%) slight
- ❑ 22,279 (9%) overall
- ❑ 2% of traffic flow!

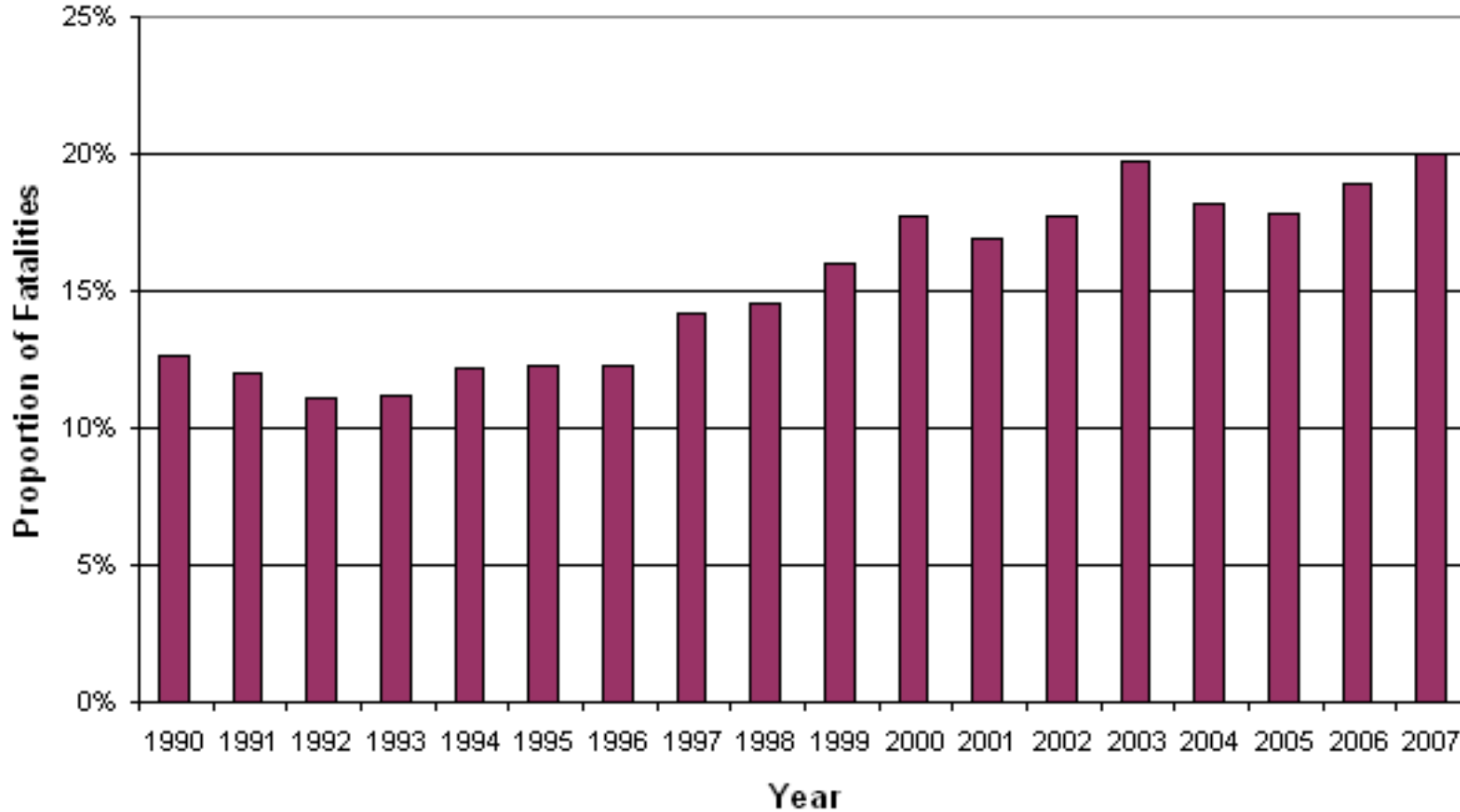


## P2W Casualties

- ❑ Mainly male (94% KSI)
- ❑ Younger riders (16-25) most likely to be injured but same true of other categories
- ❑ P2W risk of fatality **3x** risk of pedal cycle and pedestrian and **40x** car user per Km of travel

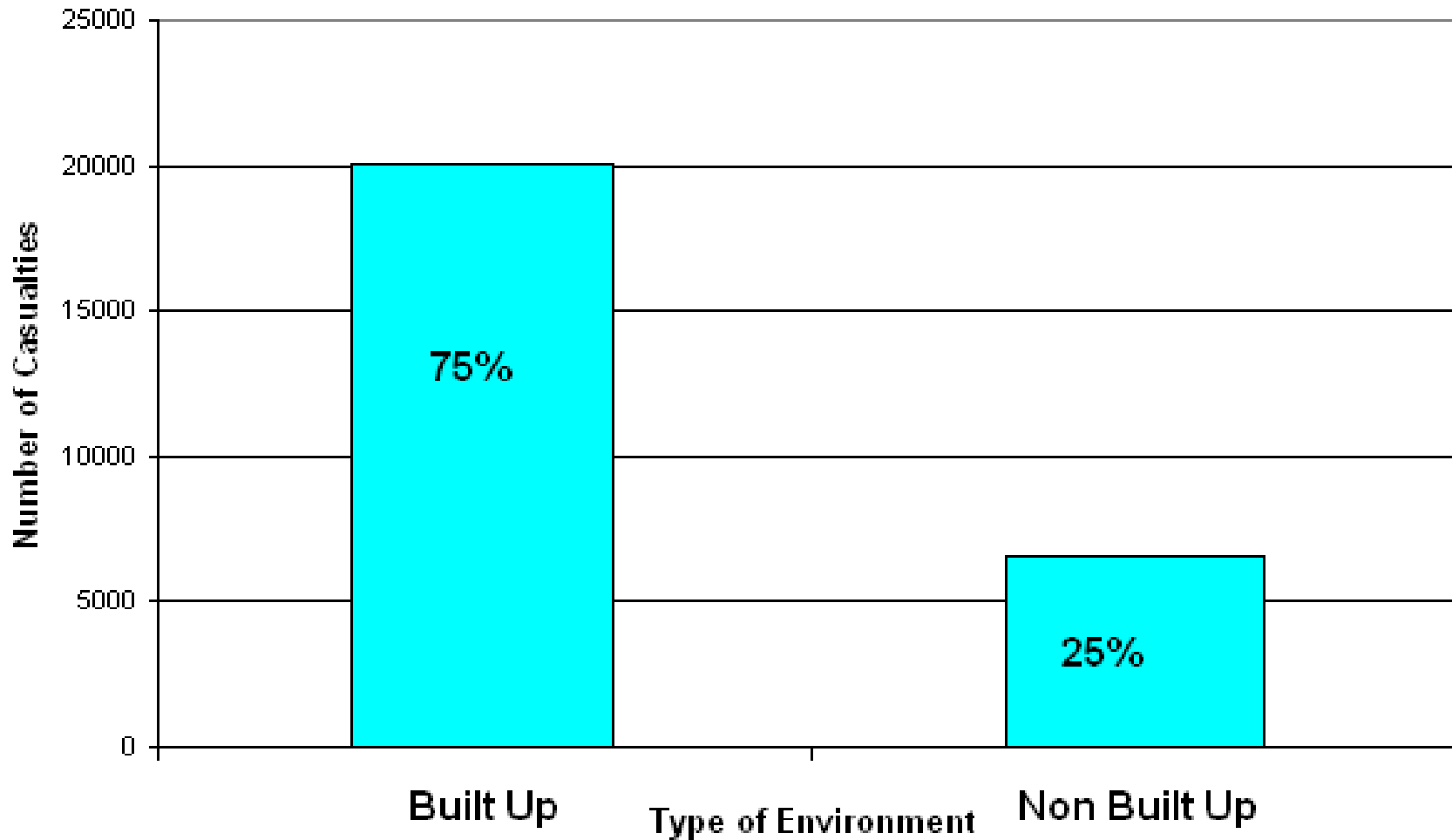
# Fatal Casualties

Percentage of All Fatalities Who Were P2W Users



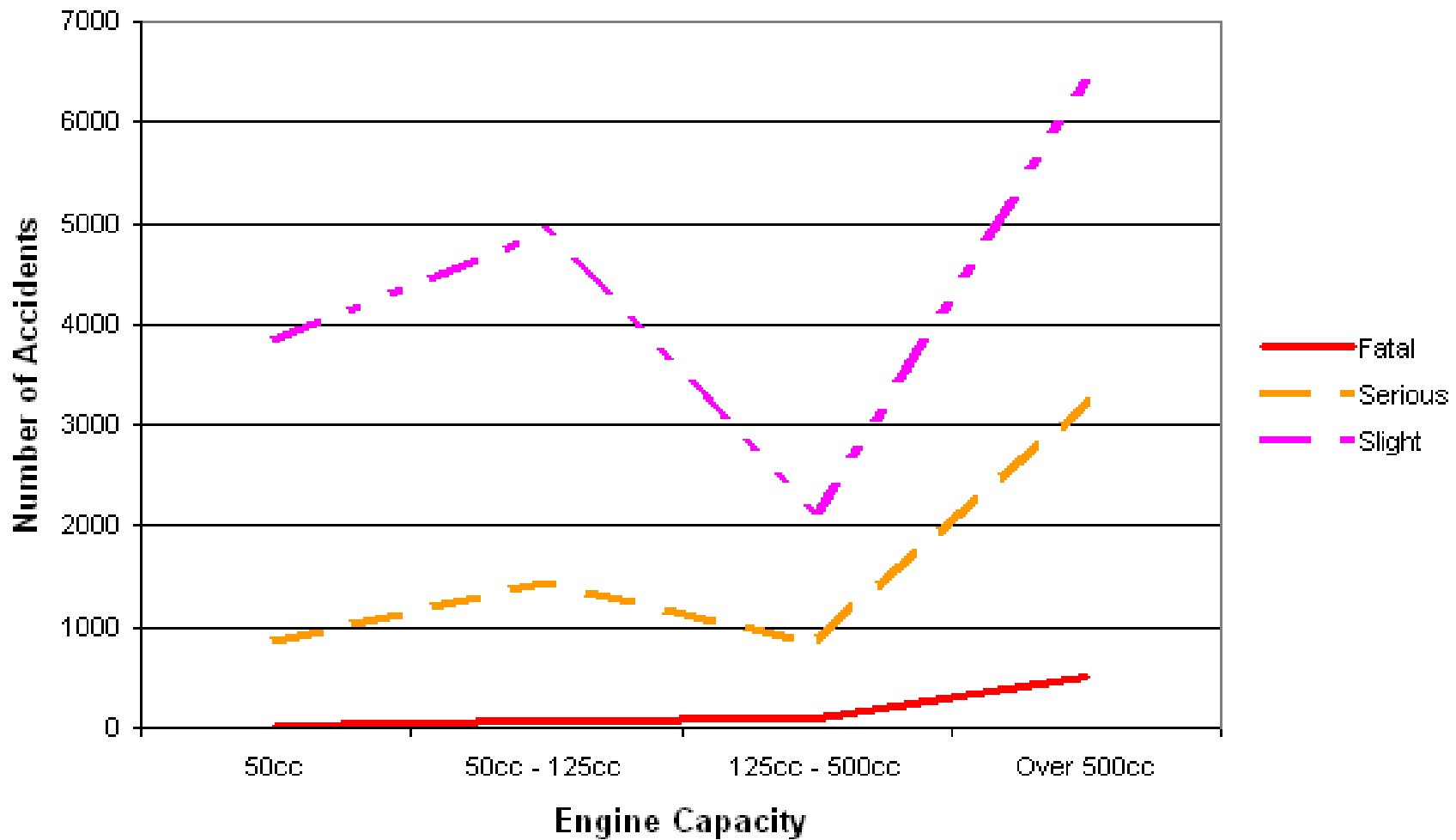
# Built-up / Non built-up

## Comparison of All Injuries



# By Engine Size

## Accident Severities by Engine Capacity



# Common types of P2W accident (clues for safety engineers and auditors)

- ❑ Looked but didn't see
  - ❑ Vehicles turning at junction
  - ❑ Visibility / priority at junctions & crossings
  - ❑ Rider eye-height not considered (much higher than car drivers)
- ❑ Loss of control/grip
  - ❑ Service covers and gully gratings where rider is leaning
  - ❑ Surface irregularities, poor surface tie-ins threaten stability, grip

# Common types of P2W accident (clues for safety engineers and auditors)

- ❑ Loss of control/grip
  - ❑ Large areas of road markings, esp. near bends or junctions
  - ❑ Slippery materials including overseas banding
  - ❑ Overrun areas
  - ❑ Roadside objects – sign posts, lamp columns and hazards
  - ❑ Poorly designed traffic calming
  - ❑ Poorly designed drainage
  - ❑ Bends generally

# Visibility: Junctions





# Obstacle free zones ~ sign 'over load'







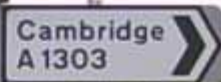
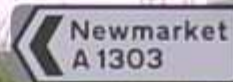
# A428 Hillmorton Road, Rugby

- ❑ Think Bike Signs + Coloured surface
- ❑ Accidents - 3 years Before
  - ❑ 45 PIA (total) scattered along route mainly at junctions (17)
  - ❑ 13 Pedal cycles
  - ❑ 8 P2Ws
- ❑ Accidents - 3 year After
  - ❑ 23 PIA (total) – 50% down
  - ❑ 3 Pedal cycles – 77% down
  - ❑ 2 P2Ws – 75% down









# Grip: Service Covers



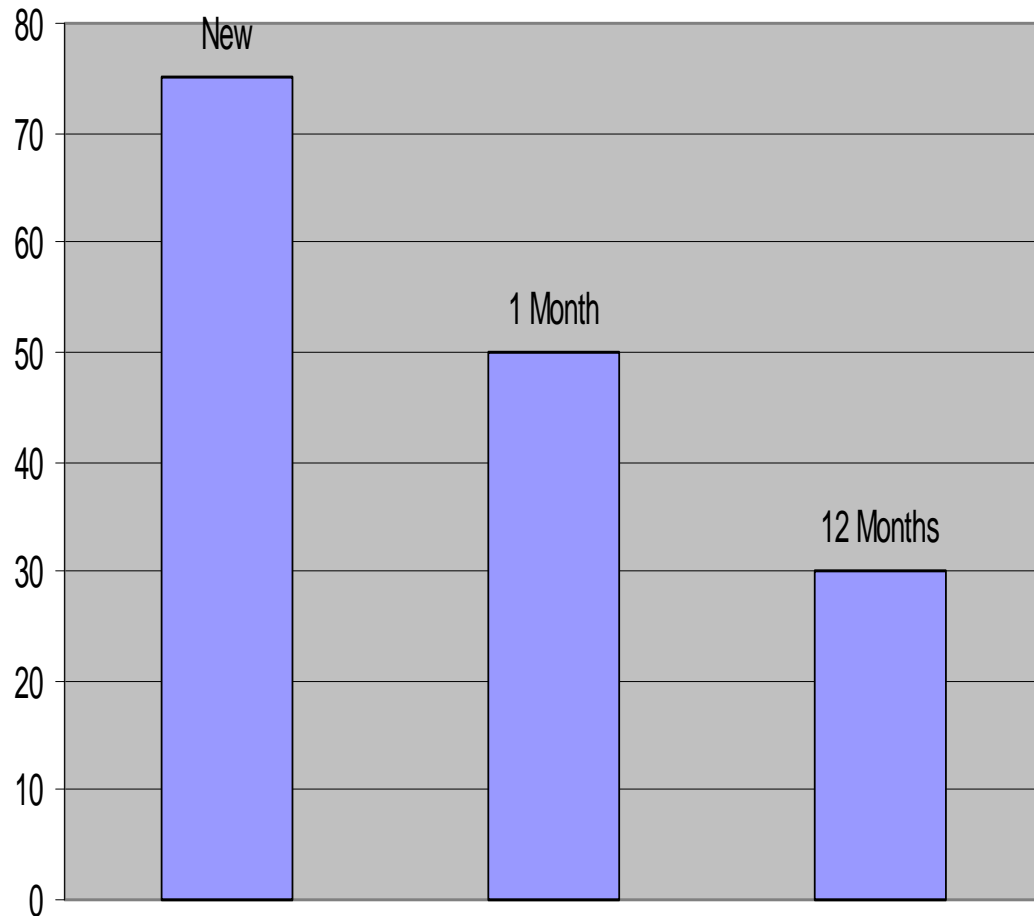
Service covers frequently mentioned in rider surveys  
If possible should be installed out of carriageway and away from bends

**Current standard (CEN 124)**  
**doesn't cover skid resistance**  
*(“Experience indicates that surface castellation provides adequate skid resistance”)*



# Service Covers

ductile Iron



**Skid Resistance tests on traditional covers have shown initially high values of SRV declining to extremely low SRV values after only 1 year**



# Grip: Service Covers

## DMRB Vol 6 Sec 2 Part 2

### TD 54/07 ~ DESIGN OF MINI-ROUNDBABOUTS

4.8 Road surfacing at a mini-roundabout can become polished or deformed by turning vehicles, particularly lorries. The skidding resistance of road markings and ironwork can also be different from that of surfacing materials. Surface features within the junction should not present a hazard for turning motorcyclists. It is recommended that ironwork is not positioned along the line a motorcyclist might be expected to take.

**4.9 Ironwork must be carefully positioned to minimise the potential for powered two-wheeled vehicle loss-of-control accidents and have a suitable loading class with similar friction properties to that of the road surface.**



# Service Covers



**A number of UK Highway Authorities have experimented with an 'anti-skid' cover**



**Bristol City Council have now installed 100+ as part of City centre redevelopment ahead of any revision to CEN 124**

## Roundabouts and mini-roundabouts

- ❑ Dangerous locations for P2Ws
  - ❑ 14% of accidents at roundabouts
  - ❑ 17% at mini-roundabouts
  - ❑ 2% traffic flow











# Overrun Areas

- ❑ Help to provide for long vehicles
- ❑ Discourage cars entering too fast
- ❑ Design doesn't always achieve this
- ❑ Conspicuous in dark and wet - Motorcycles?
- ❑ Upstand?









# Joints and cracks



## **DMRB Vol 2 Sec 2**

# **TD 19/06 Requirement for (Vehicle) Road Restraint Systems**

**3.41 At sites identified, e.g. through accident records, to be high risk to powered two-wheel vehicles, such as tight external bends, consideration must be given to the form of VRS chosen to minimise the risk to this category of driver. Any special requirements must be stated in the contract.**

**3.42 At such high risk sites, it is recommended to use an ‘add on’ motorcycle protection system to post and rail type safety barriers to minimise the risk of injury to motorcyclists. The Design Organisation must check with the safety barrier manufacturer that any such proposed protection will not invalidate the tests on the safety barrier. Such ‘add on’ products must be approved by the Overseeing Organisation and be compatible with the safety barrier to which it is being attached as these products are not included within BS EN 1317.**

# Safety Fence protection



*Highway Care Ltd*





# Guard Railing 'Cat & Fiddle' BEFORE





# Guard Railing 'Cat & Fiddle' AFTER





# Guard Railing WRSF treatment?







# 'Recommendation'

~ are there viable alternatives?





# Traffic Calming and slippery blocks!



## The End

- ❑ TMS/IHIE 1 day course on  
“Designing Safer Roads for  
Motorcycles”  
[www.tmsconsultancy.co.uk](http://www.tmsconsultancy.co.uk)
- ❑ Contact details  
[gbrooks@tmsconsultancy.co.uk](mailto:gbrooks@tmsconsultancy.co.uk)
- ❑ Questions later