

Prevention of motorcycle 'conspicuity' accidents

A. Introduction

1. Motorcycle accidents often happen between:

- a) A motorcycle rider who has right of way at an intersection, private entrance or roundabout, and a motorcar
- b) A motorcycle rider and a pedestrian who crosses the road in front of the motorcycle.

The European Commission has proposed that a research project enquire into means of preventing the accidents. It has termed the accidents, for the purposes of the project, motorcycle 'conspicuity' accidents.

B. Analysis

2. In the light of study findings, as a global term for accidents of the type described, motorcycle 'conspicuity' accidents is a misnomer.

Such accidents may have as their cause:

- a) The difficulty that motorcar drivers and pedestrians may have in noticing a small vehicle, such as a motorcycle.

But they may also have as cause:

- b) The ease with which a small vehicle, such as a motorcycle, is obscured from view by other vehicles, or a roadside obstruction (The analysis of motorcycle accidents in Victoria by *Williams 1976*)
- c) The preoccupation of the motorcycle rider with the road surface — so that the rider does not see the motorcar or pedestrian until too late (The analysis of motorcycle accidents in Osaka Prefecture by *Nagayama 1978*; the eye-marker camera study of *Nagayama et al 1979*; the analysis in detail of motorcycle accidents at intersections by *Nagayama 1984*)
- d) The inadvertent failure of the motorcar driver or pedestrian to look completely to see that the road is clear
- e) The failure of the motorcar driver or pedestrian to look completely to see that the road is clear because he or she has restricted head movement
- f) The perceptual impossibility of estimating the speed of a small vehicle in head-on view — so that motorcar drivers and pedestrians will usually only be able to make an arbitrary estimate of the motorcycle's speed (The measurements of *Hills 1975b*)
- g) A tendency of motorcar drivers only to give way at intersections to police motorcycles (The observational studies of *Leonard 1974* and *Booth 1978*)

C. Current remedies

3. The principle remedy for motorcycle 'conspicuity' accidents that has been proposed to date addresses Causes (a), (d), and (e) above.

The remedy is daytime lights (or other conspicuity treatments) for motorcycles.

Daytime lights are intended to make motorcycles noticeable at up to 30° peripheral vision (the tests conducted by *Hörberg & Rumar 1975*).

4. A number of laws requiring motorcycles (or motorcars) to use daytime lights have been enacted.

But the findings of monitoring studies of the laws have been equivocal, and the methods of the studies open to fundamental criticism (the lack of specificity of the 'odds-ratio' test).

In explanation of the failure, it will be observed that:

- Daytime lights do not treat Cause (b).
- Causes (c), (f) and (g) will continue to operate, even though the motorcar driver or pedestrian notices the motorcycle.
- Between them, the findings of a number of the studies (*Whitaker 1980*, *Olson et al 1981*, *Hurt et al 1981*, and *Ouellet 1990*) suggest that, in the absence of:
 - The operation of Cause (c)
 - An 'After you, Claude', or 'Après vous, M. Dupont', misunderstanding between the parties, in the bulk of motorcycle 'conspicuity' accidents, the motorcycle will be less than 100yd away from the motorcar driver or pedestrian – and so perfectly noticeable – when the driver ignores its presence.
- And should the motorcar driver or pedestrian, as a result of daytime lights, notice the motorcycle, not in good time, but – through the operation of Cause (b), (d) or (e) – instead belatedly, he or she may wrongly in response hesitate in the collision zone, and so precipitate an accident that would not otherwise have happened.

D. Research needs

5. Current research needs in the field of motorcycle 'conspicuity' accidents are:

- a) Repetition and confirmation of the findings of *Nagayama et al 1979* — currently the findings are in conflict with the earlier findings of *Mortimer & Jorgeson 1975*
- b) A survey of the prevalence of restricted head movement amongst motorcar drivers and pedestrians
- c) A survey of the prevalence of driving with uncorrected defective eyesight by motorcar drivers
- d) Repetition and confirmation of the measurements of *Hills 1975b*
- e) The conduct of a supporting study of the errors of estimation of the speed of a motorcycle that subjects make in head-on view — the method of the existing study *Nagayama et al 1980* is defective since it does not measure the errors that subjects make at a constant distance of the motorcycle from them

- f) Repetition of the studies of *Leonard 1974* and *Booth 1978* by academic authors — Leonard and Booth were lay authors
- g) Conduct of an in-depth analysis of motorcycle ‘conspicuity’ accidents that is intended to elucidate the contribution to them of all seven of the above Causes (and also ‘Hesitation in the collision zone’, and the ‘After you, Claude’ misunderstanding) — No such analysis has been conducted to date, although other in-depth analyses (eg *McLean et al 1979*) have incidentally made important contributions to knowledge of the subject

E. Prospective remedies

6. It is not possible in a short paper to canvass all of the remedies for motorcycle ‘conspicuity’ accidents that might be indicated by the completion of the research detailed above.

To make therefore a selection of remedies, they include:

- a) To inform motorcycle riders, motorcar drivers, and pedestrians of the limits of human perception of the speed of an approaching motorcycle, so that all conduct themselves on the road accordingly — Presently:
- Motorcycle riders often take the view that the failure of motorcar drivers or pedestrians to give way to motorcycles is culpable, and so fail routinely and dispassionately to expect or anticipate it
 - Motorcar drivers and pedestrians, in the presence of motorcycles, often fail to observe the ordinary rule of the road: ‘Only proceed if you are positively sure that it is safe to do so’
- b) To inform motorcycle riders under instruction of the two paradoxes that flow from:
- The fact that motorcar drivers will accordingly usually only be able to make an arbitrary estimate of the speed of a motorcycle in head-on (by contrast with oblique) view
 - The probability that drivers will adopt as their estimate the ‘normal speed of other traffic on the road’.

The paradoxes are:

‘The closer that the rider rides to a waiting driver at a junction, not only the less opportunity that he will have to avoid a collision should the driver pull out in front of him, but also – paradoxically – the greater the likelihood that the driver will in fact pull out in front of him’.

‘The faster that the rider rides past a junction, not only the lower the chances that he will be able to stop in time should a waiting driver pull out in front of him, but also – paradoxically – the greater the likelihood that the driver will in fact pull out in front of him’.

- c) To advise motorcycle riders under instruction whenever possible to ride an oblique line past waiting motorcar drivers or pedestrians, so as to maximise the perceptual information that the driver receives of their true speed of approach

[*Ouellet 1990* also calculates that riders can minimise the length of the zone in which a collision is inevitable if a waiting motorcar driver fails to give way to them by positioning themselves as far as possible in the road away from the motorcar.

In practice the ‘Ouellet line’, and the ‘oblique line’, will largely coincide.]

- d) To advise motorcycle riders under instruction that they must deliberately raise their eyes from the road surface in the presence of hazard
- e) To accelerate the development of anti-lock brakes for the mass motorcycle market — The preoccupation of motorcycle riders with the road surface must flow to a large extent from their fear of locking up the wheels under emergency braking

7. It will be observed that the above list does not include daytime lights, or other measures that are intended to enhance the motorcycle's conspicuity.

The omission is deliberate. It is anticipated that the completion of the research will show that the case in favour of daytime lights is predicated upon a scanty and wrong analysis of the causes of motorcycle ‘conspicuity’ accidents.

Further daytime lights are not a harmless palliative. Instead they stand in the way of the acceptance – be it by motorcar drivers and pedestrians, or by motorcycle riders, alike – of the true causes of motorcycle ‘conspicuity’ accidents, and so the acceptance of the true remedies for them.

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Supporting documents

1. ‘*Daytime lights for motorcycles: Summary of current state of evidence*’ [1 page]
2. ‘*Bijleveld 1997: Calculation of odds ratio values for Austria 1976–1995*’ [3 pages]
3. ‘*Answer to six points that are frequently put forward in favour of motorcycle daytime lights*’ [13 pages — Available on request]
4. ‘*Findings of leading motorcycle daytime lights studies*’ [5 pages — Available on request]
5. ‘*Prevention of motorcycle accidents at junctions (Extracts)*’ [45 pages — Available on request]