BP5: PTW Design and Protective Equipment

Reference: BP5 007	Title of Project:	**Daytime Running Lights (DRLs)**
Version: 1	**Website:**	DfT DLR Report: http://www.dft.gov.uk/pgr/roads/vehicles/vssafety/drls/daytimerunninglampsexecutive1702)
Brief Description of Project:	The use of headlamps in daylight by PTWs (DRLs) is one of the suggested countermeasures to the most common type of urban PTW collision, where a car driver fails to perceive the position, path or speed of the smaller vehicle. Since 2002, all motorcycles sold in Europe have their lights hard wired to illuminate on start up (Automatic Headlamps On, AHO). Increasing the conspicuity of the PTW and rider in principle has obvious benefits and does appear to increase the chance of perception by the driver of the 'other' vehicle, although it is not a guarantee. There is a clear need to improve driver awareness of vulnerable road users such as PTW riders. Although there has been much positive research, there have been counter claims that, in some circumstances, DRLs make the correct assessment of PTW speed more difficult. In one study this appeared to lead to decreased gap acceptance by other drivers. There have also been suggestions that in a bright, busy, urban environment DRLs can reduce the conspicuity of PTWs due to dazzle-camouflage effects.  FEMA suggest that the proposed introduction of DRLs for all vehicles in the EU would create a masking effect for PTWs using lights. PTWs could be hidden by the lights of following vehicles and any conspicuity gains eroded by the proliferation of DRLs. The use of DRLs by PTWs is a mature safety measure with many casualty based case studies. As several nations have introduced DRL legislation there is considerable data available. Although contested by some rider's groups, there appears to be substantial evidence that AHO/DRL reduces the frequency of collisions involving PTWs.	

Monitoring Data:	Research in Malaysia, where DRL's were made compulsory for PTWs in 1992, showed that following the legislation collisions where conspicuity was given as a factor reduced by 29% (Umar, Mackay and Hills 1996). Research in Singapore (Yuan 2000) and the US (Zador 1985) also showed reductions in 'failure to see' collisions following the introduction of compulsory DRLs. A review of PTW DRLs in 16 countries by Elfvik and Olsen in 2003 concluded that laws and campaigns advocating their use had lead to an average reduction of 7% in multi-vehicle PTW collisions. However the mandatory use of DRLs in Australia introduced in 1992 was revoked in 1997 due to a lack of evidence of their effectiveness. In the Netherlands SWOV in their Research Report (R-97-48) on the subject concluded; *The daytime visibility of motorcycles can be improved by the use of lighting, but there is still a small group of motorcyclists who are not yet doing this. Other possibilities for making motorcycles more conspicuous are limited. Recognising a motorcycle as being a motorcycle from a short distance away is no problem during the daytime. Recognising them at night can be improved if the motorcycle is equipped with retroflecting material that emphasises the contour of the motorcycle.* In the UK the Department for Transport funded a review of research into DRLs http://www.dft.gov.uk/pgr/roads/vehicles/vssafety/drls/daytimerunninglampsexecutive1702 http://www.dft.gov.uk/pgr/roads/vehicles/vssafety/drls/daytimerunninglampsfinalreport The report suggests that it is possible to develop DRLs for wider use that does not reduce motorcycle conspicuity. However, the technical details of the implementation must be considered very carefully to ensure there is no adverse effect. Based on the report and revised EC proposals, "*the UK is now fully prepared to accept and implement the amended proposals, which are expected to reduce fatalities and other injury accidents by up to 6% each year, once dedicated DRL are fitted to all vehicles*."
Results:	The balance of research appears to indicate that use of DRLs by PTWs does produce a reduction in failure of perception collisions.
Key Effective Conclusions:	The fact that, where use of DRLs is voluntary, up to 90% (UK) of PTW riders choose to use them indicates that many riders have confidence in DRLs as an effective countermeasure. Some of the concerns expressed by FEMA and other groups, expecially relating to the loss of conspicuity resulting from all-vehicle DRLs, appear legitimate and founded on casualty based research, albeit circumstantial. The primary causation of the majority of urban multi-vehicle PTW collisions is a behavioural/perceptive failing on the part of the other driver (MAIDS, DfT). Whilst the principal responsibility for correction should lie with the other driver, PTW riders can influence the risk of collision.

	The evidence from countries with high use of DRLs or AHO by PTWs does seem to show a reduction in the frequency of collisions where conspicuity is a factor.
Projects for Comparison:	High visibility protective clothing (BP5 012).
Justification:	Whilst there are conflicting opinions on DRLs, the balance of casualty based research appears to indicate a reduction in risk of collision. DRL/AHO would therefore contribute to eSUM objectives for WP3, BP5 by providing the potential for a reduction in casualties through PTW design.