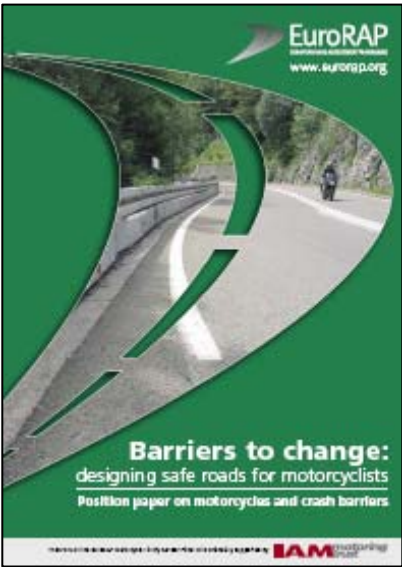

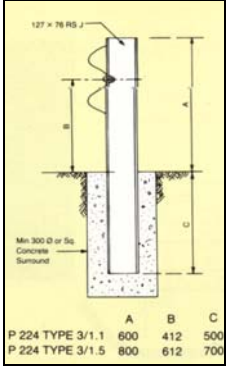




BP6: 'Softening' the Highway Infrastructure

Reference: BP6 004	Title of Project:	Motorcycle Friendly Crash Barriers
Version: 1	Website:	http://www.eurorap.org/
Brief Description of Project:	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  </div> <div style="width: 50%;"> <p>The traditional designs of crash barrier have received considerable criticism from rider groups and some Safety Auditors because of the apparent increased risk of injury to PTW riders in a collision.</p> <p>Crash barriers have been designed with the purpose of deflecting an impacting vehicle to prevent that vehicle leaving the carriageway or crossing into the path on oncoming traffic.</p> <p>The continuous barrier designs often left a gap underneath the panel and this allowed motorcyclists to slide under and into the metal rail and the fixing posts behind.</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;">   </div> <p>There are recorded incidents of very severe and fatal injuries to PTW riders from impact with this type of barrier although these are not common in urban areas.</p>	



Similarly wire rope barriers, whilst providing a cheap and effective method of restraining out-of-control vehicles, present a potential additional hazard to a sliding motorcyclist.



EURORAP has produced a review titled 'Barriers to Change' which provides an analysis of the issues and a series of recommendations for improvements to barrier design.

At FEMA's request, in 2001 the European Parliament adopted a resolution on the 'Priorities in EU road safety' stating that "safety barriers must meet the specific safety requirements of motorcyclists" (FEMA, 2005). In the absence of a pan-European standard for motorcycle-friendly barriers, organisations including the Federation of European Motorcyclists' Associations (FEMA, 2000), the Association of European Motorcycle Manufacturers (ACEM, 2006), the UK's Institute of Highway Incorporated Engineers (IHIE, 2005), and the Norwegian Motorcycling Union (NMCU, 2004) are leading the way in educating road authorities on delivering a safer road environment, listing best practice and design innovation across Europe.

The simplest method of improving existing crash barrier is the installation of a secondary rail to prevent under-run.

Secondary rail systems such as BikeGuard, Moto.Tub, Plastrail, Motorail and Shield are metal rails or plastic tubes that fit below the existing barrier, preventing riders from sliding under the horizontal beams and offering protection from the metal support posts. They are the most common motorcycle-friendly systems being promoted.



There is some evidence that simply fitting secondary rails can increase the risk of cars or trucks mounting the barrier (BAST 2004)



Image courtesy of Sodirel

There is currently no European standard covering provision and design of PTW friendly crash barriers. The Eurorap review recommends that engineers are provided with clear guidance on the design of barriers and where they should be used. In the Netherlands a protocol has been developed in order to assist in the

process of deciding where to place barriers and there is guidance from FEMA, ACEM, IHIE and others on how barriers should be used.

<p>Monitoring Data:</p>	<p>There is little specific PTW/barrier collision data available. The records suggest that absolute numbers of collisions are low but the severity ratio is high. MAIDS and DfT in-depth studies do not identify this collision type as being significant in urban situations but loss of control on bends does feature in rural collision data.</p>
<p>Results:</p>	<p>Monitoring of the use of ‘motorcycle friendly’ crash barrier has produced conflicting results. The addition of secondary rails does appear to prevent ‘under-run’ of the barrier by motorcyclists but possible dis-benefit to other road users has been suggested.</p>
<p>Key Effective Conclusions:</p>	<p>Because of the lack of robust data, conclusions on the overall effectiveness of modified crash barriers are difficult to draw. For example, in Sweden, wire rope barriers have reduced PTW fatalities on treated routes where no barriers were previously installed by up to 90 per cent (Larsson et al., 2003). Unpublished research commissioned by the Swedish Roads Authority and subsequently supported by experience in the Republic of Ireland and Iceland (Ref; Eurorap), found that more PTW lives were saved in situations where cars would have crossed into the opposing traffic flow, than PTW lives that would have been lost by crashes into the barrier itself. However effective, this specific countermeasure would not be appropriate to many collisions in urban areas where impacts with other vehicles are prevalent.</p>
<p>Projects for Comparison:</p>	<p>Norway’s ‘Vision Zero’ motorcycle road (BP4 006).</p>
<p>Justification:</p>	<p>Whilst the installation of appropriately designed crash barriers is important in a rural setting, in depth studies of PTW collision data have shown that this countermeasure is unlikely to make a significant contribution to the eSUM objective of reducing motorcycle casualties in urban areas. However, there are limited urban routes with carriageway separation and higher speeds where improved barriers may contribute to casualty reduction.</p>