Reducing the impact

The use of passive safety products is still largely restricted to trunk roads, says David Milne, despite the reduction in fatalities more widespread use could bring.

Conventional signposts and lighting columns have always had the capacity to kill or severely injure in a vehicle impact. Using passively safe street furniture to EN 12767 can almost totally eliminate these casualties. Typically passively safe street furniture is comparatively light and shears off and/or deforms relatively easily to lessen the severity of an accident in a vehicle impact.

The passively safe street was initially a Scandinavian initiative in the 1980s and 1990s. Norway developed aluminium Lattix signposts, and lighting columns in steel and aluminium were also Scandinavian developments. Finland has notably made great steps with passively safe lighting columns now used on most of its roads.

A standard was published in 2000: EN 12767: 2000 Passive safety of support structures for road equipment – requirements, classification and test methods. This pan-European standard is a protocol for carrying out crash tests using a small car at speeds up to 100kph to identify if an object of street furniture is relatively safe to hit. The car is instrumented with accelerometers to record accident severity. This standard allowed highway authorities to specify passively safe street furniture with confidence.

The Highways Agency approved passively safe Lattix signposts for large signs without a safety barrier on the A43 Silverstone bypass which opened in June 2002. This was the first major new road scheme to use passively safe road signs throughout.

In 2004 (updated in 2005), the Design Manual for Roads and Bridges document, TA89 Use of passively safe signposts, lighting columns and traffic signal posts to BS EN 12767, was published. This document legitimated installation of signs and lighting columns on trunk roads without the disruptive provision of expensive protective safety fences. It greatly aided the extensive use of passively safe street furniture in the UK which effectively began in the same year.

Three years later the first European standard was updated to EN 12767: 2007 and now includes some limited guidance on using passively safe street furniture in the National Annex at the back of the document. TA89 was then withdrawn.

Further guidance on using passively safe street furniture is given in the Passive Safety UK Guidelines for Specification and Use of Passively Safe Street Furniture on the UK Road Network (see website below).

Passively safe street signposts and lighting columns are now almost universally specified for any new installation on a trunk road.

Lighting engineers are both conservative and more likely to consider illumination the main priority. The concept of trying to protect passengers in errant run-off vehicles has yet to gain traction away from the trunk road network.

Products

There is an extensive range of passively safe products for signposts, lighting columns, traffic signal posts and even stainless steel roadside cabinets being marketed in the UK. Products can be made from fibre-reinforced plastic, steel, aluminium and stainless steel. Initially the products tended to be almost entirely Scandinavian but increasingly UK...
firms are developing their own products (see UK Roads website below for a selection of products).

**Use of passively safe street furniture on non-trunk roads**
The table below demonstrates casualties from hitting lighting columns are mostly an urban problem with most deaths occurring in towns. On trunk roads the use of passively safe lighting columns or installing lighting columns behind safety fences has almost eliminated casualties. Hitting conventional lighting columns, even at the lower speeds in urban situations, is often serious or fatal as the figures below demonstrate.

Specifying passively safe street furniture on urban roads has still hardly begun. There are a number of reasons for this slow take-up:

- There is a profusion of obstacles and often people next to the road in an urban environment
- Lighting engineers are both conservative and more likely to consider illumination the main priority. The concept of trying to protect passengers in errant run-off vehicles has yet to gain traction away from the trunk road network
- Passively safe lighting columns are often more expensive than conventional lighting columns. Developing a range of passively safe lighting columns and undertaking the crash tests to get the range approved is expensive. However, with increasing use costs should fall
- There is an additional requirement for electrical isolation in an impact for passively safe lighting columns in the National Annex to BS EN 12767. This requires the power supply to a passively safe lighting column to be cut off in an impact. A number of competing systems have been developed to achieve this, including pull-out plugs and impact sensors on the lighting column, activating a remote relay in a cabinet away from the highway. There is probably a case for reviewing this requirement as in practice the risk of electrocution from electrically live lighting columns after an impact is probably similarly low for passive and non-passive lighting columns with the real risk being death or injury from the impact accelerations on the vehicle.

<table>
<thead>
<tr>
<th></th>
<th>Fatal</th>
<th>Serious</th>
<th>Slight</th>
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<tr>
<td>Built-up roads</td>
<td>23</td>
<td>152</td>
<td>640</td>
</tr>
<tr>
<td>Non built-up roads</td>
<td>5</td>
<td>50</td>
<td>228</td>
</tr>
<tr>
<td>Motorways</td>
<td>0</td>
<td>3</td>
<td>14</td>
</tr>
</tbody>
</table>

Casualties in Great Britain from hitting lamp posts in 2012 (in single vehicle accidents)

My view is that passive safety has most certainly demonstrated its worth on trunk roads. The extension to busier urban 40mph and 30mph highways would have much to offer in increasing road safety.

Free from the ILP: www.theilp.org.uk/documents/css-sl4-passive-safety/


[Image: Car after a fatal accident involving a side impact on a conventional steel lighting column]

[Image: Car after hitting a Kapu passively safe lighting column in a side impact (a non-injury accident)]