6.8.9 Speed Reduction Devices

Background

Excessive speed is one of the most commonly occurring contributory factors to road accidents. Reducing speeds, therefore, is likely to offer substantial safety benefits. As discussed in 5.10, speed limits are widely abused and in many countries the police have insufficient training, manpower and equipment to enforce them.

This suggests that self-enforcing physical measures are necessary to encourage, or force, drivers to slow down. A number of methods have been developed to achieve this and Table 6.04 and Fig 6.44 below are based upon the descriptions given in reference 1.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
<th>Use</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road humps</td>
<td>Single humps or a series extending across the carriageway at right angles to the direction of flow.</td>
<td>Best used as part of an area wide scheme and especially appropriate on access roads where layout encourages speed. Should not be used on major routes.</td>
<td>Urban</td>
</tr>
<tr>
<td>Bar markings</td>
<td>Standard marking is 90 yellow transverse lines applied over about 400 metres, the spacing between which progressively reduces towards the hazard.</td>
<td>On approaches to roundabouts on major routes.</td>
<td>Rural on high speed roads</td>
</tr>
<tr>
<td>Rumble areas</td>
<td>Continuous length of carriageway with coarsely textured surface designed to produce a rumble within vehicles driving over it which increases with speed.</td>
<td>In urban areas but consider noise nuisance if adjacent to residential development.</td>
<td>Urban and rural</td>
</tr>
<tr>
<td>Rumble strips and joggle bars</td>
<td>A series of lateral bands of surface treatment designed to cause intermittent noise within vehicles driving over them. Variable spacing and dimensions.</td>
<td>For use on roads with high flow levels.</td>
<td>Urban and rural</td>
</tr>
</tbody>
</table>

Table 6.04
Summary of speed reducing devices
(ref 1)

Problems

While the other methods are not commonly in use, the concept of road humps is accepted in many developing countries. However, their design and construction is often very poor resulting in them becoming ineffective or dangerous. In many cases road humps are too short and sharp and drivers, at the risk of serious damage to their suspension systems, can drive over them fast without experiencing discomfort. It is only the long humps (Fig 6.44) which result in progressively greater discomfort to drivers as vehicle speeds increase. Such humps are more costly and more difficult to construct, but are the most effective in preventing high speeds while also being the safest.

All devices which rely on audible warnings to drivers are likely to cause complaints from residents if sited close to properties.

Rumble areas are unlikely to produce noticeable reductions in speed.

Summary

Excessive speeds and driver inattention are a common occurrence at accident blackspots. Countermeasures designed to alert drivers to the conditions and to encourage or force them to reduce speed can be effective in such circumstances. Self-enforcing devices, such as road humps, are especially desirable in countries where enforcement is limited and there is widespread abuse...
Possible Solutions/Benefits

Road humps are likely to be most useful in residential areas where pedestrian/vehicle conflicts occur or to slow down vehicles on long rural roads at points where they pass through isolated communities or trading centres. It is important to indicate the transition from high speed roads to a low speed area by road narrowing, perhaps with a hump, and then to continue the low speed treatment throughout the area. The presence of humps will slow traffic and provide safer locations for pedestrians to cross. They may also be used on approaches to schools, to slow traffic in the presence of children.

Bar markings rely for their effect on the visual impression of speed given to drivers as they pass over them. The closer spacing gives a greater impression of speed and produces a natural tendency for drivers to slow. This is effective on the approaches to intersections on high speed dual carriageways where they can be an effective countermeasure.

Rumble strips, jiggle bars and rumble areas adopt a similar principle to bar markings but provide a sound stimulus to drivers. As the vehicle passes over the rougher texture, noise levels increase. The intermittent nature of rumble strips alerts drivers and creates an impression of speed. If the texture is sufficiently rough, as with jiggle bars, then vibration also occurs, which should cause drivers to reduce speeds. These methods are most appropriate on the approaches to accident blackspots where high speed and drivers’ inattention has been found. Typical examples may be on the approach to a trading area on a major rural route, or to a dangerous intersection.

Speeds can also be reduced and pedestrian safety improved by making changes to the road alignment, for example, by narrowing or modifying intersection layouts to slow traffic down and to reduce the width of road to be crossed.

Other relevant sections: 4.1.2, 5.10, 6.8.10
Key external references: 1