

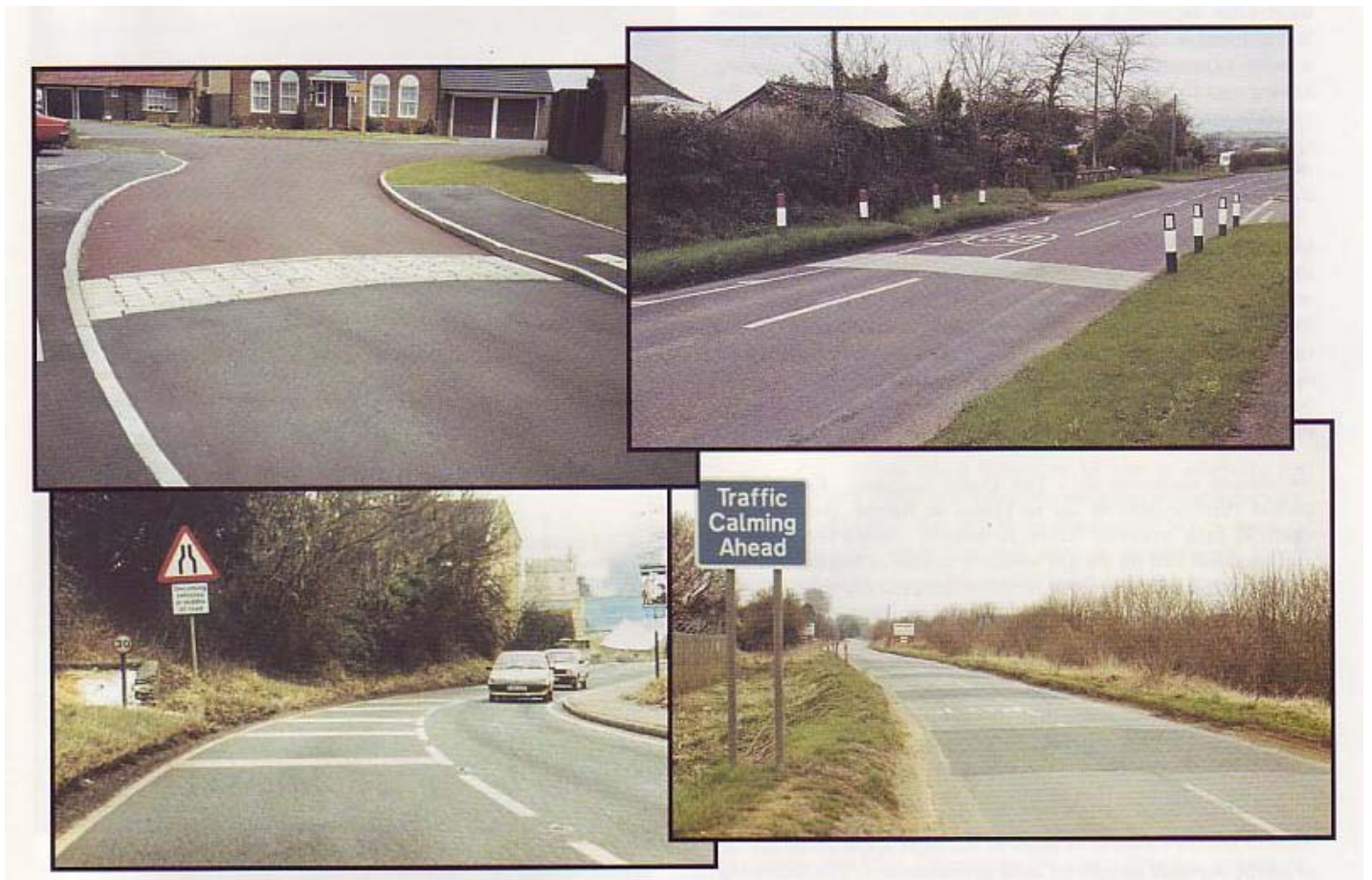
**Traffic Advisory Leaflet 11/93**  
**November 1993**



# Rumble Devices

## *Introduction*

Rumble devices can now be installed under the Traffic Calming Regulations, within certain permitted design dimensions. Outside these dimensions special authorisation can be sought, (see Traffic Advisory Leaflet 3/93), though justification will be required as to why the features could not conform. This leaflet is intended to provide further explanation of the dimensions given in the regulations, and offer advice on appropriate uses for these features.



## Purpose

Features with a vibratory and audible effect can be used, usually in rural areas, to alert drivers to take greater care in advance of a hazard such as a bend or junction. In combination with a gateway they can indicate the entry to a village or the start of a series of traffic calming measures. They have also been used to designate the start of shared use roads in new residential developments. Although rumble devices have been used, in places, with the aim of reducing speeds, the evidence so far indicates that any speed reduction obtained will tend to be minimal, and will be eroded with the passage of time. It is also known that in some locations drivers have learned to accelerate over the devices to lessen the vibratory effect. **Reliance should, therefore, not be placed on using rumble devices alone to reduce speed.**



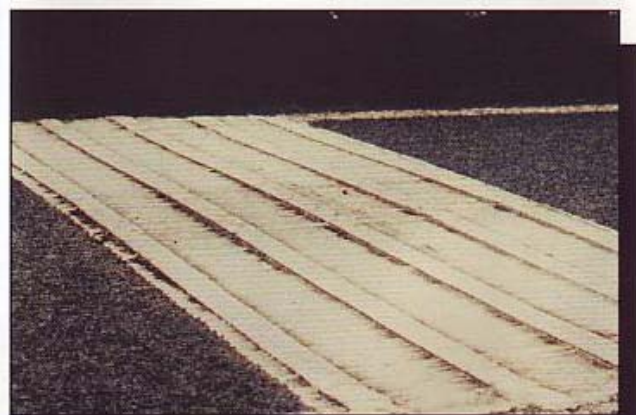
## Types

Rumble devices come in a variety of different forms, which have been described as rumble strips, jiggle bars, and rumble areas. Rumble strips and jiggle bars are similar in concept

and design, both comprising narrow strips of material laid transversely across the carriageway.

Single rumble strips will seldom if ever be appropriate. However, a single *group* of rumble strips has been used, though to achieve any noticeable effect the group would need to have a large number of strips i.e. at least 10. Normally rumble strips will be laid in a series of groups consisting of between two to five strips per group. Spacing between the groups can vary.

Rumble areas are generally constructed of coarse chippings, but can also be formed from block paving or gravel filled cellular blocks. Again they can be laid as a single area, or a series of areas, in advance of a hazard. Single areas unless accompanied by other measures are likely to have a very limited effect, not only with regard to speed reduction but also as an alerting device.



## Noise

Rumble devices can generate considerable noise over a large area depending on the topography and ambient noise levels. Rumble



areas tend to be less noisy than rumble strips, but a more expensive form of construction. To avoid complaints arising and the subsequent necessity to remove the device, the possible nuisance that might be caused by any noise generated should be considered at the outset. Noise generated will vary from location to location and depend on the pattern and type of device used.

In general, siting of rumble strips close to residential properties should be avoided. Some authorities do not use rumble devices within 200m of residential properties. Where a conflict seems likely to arise between safety gains and increased noise levels, consideration should be given to whether the noise disbenefit outweighs the benefit of accident reduction. Additionally consideration could be given to using a lower height device, though this may be at the expense of overall effectiveness.



### ***Regulation requirements***

The Traffic Calming Regulations permit rumble devices up to 15mm in height, provided no vertical face exceeds 6mm in height. However,

special authorisation can be sought where a device is required which might exceed either or both of these dimensions, though clear justification as to why this was thought necessary would be required.

The requirement not to exceed 6mm for the vertical face is important. Heights greater than this could create difficulties for two wheeled vehicle drivers particularly cyclists. If materials such as thermoplastic are used to form rumble devices they confer the advantage that any faces formed are rounded.



### ***Rumble Device layouts***

Choice of the most appropriate layout to adopt depends largely on local circumstances. The following should therefore only be considered as general advice, to be modified as the particular location dictates.

#### **Full or half width**

Rumble devices can be constructed across part of a carriageway only, so that they only affect drivers approaching a hazard. Existing evidence suggests that, particularly where

rivers can see a long way ahead, they may cross the centre line of the road to avoid the devices. This obviously can be dangerous but also lessens the effectiveness of the rumble devices. Extending the device across the full width of the carriageway will prevent this. However, it will be necessary to consider whether the additional noise that might be generated could become a nuisance.

## **Cycle and drainage provision**

To allow for drainage and help cyclists to avoid rumble devices it is advisable to provide a gap, preferably in the range of 750mm to 1m, between the edge of carriageway and the device.

## **Appearance**

Rumble devices should be of a contrasting colour from the generality of the carriageway, so that drivers can see them. White must not be used, to avoid confusion with road markings. Rumble devices should also be clearly visible at night: where the colour of the construction is relied on, rather than signing, the use of a suitable reflective material may be feasible.

## **Location**

Rumble devices will be most appropriate in rural locations in advance of hazards such as bends and junctions. There is some evidence to suggest that rumble strips should not be used on bends with a radius less than 1,000m, because of possible danger to motorcyclists. Rumble devices used in urban areas will generally be limited because of the noise they can generate. If rumble areas are used to indicate the start of shared surface roads the overall height should be in the order of 5mm in order to reduce noise levels, and make them more friendly for cyclists to cross.

## **Signing**

Where rumble strips provided in accordance with the Traffic Calming Regulations do not stand out visually from the rest of the road surface, authorities should consider whether they should be signed. The Traffic Calming Regulations allow warning signs to be used. Where rumble strips are specially authorised,

and have different dimensions to the regulations, specific signing may be required. Where rumble strips are used at the approach to a hazard such as a bend or junction they should where possible be sited in obvious relationship to signing warning of the hazard. Where this cannot be achieved, specific signing for the rumble strips should be considered.

## **Height**

For normal use a height of 13mm is adequate for providing both audible and vibratory warning, whilst achieving any speed reduction that might be obtainable. When used in combination with other features, such as at gateways, lower heights may yield acceptable results. In all cases it is important to ensure that vertical faces do not exceed 6mm in height. For rumble areas a 14mm chipping size set in an epoxy resin has been used relatively successfully and can comply with the maximum height of 15mm permitted by the Traffic Calming Regulations.

## **Pattern**

The pattern to be adopted will depend on physical features and driver behaviour at the particular location. Irregular spacing between groups or areas will help to break up the noise patterns generated, which may make them more acceptable to any nearby residents. Decreasing the space between groups or areas is generally the most effective. The number of groups/areas and strips per group should be kept to the minimum. In the case of rumble strips, about 50 strips divided into 2 to 4 groups will normally be sufficient. With regard to rumble areas 4 to 6 areas will normally be adequate, though where these take the form of narrow bands this number may need to be doubled. Normally, spacing between rumble strips in the individual groups will be between 300mm and 500mm. Spacings below 400mm are more suitable for roads having speed limits less than 40mph. On roads with higher speeds, the closer spacing tends to allow vehicles to "float" over the strips. The pattern of rumble devices should finish within 50m of any hazard it is associated with.

## Materials and costs

**Rumble areas** are generally much more expensive than rumble strip schemes, particularly those using thermoplastic material. Currently prices for rumble area schemes range between £2,500 to £10,000, depending on materials used. This needs to be set in the context that the average cost of a personal injury accident is £20,000, and therefore the saving of one accident would justify even the more expensive schemes. **Rumble strips** have mainly been constructed in a thermoplastic material. They vary between £500 to £1,500 per scheme. It is likely, however, that they would need to be replaced more frequently than rumble areas.

## Further Information

Details of an examination of 33 sites where rumble devices have been installed are contained in Project Report PR 33 - An Assessment of Rumble Strips and Rumble Areas, which can be obtained from the Transport Research Laboratory, price £35.

Information on the Traffic Calming Regulations is contained in TA Leaflet 7/93.

Details of a trial of rumble areas are contained in TRL Laboratory Report 800 - "The use of rumble areas to alert drivers". This also gives

details on materials used and how the spacing was calculated.

## References

- Traffic Calming Act 1992
- Highways (Traffic Calming) Regulations 1993 SI 1993 No. 1849
- TA Leaflet 3/93 Traffic Calming Special Authorisations
- TA Leaflet 7/93 Traffic Calming Regulations
- TRL Project Report 33 - An Assessment of Rumble Strips and Rumble Areas
- TRL Lab Report 800 - The use of rumble areas to alert drivers
- BS 7263: Part 1: 1990 - Precast concrete flags, kerbs, channels, edgings, and quadrants.

## Enquiries

Traffic Management Division  
2/06 Great Minster House  
76 Marsham Street  
London SW1P 4DR  
Tel: 020 79442594

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