

**Traffic Advisory Leaflet 7/94**  
**October 1994**



# "THUMPS" Thermoplastic road humps

## *Introduction*

In 1990 Wakefield Metropolitan District Council has carried out initial trials to road humps formed from thermoplastic (thumps) as an alternative to standard road humps. These results were encouraging. The thumps were 37mm high and 900mm wide, used a circular profile, and extended across the full width of the carriageway.

The Department of Transport (DOT) instigated further trials and a study of other schemes as part of a programme of research to establish a wide and effective range of traffic calming measures. The trials were conducted by the Transport Research Laboratory (TRL).

Changes to the Highways Act 1980, which came into effect in July 1992, enabled the Secretary of State for Transport to authorise road hump profiles which do not conform to the requirements of the Highways (Road Humps) Regulations 1990.

## *Track trials*

Prior to any extended on-road use it was considered essential that the impact on safety of the devices should be assessed, along with their effect on the comfort of drivers and passengers of vehicles.



A track trial was conducted by TRL. 50mm high by 900mm wide thumps were used at 25m intervals. These were slightly higher than those in Wakefield, but conformed to the minimum height allowed under the road humps regulations.

The results of the trial were not entirely satisfactory as, unlike more conventional road humps, the thumps did not achieve any substantial increase in discomfort as speed increased. There was also some suggestion that they might be too harsh and cause damage to vehicle suspensions. However, the trials did not give any cause to believe that the thumps would adversely affect the safety of road users.

## *On-road trial*

It was decided that there was sufficient promise in the thumps to justify a test of their performance under actual road conditions. Because of their earlier involvement,

Wakefield MDC were asked to participate in an on-road trial. This was funded by the DOT and supervised and monitored by TRL.

The site chosen was Ash Grove, South Elmsall. This road was within a 30mph speed limit, formed part of a bus route, and being about 750m long was of a suitable length.

Because of the comments regarding possible bus suspension problems, the original 37mm high dimension was used. 12 of these circular profile thumps, 900mm wide, were installed at a cost of £11,000. The spacing between the thumps varied between 35m and 75m.

About 2,700 vehicles per day used Ash Grove prior to the thumps being installed. Four bus operators had routes operating along the road. One of the operators used only mini or midi buses; the others had standard double deck or single deck buses.

The mean and 85th percentile speeds before installation of the thumps were in the order of 30mph and 34mph respectively.



## ***Design guidelines for thumps***

It is a matter for individual authorities to determine whether thumps provide a suitable alternative to road humps in particular circumstances and along particular lengths of road. Where they are judged to be appropriate, it is suggested that the following is used as a basis for design:

### **Profile**

Circular, 37mm high. Thumps higher than this can be used but there does not appear to be any great advantage, and they may increase the discomfort problem.

### **Width**

900mm. Widths up to 1500mm are feasible: greater widths will result in lower speed reductions, though they may cause less discomfort to occupants of mini/midi buses.

### **Speed limit**

30mph. Thumps need to be combined with additional measures if used in a 20mph zone. They would be ineffective on roads having speed limits greater than 30mph.

### **Longitudinal spacing**

Approximately 50m. This should result in 85th percentile speeds around 28mph.

### **Channel gaps**

Nominal, for drainage purposes only. At a maximum height of 37mm, cyclists and motorcyclists can negotiate the thumps without great discomfort. With higher thumps consideration could be given to increasing the channel gaps to 750mm so that cyclists can avoid the thumps, providing the channel is not likely to be blocked by parked vehicles.

### **Colour**

Yellow (reflectorised).

### **Costs**

£300 - £500 per thump.

### **Maintenance**

Some flattening at the edges, particularly at the first thump encountered, has been reported. Hot weather appears to worsen this problem. Periodic building up to maintain the height may be required.



## ***On-road trial results***

Speed measurements between a pair of thumps showed that mean speeds were reduced by 7mph (to 23mph) and 85th percentile speeds by 5mph (to 29mph). The mean and 85th percentile speeds at the thumps were 22mph and 28mph respectively.

The combined two way flow reduced by 23% after one year.

Bus journey times increased, particularly those for the min/midi buses; these increases were measured in seconds rather than minutes.

There were 3 accidents, two slight and one fatal, in the 3 year period prior to installation, and none in the 13 month period afterwards. Though the initial results were encouraging, a longer period would be necessary to establish the full effect of thumps in reducing accidents.

Reactions to the scheme were mixed:-

In spite of initial concerns the West Yorkshire Fire Service were satisfied that no problems occurred when driving within the speed limit. Higher speeds were not tested.

No problems were encountered for pedal cyclists and motorcyclists.

The operator of the mini/midi buses claimed a substantial increase in maintenance costs for the buses using the route, as compared to buses using other routes where there were no road humps of any kind. As a result of this complaint and a threat to withdraw the service, the thumps were removed from Ash Grove.

## ***Use of thumps elsewhere***

The TRL have also obtained data collected by other authorities where thumps have been installed. These generally confirm the results of the Wakefield trial, and are reported in TRL Project Report PR101, Speeds at thumps and low height humps.

One authority had increased the width of the thumps to 1500mm to counter complaints regarding discomfort to bus passengers and increased journey times. Though more comfortable, the change in width resulted in a

1 to 5 mph increase in the 85th percentile speed over that for the 900mm width.

## ***Signing***

Warning signs should be placed in advance of thumps in accordance with the requirements of the Highways (Road Humps) Regulations 1990. Road markings on the thumps themselves are not necessary.



## ***Comparison with low height road humps***

TRL compared the performance and cost of thumps with 50mm high road humps and found generally that:

- Thumps were cheaper: £300 - £500, as against £500 or more for standard 50mm road humps;
- Speed reductions were similar, though the spacing between thumps was closer, 56m as compared to 70m for road humps;
- Mean speeds for both devices were above 20mph: therefore, used on their own neither would be appropriate for 20mph zones.

## ***Special authorisation***

Because thumps do not conform with the current requirements of the Highways (Road Humps) Regulations, special authorisation from the Department in accordance with Circular Road 2/92 is needed. Normal procedures for advertising road humps would apply.

## ***Acknowledgement***

The development of thumps by Wakefield MDC, and their cooperation in the Departments trials is gratefully acknowledged.

## ***References***

- An experiment with road humps. K Broadbent and A M Salmon. Highways and Transportation, November 1991
- Traffic Advisory Leaflet 3/93, Traffic Calming Special Authorisations.

- TRL Project Report PR32 - Speed Control Humps - a trial at TRL.
- TRL Project Report PR101 - Speeds at thumps and low height road humps.
- Highways (Road Humps) Regulations 1990 (SI 1990 No 703 and SI 1990 No 1500).
- Traffic Advisory Leaflet 2/90, Speed Control Humps.
- Circular Roads 2/92 (Welsh Office 46/92), Road Traffic Act 1991: Road Humps and Variable Speed Limits.

## ***Enquiries***

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