



# **TRAFFIC CALMING SCHEMES AND THEIR EFFECT ON THE MOBILITY IMPAIRED**

**LOCAL COMMITTEE FOR WOKING  
14 OCTOBER 2004**

## **KEY ISSUE:**

To consider how traffic calming schemes can affect the mobility impaired, and how these effects can be minimised.

## **SUMMARY:**

Vertical traffic calming measures are an important tool in reducing vehicle speeds and road casualties. Recent research has shown that, provided such schemes comply with current legislation and guidelines, and parking is prevented in the vicinity of speed cushions, they will not cause undue discomfort for drivers or their passengers. Vehicle occupants with medical conditions which mean that sudden jolts cause pain are more likely to suffer discomfort from driving over potholes and uneven surfaces than from driving over vertical traffic calming measures at an appropriate speed.

**CONSULTATIONS:**

The Department for Transport was consulted during the compilation of this report.

**OFFICER RECOMMENDATIONS:**

**The Committee is asked to agree**

- (i) That the report be noted, and**
- (ii) that, in any future schemes involving the introduction of speed cushions, parking is prevented in the vicinity of the cushions.**

## **INTRODUCTION and BACKGROUND**

1. At its meeting on 14 July 2004, the Committee received a report on the effect of vertical traffic calming measures on the disabled. The Committee requested a further report setting out what can be done to ensure that traffic calming measures do not increase inconvenience, pain and social exclusion of disabled people, and to ensure that vertical deflection is not in breach of the Disability Discrimination Act.

## **ANALYSIS AND COMMENTARY**

2. Traffic calming measures do not currently come within the scope of the Disability Discrimination Act. However, there will be changes made in a Bill due before Parliament shortly which will bring "public functions" within the scope of the Act. When this happens, Local Authorities will need to satisfy themselves that particular traffic calming measures do not make access "impossible or unreasonably difficult" for a disabled person.
3. Traffic calming is an important technique in reducing both the number and severity of road accidents in Surrey. The County is committed to the promotion of traffic calming schemes where the benefits can be shown to outweigh the disadvantages. In particular, it will direct resources into those schemes where the accident reduction potential is greatest.
4. This report is only concerned with vertical traffic calming measures. Other measures, such as chicanes and road narrowings, are not considered.
5. Vertical deflection traffic calming measures include round top humps, flat top humps (tables) and speed cushions (smaller humps that allow wider wheel tracked vehicles to pass unhindered). Vertical deflection traffic calming has been particularly successful in reducing speeds and consistently achieves accident reduction in excess of 60%. Vertical deflection is most appropriate in residential roads, where as advised by the Department for Transport (DfT), average speeds of 20mph are appropriate.
6. The legislation which controls provision of vertical deflection traffic calming measures is The Highways (Road Humps) Regulations 1996, which prescribe certain maximum and minimum dimensions, but leave the design and location of road humps as a matter for local authorities to determine.
7. The only road hump dimensions constrained by regulations are:
  - Maximum height 100mm with no tolerance
  - Minimum height 25mm
  - Minimum length 900mm
  - No vertical face to exceed 6mm in height
8. The DfT also recommends that speed cushions should be no higher than 75mm. in order to minimize the risk of vehicles grounding while travelling over them.

9. Consultation with the emergency services and bus operators, as well as the feedback from disabled groups, pedestrians, motor cyclists, pedal cyclists and drivers, suggests that round top road humps are less acceptable than road tables. Therefore, it is County policy not to use round top road humps.
10. All traffic calming schemes implemented in Woking have been designed and constructed to comply with current legislation, and speed cushions have been constructed with a maximum height of 75mm. in line with DfT recommendations.

## RESEARCH AND TECHNICAL ADVICE

- 11 Research has been carried out by the Transport Research Laboratory (TRL), on behalf of DfT, into the impact of road humps on vehicles and their occupants, and the results were published last month.
- 12 The study was based on five different vehicle types (medium saloon car, London taxi, ambulance, single deck bus and minibus) being driven over four different hump types (round top, flat top and sinusoidal humps, and a speed cushion, all 75mm. high). This vehicle testing took place at Millbrook Testing Ground, Bedfordshire.
- 13 One of the main outputs from the vehicle testing was the vertical acceleration recorded at different points in the vehicles. This has been shown to correspond closely to the level of discomfort felt by vehicle occupants. Basically, the greater the vertical acceleration, the greater the degree of discomfort felt.
- 14 The data collected were used to assist TRL in assessing the physical effects of vertical traffic calming on vehicle occupants, using a bio-mechanical model of the human spine. It was thus possible to estimate the forces in the spinal ligaments of a vehicle occupant when the vehicle traverses a hump, for a range of hump type/vehicle type/speed combinations.
- 15 The research showed that:
  - forces generated in the spinal ligaments were almost an order of magnitude smaller than the damage threshold for such ligaments.
  - forces transmitted through the spine as a whole were at least a factor of four smaller than those generated in discs by heavy lifting.
  - vehicle occupants are very unlikely to be injured as a result of single or repeated traversing of road humps. The exceptions to this statement are people with pre-existing conditions that result in either degenerated discs or weak bones, in which case they could be more susceptible to injury depending on the seriousness of their condition.
- 16 Some of the recommendations made by the TRL, based on their research, are:

- Vertical traffic calming measures should continue to be used as an effective method of reducing vehicle speeds, preventing injuries and saving lives. The existing guidance on road hump design should not be altered.
- Where vertical traffic calming measures are required on bus and ambulance routes, speed cushions rather than standard road humps should be used.
- Vehicles should be prevented from parking near to speed cushions, to enable buses and ambulances to straddle the cushions (since discomfort is greater when such vehicles are forced to mount the cushion).
- Road humps need to be carefully built to specification as earlier work has shown that quite small deviations can adversely affect the comfort of vehicle occupants.
- Careful attention needs to be paid to the signing and marking of road humps to ensure their visibility, especially at night, and to encourage drivers to slow down for them in good time.

## **COMMENTS ON TRL RESEARCH**

- 17 TRL's findings basically support existing Surrey County Council policy to promote vertical traffic calming (tables and cushions - constructed to existing recommended specifications) to reduce casualties.
- 18 Provided that vertical traffic calming measures are negotiated at an appropriate speed, they should not cause problems for drivers or passengers. For those with a disability or medical condition where sudden jolts can cause pain, an unexpected jolt caused by a pothole or raised/lowered gully traversed at 30mph is likely to be much greater than any discomfort felt from travelling carefully over a speed table or cushion. In view of this, any future vertical traffic calming schemes should not be in breach of the Disability Discrimination Act, even allowing for any future changes in the legislation. (See para. 2).
- 19 It will be necessary to ensure, in any future traffic calming schemes involving the use of speed cushions, that parked vehicles cannot prevent drivers from traversing the speed cushions by straddling them, as this could mean greater levels of discomfort.

## **FINANCIAL IMPLICATIONS**

- 20 There may be additional costs involved, in any future traffic calming schemes, in preventing parking in the vicinity of speed cushions.

## **SUSTAINABLE DEVELOPMENT IMPLICATIONS**

- 21 There are no sustainable development implications.

## **CRIME & DISORDER IMPLICATIONS**

22 There are no crime and disorder implications.

## **EQUALITIES IMPLICATIONS**

23 Provided that vertical traffic calming measures comply with current legislation and guidelines, that they are negotiated at appropriate speed, and that parking is prevented in the vicinity of speed cushions, they should not cause pain or discomfort for drivers or passengers.

## **CONCLUSIONS AND REASONS FOR RECOMMENDATIONS**

24 Research has shown that vertical traffic calming measures should not cause discomfort to drivers or passengers, provided that they are negotiated at appropriate speeds.

25 Those with a medical condition where sudden jolts cause pain are more likely to have problems with potholes, etc. rather than properly constructed, signed and marked vertical traffic calming measures.

26 In any future speed cushion schemes, parking in the vicinity should be prevented. This will enable drivers and passengers to straddle the cushions, the most comfortable means of negotiating them.

**Report by: Stephen Child, Local Transportation Director, Woking**

---

**LEAD/CONTACT OFFICER: John Masson**

**TELEPHONE NUMBER: 01483 518300**

**BACKGROUND PAPERS: Transport Research Laboratory Report  
TRL614 "Impact of Road Humps on  
Vehicles and Their Occupants"**

---

Version No. 2    Date: 27/9/04    Time: 13.00    Initials: JM    No of annexes: -