

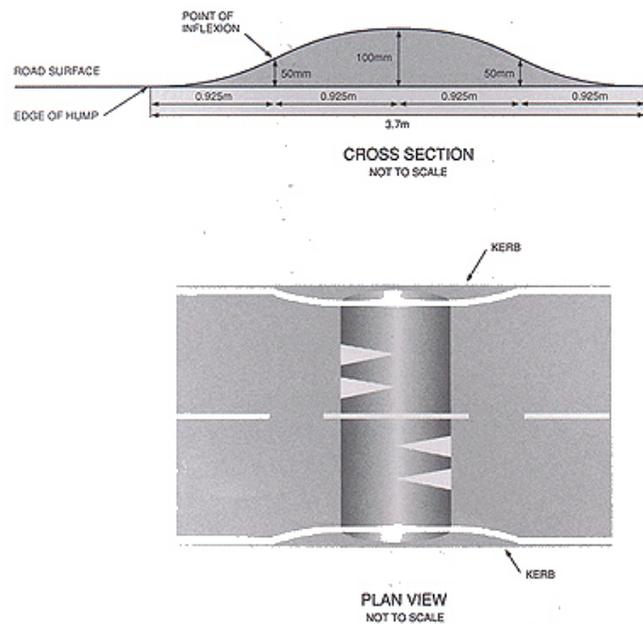
Sinusoidal humps

Humps with a sinusoidal profile are similar to round-top humps but have a shallower initial rise. They were developed in the Netherlands and Denmark to provide a more comfortable ride for cyclists in traffic calmed areas. The sinusoidal profile has also been used instead of straight ramps for flat-top road humps.

A few highway authorities in the UK have installed sinusoidal humps, though precise information on the discomfort performance is not available.

In the City of Edinburgh, 100mm high sinusoidal asphalt humps (Figure 1) have been installed on residential roads in The Grange area. Speeds have been reduced to values similar to that for round top humps. The original mean speed of 33 mph has gone down to 15.5 mph at the humps, and 22 mph between humps spaced 100m apart.

Figure 1: Dimensions for high sinusoidal asphalt humps



Flat-top humps with pre-formed sinusoidal ramps (75mm high) have been used in 20 mph zones in Burnley and Warrington. As yet, no detailed information on speed reductions is available.

Norfolk County Council have modified 75mm high flat top humps with ramp gradients of 1:13 to 1:15, so that they are rolled over at the top of the ramp to give an approximate sinusoidal profile. Mean crossing speeds (about 16 mph to 18 mph) are slightly higher than for flat-top humps with straight ramps.

Side view of a high sinusoidal asphalt humps



Warwickshire County Council used 75mm high flat-top humps with a similar rolled top ramp profile in the Rugby 20 mph zone. The average of mean speeds at and between the humps was 18 mph.

Front view of a high sinusoidal asphalt humps



Sinusoidal, 'H' & 'S' Humps Briefing Note

Track trials at TRL, measuring passenger discomfort, have shown that, compared with a round top hump, a sinusoidal hump would produce a small reduction in discomfort for cyclists (both humps 75mm high, 3.7m long). The trial indicated that there was little, if any, benefit in terms of driver or passenger discomfort for car or bus passengers in using a sinusoidal hump in preference to a round-top hump or in using sinusoidal ramps in preference to straight ramps.

The experience of cyclists taking part in the tests was that it was probably more important to ensure that there was no large upstand at the leading edge of the hump where it meets the road surface. The Highways (Road Humps) Regulations 1996 and the Road Humps (Scotland) Regulations 1998 specify that vertical projections should not be greater than 6mm.

Local highway authorities will need to consider carefully the cost effectiveness of achieving the sinusoidal profile, particularly as the reduction in discomfort to cyclists over that of a round top hump appears to be small.