

THE DESIGN AND IMPLEMENTATION OF TRAFFIC CALMING SCHEMES

WHAT IS HAPPENING IN CONTINENTAL EUROPE?

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This paper deals with some issues of traffic calming design and implementation that arise from experience on the near continent.

1. THE "BADMINTON TRIALS"

Traffic calming as developed in the Netherlands and Germany is more than just traffic management, or accident remedial work. Traffic calming is seen as a total design technique for meeting a variety of objectives, not just accident reduction. This range of objectives is discussed in an earlier paper for PTRC (Ref 1).

An issue frequently raised in Britain is whether "environmental" treatments can be justified in addition to basic humps. Experience from the near continent suggests the following tenets of sound traffic calming practice:

- \* Landscaping, paving and other environmental treatments will not, by themselves, have sufficient effect on driver behaviour and speed to achieve the casualty reduction and other objectives required.
- \* Such improvements can, however, reinforce the speed reduction and calm driving effects of other measures such as humps and lateral shifts. This requires a change in the character and appearance of the street.
- \* Environmental improvements can be important, or even essential, in getting public support for the traffic calming measures.

The effect of a major change in street character on driver behaviour and acceptance of traffic calming measures was demonstrated in Essen in the 1970s (Ref 2). The demonstrations used badminton players in the street before and after the introduction of traffic calming measures and environmental works. The results were as follows:

BEFORE

- Drivers approached the badminton players fast, and braked late, expecting the players to move aside.
- 24% of drivers sounded their horn to get the players to leave the carriageway.

## AFTER

- Drivers approached the badminton players more slowly, and with preparedness to slow down further.
- Only 11% of drivers sounded their horn.

The conclusion was that drivers show less aggression and much greater tolerance of activity in the street when the appearance of the street has been changed to reflect priority for residents and pedestrians.

## TRAFFIC CALMING AS PART OF TRANSPORT STRATEGY

It is recognised in many cities that traffic calming can help to regenerate the economy of city centres and sub centres, and can also help to moderate demand for the private car. Traffic calming is thus pursued as part of a wider strategy for strengthening urban areas, and fighting off pressures for car-based out-of-centre developments. All but one of the six German area-wide demonstration projects showed positive improvements for local trade. More widely, a study of 30 German cities found higher retail growth rates amongst those cities which had lower parking provision in the city centre.

Cities which are progressively clearing cars and parking out of the centre include Frankfurt, Freiburg, Groningen, and Nuremburg plus about 40 Italian cities of all sizes. Aachen and Lubeck are both part-way towards a car-free city centre, while people in Amsterdam recently voted in favour of such a policy.

## BEYOND SHARED SPACES

The shared space solution (developed in the Netherlands in the 1970s as the Woonerf principle) can produce safe and attractive living areas. The special traffic rules for such areas include pedestrians rights over the entire street surface, parking at specified bays only, and vehicles to proceed at no more than "walking pace". To meet these requirements it is usually necessary to repave the entire street, and to introduce planting and street furniture on a generous scale. Most European countries have adopted the international shared surface sign (the so-called "house on skies" sign) but not Britain, where no equivalent traffic rules exist for shared surfaces.

The shared surface solution is now rarely adopted, certainly in existing areas, for several reasons:

- Too expensive to be adopted universally,
- Most benefits can be gained more cheaply using 20 mph zone techniques,
- Pedestrians do not always feel secure without dedicated footways (German schemes have often retained footways for this reason) even though accident rates are very low,

- Only work with low traffic volumes (maximum about 200 vph), so cannot be a universal solution.
- Shared surfaces can become cluttered with parked vehicles in areas of high parking demand.

The shared surface continues to be used in new UK housing developments, but it is often poorly designed and with the effect of giving priority to the car.

The clear lesson from continental experience is that shared surfaces can be valuable in limited circumstances, but that universal traffic calming must rely on 20 mph techniques.

#### PRIORITY TO THE RIGHT OR LEFT

It is common in continental Europe for priority to be given to vehicles entering or crossing one's direction of travel, ie. priority to the right. This rule these days is usually suspended on main traffic routes where priority markings and signs are displayed. There is no equivalent (priority from the left) rule in Britain. [The only priority to traffic joining one's direction of travel is the priority to the right rule at roundabouts.]

The absence of this priority rule in Britain deprives us of a useful speed reduction technique. Often in continental schemes, the simple removal of priority markings at junctions has had a dramatic effect on vehicle speeds, equivalent to the effect of a speed hump but without any cost. Valuable though a new "priority to the left" rule in Britain would be to add to the traffic calming toolkit, it could be difficult to introduce given that drivers have no experience of it. There might be a case for experimentation however.

#### LEGAL LIMIT ONLY OR PHYSICAL MEASURES?

Although a large proportion of residential streets in Danish, Dutch, German and Swiss cities are now subject to the 30 kph speed limit, in many cases this is not backed up by physical measures to make the limit self-enforcing. There has been some success in terms of accident reduction from this lowering of the legal limit alone, but we cannot assume that such success would follow the application of this approach in Britain. We must remember that people in the countries mentioned have become used to lower speed limits, and there have been campaigns to promote traffic calming for over fifteen years. In addition, certainly in Germany, traffic laws tend to be more rigidly respected than in Britain.

The Department of Transport, quite rightly in my view, have insisted that 20 mph zones should be designated only where average vehicle speeds are 20 mph or less, and in most places this can be achieved only by the use of physical measures.

Nevertheless, as awareness of the dangers and problems of speed in towns grows, and as people gain experience of 20 mph areas, and understand their purpose, it should be possible to relax this requirement. It should be possible to introduce 20 mph zones where physical measures are used selectively to reinforce speed reduction at locations where the greatest benefits can be gained (eg. at junctions, and outside schools), rather than the blanket use of humps or other measures as at present.

#### MAIN ROAD TRAFFIC CALMING

The biggest prizes are to be won on main roads. Most traffic calming effort has been concentrated in residential areas, and this has produced important accident reductions, especially amongst children. But it is main traffic routes where conflicts are most intense, and where a substantial majority of all urban accidents occur.

There are now numerous main road schemes to tip the balance of advantage towards pedestrians and cyclists, but most of them have relied on reallocating space, rather than more direct methods of speed reduction. Examples are in the Eindhoven demonstration project, the Damrak in Amsterdam and Cologne's inner ring road.

Experiments in 11 village through roads in Germany produced generally favourable but rather mixed results. Vertical shifts were not used in any of these schemes, and speed reduction was modest. Lateral shifts were effective only where these were severe. Similar results were obtained from Denmark's through road schemes. The relative effectiveness of different speed reduction measures is summarised in Devon County Council's "Traffic Calming Guidelines" (Ref 3).

France is unusual in that most traffic calming effort has gone into urban main roads and through roads in small towns and villages, rather than residential areas. This stems from the relatively scattered distribution of settlements over a large geographical area, and the impossibility of providing by-passes for the thousands of towns and villages lying astride Routes Nationale and other important roads. The French government embarked on an ambitious programme of 50 demonstration projects in the mid-1980s, a majority of which were on through-roads (Ref 4). Main road traffic calming, including the use of humps, chicanes and roundabouts, is now common in most parts of France.

Some effective urban main road schemes in Germany include Buxtehude, Cologne, Berlin, Frankfurt, Hennef, Herne and Langenfeld. The latter two schemes have made particularly good use of "cushions" to reduce speeds for general traffic without interfering with bus operation (Ref 5).

## AUTONOMY FOR LOCAL AUTHORITIES OR CENTRAL REGULATION?

There is no doubt that many of the best ideas in traffic calming have come from local authorities who have been able to devise techniques without fear of legal or other challenge. There is also no doubt that some very poor schemes have resulted from local autonomy. There are potentially great benefits from encouraging good practice through conditional grants (as in the Netherlands), or by investment in major demonstration projects to research the best techniques (as with the 6 German Federal area-wide projects, and projects by Landes Northrhine-Westfalia). Standard bus chassis design in Germany has proved to be a useful asset in the design of "cushions".

Central regulation (as in Britain) is therefore potentially useful in getting widespread adoption of effective techniques, but of course such regulations must be based on properly conducted research, and supported with adequate funds.

## CONCLUSION

Mainland European countries are 10 - 15 years ahead of Britain in the development and application of traffic calming, and in public awareness of its value. Nevertheless, while there are many excellent schemes, there is still a reluctance in most places to exploit the full potential of traffic calming techniques. Residential areas need more widespread physical measures to enforce low speeds, and to create the required change in street character "to return the streets to the people". On main roads in towns and villages, much bolder experimentation is needed with speed reduction measures, especially vertical shifts. The Borehamwood experimental scheme (Hertfordshire), with three flat-top humps on an "A" road carrying 18,000 vehicles per day remains one of the boldest examples of main-road traffic calming in Europe.

The really crucial, and highly visible, difference between traffic calming schemes in Britain and countries on the near-continent is in the quality of design and construction. Dutch and German schemes in particular often reach astonishingly high standards of paving, landscaping and detailing. This reflects a much greater respect for the urban environment and public spaces. British urban areas by contrast often look shamefully neglected. A revival of urban design and investment in the renewal and maintenance of public areas is long overdue.

## REFERENCES

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3. Devon County Council, 1991, "Traffic Calming Guidelines".
4. Ministere de l'Equipement, du logement, de l'Amenagement du territoire et des Transports, 1987, "Ville Plus Sure, Quartiers sans Accidents",
5. Pharoah, Tim, "Bus Friendly Traffic Calming Techniques" in Urban Transport International, March/April 1992.

## CONCLUSION

For discussion of traffic calming as part of wider transport strategies, see:

6. Pharoah, Tim, "Less Traffic, Better Towns", Friends of the Earth, 1992.