Village traffic calming - reducing accidents

Introduction

The Department of the Environment, Transport and the Regions commissioned the Transport Research Laboratory (TRL) to assess the effect on accidents of traffic calming measures in a number of villages. The schemes studied included those within the Village Speed Control Working Group Study (VISP) (see TA Leaflet 1/94) and the Traffic Calming in Villages on Major Roads project (see TA leaflet 1/00).

This leaflet summarises the results of the research. They are set out more fully in TRL Report 452 and a European Transport Conference 2000 paper.

Accident analysis

In all, accidents in 56 village traffic calming schemes were studied. The schemes included 24 from the VISP study and 9 from the Traffic Calming in Villages on Major Roads Study. The remaining 23 schemes were offered by local highway authorities, and have similar characteristics to the other groups.

Villages were classified into the following scheme types:

A. No measures in village, but use of gateway signing associated with significant markings/coloured surface/minor narrowing, and in some cases one-way working through narrowings.

B. Measures within village, involving mainly road markings, coloured surfaces and traffic islands, some with gateway features.

C. Significant physical measures within village, involving horizontal and/or vertical deflections, usually in conjunction with gateways.

The majority of the schemes had been installed during the period 1992 to 1997 and are mostly subject to a 30 mph or 40 mph speed limit.

The injury accident data obtained covered an average of 7 years before and 5 years after scheme implementation. It was grouped into slight injury accidents, killed and seriously injured accidents (ksi), and all injury accidents. Over 1400 accidents were analysed.
Results

Table 1 is a summary of the average number of accidents occurring each year in the before (1986 - 1993) and after (1994 - 1998) periods. It reveals distinct reductions resulting from the implementation of the schemes.

### Table 1: Accident Frequency per Year Summary Table

<table>
<thead>
<tr>
<th>Villages Group</th>
<th>Slight</th>
<th>KSI</th>
<th>All</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>VISP Before</td>
<td>29.3</td>
<td>13.2</td>
<td>42.5</td>
<td>5.9</td>
</tr>
<tr>
<td>VISP After</td>
<td>28.3</td>
<td>7.9</td>
<td>36.2</td>
<td>6.1</td>
</tr>
<tr>
<td>Major road Before</td>
<td>19.7</td>
<td>6.8</td>
<td>26.5</td>
<td>9.3</td>
</tr>
<tr>
<td>Major road After</td>
<td>19.2</td>
<td>2.7</td>
<td>22.0</td>
<td>3.3</td>
</tr>
<tr>
<td>Additional Before</td>
<td>37.7</td>
<td>14.7</td>
<td>52.4</td>
<td>7.8</td>
</tr>
<tr>
<td>Additional After</td>
<td>32.7</td>
<td>6.3</td>
<td>39.0</td>
<td>5.2</td>
</tr>
</tbody>
</table>

Comparing the before and after perspectives, Table 2 shows the percentage changes in accident frequency for each of the severity types by village group.

### Table 2: Percentage Changes in Injury Accidents

<table>
<thead>
<tr>
<th>Villages Group</th>
<th>Change in Injury Accident Frequency</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VISP</td>
<td>Slight -3%</td>
<td>KSI -40%</td>
<td>All -15%</td>
<td></td>
</tr>
<tr>
<td>Major road</td>
<td>Slight -2%</td>
<td>KSI -60%</td>
<td>All -17%</td>
<td></td>
</tr>
<tr>
<td>Additional</td>
<td>Slight -13%</td>
<td>KSI -57%</td>
<td>All -25%</td>
<td></td>
</tr>
</tbody>
</table>

Overall, the frequencies of all injury accidents and KSI accidents have reduced by about 25% and 50%, respectively.

National trends over a similar period, see TRL Report 452, excluding motorways, show a 7% reduction in all accidents, and a 27% reduction in KSI accidents.

The overall injury accident frequency was lowered most at the sites where 85th percentile speeds reduced by 7 mph or more within the village. It showed the least fall where speed reductions were 2 mph or less (Table 3).
There was a greater reduction in the overall frequency of accidents involving vulnerable road users than for those involving vehicles only (Table 4).

Further analyses of the results were undertaken to establish the scale of all-severity and ksi accident reduction that could be expected, on average, in village situations from a known reduction in speed. Additionally, investigations were made of changes in other parameters of the speed distribution, and which traffic calming features would influence these changes the most. The results are as follows:

- a 1 mph reduction in mean speed would result in a 4.3% reduction in all-injury accidents, and a 10% reduction in ksi accidents;
- schemes with physical measures in the village would reduce mean speeds by almost 8 mph and reduced the proportion of drivers exceeding the speed limit by more than 30 percentage points;
- the most substantial measures (physical features and signing/marking measures with high visual impact) would be the most effective in terms of speed and accident reduction;
- for all types of measures a downward shift in the distribution of speeds would result in a reduction in mean speeds.
Conclusions

Traffic calming measures in villages can yield reductions in speed, which are associated with substantial reductions in injury accidents, particularly ksi accidents.

From previously published results on the VISP and Main Road Schemes, firm estimates can be made of the reduction in mean speeds obtainable from proposed new schemes. It is now possible to predict the reduction in ksi and all-injury accidents that are possible.

Technical enquiries

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References

TA Leaflet 1/94, VISP - A Summary
TA Leaflet 2/97, Traffic Calming on Major roads: A49, Craven arms, Shropshire
TA Leaflet 6/97, Traffic Calming on Major Roads: A47, Thorney, Cambridgeshire
TA Leaflet 14/99, Traffic Calming on Major Roads: A Traffic Calming Scheme at Costessey, Norfolk
TA Leaflet 1/00, Traffic Calming in Villages on Major Roads.
TRL Report PR85, Speed Reduction in 24 villages: Details from the VISP Study.
TRL Report 212, Traffic Calming on Major Roads: The A49 Trunk Road at Craven Arms, Shropshire
TRL Report 238, Traffic Calming on Major Roads: The A47 Trunk road at Thorney, Cambridgeshire
TRL Report 364, A Traffic Calming Scheme at Costessey, Norfolk
TRL Report 452, Changes in Accident Frequency Following the Introduction of Traffic Calming in Villages

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