

Traffic Advisory Leaflet 12/00
December 2000



Urban Street Activity in 20 mph Zones - Ayres Road Area, Old Trafford

A study into six 20 mph zones is being carried out for the Department of the Environment, Transport and the Regions by Allott & Lomax, Consulting Engineers (now part of the Babbie Group). This is assessing the benefits and disbenefits of changes in accidents, vehicle emissions, travel modes, and street activities, within and in the immediate surroundings of the zones. The project is also examining the perceptions and attitudes of residents to changes that occur. This leaflet summarises the results found in the 20 mph zone installed in the Ayres Road area of Old Trafford in the Metropolitan Borough of Trafford. More detailed results are contained in a report Ayres Road, Old Trafford - Final Zone Report.



Background

Old Trafford lies approximately 2 miles to the south of Manchester City Centre. The 20 mph zone covers the area bounded by Seymour Grove, Kings Road, Chorlton Road, Northumberland Road and Park Road. The roads within the zone are generally flat.

The scheme

Ayres Road acts as a local distributor road, as well as a local shopping centre. A number of accidents had occurred in the area and along Ayres Road. The purpose of the scheme was to provide a safer environment, particularly for children.

The measures used consisted of a mixture of gateway features, speed cushions (some with narrowings) round-top humps and realignment of junctions.

Results

Traffic flows. Within the zone, weekday traffic flows fell between 12% to 40% on the more major roads in the zone, such as Ayres Road and Northumberland Road, but by much less than this on the minor connecting roads.

Speeds. These are shown in Tables 1 and 2 for Northumberland Road and Ayres Road, respectively.

Table 1 shows that the speed cushions in Northumberland Road have been quite effective with considerable reductions in both mean and 85th percentile speeds. However, although mean speeds were below 20 mph, 85th percentile speeds were not. Also, comparing the 3 month with the 12 month after measurements reveals that speeds increased.

In contrast, Table 2, shows that similar cushions used in Ayres Road resulted in very little change in mean speeds. The 3 month after mean shows a reduction in speed, though it was not sustainable over time. The 85th percentile speeds indicate some reduction between the before and after situations, but again show an increase in the 12 month after speeds when compared with the 3 month after speeds.

Accidents. Insufficient time has elapsed since implementation for accidents to be fully analysed. This topic will be the subject of a separate report in the future.

TABLE 1: VEHICLE SPEEDS - NORTHUMBERLAND ROAD

| | MEAN SPEED (mph) | | | 85TH PERCENTILE SPEED (mph) | | |
|------------------------------------|------------------|-------------|-------|-----------------------------|-------------|-------|
| | SOUTH BOUND | NORTH BOUND | 2-WAY | SOUTH BOUND | NORTH BOUND | 2-WAY |
| Before | 30.7 | 30.7 | 30.7 | 37.5 | 37.1 | 37.3 |
| At cushion - after 3 months | 14.9 | 18.5 | 15.7 | 20.4 | 22.6 | 21.5 |
| At cushion - after 12 months | 19.3 | 18.9 | 19.1 | 25 | 24.9 | 25 |
| Between cushions - after 3 months | 15.6 | 17.9 | 16.8 | 23.1 | 24.9 | 24 |
| Between cushions - after 12 months | 18.9 | 19.7 | 19.3 | 26.1 | 26.8 | 26.5 |

TABLE 2: VEHICLE SPEEDS - AYRES ROAD

| | MEAN SPEED (mph) | | | 85TH PERCENTILE SPEED (mph) | | |
|------------------------------------|------------------|------------|-------|-----------------------------|------------|-------|
| | EAST BOUND | WEST BOUND | 2-WAY | EAST BOUND | WEST BOUND | 2-WAY |
| Before | 19.3 | 20.9 | 20.1 | 27.6 | 27.9 | 27.8 |
| At cushion - after 3 months | 12.9 | 12.1 | 12.5 | 23.6 | 22.1 | 22.9 |
| At cushion - after 12 months | 15.7 | 16.7 | 16.2 | 20.3 | 20.9 | 20.6 |
| Between cushions - after 3 months | 17.1 | 17 | 17.1 | 22.7 | 22.8 | 22.8 |
| Between cushions - after 12 months | 19 | 20.1 | 19.6 | 24.6 | 24.9 | 24.8 |

Noise. Road traffic and vehicle noise surveys were conducted on three roads. This was done to ascertain both the general level of noise generated by traffic in the vicinity, and the maximum level of noise generated by individual vehicles, respectively. A summary of the results is shown in Tables 3 & 4. The data obtained gives similar results to those in other studies, with a reduction in speed resulting in an overall reduction in noise. Night-time noise ($L_{10-6hrs}$) was also reduced.

Air Quality. Nitrogen dioxide and benzene were monitored using passive diffusion tubes. These were installed at four sites (one outside the zone) for a month before and at 3 and 12 months after implementation of the zone. For nitrogen dioxide four different tubes were used at each site. Tables 5 and 6 show the results. Although some differences in concentrations were observed, changes are not regarded as significant and were possibly affected more by changes in meteorology than changes in traffic flow and speed.

TABLE 3: TRAFFIC AND NOISE SUMMARY

| | TRAFFIC NOISE dB(A) | | | | | |
|----------------------------|---------------------|---------------|--------------|---------------|---------------|---------------|
| | BEFORE | | 3 MTHS AFTER | | 12 MTHS AFTER | |
| | L_{10-6hr} | $L_{10-18hr}$ | L_{10-6hr} | $L_{10-18hr}$ | L_{10-6hr} | $L_{10-18hr}$ |
| AYRES ROAD | 50.7 | 68.0 | | | | |
| Between speed cushions | | | 49.9 | 64.8 | 46.7 | 64.5 |
| At speed cushions | | | 47.0 | 64.4 | 45.5 | 64.2 |
| NORTHUMBERLAND ROAD | 49.0 | 66.6 | | | | |
| Between speed cushions | | | 46.8 | 60.8 | 44.3 | 60.2 |
| At speed cushions | | | 44.7 | 60.3 | 43.5 | 60.8 |
| ST JOHN'S ROAD | 47.3 | 63.4 | | | | |
| Between road humps | | | 46.7 | 61.5 | 43.1 | 60.9 |
| At road hump | | | 42.0 | 60.6 | 47.5 | 59.4 |

TABLE 4: VEHICLE NOISE SUMMARY

| | VEHICLE NOISE LAMAX dB(A) | | | | | |
|----------------------------|---------------------------|--------------|--------------|--------------|---------------|--------------|
| | BEFORE | | 3 MTHS AFTER | | 12 MTHS AFTER | |
| | Noise | Speed (km/h) | Noise | Speed (km/h) | Noise | Speed (km/h) |
| AYRES ROAD | 74.6 | 41.7 | | | | |
| Between speed cushions | | | 68.9 | 30.0 | 70.7 | 28.0 |
| At speed cushions | | | 66.8 | 26.5 | 66.7 | 26.1 |
| NORTHUMBERLAND ROAD | 74.3 | 50.3 | | | | |
| Between speed cushions | | | 70.9 | 38.8 | 70.0 | 32.6 |
| At speed cushions | | | 69.3 | 31.7 | 68.6 | 31.2 |
| ST JOHN'S ROAD | 74.2 | 41.3 | | | | |
| Between road humps | | | 70.3 | 31.2 | 69.2 | 24.9 |
| At road hump | | | 66.4 | 21.7 | 63.5 | 21.0 |

Pedestrians. Twelve-hour directional counts were carried out at four junction locations during the before survey, and three junction location during the after period. Results show a fall in pedestrian flows throughout the periods of the counts. There was no clear indication as to the reasons for this, but in part it may have been due to pedestrians crossing away from the junctions because of improved conditions along the roads following zone implementation.

Cyclists. The zone appears to have had little effect on cycling. There was a small decrease between the before and the 3 month after survey. However, the 12 month after survey showed a similar number of cyclists entering to that recorded in the before data.

Household questionnaire. Surveys were carried out before implementation, 3 months after and 12 months after.

Prior to implementation of the scheme, 70% of respondents considered that vehicles travelled too fast. Following installation, some 50% of respondents felt that speed had decreased. However, a large minority considered that speeds had either not changed or had increased. In reality, speeds had generally decreased as a result of the installation of the 20 mph zone, as shown in Table 2.

Feelings regarding traffic and vehicle noise were mixed, but 76% of respondents felt traffic to be noisy or very noisy before the scheme was implemented. Following implementation of the zone 55% of respondents felt that noise had remained the same. Measured noise values as shown in Table 3 had actually decreased.

It can be very difficult for the general public to judge changes in air quality. In the before questionnaire, 50% of respondents felt air quality to be acceptable. In the after surveys, around 70% felt that traffic pollution had stayed the same.

76% of respondents in the 12 months after survey liked the measures; 66% preferred road humps; and 24% disliked speed cushions.

In response to questions on walking and cycling post-implementation, there appeared to be a significant increase in the proportion of respondents who said they walked to shops on a daily basis; from 25% to 40%. Respondents were also asked whether they were more likely to walk or cycle, and 10% said they would. There was no physical evidence to support this, though given the small numbers involved for both walking and cycling there would need to have been a considerable increase to have registered any substantial change.

TABLE 5: AV NITROGEN DIOXIDE MEASUREMENTS (PPB)

| | AYRES ROAD AT POWELL STREET | NORTHUMBER- LAND ROAD | AYRES ROAD AT ALBION STREET | SKERTON ROAD (CONTROL O/S ZONE) |
|-------------------|-----------------------------------|--------------------------|-----------------------------------|---------------------------------------|
| Before (Oct 1997) | 30 | 26 | 28 | 25 |
| After (Oct 1998) | 30 | 28 | 27 | 21 |
| After (Oct 1999) | 26 | 29 | 27 | 24 |

TABLE 6: BENZENE MEASUREMENTS (PPB)

| | AYRES ROAD AT POWELL STREET | NORTHUMBER- LAND ROAD | AYRES ROAD AT ALBION STREET | SKERTON ROAD (CONTROL O/S ZONE) |
|-------------------|-----------------------------------|--------------------------|-----------------------------------|---------------------------------------|
| Before (Oct 1997) | 2.5 | 1.8 | 2.6 | 1.8 |
| After (Oct 1998) | 1.3 | 1.2 | 0.9 | 0.7 |
| After (Oct 1999) | 1.4 | 1.0 | 1.2 | 0.9 |

Summary

The study showed that 20 mph zones can have a positive effect in reducing speeds, but that not all residents appreciate the fact. Whilst mean speeds were reduced to 20 mph or less, 85th percentile speeds in the Ayres Road Area zone were still above 20 mph. It was perhaps for that reason that some residents considered speeds still to be excessive. Previous research had indicated that speed cushions might not be entirely suitable for 20 mph zones. As far as street activity was concerned, whilst some residents stated that they would be willing to cycle or walk more, there was no physical evidence to that effect. However, it is a hopeful sign that people expressed this intention. There was also an increase in the number of parents who expressed themselves willing to allow their children to play in the streets following zone implementation. At the same time, a majority of respondents did not feel that the streets were safe enough for their children to play in. The response from elderly people gave no indication that they found that conditions had substantially improved. The majority of residents questioned were in favour of the scheme, but felt that further measures could have been introduced. Overall, the project has had no significant effect on local travel patterns and choices.

Acknowledgement

The Department would like to thank Trafford Metropolitan Borough Council for its assistance.

Technical enquiries

Traffic Management Division, Department for Transport, Zone 2/06 Great Minster House, 76 Marsham Street, London, SW1P 4DR Tel: 020 7944 2974

Monitoring

Babtie Group (Allott & Lomax Consulting Engineers), Fairbairn House, Ashton Lane, Sale, Manchester, M33 6 WP Tel: 0161 962 1214

References

Urban Street Activity in 20 mph Zones - Ayres Road, Old Trafford, After Survey 2 - Final Zone Report, Allott & Lomax Consulting Engineers (Babtie Group), February 2000.

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, January 2000. Stationary Office, ISBN 0 10 145482 1

TA Leaflet 1/98, Speed Cushion Schemes

Traffic Advisory Leaflets (TAL) are available to download free of charge on the Department for Transport website www.dft.gov.uk

Sign up for a free e-mail alert to receive notification when a new TAL is published by sending an e-mail to tal@dft.gsi.gov.uk with the subject line "subscribe".

To obtain a printed copy of this and/or other TAL's, contact: DfT Publications, PO Box 236, Wetherby, West Yorkshire, LS23 7NB. Telephone 0870 122 6236. Fax 0870 122 6237. E-mail: dft@twoten.press.net

The Department for Transport sponsors a wide range of research into traffic management issues. The results published in TAL's are applicable to England, Wales and Scotland. Attention is drawn to variations in statutory provisions or administrative practices between the countries.

Within England, enquiries should be made to: Traffic Management Division, Department for Transport, 2/07 Great Minster House, 76 Marsham Street, London, SW1P 4DR. Telephone 020 7944 2478. E-mail: tal@dft.gsi.gov.uk