

Updated 2006

# A before and after study of 3M™ Driver Feedback Signs



**3M**

# Site 1 Cleves Cross, Ferryhill, County Durham

## Site Description

Cleves Cross is on the eastern side of Ferryhill. The site is approximately 5km south of the A1(M) Junction 61 and lies close to the A688 route to Bishop Auckland. The area in which the site is located is residential, and there is a Junior & Infants School at the site.

The road is single carriageway, and the speed limit at the site, prior to any works being carried out, was 40mph.

## Scheme Details

The scheme at Cleves Cross involved the implementation of a School Safety Zone, with a 20mph speed limit, outside Cleves Cross Junior & Infants School. The work included the installation of a traffic calming scheme consisting of one-way priority entry chicanes and speed cushions. It was anticipated that this would achieve significant speed reduction immediately outside the school. The traffic calming was installed, and new speed limits implemented, in February 2003.

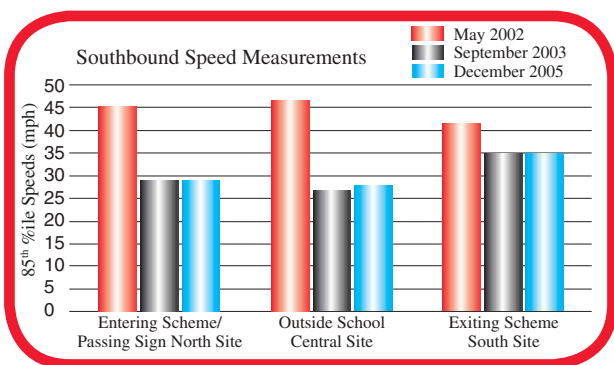
In addition to the new speed limits and traffic calming, 3M Driver Feedback Signs were installed in both directions, approximately 20m in advance of each chicane. This work was carried out at the same time as the implementation of the traffic-calming scheme.

## Results

Speed measurements were taken at three sites. Measurements were taken by permanent Automatic Traffic Counters, one positioned to the north of the scheme (adjacent to the southbound sign), one in the centre of the scheme (outside the school), and one to the south of the scheme (adjacent to the northbound sign). The counters were positioned approximately 110 metres apart.

### Southbound Carriageway

Results of speed measurement on the southbound carriageway show the following:



**Southbound 85<sup>th</sup> Percentile Speed Measurements**  
Data Supplied by: TMS Consultancy



Cleves Cross, Ferry Hill

## Comments

85<sup>th</sup> percentile traffic speeds through the site before the scheme was introduced were between 40mph and 45mph.

The introduction of the scheme (including the 3M Driver Feedback Signs) had a dramatic effect on traffic speeds, which reduced by more than 15mph at most of the traffic count locations. In December 2005, 27 months after these initial measurements, 85<sup>th</sup> percentile speeds were very similar to those recorded in September 2003, indicating that speed reductions previously achieved have been maintained.



## Site 2 Burnhope Way, Peterlee, County Durham

### Site Description

Burnhope Way lies 800m to the west of Peterlee Town Centre, approximately mid-way between the A19 Trunk Road and the central shopping area. The area in which the site is located is residential, with several schools and sports facilities nearby. Burnhope Way is the main link to Peterlee from the west.

The road is single carriageway, on a downhill gradient south-eastbound, with a 40mph speed limit.



Burnhope Way, Peterlee

### Scheme Details

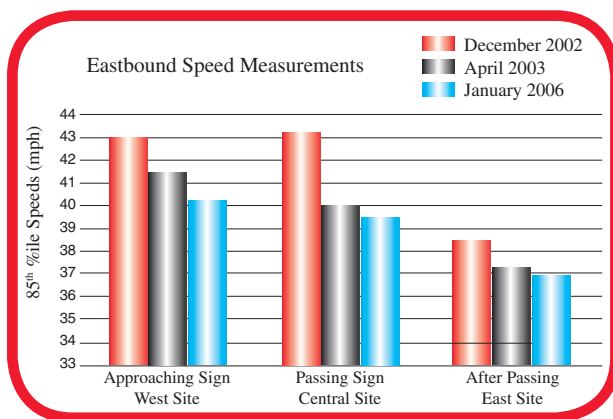
The scheme at Burnhope Way involved the installation of 3M Driver Feedback Signs, in both directions, with no other associated highway works. As there was no personal injury accident record at the site, but an identified speeding problem, the site was selected as one where the effectiveness of the signs as a “stand alone” measure could be assessed.

The signs were installed in March 2003, and operate at all times. However, the signs were switched off temporarily, between 7th July and 11th August 2003, in order to evaluate whether the signs had any effect on traffic speeds during school term time and during school holidays.

### Results

#### Eastbound Carriageway

Results of speed measurement on the eastbound carriageway show the following:



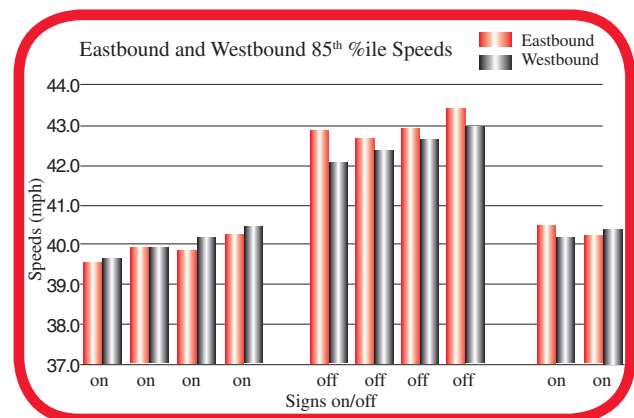
#### Eastbound 85th Percentile Speed Measurements Data Supplied by: TMS Consultancy

### Comments

85<sup>th</sup> percentile traffic speeds through the site before the signs were installed were between 38mph and 43mph. The installation of the 3M Driver Feedback Signs initially reduced traffic speeds close to the signs by between 1.9mph and 3.2mph, and these reductions have been maintained through the following 33 months.

### Results

The signs were temporarily switched off between 7th July and 11th August 2003. During this period additional speed measurements were recorded at the central site in order to obtain a direct comparison between periods when the signs were operating and when they were switched off. The results show the following:



#### 85<sup>th</sup> Percentile Speed Comparison at Central Site Data Supplied by: TMS Consultancy

### Comments

In the eastbound direction, 85<sup>th</sup> percentile speeds were an average of 39.9mph when the signs were operational, and increased to an average of 43.0mph when the signs were switched off.

When the signs were switched back on, 85<sup>th</sup> percentile speeds reduced to an average of 40.3mph. Westbound speeds followed a similar pattern. The t-test showed this to be statistically significant to the 0.1% level.

## Site 3 Various locations, Doncaster

### Scheme Description

3M Driver Feedback Signs have been installed in 10 very different locations within the Doncaster area. One is in a 20mph limit zone, another on a dual carriageway, some on semi-rural roads and others on urban roads.

### Results

Before and after study results for the 3M Driver Feedback Signs sites show the following:

Road Name/ Post Code	Existing Limit	85 <sup>th</sup> ile Before	85 <sup>th</sup> ile After	% Decrease
Parkway Armthorpe DN3 3RL	(20 Zone)	36*	32 (-4)	11%
Alverley Lane Balby DN4 9AR	30	38	35 (-3)	8%
Ruddle Lane Micklebring S66 7RR	30	36	34 (-2)	6%
Station Road Hatfield DN7 6QN	30	39	37 (-2)	5%
Warmsworth Road Balby DN4 ORP	40	42	42 (NC)	0%
Armthorpe Lane Barnby Dun DN3 1NB	30	43	38 (-5)	12%
Thorne Road Stainforth DN7 5BQ	30	38	36 (-2)	6%
Legerway 'A' Intake DN2 6HW	40	47	40 (-7)	15%
Legerway 'B' Intake DN2 7LS	40	47	44 (-4)	9%
Park Drive Sprotbrough DN5 7LS	30	32	30 (-2)	6%

**Data Supplied by: Doncaster MBC**

### Comments

The 3M Driver Feedback Signs have produced speed reductions at 9 of the 10 locations.

Speed reductions of more than 10% were observed at 3 sites, at Legerway 'A' Intake 85<sup>th</sup> percentile speeds have been reduced by 15%. Elsewhere reductions of between 5 - 9% were achieved with only one site remaining unchanged.

\* Before speed was taken when the speed limit was 30mph.



Legerway 'A' Intake, Doncaster





## Background to the study

TMS Consultancy were appointed by 3M United Kingdom plc to carry out a study of vehicle speeds before and after the installation of 3M™ Driver Feedback Signs (DFS) at two sites in Durham. The two sites are different in nature, with different speed limits, and are located at Cleves Cross, Ferryhill, Co. Durham and Burnhope Way, Peterlee, Co. Durham. Doncaster MBC also conducted independent before and after speed studies at 10 locations throughout Doncaster.

The 3M Driver Feedback Sign detects the speed of an approaching vehicle and displays it in either mph or kph. It utilises a unique patented hybrid technology, which combines low energy LEDs and 3M™ Diamond Grade™ Fluorescent Reflective Sheeting.

The aim of the studies were to assess the effectiveness of the signs as a speed reducing measure, both in conjunction with other highway engineering measures and in isolation from any other improvements. The sites were then revisited approx 2.5 – 3 years after the 3M Driver Feedback Signs were installed to establish whether the speed reductions previously identified had been maintained in the intervening period, or whether driver familiarity with the signing had lead to any subsequent increase in speeds.



## Conclusions

The most effective site was Cleves Cross, where the speed limit was reduced from 40mph to 20mph. At this site, a considerable amount of traffic calming (both vertical and horizontal) was introduced along with the 3M Driver Feedback Signs.

In Doncaster speed reductions were achieved at 9 of the 10 sites. The most successful site being Legerway 'A' Intake where a healthy reduction of 15% occurred.

In all cases, the 3M Driver Feedback Signs seem to have contributed to speed reduction and furthermore, they appear to have a continuing effect on vehicle speeds and driver behaviour. Even in the cases where speed reductions are modest the lower speed can lead to road accident reductions. Research has shown a relationship between speed and accidents in the order of a 5% reduction in accidents for every 1mph reduction in average speed.

More recently, TRL Report 548; "Vehicle-activated signs – a large scale evaluation" identified an overall reduction in accidents of 33% over a group of speed limit roundel sites, where mean speeds had been reduced by an average of 3-9mph.



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