Evaluating the Effectiveness of Vehicle Activated Signs in the Wakefield District

1. Introduction

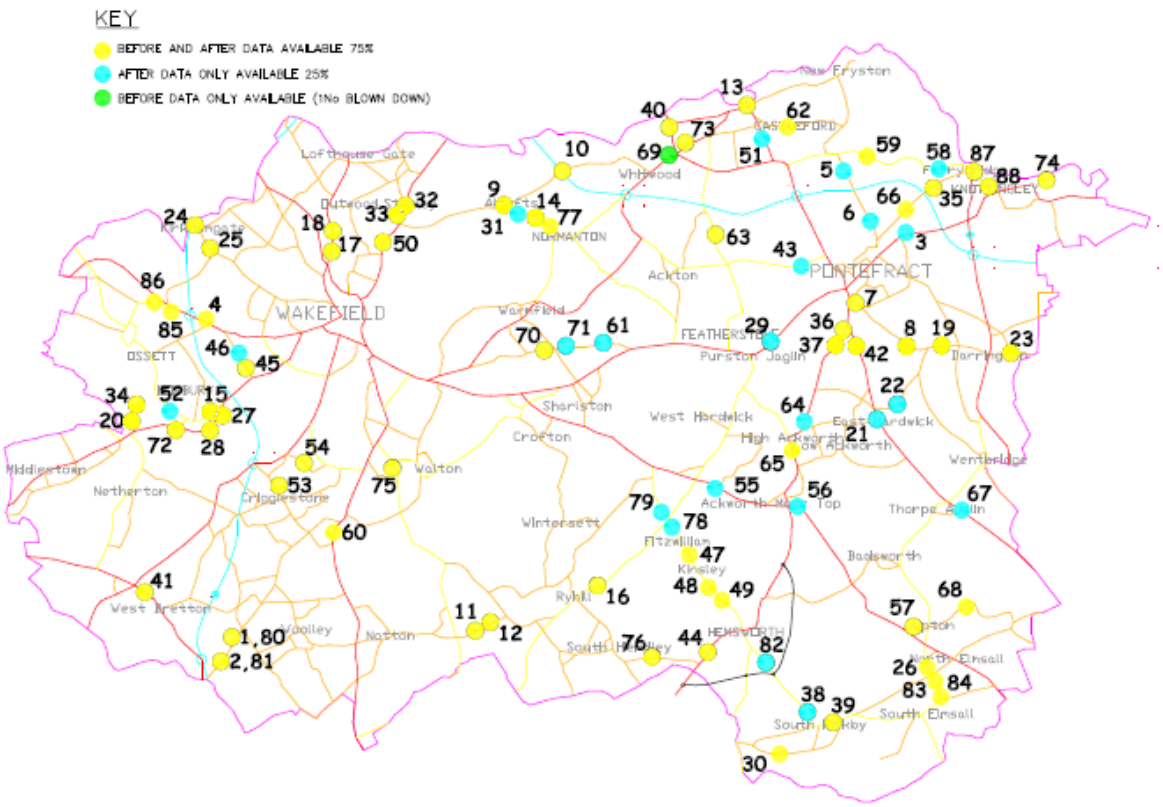
Vehicle Activated Signs (VAS) in this study are the signs that illuminate a road safety message, accompanied with flashing amber lights, when activated by a vehicle travelling above a pre-set speed. They can be used to warn drivers that they are travelling too fast, to warn of a hazard (such as a bend), approaching a traffic- calmed area, or a school frontage.

VAS Sign – 30 – SLOW DOWN

VAS Sign - bend warning – SLOW DOWN

Wakefield's criteria for installing permanent VAS was determined in the late 1990's when VAS were first installed in the District. As the main purpose of the signs was to warn drivers to slow down to reduce the likelihood of potential accidents, it was felt that sites should be initially selected where the measured 85th percentile traffic speed was around 10mph or more higher than the speed limit of the road, generally on A or B class roads.

Within Wakefield District, VAS have been installed at approaching 100 permanent locations over the past 10 years. Appropriate illuminated messages have been used for different circumstances. For example, the early VAS installations had a simple "Slow Down" message or a "30" speed limit roundel, which has developed over the years by combining both with a "School Slow Down" message and displaying typical warning signs such as children crossing the road, sharp bends and cross-roads.



Locations of VAS within Wakefield District

More recently a new type of VAS sign has been used at one location within in the District – the *Driver Feedback Sign* (DFS) supplied by 3M UK plc.

This sign displays the speed of the vehicle back to the driver, with the aim of modifying driver behaviour by giving a positive green display to drivers travelling at or below the speed limit, an amber for speeds just over the speed limit, and a red (danger) display for drivers travelling at speeds well above the speed limit.

Driver feedback sign

During the early years of VAS, the Transport Research Laboratory carried out an evaluation of the impact VAS (TRL report 548). Their report concluded that drivers can be influenced to reduce speeds when they are specifically targeted, and that VAS appears to be very effective in reducing speeds and accidents.

More recently, an extensive programme of VAS installation has been undertaken within Surrey. Initial results from Surrey County Council indicate good reductions in personal injury collisions of around 28% over a 3-year period.

A recent report assessing "The Effectiveness of Traffic Calming Schemes in the Wakefield District" concluded that VAS are the most popular type of traffic calming feature and recommended that a further study be carried out specifically to evaluate of the *effectiveness of VAS within the Wakefield District*.

2. Aims and Objectives

Bearing in mind the above, the two key aims of the study were to:

a) Evaluate the effect of VAS on speeds and accidents within Wakefield District, and

b) Evaluate public attitudes, behaviours and understanding of VAS within Wakefield District

3. Methodology Used

a) Speeds and accidents:

"Before and after" speed and accident data was collected at the 88 VAS sites installed within the Wakefield District between January 2001 and April 2007. Speeds were collected from automatic loops or by hand-held radar. Accident numbers were obtained from the Council's KeyAccident database derived from Stats19 info.

The "after" speed data was collected at least 6 months after the signs became operational to avoid any bias from the initial impact of the signs and the 85th percentile speed was used as the basis speed comparison. Accident data comprised 3 years "before" and 3 years "after" the introduction of each VAS, within a 200m length either side of the VAS. The 10-year speed-related accident record on the A and B road network was used as a comparator.

b) Public Attitude Survey

A public attitude survey was devised to gain an understanding of attitudes, impact and perception of the general public towards VAS and provide some "qualitative" evaluation. Various means of collecting representative sample data from the public were considered for this task including distribution of a leaflet with a questionnaire, telephone surveys, and face-to-face interviews.

The favoured method was to conduct short face-to-face interviews undertaken by enumerators at Council-owned car parks in Wakefield and Pontefract. This was considered to offer the best means of obtaining the opinions about VAS from a representative sample of *drivers* in the District.

More than 350 individual questionnaires were completed over a period of 2 weekday mornings and a Saturday at 2 car parks in Wakefield and 2 car parks in Pontefract, using 4 enumerators per session (for a total cost of approximately £480).

The success rate of requests for an interview to acceptance was about 10 to 1. Anecdotally, reasons given for refusal were that the respondent was in a hurry, had children in the car, were on urgent personal business, or the weather. The offer of free car park tickets as a reward for completing the survey could have improved the response rate, but would have increased cost of the survey.

4. What has been achieved?

a) Speed survey results

Out of the 88 VAS sites in the survey, 64 had a complete set of before and after data (73%). The speed data set is shown in Appendix A.

The average reduction in speed at the sites was more than 4 mph.

When analysed by sign facia, the average speed reductions of the 85th percentile speed were as follows:

VAS message	No. of signs	Speed reduction (mph)
"30" and/or Slow down	38	4.2
"School" with "children crossing"	15	6.6
Other (hazard warning)	11	2.5

The results in the table above suggest that installation of the signs has, in general, influenced the driver to slow down, and were particularly effective outside schools. The impact of VAS on driver behaviour at locations *away* from the actual sign location was not investigated within this survey, which would have been a useful indicator. However, the *perceived* impact of the VAS on general driving behaviour is one of the questions asked in the face-to-face interview survey.

GIS technology is becoming more readily available and can be used to map traffic speeds throughout the complete highway network (using Traffic Master) by detecting SatNav equipment fitted to vehicles. This technology is currently used for monitoring speeds along congested urban radial routes in Wakefield (ie the DfT congestion monitoring routes). However, if it is extended to other routes, speed trends along the whole of the network could be assessed.

b) Accident data results

The accident data was collected and assessed from the Council's KeyAccident data records. For the data sets, only speed-related accidents were included. The data set is shown in Appendix B.

The analysis of the accident data is a simple comparison of the total number of recorded personal injury accidents occurring within 200m of the sign location in a 3-year period after the introduction of VAS, against the number of accidents occurring in a 3-year period before installation. This comparison indicates a reduction from 63 personal injury accidents to 34 personal injury accidents (over combined 3-year periods).

Based on an average site installation cost of £4,000, the calculation producing the economic benefits accrued from installing VAS within the Wakefield District is as follows:-

First Year Benefit =10 (pias) x £80,000 (cost saving of each accident) = £800,000
The Total Installation Cost = 88 (number of VAS) x £4,000 = £352,000

This means that the Benefit to Cost ratio equals 800:352, therefore giving a **First Year Rate of Return of 227%.**

Evaluating the overall trend of speed-related accidents throughout the District over the past 10 years (from 2000 to 2009) is difficult because of changes made to the Stats 19 descriptions for the "causation factor" in 2005. However, between 2000 and 2005 the District trend shows a fall in the number of speed-related accidents. Since 2005, the number of speed-related accidents has also fallen from a peak of 61 in 2006, to 44 in 2009.

c) Face to face interviews results

As described in section 4, in-house enumerators conducted the survey by undertaking more than 350 interviews at car parks in Wakefield and Pontefract over three 4-hour sessions on two weekdays and a Saturday in January and February 2010.

The sample of people interviewed is shown to be representative of the population of Wakefield District as follows:

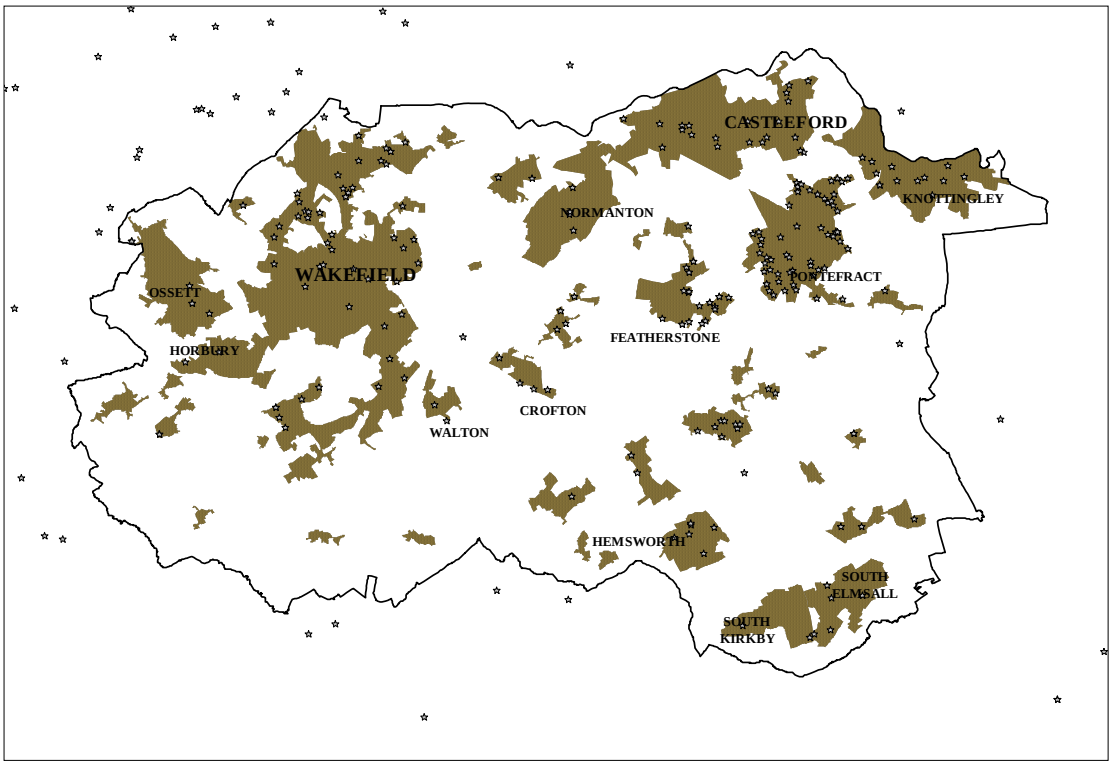
Employment	2001 census	Survey sample
	(% of total)	(% of total)
Full-Time	46%	42%
Part time	13%	15%
Other	41%	43%

Table 1 – Comparison of the employment characteristics

Age range	2001 census	Survey sample
	(% of total)	(% of total)
17-24	11%	7%
25-49	46%	45%
50+	43%	48%

Table 2 – Comparison of Age

- 54% male and 46% female respondents, with the majority residing within the District with a few outside the District boundary, as shown below:



Wakefield District boundary showing the home postcodes of people interviewed

In brief, the interviews produced the following comments:-

- Almost everyone sampled was aware of the VAS.
- Most respondents (67%) considered that the main purpose of the signs was to remind drivers to slow down.
- Most people (86%) felt that the signs had a *positive* impact on their driving as shown in the pie chart below:

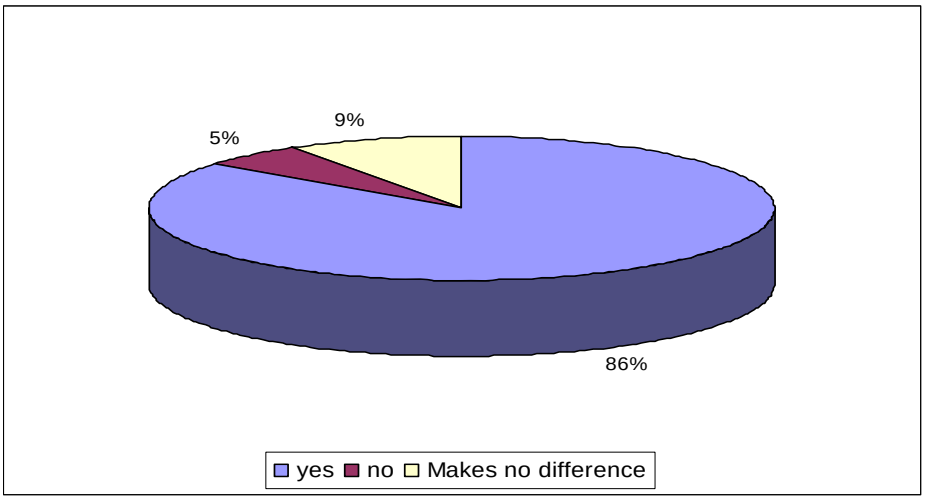


Chart – Do you feel that any of the signs has a positive impact on your driving behaviour?

- Most people (69%) felt safer driving on a road with a flashing speed sign and would like to see one in their neighbourhood (92%).

- The most effective type of measure was considered to be the Vehicle Activated Sign (flashing sign), followed by Police enforcement and fixed safety cameras as shown below:

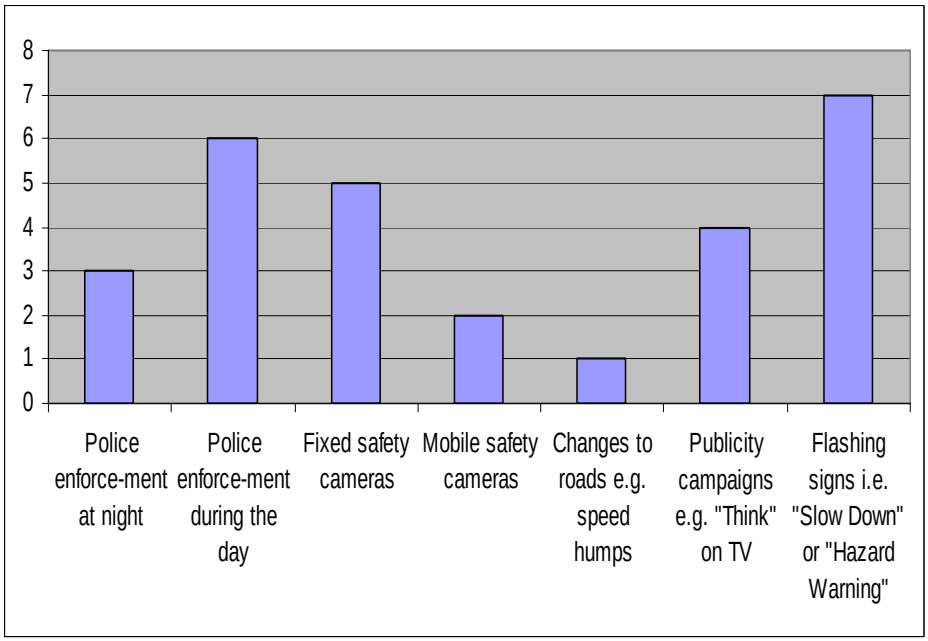


Table – How effective would you rate the following at helping drivers stay safe?
(Range 1 = not effective to 7= very effective)

6. Facilitators and Barriers

I encountered few barriers, the greatest one finding the time to plan and carry out the work in between the “day job”, as I moved jobs, just before starting the learning set.

However there were many facilitators, including the advice and assistance from the RSELS and the assistance by work colleagues in conducting the surveys, and assisting with data presentation.

7. Reflection

The RSELS helped me to focus this piece of work previously put on the “back burner”, and has encouraged me to use face-to-face interviews as an effective means of gathering data for road safety evaluation.

I did not use the statistical/surveys programmes such as *Survey Monkey* or *SPSS* to evaluate the data sets, but instead used excel spread-sheets and charts to present the findings. However there may be benefits for using these statistical packages for the evaluation of larger data sets.

Finally, I recommend use of the *RoSPA Road Safety Engineering Manual*, which gives good practical advice and worked examples for road safety evaluation.

8. The Future

The current economic climate will place a greater emphasis on Council officers to demonstrate “value for money” and the “effectiveness” of road safety initiatives within local areas, such as the VAS programmes in Wakefield.

Road safety evaluation will also be needed to provide evidence for the new *Comprehensive Area Assessments,* and through partnerships with the PCTs, Police and Fire and Rescue Services.

Evaluation should form a mandatory part of the implementation process and resources provided to enable this to happen.

For example new *Driver Feedback* sign described in this report have only relatively recently been installed at two sites within the District but it is intended that these will be assessed using the data monitoring software integral to the signs.

APPENDIX A –SPEED SURVEY DATA

No	Location and Installation Date	Speed Limt mph	85% Before Speed	85% After Speed	Traffic Calmed	Speed Diff
1	Haigh Hill Lane, Haigh Village (Uphill) S75 4BZ **(Removed, replaced by No80)**	30	41	40	No	-1
2	Haigh Hill Lane, Haigh Village (Downhill) S75 4BZ **(Removed, replaced by No81)**	30	40	38	No	-2
3	A645 / Knottingley Road / Nr Water Lane,PontefractWF8 2JX	30	NO DATA	33	No	N/A
4	Batley Road / Nr Crown Inn, Alverthorpe WF2 0AL	30	37	37	No	0
5	Spittal Hardwick Road / Nr Gypsy Lane,Castleford WF10 3PZ	30	NO DATA	40	No	N/A
6	Monkhill Lane / Nr Lady Balk Lane, Pontefract WF8 1RW	30	NO DATA	33	No	N/A
7	Carleton Road / Carleton Close, Pontefract, WF8 3ND	30	37	34	No	-3
8	Carleton Road / Moor Lane, Pontefract, WF8 3RL	30	35	34	No	-1
9	Birkwood Road, Altofts, WF6 2NL	30	41	29	No	-12
10	Church Road, Altofts, WF6 2QS	30	35	27	Yes	-8
11	Navvy Lane / Old Railway Bridge, Old Royston S71 4EF	30	43	40	No	-3
12	Navvy Lane / Canal Bridge, Old Royston, S71 4EF	30	43	40	No	-3
13	Lock Lane / Green Street, Castleford, WF10 2JY	30	36	31	No	-5
14	Station Road, Altofts WF6 2NE (01/03/02)	30	40	38	No	-2
15	Wakefield Road Horbury High School, Horbury,WF4 5HE	30	37	34	No	-3
16	Cow Lane / Hatfield Place, Havercroft, WF4 2HJ	30	41	38	Yes	-3
17	A61 Leeds Road/ Newton Avenue, Wakefield WF1 2PX	30	35	34	No	-1
18	A61 Leeds Road / First Avenue, Wakefield WF1 2HS	30	34	29	No	-5
19	Carleton Road Road, Darrington WF8 3AG	30	36	36	No	0
20	Storrs Hill Road / Bottom of the Hill, Ossett, WF4 6EY	30	34	36	No	2
21	A639 Doncaster Road / Station Road, East Hardwick WF8 3DP	40	NO DATA	39	No	N/A
22	A639 Hardwick Road Water Lane,East Hardwick WF8 3DU	40	NO DATA	44	No	N/A
23	Valley Road, Darrington WF8 3BT	30	40	35	Yes	-5
24	Batley Road, Near 117, Kirkhamgate WF2 0SP	30	41	38	Yes	-3
25	Batley Road / Star Public House WF2 0RZ	30	41	36	Yes	-5

No	Location and Installation Date	Speed Limt mph	85% Before Speed	85% After Speed	Traffic Calmed	Speed Diff
26	Minsthorpe Lane / Bailey Cresent, South Elmsall WF9 2UU	30	41	35	No	-6
27	Northfield Lane Horbury WF4 5JL	40	41	35	No	-6
28	Southfield Lane / Cluntergate, Horbury WF4 5AX	40	45	41	No	-4
29	Pontefract Road / Featherstone High School WF7 5AJ	30	NO DATA	34	No	N/A
30	Common Road / Saxon Grove South Kirby WF9 3EF	30	40	32	Yes	-8
31	High Green Road / Lee Brigg Altofts WF6 2LN	30	NO DATA	27	Yes	N/A
32	Aberford Road / Lime Pit Lane Stanley WF3 3NT	30	53	33	No	-20
33	Aberford Road / Near Number 256 Stanley WF3 3NS	30	40	33	No	-7
34	Storrs Hill Road / Top of the Hill, Ossett WF5 0AA	30	34	35	No	1
35	Pontefract Road / Wordsworth Drive, Ferrybridge, WF11 8PS	30	44	23	Yes	-21
36	Ackworth Road / Outside Number 66 (Inbound), Pontefract WF8 4LH	30	39	36	No	-3
37	Ackworth Road / Tudor Close (Outbound), Pontefract WF8 4NQ	30	40	37	No	-3
38	A642 Hemsworth Road / Holmsley Lane South Kirby WF9 3HQ	30	NO DATA	38	Yes	N/A
39	White Apron Street / Outside the Library, South Kirby WF9 3LD	30	37	33	Yes	-4
40	Jin Whin Hill / Central Drive, Castleford WF10 1PZ	30	37	35	No	-2
41	A637 Huddersfield Road, West Bretton WF4 4JW	30	42	40	No	-2
42	A639 Hardwick Road / Brockadale Avenue, Pontefract WF8 3QY	40	49	45	No	-4
43	Park Lane / Near to Stables, Pontefract, WF8 4QL	40	NO DATA	29	Yes	N/A
44	Barnsley Road / Outside Number 162, Hemsworth WF9 4PQ	40	37	32	Yes	-5
45	Broadway / Outside St Georges Hall, Wakefield WF2 8DA	30	39	33	No	-6
46	Broadway / Outside Number 82, Wakefield WF2 8LY	30	NO DATA	30	No	N/A
47	B6273 Wakefield Road / Opposite Unit 10, Kinsley. WF9 5EA	40	42	33	No	-9
48	B6273 Wakefield Road / Near to the Church of Ascention, Kinsley. WF9 5EA	40	44	42	No	-2

No	Location and Installation Date	Speed Limt mph	85% Before Speed	85% After Speed	Traffic Calmed	Speed Diff
49	B6273 Wakefield Road / Opposite the Park, Kinsley. WF9 5HS	40	47	41	No	-6
50	Aberford Road / Near Prison Training Centre, Wakefield. WF1 4DE	30	33	35	No	2
51	Pontefract Road / Newfield Avenue, Castleford. WF10 4BH	30	NO DATA	38	No	N/A
52	Westfield Road / Near Victoria Public House, Horbury. WF4 6 EQ	30	NO DATA	35	No	N/A
53	Durkar Lane / Outside Number 41, Durkar. WF4 3HZ	30	43	34	No	-9
54	Durkar Low Lane / Green Acres, Durkar. WF4 3BQ	30	39	31	No	-8
55	A638 Wakefield Road / Bracken Hill, Ackworth. WF7 7BG	40	NO DATA	34	No	N/A
56	A638 Doncaster Road / Outside Number 64, Ackworth. WF7 7DD.	30	NO DATA	39	No	N/A
57	Common Lane / Sunny Avenue, Upton. WF9 1DJ.	30	38	37	Yes	-1
58	B6136 Stranglands Lane / Ferrybridge Power Station, Ferrybridge. WF11 8RA	30	NO DATA	36	No	N/A
59	Sheepwalk Lane / Hillcrest Avenue, Castleford. WF10 3QE	30	37	36	Yes	-1
60	A61 Barnsley Road / Newmillerdam, Wakefield. WF2 6QQ	30	39	35	No	-4
61	Whinney Lane / Streethouse, WF7 6DE	30	NO DATA	33	No	N/A
62	Ferrybridge Road / Park Rise, Castleford,WF10 4JR	30	40	35	Yes	-5
63	B6421 Cutsyke Road, North Featherstone, WF7 6BD	30	39	31	No	-8
64	A 628 Pontefract Road / Ackworth Meadow Way, WF7 7ET	30	NO DATA	37	No	N/A
65	A 628 Pontefract Road / Ackworth, House Close WF7 7NX	30	39	37	No	-2
66	Ferrybridge Road / Manor Park Rise. Nevison WF8 2PQ	30	38	34	No	-4
67	A639 Doncaster Road / Wentbridge Lane, Thorpe Audlin,WF8 3EH	30	NO DATA	47	No	N/A
68	Waggon Lane, Upton, WF9 1HY	30	40	32	Yes	-8
69	Willowbridge Lane, Pasture Way, Whitwood, WF10 5NL	30	42	NO DATA	No	N/A
70	High Street, Opp 126, Sharlston, WF4 1BE	30	44	39	No	-5
71	High Street, Near WMC, Sharlston, WF4 1BD	30	NO DATA	36	No	N/A

No	Location and Installation Date	Speed Limt mph	85% Before Speed	85% After Speed	Traffic Calmed	Speed Diff
72	Southfield Lane , Horbury WF4 5NF	30	48	41	No	-7
73	Lumley Street, Outside 126, Castleford, WF10 5LU	30	39	34	Yes	-5
74	The Croft, Jct Willow Rd, Knottingley, WF11 9BL	30	37	36	No	-1
75	Chevet Lane, Sandal, WF2 6JD	30	43	35	No	-8
76	High Street/ Wood Lane, South Hiendley,	30	34	32	Yes	-2
77	Station Road / West Close, NormantonWF6 2NE	30	39	35	No	-4
78	Wakefield Rd(Pizza Shop) Fitzwilliam, WF9 5AP	30	NO DATA	32	Yes	N/A
79	Garmill Head Lane, Fitzwilliam, WF9 5AY	30	NO DATA	32	Yes	N/A
80	32 Haigh Lane, Haigh, S75 5DA	30	41	37	Yes	-4
81	105 Haigh Lane, Haigh, S75 5DA	30	40	37	Yes	-3
82	Kirkby Rd, Hemsworth, WF9 4DE,	30	NO DATA	30	Yes	N/A
83	6 Manor Farm, S. Elmsall, WF9 2SH,	30	38	37	Yes	-1
84	88 High Street, S. Elmsall, WF9 2SJ	30	39	35	Yes	-4
85	168 Wakefield Rd, Ossett, WF5 9AQ,	30	36	35	No	-1
86	119-121 Wakefield Rd, Ossett, WF5 9AR	30	39	35	No	-4
87	12 Ferrybridge Rd, Knottingley, WF11 8JE	30	37	34	No	-3
88	11 Fishergate, Knottingley, WF11 8JR,	30	38	37	No	-1
				AVERAGE REDUCTION		-4

APPENDIX B – ACCIDENT DATA

No	Location	Sign Type	Date Installed	Acc 3yrs Before	Acc 3yr After
1	Haigh Hill Lane, Haigh Village (Uphill) S75 4BZ **(Removed, replaced by No80)**	VMS 2 (Fibre) Thermotor	17-Jan-01	N/A	N/A
2	Haigh Hill Lane, Haigh Village (Downhill) S75 4BZ **(Removed, replaced by No81)**	VMS 2 (Fibre) Thermotor	17-Jan-01	N/A	N/A
3	A645 / Knottingley Road / Nr Water Lane,PontefractWF8 2JX	VMS 2 (Fibre) Thermotor	17-Jan-01	3	1
4	Batley Road / Nr Crown Inn, Alverthorpe WF2 0AL	VMS 2 (Fibre) Thermotor	17-Jan-01	1	1
5	Spittal Hardwick Road / Nr Gypsy Lane,Castleford WF10 3PZ	VMS 2 (Fibre) Thermotor	17-Jan-01	1	0
6	Monkhill Lane / Nr Lady Balk Lane, Pontefract WF8 1RW	VMS 2 (Fibre) Thermotor	17-Jan-01	0	1
7	Carleton Road / Carleton Close, Pontefract, WF8 3ND	VMS 5 (Fibre)	30-Jul-01	0	0
8	Carleton Road / Moor Lane, Pontefract, WF8 3RL	VMS 5 (Fibre)	30-Jul-01	0	0
9	Birkwood Road, Altofts, WF6 2NL	VMS 1 (Fibre)	10-Sep-01	0	0
10	Church Road, Altofts, WF6 2QS	VMS 5 (Fibre)	10-Sep-01	0	0
11	Navvy Lane / Old Railway Bridge, Old Royston S71 4EF	VMS 5 (Fibre)	07-Nov-01	0	0
12	Navvy Lane / Canal Bridge, Old Royston, S71 4EF	VMS 5 (Fibre)	07-Nov-01	0	0
13	Lock Lane / Green Street, Castleford, WF10 2JY	VMS 2 (Fibre)	11-Dec-01	1	0
14	Station Road, Altofts WF6 2NE (01/03/02)	VMS 11 (LED)	01-Mar-02	1	0
15	Wakefield Road Horbury High School, Horbury,WF4 5HE	VMS 11 (LED)	12-Mar-02	1	0
16	Cow Lane / Hatfield Place, Havercroft, WF4 2HJ	VMS 5 (LED)	31-May-02	1	0
17	A61 Leeds Road/ Newton Avenue, Wakefield WF1 2PX	VMS 11 (LED)	31-May-02	0	1
18	A61 Leeds Road / First Avenue, Wakefield WF1 2HS	VMS 11 (LED)	31-May-02	0	0
19	Carleton Road Road, Darrington WF8 3AG	VMS 5 (LED) Wind & Solar	28-Jun-02	0	0
20	Storrs Hill Road / Bottom of the Hill, Ossett, WF4 6EY	VMS 9 (LED) Wind & Solar	28-Jun-02	1	2
21	A639 Doncaster Road / Station Road, East Hardwick WF8 3DP	VMS 5 (LED) W & S	28-Jun-02	0	0
22	A639 Hardwick Road Water Lane,East Hardwick WF8 3DU	VMS 6 (LED) Wind & Solar	28-Jun-02	1	0
23	Valley Road, Darrington WF8 3BT	VMS 1 (LED)	04-Jul-02	0	0
24	Batley Road, Near 117, Kirkhamgate WF2 0SP	VMS 5 (LED)	22-Jul-02	1	0
25	Batley Road / Star Public House WF2 0RZ	VMS 5 (LED)	22-Jul-02	0	0

No	Location	Sign Type	Date Installed	Acc 3yrs Before	Acc 3yr After
26	Minsthorpe Lane / Bailey Cresent, South Elmsall WF9 2UU	VMS 2 (Fibre) Thermotor	16-Dec-02	1	0
27	Northfield Lane Horbury WF4 5JL	VMS 2 (LED)	18-Dec-02	0	1
28	Southfield Lane / Cluntergate, Horbury WF4 5AX	VMS 2 (LED)	18-Dec-02	2	0
29	Pontefract Road / Featherstone High School WF7 5AJ	VMS 11 (LED)	18-Dec-02	0	1
30	Common Road / Saxon Grove South Kirby WF9 3EF	VMS 11 (LED)	28-Feb-03	1	0
31	High Green Road / Lee Brigg Altofts WF6 2LN	VMS 11 (LED)	28-Feb-03	2	3
32	Aberford Road / Lime Pit Lane Stanley WF3 3NT	VMS 11 (LED)	11-Apr-03	0	0
33	Aberford Road / Near Number 256 Stanley WF3 3NS	VMS 11 (LED)	11-Apr-03	0	0
34	Storrs Hill Road / Top of the Hill, Ossett WF5 0AA	VMS 7 (LED)	18-Jun-03	1	2
35	Pontefract Road / Wordsworth Drive, Ferrybridge, WF11 8PS	VMS 11 (LED)	18-Jun-03	2	0
36	Ackworth Road / Outside Number 66 (Inbound), Pontefract WF8 4LH	VMS 5 (LED)	18-Jun-03	0	1
37	Ackworth Road / Tudor Close (Outbound), Pontefract WF8 4NQ	VMS 5 (LED)	18-Jun-03	2	1
38	A642 Hemsworth Road / Holmsley Lane South Kirby WF9 3HQ	VMS 5 (LED)	18-Jun-03	0	1
39	White Apron Street / Outside the Library, South Kirby WF9 3LD	VMS 14 (LED)	18-Jun-03	0	0
40	Jin Whin Hill / Central Drive, Castleford WF10 1PZ	VMS 13 (LED)	26-Aug-03	3	0
41	A637 Huddersfield Road, West Bretton WF4 4JW	VMS 15 (LED)	06-Nov-03	0	0
42	A639 Hardwick Road / Brockadale Avenue, Pontefract WF8 3QY	VMS 2 (LED)	18-Dec-03	1	0
43	Park Lane / Near to Stables, Pontefract, WF8 4QL	VMS 2 (LED)	27-May-04	4	2
44	Barnsley Road / Outside Number 162, Hemsworth WF9 4PQ	VMS 2 (LED)	27-May-04	0	0
45	Broadway / Outside St Georges Hall, Wakefield WF2 8DA	VMS 14 (LED)	27-May-04	0	0
46	Broadway / Outside Number 82, Wakefield WF2 8LY	VMS 14 (LED)	27-May-04	0	0
47	B6273 Wakefield Road / Opposite Unit 10, Kinsley. WF9 5EA	VMS 2 (LED)	01-Aug-04	0	0
48	B6273 Wakefield Road / Near to the Church of Ascention, Kinsley. WF9 5EA	VMS 16 (LED)	01-Aug-04	1	1

No	Location	Sign Type	Date Installed	Acc 3yrs Before	Acc 3yr After
49	B6273 Wakefield Road / Opposite the Park, Kinsley. WF9 5HS	VMS 17 (LED)	01-Aug-04	1	0
50	Aberford Road / Near Prison Training Centre, Wakefield. WF1 4DE	VMS 17 (LED)	20-Sep-04	2	0
51	Pontefract Road / Newfield Avenue, Castleford. WF10 4BH	VMS 2 (LED)	29-Oct-04	0	0
52	Westfield Road / Near Victoria Public House, Horbury. WF4 6 EQ	VMS 11 (LED)	29-Jan-05	1	0
53	Durkar Lane / Outside Number 41, Durkar. WF4 3HZ	VMS 11 (LED)	19-Apr-05	1	1
54	Durkar Low Lane / Green Acres, Durkar. WF4 3BQ	VMS 5 (LED)	19-Apr-05	0	0
55	A638 Wakefield Road / Bracken Hill, Ackworth. WF7 7BG	VMS 16 (LED)	20-Apr-05	1	0
56	A638 Doncaster Road / Outside Number 64, Ackworth. WF7 7DD.	VMS 5 (LED)	20-Apr-05	2	2
57	Common Lane / Sunny Avenue, Upton. WF9 1DJ.	VMS 5 (LED)	20-Apr-05	0	1
58	B6136 Stranglands Lane / Ferrybridge Power Station, Ferrybridge. WF11 8RA	VMS 5 (LED)	21-Apr-05	2	1
59	Sheepwalk Lane / Hillcrest Avenue, Castleford. WF10 3QE	VMS 5 (LED)	25-Apr-05	2	0
60	A61 Barnsley Road / Newmillerdam, Wakefield. WF2 6QQ	VMS 5 (LED)	04-May-05	2	0
61	Whinney Lane / Streethouse, WF7 6DE	VMS11 (LED)	04-May-05	0	0
62	Ferrybridge Road / Park Rise, Castleford,WF10 4JR	VMS 5 (LED)	12-Jul-05	1	1
63	B6421 Cutsyke Road, North Featherstone, WF7 6BD	VMS 11 (LED)	12-Jul-05	1	0
64	A 628 Pontefract Road / Ackworth Meadow Way, WF7 7ET	VMS 17 (LED)	20-Apr-05	0	2
65	A 628 Pontefract Road / Ackworth, House Close WF7 7NX	VMS 5 (LED)	04-May-05	1	0
66	Ferrybridge Road / Manor Park Rise. Nevison WF8 2PQ	VMS 5 (LED)	05-May-05	0	0
67	A639 Doncaster Road / Wentbridge Lane, Thorpe Audlin,WF8 3EH	VMS 6 (LED)	13-Jan-06	0	0
68	Waggon Lane, Upton, WF9 1HY	VMS 18 (LED)	13-Jan-06	0	0
69	Willowbridge Lane, Pasture Way, Whitwood, WF10 5NL	VMS 5 (LED)	26-Apr-06	5	2
70	High Street, Opp 126, Sharlston, WF4 1BE	VMS 5 (LED)	26-Apr-06	0	0
71	High Street, Near WMC, Sharlston, WF4 1BD	VMS 5 (LED)	26-Apr-06	0	0
72	Southfield Lane , Horbury WF4 5NF	VMS 5 (LED)	26-Apr-06	0	0

No	Location	Sign Type	Date Installed	Acc 3yrs Before	Acc 3yr After
73	Lumley Street, Outside 126, Castleford, WF10 5LU	VMS 5 (LED)	26-Apr-06	2	0
74	The Croft, Jct Willow Rd, Knottingley, WF11 9BL	VMS 5 (LED)	27-Apr-06	0	1
75	Chevet Lane, Sandal, WF2 6JD	VMS 5 (LED)	06-Jun-06	0	0
76	High Street/ Wood Lane, South Hiendley,	VMS 19 (LED)	06-Jun-06	0	0
77	Station Road / West Close, NormantonWF6 2NE	VMS 11 (LED)	05-Jun-06	2	0
78	Wakefield Rd(Pizza Shop) Fitzwilliam, WF9 5AP	VMS 5 (LED)	05-Jun-06	1	0
79	Garmill Head Lane, Fitzwilliam, WF9 5AY	VMS 5 (LED)	01-Sep-06	0	1
80	32 Haigh Lane, Haigh, S75 5DA	VMS 5 (LED)	12-Oct-06	0	0
81	105 Haigh Lane, Haigh, S75 5DA	VMS 5 (LED)	12-Oct-06	1	0
82	Kirkby Rd, Hemsworth, WF9 4DE,	VMS 19 (LED)	26-Mar-07	1	0
83	6 Manor Farm, S. Elmsall, WF9 2SH,	VMS 5 (LED)	26-Mar-07	0	1
84	88 High Street, S. Elmsall, WF9 2SJ	VMS 5 (LED)	26-Mar-07	1	1
85	168 Wakefield Rd, Ossett, WF5 9AQ,	VMS 11 (LED)	10-Apr-07	0	0
86	119-121 Wakefield Rd, Ossett, WF5 9AR	VMS 11 (LED)	10-Apr-07	0	0
87	12 Ferrybridge Rd, Knottingley, WF11 8JE	VMS 11 (LED)	10-Apr-07	0	1
88	11 Fishergate, Knottingley, WF11 8JR,	VMS 5 (LED)	10-Apr-07	1	0
			TOTAL ACCIDENTS	63	34

Appendix C – Survey Questionnaire

FLASHING SIGN SURVEY JANUARY/FEBRUARY 2010

Pontefract: Tesco Car Park ____ Stuart Road Car Park___ Wed___Sat____
Wakefield: Borough Road Car Park_____ Sun Lane Car Park_____

Introduce yourself as being from Wakefield Council conducting a survey among drivers in the Wakefield district about their views on road safety signs to improve road safety in the area.
ASSURE THEM YOU WILL NOT BE COLLECTING THEIR NAME OR ANY CONTACT DETAIL

Q1. Can you tell me if you have seen signs like these?
SHOW CARD A

a. *Dambach* type signs Yes ☐ No ☐ **(IF NO GO TO Q3)**

Q2. What do you think is the purpose of these signs?
DO NOT PROMPT, TICK ALL MENTIONED

Slow drivers down ☐ Alert drivers of hazards☐ Enforcement ☐

Reduce accidents ☐

Q3. Can you tell me if you have seen a sign like this?
SHOW CARD B
b. *"Your speed"* type sign Yes ☐ No ☐ **(IF NO GO TO Q9)**

Q4. What do you think the purpose of this sign is?
DO NOT PROMPT, TICK ALL MENTIONED

Slow drivers down ☐ Alert drivers of hazards☐ Enforcement ☐

Reduce accidents ☐

Q5. What impact do you think any of these signs have on your driving behaviour?
RUNNING PROMPT
I Slow down ☐ I Speed up ☐ I ignore it ☐
I slow down but then speed up afterwards ☐ Other ☐ ----------

Q6. Do you feel that any of these signs have a positive impact on your driving?
Yes ☐ No ☐ Makes no difference ☐

Q7. Do you feel safer driving on a road with a flashing speed sign?
Yes ☐ No ☐ Makes no difference ☐

Q8. Are these the types of signs something you would like in your neighbourhood?
Yes ☐ No ☐

Q9. SHOW CARD C
How effective would you rate the following at helping drivers stay safe?
Please give me answer from 1 to 7 where 1 = Not effective at all and 7 = Very effective

	Not effective at all							Very effective
Police enforcement at night		1	2	3	4	5	6	7	
Police enforcement during the day		1	2	3	4	5	6	7	
Fixed safety cameras		1	2	3	4	5	6	7	
Mobile safety cameras		1	2	3	4	5	6	7	
Changes to roads e.g. speed humps		1	2	3	4	5	6	7	
Publicity campaigns such as "Think" on TV		1	2	3	4	5	6	7	
Flashing "slow down" signs or flashing "hazard warning" signs		1	2	3	4	5	6	7	

Q10 SHOW CARD D
Which of these activities best describes what you are doing at present?

Employee in full time job (30 hours plus)	1	Unemployed and looking for work	6
Employee in part time job (16-30 hours)	2	Full-time education at school, college or university	7
Employee in casual work (< 16 hours)	3	On a Government supported training programme	8
Self employed full or part time	4	Retired	9
Full time at home	5	Doing something else (Write in)	10

Q11. SHOW CARD E - What age bracket are you in? **17-24** ☐ **25-49** ☐ **50+** ☐

Q12. Approximately how many years have you been driving? _____ **Years**

Q13. Roughly how many miles do you drive each year? **Low 0-5K** ☐ **Med 6-12K**☐ **High13K+** ☐

Q14. Are you a parent of a child under the age 18? Yes ☐ **No** ☐

Q15. What is the **Postcode** of your home address please? We only ask this in order to understand our responses better. | | | | | | | |

Q16. What is the main purpose of your trip today? **General Shopping** ☐ **Supermarket Shopping** ☐
Leisure ☐ **Work** ☐ **Other** ☐

(Record Gender of respondent) Male ☐ **Female** ☐