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The Effects of bus Deregulation on Households in selected areas of West Yorkshire

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1. INTRODUCTION

This paper reports on work that was initiated by the distribution of 16,000 'screening' questionnaires to households in selected areas of West Yorkshire. The aim of the work was to assess the effects of various aspects of bus deregulation on individuals' travel patterns and attitudes towards public transport. In the rest of this section we shall discuss how this market research was timed and the panel survey approach will be explained. In addition, the choice of study areas and the scope of the surveys will be outlined.

In section two, we shall look at the results of the screening stage, the before survey and after survey, in order to determine how representative our sample is. A bias check will be undertaken by comparing our sample with the results from the 1981 Census and West Yorkshire PTE's own household surveys.

In the rest of the paper, we will concentrate on comparing the results of the before and after surveys, for those individuals who responded to both stages. In section three, we attempt to isolate exogeneous factors (i.e. factors other than bus deregulation) such as changes in household structure, life-cycle/-style effects and seasonal trends. Having done this, we go on, in section four, to examine the effects of bus deregulation on travel patterns. This is done by assessing changes in journey purpose, trip generation, trip distribution, mode split and generalised cost. In section five, we go on to assess attitudinal changes by assessing changes in the perceived importance and performance of thirteen public transport attributes, as well as studying respondents' comments.

In the conclusions it is shown that some perverse results have occurred. In particular, the observed changes in bus services, bus usage and attitudes to public transport are not always consistent. The research methodology adopted is only partly to blame for these inconsistencies. It is shown that there may be a number of plausible explanations for our results and it is shown that our results are consistent with other studies. In a final conclusion, a cursory examination of the welfare effects of bus deregulation in West Yorkshire is attempted.

1.1 Timing of the Surveys

The survey was designed as a before and after panel survey. In fact the survey involved three stages:

(i) Stage One - a screening survey to identify households that were interested in joining the panel. (See Appendix 1).

(ii) Stage Two - a before survey of selected households to follow on immediately from the screening stage. All households with one (or more) member making public transport trips at least once a week were screened in, as were one out of every two non public transport using households. (See Appendix 2).

(iii) Stage Three - an after survey of the same households to follow on around six months later and involving broadly the same questions as in the before survey. (See Appendix 3).

Initially, it was planned to distribute all screening cards in late September 1986 (i.e. before deregulation). However, given that October 26th 1986 ('D-Day') did not lead to major changes in overall public transport provision in West Yorkshire (see Headicar et al., 1987) and that a major operator (United Transport Buses) was threatening subsequent entry, it was decided to devote only half our market research resources to this period. Hence, phase one involved the distribution of 8,000 screening cards in early October 1986, with the before survey occurring in mid October 1986 and the after survey in May/June. Phase two took place almost a year later and, given that United Transport Buses did not enter the West Yorkshire bus market, was designed to monitor service changes that took effect from 1st November 1987. Hence, the screening stage and before survey took place in October 1987, with the after survey following in May/June 1988.

1.2 <u>Choice of Study Areas</u>

The survey was designed so as to monitor a wide range of deregulation effects. In phase one four areas were covered:

(i) Morley. This is the one area of West Yorkshire that on 'D-Day' saw on-the-road competition, with new entrants, Black Prince (BP) and Muffit and Taylor (M & T) competing with Yorkshire Rider's (YR) services to Leeds. In addition, BP registered a Morley local service that partially competes with some services operated by West Riding (WR). This on-the-road competition has continued with YR retalliating by introducing minibuses, and BP entering new markets (Cottingley estate, Beckett's Park).

(ii) Halton Moor. The main service to this area was, on 'D-Day', converted by YR to high frequency minibus (service 6). Subsequently, an additional minibus service (service 63) has been introduced. Big bus services continue along the main York/Selby roads, operated by YR, WR and West Yorkshire Road Car (WYRC).

(iii) Gipton. The main services in this area continued to be provided by YR big buses, but one service (42) was converted by YR to high frequency minibuses. Due to peak capacity problems, some big buses were re-introduced on both services 6 and 42.

(iv) Ilkley/Burley-in-Wharfedale. The main bus services to Leeds and Bradford, operated by WYRC, were on 'D-Day' converted to limited stop bus services in order to compete with rail. In addition, WYRC began operations of a tendered minibus service in Ilkley.

Phase two concentrated on Pudsey. Here changes to bus services focussed on tendered rather than commercial services. From November 1st, four tendered services, formerly operated by YR, began to be operated by independant operators. These were:

(i)	66	Leeds to Greengates, won by Cityline
(ii)	90	Leeds to Tyesal, won by Airebus
(iii)	81/82	Pudsey to Holt Park, also won by Airebus
(iv)	88	Pudsey to Leeds won by Amberley Coaches.

In addition, there were minor re-routeings, re-timings and fare revisions.

The Pudsey area surveyed can be divided into four; Pudsey itself, Farsley, Stanningley and Calverley. Bus services in the first three are dominantly provided by YR and in the latter by WYRC.

The eight areas surveyed are shown by Figure 1.

1.3 SCOPE OF SURVEYS

Table 1 shows where the 16000 screening cards were distributed. It was not intended to distribute these cards evenly between the eight study areas but our aim was to achieve a before and after panel of over 1000 individuals drawn from a range of areas. It can be seen that only 12.6% of our screening cards were returned and that only three quarters of these were re-contacted. This low initial response is not untypical of unsolicited mail, although there were differences between the response rates of the eight areas. The highest response rates were achieved in Calverley and Ilkley (19% and 17%) and the lowest response rates in Stanningley and Gipton (both 8%). In part these differences are related to the socio-economic characteristics of the areas, although in Stanningley the low response rate was also due to problems with the door-to-door distribution agency that was employed to carry out the mail drop in that area.

Despite these low response rates, Table 2 shows that a before and after panel survey of over 1000 individuals was developed. However, 43% of our sample was drawn from the Ilkley and Calverley areas, whilst Farsley, Gipton, Morley and Stanningley each account for less than 10% of our sample. It should be noted that there are slightly more individuals in our before survey than our after survey because matches were made on a household basis and not all household members responded to the after survey.

Table 1

NUMBER OF RESPONSES TO THE SCREENING STAGE (Households)

	DELIVERED	RETURNED	RATE(%)	RE-CONTACTED	RE-CONTACT RATE(%)
Morley	1441	162	11.2	113	7.8
Halton Moor	1972	205	10.4	157	8.0
Ilkley	2987	502	16.8	290	9.7
Gipton	1600	130	8.1	99	6.2
PHASE ONE TOTAL	8000	999	12.5	659	8.2
Stanningley	2600	210	8.1	140	5.4
Pudsey	2400	298	12.4	173	7.2
Calverley	1800	344	19.1	209	11.6
Farsley	1200	161	13.4	96	8.0
PHASE TWO TOTAL	8000	1013	12.7	618	7.7
TOTAL	16000	2012	12.6	1277	8.0

Table 2

NUMBER OF INDIVIDUALS IN BEFORE AND AFTER DATA SETS

	BEFORE	%	AFTER	%
Morley	92	7.6	80	7.0
Halton Moor	156	12.9	149	13.1
Ilkley	331	27.5	307	26.9
Gipton	73	6.0	73	6.4
PHASE ONE TOTAL	652	54.1	609	53.5
Stanningley	98	8.1	93	8.2
Pudsey	163	13.5	162	14.2
Calverley	188	15.6	182	16.0
Farsley	104	8.6	92	8.1
PHASE TWO TOTAL	553	45.9	529	46.5
TOTAL	1205		1138	

2. SOCIO-ECONOMIC CHARACTERISTICS OF THE SCREENING SAMPLE

In this section, the socio-economic characteristics of respondents to the screening and the before and after surveys are examined. This is done in order to assess the representativeness of our sample as our work may be prone to both sampling and self selectivity bias.

2.1 SOCIO-ECONOMIC CHARACTERISTICS OF THE SCREENING SAMPLE

Table 3 shows that, although the samples for some of our study areas appear to be unrepresentative (which is not surprising given the small number of observations in some cases), overall our sample appears to be representative of West Yorkshire as a whole. Mean household size is slightly lower than that for West Yorkshire as a whole in 1981, whilst, although car ownership is much higher than for West Yorkshire in 1981 (by about 19%), much of this might be explained by an upward time trend. Moreover, if self-selectivity bias existed, we might have expected car ownership to be below the West Yorkshire average. In terms of age structure, the very young (0-5), young adults (16-24) and middle-aged (45-Pensionable Age). By contrast, children (5-15) and pensioners are under-represented and adults aged 25-44 over-represented.

Table 3

SOCIO-ECONOMIC CHARACTERISTICS OF THE SCREENING SAMPLE

		H'HOLD		AGE(%)					
		MEAN SIZE	MEAN NO. OF CARS	0-4	5-15	16-24	25-44	45-PA	PA+
Morley	- 1	2.64	0.64	5.8	16.7	12.9	27.6	19.8	17.1
	- 2	2.54	0.71	4.9	12.8	15.8	31.1	19.3	16.2
Gipton	- 1	2.60	0.52	6.1	17.6	15.1	22.2	20.2	18.7
	- 2	2.70	0.38	11.1	15.4	16.0	28.8	13.7	15.1
Halton	- 1	2.69	0.54	5.5	16.8	15.1	23.5	21.3	17.7
	- 2	2.95	0.58	8.7	18.0	16.2	26.0	18.8	12.3
Ilkley	- 1	2.63	0.93	5.1	15.7	12.6	24.5	21.0	21.1
	- 2	2.61	0.99	4.6	17.4	12.0	27.9	20.1	18.0
Stanningley	- 1	2.63	0.87	4.9	9.6	21.2	32.5	18.9	12.9
	- 2	2.69	0.50	6.4	17.0	14.9	24.5	19.3	17.8
Pudsey	- 1	2.53	0.75	7.5	13.8	12.3	33.0	17.0	16.4
	- 2	2.72	0.66	5.7	17.7	13.6	26.7	20.2	16.1
Calverley	- 1	2.56	0.90	6.5	13.7	13.4	33.2	19.0	14.2
Farsley	- 2	2.64	0.67	6.4	17.1	14.0	26.0	19.6	16.9

Notes PA = Pensionable Age
1 = Screening sample
2 = 1981 Census (for Total this figure refers to West Yorkshi
all other figures based on Ward figures - N.B. Calverley
Farsley in same Ward).

2.2 SOCIO ECONOMIC CHARACTERISTICS OF THE BEFORE AND AFTER SURVEYS

Table 4 shows the socio-economic characteristics of the before and after surveys. In terms of car ownership it is clear that, because of the screening procedure adopted, there is now a slight bias towards non-car owning households (45% of households in our sample, 42% in the 1981 Census) and away from households owning two or more cars (less than 12% in our sample but 14% in the 1981 census). In terms of household size it can be seen that, excluding under fives, in our sample households are slightly smaller than in the 1981 census. This result suggests that something like one in five household members failed to respond to our survey. In terms of age structure it can be seen that, compared to the 1981 census, the young and the elderly are under-represented in our before survey. In the after survey, partly as a result of the ageing process (see section 3.1), those aged under 25 are under-represented and all other age groups over-represented.

Table 4 does indicate that our before and after samples are slightly biased. In earlier work a series of correction factors for each of the four survey areas in phase factors for each of the four survey areas in phase one were developed. However, these had little effect on the overall results and introduced unnecessary complications. As a result, all data presented in the rest of this paper are unadjusted. Where a bias is thought to exist, results will be presented for both public transport and non-public transport users.

Thus, although some sampling and self-selectivity bias is likely to exist in our sample (as in all samples), we believe that our sample is reasonably representative of the socio-economic characteristics of West Yorkshire as a whole. Where self-selectivity bias does exist we may expect it to be of a similar magnitude to that found by Simpson and Walmsley (1987) in similar surveys carried out in English and Scottish Metropolitan Area i.e. the strength of our findings might be slightly reduced but our overall conclusions will still remain valid.

Table 4

SOCIO-ECONOMIC CHARACTERISTICS OF THE BEFORE AND AFTER SURVEY(%)

	CARS			MEAN	AGE				
	0	1	2+	SIZE*	5-15	16-24	25-44	45-PA	PA+
PHASE ONE - Before	48.7	40.0	11.3	2.21	17.5	14.0	30.2	20.9	17.4
- After				2.04	15.4	12.0	30.5	25.1	17.0
PHASE TWO - Before	41.3	46.8	11.9	1.73	10.7	15.5	33.8	21.6	18.4
- After				1.89	10.6	12.9	30.2	24.0	22.3
TOTAL - Before	45.3	43.1	11.6	1.99	14.4	14.7	31.9	21.2	17.8
- After				1.97	13.2	12.4	30.4	24.6	19.4
W YORKS CENSUS 1981	42.1	43.9	14.0	2.50	18.3	15.0	27.8	20.9	18.1

*N.B. Under fives excluded.

3. IDENTIFICATION OF EXOGENEOUS FACTORS

As the aim of this paper is to identify the effects of bus deregulation, it is necessary to identify and, if possible, isolate exogeneous factors. Three such factors can be identified: changes in household structure, changes in life-cycle/style and seasonal trends.

3.1 CHANGES IN HOUSEHOLD STRUCTURE

Table 5

CENTRE AGE GROUP OF RESPONDENTS (%)

	5-15	16-24	25-34	35-44	45-54	55-64	65+
Before	14.1	13.1	15.2	16.0	13.1	12.5	16.0
After	13.2	12.4	14.6	5.7	14.1	13.2	16.8
(Adjusted	13.4	13.1	15.1	16.0	13.2	12.6	16.6)

Table 5 shows that there are two processes at work. Firstly, the ageing process means that, on average, one in twenty of our sample will move into the next age group. This appears to explain the decrease in the 5 to 15 age group and the increase in those 65 and over (although fatalities might also be a factor here). Secondly, it appears those aged 45 and above may be over represented in our after sample. This may be due to the fact that the younger groups are likely to be more mobile and therefore more prone to drop out of our survey.

These two processes lead to a general ageing of the population which will have an impact on public transport usage (Hill and Ling 1988). Similarly, the fact that 56% of our before sample was female, decreasing to 54.9% in the after survey, will have had a small effect, probably downwards, on public transport usage.

3.2 LIFE-CYCLE AND LIFE-STYLE EFFECTS

Table 6 shows that there has been a slight reduction in all economic activity categories except for retired. This is consistent with the ageing process identified above and the small decline in economic activity will have led to a small decline in travel.

Table 6

ECONOMIC ACTIVITY %

	Full time employment	Part time employment	Education	Retired	Other
Before	37.7	12.6	15.6	18.6	15.5
After	37.3	12.2	15.1	20.1	15.3

It is also interesting to note that the percentage of respondents possessing a car licence has increased from 38.8% to 41.2% (this trend was especially marked in phase one). There has also been an increase in the percentage holding a motorbike licence (up from 2.3% to 4.9%). Some of these trends may be due to an upwards secular trend and the ageing of our panel but, as will become evident, some of these changes may be related to bus deregulation.

3.3 SEASONAL TRENDS

Although the two survey periods were chosen so as to make comparisons possible, it is likely that trip making behaviour in October is different from that in May or June. For example the Metrocast model (Cottham, 1985) suggests that bus usage in June is some 5.6% lower than in October (although there is likely to be much variation by route). By contrast Bellamy (1978) reports that road traffic levels in June are between 5.9% and 14.9% higher than in October (although no distinction is made between urban and non-urban (and particularly holiday) areas). Seasonality will also effect journey purpose, as will be examined in the next section.

4. CHANGES IN TRIP PATTERNS

In this section we shall examine the effects of deregulation on trip generation, journey purpose, trip distribution, mode split and, finally, generalised cost for matched trips.

4.1 TRIP GENERATION

In the before survey 2919 trips were recorded, representing 2.42 trips per individual. In the after survey there were 2305 trips recorded, representing 2.03 trips per individual. This suggests that there has been a decrease in the number of trips generated. However, it is likely that much of this decrease is due to the way respondents replied to the questionnaires. In the before survey respondents were asked to list all trips (of over a quarter of a mile) that they made yesterday. It seems likely that some respondents delayed filling in the questionnaire until they made some trips on the previous day. In the after survey, this effect will have been reduced (for irregular trips) as the question asked for trips made on a specific day of the week (corresponding to the day of the week in which the before survey was filled in).

However, more accurate information on trip generation was obtained for bus, train and taxi as shown by Table 7. At first glance changes are difficult to detect but converting the frequencies to annual trip rates, through the choice of suitable mid-points, allows a pattern to be detected. In phase one, bus use is down by 2%, whilst train and taxi use has increased by 24% and 57% respectively (although from a low base). There are differences amongst the four areas in that bus usage in Morley increased (by 2%), remained static in Halton, decreased slightly in Gipton (down 2%) and decreased markedly in Ilkley (down 9%). In phase two, bus use is down by 11%, whilst train use is up 31% and taxi use up 4% (again from low bases). If the two data sets are combined, bus use is down by 6%, train use is up 26% and taxi use is up 32%. In terms of total public tranport use there has been a decline of less than one per cent, although evidence from the trip diary does suggest a more marked decline.

It should though be noted that our survey has a deliberate bias towards public transport use. Comparison with a survey carried out by West Yorkshire P.T.E. (1987), suggests our survey overstates countywide bus usage by around a third. However, WYPTE's follow up survey (1988) does suggest that bus usage is down over a year by 6% i.e. the rate of decrease in bus usage in our sample, which is based on a seven/eight months interval, is roughly one third greater than the rate for the county as a whole. This should not be too surprising, considering we have concentrated on corridors where bus services have undergone major changes and rail has a stronger presence than the county average (in our after surveys rail usage is three and a half times greater than in the equivalent WYPTE surveys).

Table 7

WEEKLY FREQUENCY OF PUBLIC TRANSPORT USE (%)

			5 DAYS+	3-4 DAYS	1-2 DAYS	1 A FORTNT	1 A MONTH	LESS THAN 1 A MONTH	LESS THAN 1 A YEAR	ANNUAL TRIP RATE
BUS	PHASE 1	- B	30.1	13.0	18.4	6.8	4.6	14.9	2.1	259.2
		- A	29.1	13.9	16.0	8.2	6.6	13.9	12.2	253.9
	PHASE 2	- B	34.3	15.1	20.9	7.1	5.4	10.7	6.9	296.3
		- A	29.0	15.7	17.5	8.9	8.9	11.7	8.3	263.4
	TOTAL	- B	32.0	14.0	19.5	6.9	5.0	13.0	9.7	276.2
		- A	29.1	14.7	16.7	8.5	7.7	12.9	10.4	259.1
	WYPTE	- B	20.0	13.0	24.0	6.0	4.0	9.0	24.0	206.9
		- A	20.0	12.0	18.0	4.0	3.0	19.0	23.0	194.4
TRAIN	PHASE 1	- B	4.0	3.3	6.0	7.6	8.4	23.2	47.5	52.2
		- A	5.1	3.0	9.4	8.6	13.7	25.2	35.0	64.7
	PHASE 2	- B	1.3	0.9	2.6	2.8	7.3	27.4	57.6	22.1
		- A	2.2	1.4	2.8	2.6	6.9	23.8	60.3	29.0
	TOTAL	- B	2.8	2.2	4.4	5.4	7.9	25.1	52.1	38.3
		- A	3.8	2.3	6.3	5.8	10.5	24.5	46.8	48.1
	WYPTE	- B	N/A							
		- A	1.0	0.0	1.0	2.0	2.0	29.0	64.0	13.4
TAXI	PHASE 1	- B	0.3	0.8	3.1	2.8	4.3	19.7	69.0	13.6
		- A	0.4	0.9	6.4	4.8	7.6	22.1	57.8	22.1
	PHASE 2	- B	0.4	0.8	4.1	2.3	5.1	26.1	61.3	17.7
		- A	0.4	1.0	3.7	4.1	6.5	20.7	63.6	18.4
	TOTAL	- B	0.3	0.8	3.6	2.6	4.7	22.6	65.5	15.5
		- A	0.4	0.9	5.1	4.5	7.1	21.4	60.5	20.4

4.2 JOURNEY PURPOSE

In terms of journey purpose, Table 8 indicates that overall a stable pattern emerges, with the main effect being a decrease in the percentage of shopping trips in the after surveys and an increase in the percentage of social/recreational trips. The decrease in education trips may be related to seasonal factors (Easter school leavers, exams etc).

Table 8

JOURNEY PURPOSE OF TRIPS (%)

	WORK	EMPLOYER'S BUSINESS	EDUCATION	SHOPPING	SOCIAL/ RECREATIONAL	GIVING A LIFT	OTHER
BEFORE	28.2	2.9	6.6	33.0	24.5	2.6	2.2
AFTER	28.5	2.0	5.9	31.4	28.1	2.4	1.8

4.3 TRIP DISTRIBUTION

Table 9 shows the destination for all trips other than trips 'home'.

Table 9

TRIP DISTRIBUTION (%) - 'HOME' EXCLUDED

	BEFORE	AFTER
Conurbation Centre (1)	24.0	21.7
Local Area (2)	40.1	38.6
Elsewhere	35.9	39.7

(1) LS01-03, BD01 (2) Phase 1: LS09, LS14-15, LS27 and LS29. Phase 2: BD10, LS13 and LS28.

This Table shows that there have been slight decreases in the percentage of trips to the conurbation centre and within the local area and a resultant increase in the percentage of trips going elsewhere. This change may be explained by seasonal factors. In particular, we might expect more long-distance social/recreational trips to be made in the spring than in the autumn.

4.4 MODE SPLIT

Table 10

MODE SPLIT (%)

		BUS	TRAIN	TAXI	CAR DRIVER	CAR PASS	MOTOR-CYCLE	PEDAL-CYCLE	WALK	OTHER
PHASE 1	- BEFORE	42.1	6.1	0.8	26.4	14.6	0.3	1.5	6.2	2.0
	- AFTER	37.4	5.2	0.8	25.9	17.4	0.7	2.8	7.3	2.5
PHASE 2	- BEFORE	49.8	2.2	1.2	26.2	12.2	0.7	0.4	6.5	0.8
	- AFTER	40.8	1.9	1.3	31.2	14.6	0.4	0.5	8.0	1.3
TOTAL	- BEFORE	45.6	4.3	1.0	26.3	13.5	0.5	1.0	6.3	1.4
	- AFTER	39.0	3.7	1.0	28.4	16.1	0.5	1.7	7.6	1.9

On the basis of reported trips, Table 10 suggests that bus usage has declined by over 6 percentage points (or 15% of total bus usage). However, in Section 3.3 we showed that seasonal factors would lead to a reduction in bus usage and an increase in car usage (Table 9 also suggests there has been a small seasonal increase in walk trips). Using these adjustments it can be shown that bus usage should have fallen to 43.0% (actual value 39.0%) and car usage should have increased to 42.1% (actual value 44.5). This suggests that overall bus use has decreased by 4 percentage points (or 8.7%) of total bus usage. Something like half this decline might be explained by switching modes to car, with the remainder due to switching to other modes (walk, pedal-cycle) and suppression of travel demand.

There was however an important difference between the two phases of our research. In phase one seasonally adjusted results suggested that total bus usage had declined by 6%. In phase two the figure was even higher, as bus usage appeared to be down by about 11%. If the results in section 4.1 are also taken into account and a simple average taken, our work suggests that in phase one bus usage declined by around 4% but in phase two bus usage decreased by around 12%. Possible explanations for this will be sought in a later section.

Table 11 shows the changes within the bus market during our surveys. In the before situation Yorkshire Rider carried 62.4% of bus trips, with the remainder being carried by the ex NBC companies, WR and WYRC. In the after situation it can be seen that the five independent entrants to the bus market have gained a small foothold in the bus market (5.5%), as a result of shares of the Morley and Pudsey markets. YR's market share has declined slightly to 58.1%, with minibuses accounting for about 13% of YR's passengers as a result of their introduction in East Leeds (Gipton, Halton Moor) and Morley. The share of NBC operators has also declined slightly to 36.4%, with express services accounting for around half of the bus trips in the Ilkley area.

Table 11

CHANGES IN THE BUS MARKET - OPERATOR SHARES

		YR BIG BUSES	MINIBUSES	EX NBC COMPANIES		INDEPENDENTS
GIPTON/HALTON	- B	98.6	0	2.4		0
MOOR	- A	63.3	33.4	3.3		0
ILKLEY	- B	0	0	11.3 (1)	88.7(2)	0
	- A	0	0	50.0 (1)	50.0(2)	0
MORLEY	- B	83.5	0	16.5		0
	- A	50.7	17.3	21.3		10.7
PUDSEY	- B	75.5	5.0	19.5		0
	- A	74.4	0	15.5		10.1
TOTAL	- B	60.1	2.3	37.7		0
	- A	50.5	7.6	36.4		5.5

B = Before A = After
1 = Limited stop 2 = Stage service

4.5 GENERALISED COST

In this section, we analyse the generalised cost of trips being made. For public transport trips, Table 12 shows that there have been some changes in ticket type. In terms of concessionary fares, the percentage of public transport users making use of such fares increased from 33.6 to 34.9 which might be due to the changing age profile of our respondents. By contrast, the percentage of public transport users making use of pre-payment/bargain fares decreased slightly from 36.6 to 32.8 (see also Bonsall and Plows, 1988). This suggests that deregulation has had a slightly negative impact on integrated ticketing.

In analysing the generalised costs of trips made it was necessary to match up trips made by individuals in both the before and after data sets in order to isolate outliers. In fact, only 205 matched trip pairs were identified in the phase 1 data set and 213 in the phase 2 data set (i.e. 418 overall - representing only

16.0% of all trips).

Table 12

PUBLIC TRANSPORT USERS PAYING BARGAIN CONCESSIONARY OR BARGAIN FARES(%)

	CONCESSIONS				BARGAIN FARES			
	SCHOLARS	OAP	JOB SEEKER	OTHER	METROCARD	SAVER STRIP	DAY ROVER	OTHER
BEFORE	4.6	23.7	0.7	4.6	14.9	18.2	1.5	2.0
AFTER	4.0	25.1	0.7	5.1	12.9	17.1	1.0	1.8

Table 13

MEAN TIMES AND COSTS OF MATCHED TRIPS (STANDARD DEVIATION IN BRACKETS)

			TOTAL TIME (MINS)	WAIT TIME(MINS)	WALK TIME(MINS)	COST (PENCE)	GENERALISED COST(PENCE)
PHASE	1- BUS	B	31.2 (15.1)	8.6 (8.5)	6.7 (5.3)	24.0 (17.4)	135.6 (1)
		A	27.2 (13.9)	7.5 (6.2)	5.2 (5.2)	27.1 (19.1)	122.9
	z-TEST		1.79	0.97	1.86	0.67	
PHASE	2- BUS	B	36.4 (16.7)	9.1 (6.9)	6.4 (4.9)	24.7 (24.8)	149.3 (1)
		A	32.6 (14.6)	8.1 (6.7)	6.2 (4.6)	23.5 136.0	
	z-TEST		1.91	1.16	0.32	0.40	
TOTAL	BUS	B	34.2 (16.0)	9.0 (7.1)	6.2 (4.6)	23.6 (21.1)	142.2 (1)
	USERS	A	30.3 (14.5)	8.0 (6.1)	5.9 (5.3)	24.6 (20.9)	130.7
	z-TEST		2.04	1.21	0.48	0.38	
PHASE	1-NONBUS	B	19.2 (29.7)	1.09 (4.5)	5.2 (10.3)	7.7 (29.7)	102.4 (2)
		A	18.4 (18.1)	2.0 (4.3)	3.6 (9.5)	11.8 (49.8)	98.2
	z-TEST		0.25	0.18	1.26	0.79	
PHASE	2-NONBUS	B	14.7 (7.5)	0.8 (2.3)	4.4 (8.1)	7.7 (37.5)	79.3 (2)
		A	14.8 (11.5)	1.9 (3.9)	2.3 (4.6)	9.5 (41.1)	77.9
	z-TEST		0.07	2.32	2.02	0.30	
TOTAL	NON BUS	B	19.4 (29.1)	1.7 (3.7)	5.4 (10.0)	10.4 (40.7)	110.1 (2)
	USERS	A	16.9 (14.5)	1.9 (3.9)	3.7 (3.8)	12.1 (48.8)	93.1
	z-TEST		0.83	0.41	1.41	0.83	
TOTAL	ALL USERS	B	27.7 (24.5)	5.6 (6.9)	5.8 (7.6)	16.7 (29.0)	127.3
		A	23.3 (16.1)	4.8 (5.9)	4.7 (7.4)	17.5 (36.1)	111.1
	z-TEST		2.29	1.35	1.58	0.27	

N.B. The TOTAL figures were based on the results for individuals. The PHASE 1/PHASE 2 figures were based on the results for individual trips. This explains some discrepancies.
(1) Value of time 2.4 p per minute (2) Value of time 3.6 p per minute.

The results of this analysis are shown by Table 13. This shows that for bus trips in both the phase one and phase two data sets there were slight decreases in travel times and slight increases in travel costs but these changes were not significant at the 5% level. However, analysis of both data sets suggests that there has been a significant decline in travel time for bus users. A similar pattern of decreasing travel times and increasing costs was also observed for non bus users, although none of the changes were significant, except for out-of-vehicle time in the phase two data set. The results for non bus trips do suggest an increase in speeds, which may be seasonal and may have contributed to the decrease in bus travel times.

4.6 CHANGES IN CONSUMER SURPLUS

Given the information on annual bus usage presented in Table 7 and the information on times and costs given in Table 13, we are able to speculate on the change in consumer surplus. This is done in Figure 2. From our data, we estimate the bus use decreased from 276 trips per annum to 259 trips per annum. At the same time the mean generalised cost of bus travel decreased from 142 pence to 131 pence. This suggests that the demand curve has shifted downwards, possibly as a result of a deterioration in attitudes towards bus travel (which will be investigated in the next section). The welfare results depend on the shape of the demand curve. In Figure 2 it is assumed that the demand curve is linear with a generalised cost elasticity of -1 at the current price/quantity level (for evidence on public tranport generalised cost functions and elasticities see TSU, 1984). In assessing changes in consumer surplus two areas are important; ABDC which is the consumer surplus gain as a result of small decreases in generalised cost accruing to all remaining bus users and FCEG which is the consumer surplus loss associated with users who have reduced travel by bus. Given our assumptions about the form of the demand curve, it can be shown that FCEG > ABDC (or put another way AGE > BFD) and that on average there is a consumer surplus loss equivalent to £26 per person per annum. However, it was shown in Table 7 that, in our sample, bus usage was around one-third greater than the West Yorkshire average. Adjusting for this but then assuming our sample is typical of West Yorkshire suggests that county wide there has been a decrease in consumer surplus equivalent to around £37 million per annum.

If the function chosen produces a steeper line (i.e. generalised cost elasticty less) the loss of consumer surplus will be increased and if the line chosen is less steep (i.e. higher generalised cost elasticity) the loss of consumer surplus will be reduced. Assuming an elasticity of -1 at the current price/quantity level, if the function was concave from above (for example the commonly used semi log function) the loss in consumer surplus would increase, but a convex from above function would reduce the loss in consumer surplus.

An alternative explanation might be that the demand curve has pivotted around point G on Figure 2 and hence the relevant areas of consumer surplus to compare are AGE (for the before situation) and BGD (for the after situation). The result implies a consumer surplus gain of £2 per person per annum but also suggests, somewhat implausibly, that the generalised cost elasticity has reduced.

It will be shown in the next section that the most plausible explanation of behaviour is that the demand function has shifted inwards in a parallel manner due to the effect of deregulation on attributes that are not picked up by our generalised cost measure. Hence we believe that a consumer loss in West Yorkshire of over £30 million in the first year of deregulation has resulted. This is likely to have exceeded any increases in porducer surplus and suggests that, at least initially, bus deregulation has led to a net decrease in welfare.

5. CHANGES IN ATTITUDES TO PUBLIC TRANSPORT

In this section an assessment of attitudes to public transport will be made. Our approach will be based on the semantic differential scaling approach developed in psychology by Osgood (1952). In section 5.1 we will discuss some of the problems of using such an approach. However, in this section we shall, firstly, examine 13 public transport attributes in terms of their perceived importance and performance. Secondly, we will convert this information into attitudinal scores and, thirdly, we will analyse respondents general comments.

5.1 IMPORTANCE AND PERFORMANCE OF PUBLIC TRANSPORT ATTRIBUTES

Table 14

IMPORTANCE OF PUBLIC TRANSPORT ATTRIBUTES (%)

		VERY IMPRT	IMPRT	QUITE IMPRT	NOT IMPRT	UN-IMPRT	MISS-ING
FARE	B	28.3	16.4	13.0	12.1	19.7	10.8
	A	19.2	17.4	12.7	13.9	19.6	12.5
SPEED	B	18.5	22.6	21.8	20.5	10.7	13.2
	A	14.9	22.1	19.9	19.1	10.9	14.2
DAYTIME	B	24.2	19.1	12.0	11.7	17.5	15.3
FREQNCY	A	24.0	17.4	14.1	13.0	21.0	15.0
EARLY AM	B	19.0	15.8	10.0	15.4	18.9	20.8
FREQNCY	A	19.9	15.6	9.9	15.7	18.6	20.2
LATE PM	B	14.4	17.5	17.1	17.5	13.6	19.9
FREQNCY	A	13.9	19.1	17.5	16.6	11.2	21.7
SUNDAY	B	11.6	17.2	13.2	18.0	12.8	27.1
FREQNCY	A	12.0	17.2	17.8	16.6	9.9	26.3
NRNSS OF	B	18.8	19.2	20.9	14.9	14.7	11.5
STOPS	A	18.4	21.0	18.0	16.9	14.5	11.2
AVAILBTY	B	18.3	21.2	19.8	16.3	12.1	12.3
OF SEAT	A	17.0	21.0	19.4	17.7	14.0	10.9
COMFORT	B	12.6	22.4	27.2	16.5	8.7	12.5
	A	13.1	22.5	23.7	19.0	9.8	11.9
RELIBTY	B	41.6	9.9	4.1	5.9	27.1	11.5
	A	37.5	10.7	5.1	8.7	27.0	11.0
SAFETY	B	40.9	9.6	5.6	7.3	24.6	12.0
	A	38.9	9.4	4.5	6.9	28.8	11.4
AVLBITY	B	21.2	21.4	16.2	13.7	15.5	11.9
OF INFO	A	20.8	21.2	14.9	17.2	14.3	11.7
POLITNESS	B	19.5	20.1	21.8	15.6	12.0	11.0
OF STAFF	A	20.4	19.1	19.2	161	14.6	10.6

In terms of the importance of public transport attributes it appears from table 14 that overall there has been a slight decrease in perceived importance (exceptions include off-peak frequencies, nearness of stops and comfort). This was particularly marked for phase one where the before results were affected by the pre-deregulation "bally-hoo" which undoubtedly affected public transport awareness. By contrast, there was a general increase in the perceived performance of attributes in the phase two data set. Overall the most important attributes were seen to be reliability, safety and fare and the least important were seen to be Sunday and late evening frequencies.

Table 15 shows that in terms of the performance of the same 13 public transport attributes there appears to be a perceived decrease virtually across the board. Again this masks differences between phase one and phase two. In phase one there were marked deteriorations in the perceived performance of virtually all attributes. In phase two there were perceived improvements in the performance of most attributes. Overall, it was seen that public transport performed best in terms of fare, nearness of stops and safety and least well in terms of Sunday, early morning and late evening frequency.

Table 15

PERFORMANCE OF PUBLIC TRANSPORT ATTRIBUTES (%)

		VERY WELL	WELL	SATIS-FACTORY	NOT VERY WELL	POORLY	MISS-ING
FARE	- B	27.2	12.7	25.4	9.1	12.9	12.7
	A	20.3	13.9	26.5	9.2	17.2	13.0
SPEED	- B	12.0	18.4	38.5	11.6	4.7	14.9
	- A	8.6	19.3	35.7	14.8	7.7	14.0
DAYTIME	- B	11.8	18.6	32.7	13.6	6.4	16.8
FREQUNCY	- A	9.1	18.5	33.3	15.9	6.4	16.9
EARLY AM	- B	8.5	13.1	36.1	10.4	4.5	27.4
FREQUNCY	- A	5.0	13.3	36.5	13.1	4.8	27.2
SUNDAY	- B	7.4	12.3	29.8	13.4	5.8	31.4
FREQUNCY	- A	4.2	13.6	32.5	14.0	5.2	30.3
NRNESS OF	- B	21.2	14.5	25.5	10.2	15.9	12.6
STOPS	- A	19.6	16.8	24.1	11.8	15.2	12.5
AVLBITY	- B	14.4	18.5	28.3	16.1	9.9	12.8
OF SEAT	- A	12.6	19.2	26.4	16.7	12.2	12.9
COMFORT	- B	9.1	17.4	42.1	14.4	3.9	13.1
	- A	7.0	18.4	37.4	15.3	7.9	13.5
RELIBITY	- B	11.1	20.9	32.1	17.6	4.9	13.4
	- A	9.1	17.0	31.1	20.7	7.7	14.2
SAFETY	- B	16.3	16.8	32.8	13.5	5.9	14.7
	- A	10.6	16.7	33.5	14.7	10.2	14.2
AVLBITY	- B	12.4	19.1	32.2	16.1	6.9	13.4
OF INFO	- A	7.1	17.1	32.6	18.4	10.3	14.4
POLITNESS	- B	8.1	16.7	43.8	12.7	6.0	12.8
OF STAFF	- A	7.6	14.1	42.6	13.7	9.5	12.4

5.2 ATTITUDINAL SCORES

In order to assess overall attitudianl scores the product of performance of most attributes (Measured on a + 2, + 1, 0, - 1, - 2 scale) and importance (measured on a 5, 4, 3, 2, 1, 0) was used. This gives a measure that might be thought of as performance weighted by importance. This approach is the same as that adopted by May et al. (1982), which itself was based on the work of Mettman et al. (1975).

These mean attitudinal scores are given by Table 16. In the before data set all attributes had positive values, indicating an overall satisfaction with public transport. In the after data set there again appears to be overall satisfaction, but the mean values for all 13 attributes have decreased and those for off-peak frequencies, reliability and availability of information have become negative. However, at the 5% significance level, only the decreases in the attitudinal scores for fare, daytime, early morning and late evening frequencies, reliability and availability of information are significant. Most of these changes are plausible; fares have increased slightly in actual terms (e.g. slight increases in Metrocard and Saverstrip and the maximum off-peak fare has increased to 35p (50p on some WYRC services), despite tendering there are some gaps in early morning and late evening frequencies, reliability has been a problem in areas where there have been major service revisions and similarly up to date information has not always been available in a rapidly changing situation. However, it is likely that in our study areas daytime frequencies have increased and hence the decline in that particular attitudinal score is difficult to explain. In part it might be a manifestation of the decreases in reliability and awareness of services available. Running more buses is going to have little effect if the public don't know about them. In areas of active competition (e.g. Morley) the increases in frequencies have been tempered by head running, whilst where high frequency minibuses have been deployed there has often been bunching.

However, yet again, differences between the phase one and phase two data sets emerge. This is shown by Figure 3 which shows the trend in the total mean attitudinal scores in the two data sets for all users and regular bus users. It should be noted that our attitudinal scores are not strictly additive but we do believe that they illustrate broad trends. From this figure we can see that prior to deregulation, public transport had high attitudinal scores, but following deregulation, there was a marked deterioration (as the phase one date shows). Somewhere between the spring and autumn of 1987, we believe that attitudes towards public transport began to improve, partly as the memories of the problems with D-Day began to recede and partly because both the PTE and operators had "fine-tuned" services. Hence, our phase two data set suggests a slight improvement in attitudes towards public transport.

This change in attitudes towards public transport over time has not been matched by a change in public transport usage. In our phase one data we only had very modest decreases in bus usage. In phase two the decrease in bus usage was much more substantial. What might be happening is that attitudes have a lagged effect on usage. Hence, the decreases in usage in phase two were related to the decrease in attitudinal scores in phase one. All other things being equal, we might expect repeat surveys in the spring of 1989 to show increases in bus usage.

Table 16

MEAN ATTITUDINAL SCORES

	BEFORE	AFTER	Z-TEST
FARE	2.049 (4.597)	1.369 (4.333)	3.675
SPEED	0.759 (3.250)	0.542 (3.303)	1.601
DAYTIME FREQUENCY	0.834 (3.662)	0.526 (3.447)	2.095
EARLY AM FREQUENCY	0.342 (2.960)	-0.003 (2.805)	2.891
LATE PM FREQUENCY	0.368 (3.060)	-0.125 (2.802)	4.066
SUNDAY FREQUENCY	0.006 (2.881)	-0.143 (2.669)	1.298
NEARNESS OF STOPS	1.377 (4.491)	1.364 (4.223)	0.072
AVAILABILITY OF SEAT	0.757 (3.982)	0.563 (3.985)	1.178
COMFORT	0.590 (3.137)	0.346 (3.331)	1.821
RELIABILITY	0.461 (3.849)	-0.002 (3.897)	2.890
SAFETY	1.821 (4.081)	1.139 (3.747)	1.947
AVAILABILITY OF INFORMATION	0.238 (3.700)	-0.351 (3.692)	3.850
POLITENESS OF STAFF	0.349 (3.388)	0.097 (3.536)	1.747
TOTAL	9.951	5.332	

5.5 RESPONDENTS' COMMENTS

A further indication of attitudes towards public transport is provided by an analysis of respondents' comments. Table 17 shows that in the before data set 0.68 comments per respondent were received, decreasing to 0.51 comments per respondent in the after data set. Little should be read into this, other than that our respondents may be exhibiting form filling fatigue in the after data set. In terms of general assessment of public transport it can be seen that the majority of responses were positive. Deregulation received very few mentions, accounting for 5.4% of comments in the before data set and only 3.3% in the after data set. However, when deregulation was mentioned it was generally seen to be having a negative effect. This point is emphasised by the 4.8% of comments in the before data set referring to recent deteriorations in service (and it should be noted that deregulation was having an effect on services before October 26th, 1986). This figure had increased to 10.7% in the after data set.

TABLE 17 RESPONDENTS' COMMENTS(%)

	BEFORE	AFTER
NO. OF COMMENTS PER INDIVIDUAL	0.68	0.51
PUBLIC TRANSPORT GOOD	10.4	15.0
PUBLIC TRANSPORT BAD	0.4	0.4
DEREGULATION GOOD	0.9	1.3
DEREGULATION BAD	4.5	2.0
RECENT DETERIORATION	4.8	10.7
STAFF BEHAVIOUR	11.1	6.1
PASSENGER INFORMATION	6.6	6.2
RELIABILITY	19.7	19.4
CONDITION OF VEHICLES	2.3	2.2
CAPACITY PROBLEMS	7.5	11.9
LACK OF SERVICES/FREQUNCY	17.6	16.7
FARES	2.4	3.0
SERVICES SLOW	1.4	1.4
LACK OF INTEGRATION	2.3	0.8
OTHER	4.1	2.7

In terms of specific comments, reliability received the most mentions accounting for over 19% of comments in the before and after data sets. Concerns about lack of services (in particular unserved estates in Morley anad East Leeds) and frequency (particularly in the early morning, late evening and Sundays) accounted for around 17% of comments in both the before and after data sets. In the after data sets particular concerns included the loss of cross town links in Leeds and the re-routeing of services 81/82 in Farsley. In the before data set over 11% of comments referred to poor staff behaviour and/or driving practices. In the after data set this had decreased to 6% suggesting that operators had improved their customer awareness. By contrast, over 7% of comments in the before data set referred to capacity problems, with this increasing to almost 12% in the after data set. This resulted from problems with certain services; particularly the minibus services in East Leeds, the Ilkley train service and peak hour bus services to/from Calverley. Of the other comments raised the most important were related to information availability, accounting for 6% of comments in the before and after data sets.

6. CONCLUSIONS

From the above it can be seen that some perverse results have occurred. In phase one there were improvements in service levels yet there were large deteriorations in attitudes towards public transport usage. In phase two there was little change in service levels yet a marked decrease in public transport usage occurred whilst attitudes to public transport improved slightly. In the next section we shall re-assess our research methodology in order to determine whether it contributed to these perverse results. We shall then go on to examine some explanations for what we have observed and then compare our experience with other studies. We shall finally draw some overall conclusions.

6.1 CRITICISM OF RESEARCH METHODOLOGY

Our research methodology might be criticised on a number of grounds. Firstly, our data set does not represent a true before and after study of deregulation. What it does provide is a snapshot on the before and after effects of changes to commercial services in October 1986 and changes in tendered services in November 1987. Both these changes were a direct result of deregulation. We have, however, already indicated that these changes will have long term implications which we can not yet study.

Secondly, it might be argued that our data set is biased. However, in section 2 we showed that our sample was representative of both the areas it was drawn from and West Yorkshire as a whole. The only exception was that public transport users were, deliberately, over-represented. There did appear to be some reporting error, for example in the time and cost information, that might be related to the self completion nature of our questionnaire. This was taken into account by analysing measure of spread as well as central tendency. There may have been some self selectivity bias but we believe that this was reduced by presenting our surveys as a general survey of household travel patterns and avoiding specific mention of the 1985 Transport Act, privatisation, deregulation etc.

Thirdly, our use of the semantic differential scaling approach might be criticised, particularly by proponents of alternative methodologies, such as the repertory grid (Fransella and Bannister, 1977). For example, the labels used in the attitudinal questions are ambiguous and may have been misinterpreted by respondents, elements are not always clearly defined, the scoring system used is arbitrary and we are unable to correctly determine the relative role of each of the 13 attributes. However, some of these problems were limited by the before and after nature of our surveys and the method was effective in collecting a lot of information with regards to attitudes towards public transport.

6.2 SOME EXPLANATIONS

Given that we do not think our research methodology is to blame, in this section we offer some possible explanations for our perverse results. In particular we are concerned about the fact that changes in service levels, usage and attitudes do not appear to be consistent. The following explanations might be offered.

(i) Timetabled increases in service have not always materialised on the ground due to unreliability, bunching and headrunning. In some areas (e.g. East Leeds) minibus conversions may have increased frequency but reduced capacity. Our study suggests that, on its own, vehicle mileage is not a reliable indicator of supply.

(ii) In a constantly changing situation there have been problems with information availability. This in turn has led to imperfect knowledge and misperceptions. Moreover, bus users may be innately conservative i.e. they are averse to any form of change.

(iii) The above process may be exacerbated by asymmetry (e.g.it is easier to loose a bus user than gain one) and non linearities (big changes to a small number of users may be more important than small changes to a large number of users - see also Figure 2).

(iv) The changes that occurred in and around D-day may have acted as a life shock/trauma which has led to the breaking of the bus using habit for some people (Goodwin et al. 1987). The fact that the deterioration in services in the period up to December 1986 has had a stronger effect than the subsequent longer period of more gradual improvement again suggests non-linearities/asymmetry.

(v) Complicated interactions have led to a 'reverse halo effect' occuring. Although, there have been deteriorations in the performance of certain attributes, such as reliability and information availability, which have been correctly perceived by respondents, this has led to a perceived deterioration of all attributes, including those that may have improved (e.g. daytime frequency) or only changed slightly (e.g. fare).

(vi) There is not a direct relationship between attitudes and behaviour. Although elements of cognitive dissonance (Festinger, 1957) might exist, we believe that a more plausible explanation might be provided by a form of expectancy theory (Warr, 1980). In particular, it may be that changes in service levels affect attitudes and then changes in attitudes effects changes in trip making behaviour. However, as we have already seen this causal chain is affected by time-lags. Such a view is consistent with those who argue that long term effects are all important (e.g. Goodwin et al. 1983).

6.3 COMPARISION WITH OTHER STUDIES

Our result that attitudes towards public transport have deteriorated are replicated by the work of Simpson and Walmsley (1987) in metropolitan areas. Moreover, they too found a deterioration in attitues even where service levels were broadly the same (e.g. West Midlands) or had improved (e.g. Strathclyde). Similarly, White and Turner (1988) have found a deterioration of attitudes towards bus travel in Maidstone, even though the bus network has remained broadly the same or, as a result of minibuses, has been improved. By contrast, Green and Pope (1987) found, in a study of Plymouth, attitudes towards bus travel improved in three out of four study areas. Similarly, TRRL work in the non-metropolitan areas suggest a more favourable response.

6.4 OVERALL CONCLUSIONS

From our study of over 1000 individuals in two data sets we have shown that both commercial and tendered changes to bus services have had important impacts. Although service levels have remained broadly the same, or even improved, we have detected overall decreases in bus usage and a deterioration of attitudes towards public transport. Within the public transport market, minibus operations, limited stop services, rail services and independent bus operators have gained market share, but the big bus services of the incumbents still predominate. Our attitudinal results are consistent with the hypothesis that the demand curve for bus services has shifted downwards and inwards. The net welfare effects depend on the exact form of the demand function in the before and after situations. However it seems likely that there has been a net negative effect. Although we have some reservations about extending our results over time and space our results suggest that bus deregulation may have led to a decrease in consumer surplus in West Yorkshire equivalent to over £30 million over the first year of deregulation. This is likely to exceed any gains in producer surplus that have been achieved suggesting, at least initially, that deregulation has had a negative effect in West Yorkshire.

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APPENDIX 1 SCREENING CARD

INSTITUTE FOR TRANSPORT STUDIES
THE UNIVERSITY OF LEEDS
LEEDS LS2 9JT **Tel: 0532 431751**

Dear Householder,

HOUSEHOLD TRAVEL SURVEY

Recent changes in the law may result in major changes to your local bus services in the near future. At the Institute for Transport Studies we will be looking at how these changes affect local people. Does your service get better or worse? In order to assess this we are looking for people who would be willing to take part in a postal survey. This will involve giving details of your local travel before and after the change and your opinions on the new arrangements.

If you and members of your household are willing to co-operate we would be grateful if you could complete the few questions overleaf and return this card. After you have completed this card, simply refold it, stick it down using the gummed strip and then return it by FREEPOST. No stamp is required. The success of this study depends on a high response rate.

If you have any questions regarding this study please contact John Preston at the Institute for Transport Studies: Leeds 431751 extension 7215.

THANK YOU VERY MUCH FOR YOUR HELP

MR. J. PRESTON
INSTITUTE FOR TRANSPORT STUDIES
UNIVERSITY OF LEEDS
FREEPOST
LEEDS
LS2 1YY

№ 8001

HOUSEHOLD TRAVEL SURVEY

1. How many members of your household (including yourself) fit into each of the following age categories ?

0 - 4	[ ]	5 - 10	[ ]	11 - 15	[ ]	16 - 24	[ ]
25 - 34	[ ]	35 - 44	[ ]	45 - 54	[ ]	55 - 59	[ ]
60 - 64	[ ]	65 and over	[ ]				

2. How many members of your household, aged 5 and above, fit into each of the following categories, in terms of travel by Public Transport in the past week ?

Means of travel	Frequency of travel in the last week 10 times or more	5 - 9 times	3 - 4 times	1 - 2 times	None
Bus	[ ]	[ ]	[ ]	[ ]	[ ]
Train	[ ]	[ ]	[ ]	[ ]	[ ]
Taxi	[ ]	[ ]	[ ]	[ ]	[ ]

3. How many cars and vans are owned by your household ?

[ ]

4. If you and members of your household are willing to take part in the panel survey please give your name and address below so that a questionnaire can be sent to you.

Your name: Mr/Mrs/Miss/Ms ....

Your address: ....

.... Postcode: ....

THANK YOU VERY MUCH FOR YOUR HELP

Please moisten the gummed strip, then fold and return this card. No stamp is needed.

APPENDIX 2 MAIN BEFORE SURVEY QUESTIONNAIRE

INSTITUTE FOR TRANSPORT STUDIES

THE UNIVERSITY OF LEEDS
LEEDS LS2 9JT

Tel: (0532) 431751

HOUSEHOLD TRAVEL SURVEY

Please write today's day and date:

....

PART A: PERSONAL DETAILS

---

1. Are you:

In full time employment [ ] In part time employment [ ] In full time education [ ]

Retired [ ] Housewife [ ] Other ? [ ]
(please tick one box only)

2. If you are in employment could you give a brief description of your occupation and the industry that you work in ?

....

3. Do you possess a full driver's licence ? (please tick relevant box(es))

Yes, for car [ ] Yes, for motorcycle [ ] No [ ]

4. How often do you use the following means of travel ? (please tick one box for each row)

	5 or more days a week	3-4 days a week	1-2 days a week	About once a fort-night	About once a month	Less than once a month	Less than once a year
Bus	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Train	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Taxi	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

5. To which age group do you belong ? (please tick one box)

5 - 10 [ ] 11 - 15 [ ] 16 - 24 [ ] 25 - 34 [ ]

35 - 44 [ ] 45 - 54 [ ] 55 - 59 [ ] 60 - 64 [ ]

65 and above [ ]

6. Are you:

Male [ ] Female ? [ ]
(please tick one box)

PART B: PLEASE GIVE INFORMATION ABOUT ALL THE TRIPS YOU MADE YESTERDAY. Please list your trips
outward journeys. Do not include trips of less than 1/4 of a mile.

1 Trip no.	2 What was the purpose of your trip ? 1. To/from Work 2. On employer's business 3. To/from school or college 4. Shopping/ personal business 5. Social/ recreational 6. Giving a lift 7. Other (please specify)	3 Where did you go to ? Please give a precise address (including post code if you know it). If home, write HOME.	4 At what time did you set out on this trip ?	5 How long did this trip take you ? (in minutes)	6 How much of this time involved waiting ? (in minutes)	7 How much of this time involved walking ? (in minutes)
1						
2						
3						
4						
5						
6						
7						
8						
9						

WHEN YOU HAVE RECORDED ALL THE TRIPS

order that they were made. Remember to include return journeys separately in addition to

8	9	QUESTIONS 10 - 12 TO BE ANSWERED BY BUS AND TRAIN USERS ONLY.		
vas the main method of l used for this trip ? s (give service number(s)) ain (name station where ot on the train) ki r driver r passenger tor cycle dal cycle lk u used more than one ised method of travel them in the order that were used	How much did this trip cost you ? (in pence) Include bus fares, train fares and parking costs but not car operating costs such as petrol	10 How many Public Transport vehicles did you use ?	11 Did you use a pass that allows you free or reduced travel ? (YES/NO, if YES please specify eg Scholar's pass, OAP pass or Job seeker)	12 Did you make use of 1. Metrocard 2. Saverstrip 3. Day Rover 4. Any other special type of ticket ? (please specify)

ADE YESTERDAY GO TO PART C (OVERLEAF)

PART C Lastly we wish to ask you some simple questions about your views of Public Transport (by which we mean bus and train).

1. How important to you are the following aspects of travel by Public Transport ? (Please tick one box for each aspect of travel)

	Very important	Important	Quite important	Not very important	Unimportant
Fare	[ ]	[ ]	[ ]	[ ]	[ ]
Speed	[ ]	[ ]	[ ]	[ ]	[ ]
Daytime frequency (Mon - Sat, 7am - 6pm)	[ ]	[ ]	[ ]	[ ]	[ ]
Early morning frequency (Mon - Sat, before 7am)	[ ]	[ ]	[ ]	[ ]	[ ]
Evening frequency (Mon - Sat, after 6pm)	[ ]	[ ]	[ ]	[ ]	[ ]
Sunday frequency	[ ]	[ ]	[ ]	[ ]	[ ]
Nearness of bus stop/station	[ ]	[ ]	[ ]	[ ]	[ ]
Availability of a seat	[ ]	[ ]	[ ]	[ ]	[ ]
Comfort	[ ]	[ ]	[ ]	[ ]	[ ]
Reliability	[ ]	[ ]	[ ]	[ ]	[ ]
Safety	[ ]	[ ]	[ ]	[ ]	[ ]
Availability of information	[ ]	[ ]	[ ]	[ ]	[ ]
Politeness of staff	[ ]	[ ]	[ ]	[ ]	[ ]

2. How well does Public Transport in your area cater for your needs with regards to these aspects of travel ? (Please tick one box for each aspect of travel)

	Very well	Well	Satisfactorily	Not very well	Poorly
Fare	[ ]	[ ]	[ ]	[ ]	[ ]
Speed	[ ]	[ ]	[ ]	[ ]	[ ]
Daytime frequency (Mon - Sat, 7am - 6pm)	[ ]	[ ]	[ ]	[ ]	[ ]
Early morning frequency (Mon - Sat, before 7am)	[ ]	[ ]	[ ]	[ ]	[ ]
Evening frequency (Mon - Sat, after 6pm)	[ ]	[ ]	[ ]	[ ]	[ ]
Sunday frequency	[ ]	[ ]	[ ]	[ ]	[ ]
Nearness of bus stop/station	[ ]	[ ]	[ ]	[ ]	[ ]
Availability of a seat	[ ]	[ ]	[ ]	[ ]	[ ]
Comfort	[ ]	[ ]	[ ]	[ ]	[ ]
Reliability	[ ]	[ ]	[ ]	[ ]	[ ]
Safety	[ ]	[ ]	[ ]	[ ]	[ ]
Availability of information	[ ]	[ ]	[ ]	[ ]	[ ]
Politeness of staff	[ ]	[ ]	[ ]	[ ]	[ ]

3. If you have any general comments about Public Transport services in your area please give them below in the space provided.

THANK YOU VERY MUCH FOR YOUR HELP

Please fold the questionnaire and return, along with the forms completed by other members of your household in the FREEPOST envelope provided. No stamp is required.

 1998

INSTITUTE FOR TRANSPORT STUDIES
THE UNIVERSITY OF LEEDS
LEEDS LS2 9JT
Tel: (0532) 431751 ext
Telex: 557939

HOUSEHOLD TRAVEL SURVEY HHNO .....

Please write today's day and date:

.... 198.

PART A: PERSONAL DETAILS

---

1. Have you lived at this address for over six months ? (please tick one box)

YES [ ] NO [ ]

2. Have you changed your place of work, school or college in the past six months ? (please tick one box)

YES [ ] NO [ ]

3. Are you:

In full time employment [ ] In part time employment [ ] In full time education [ ]

Retired [ ] Housewife [ ] Other ? [ ]
(please tick one box only)

4. Do you possess a full driver's licence ? (please tick relevant box(es))

Yes, for car [ ] Yes, for motorcycle [ ] No [ ]

5. How often do you use the following means of travel ? (please tick one box for each row)

	5 or more days a week	3-4 days a week	1-2 days a week	About once a fortnight	About once a month	Less than once a month	Less than once a year
Bus	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Train	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Taxi	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

6. To which age group do you belong ? (please tick one box)

5 - 10 [ ] 11 - 15 [ ] 16 - 24 [ ] 25 - 34 [ ] 35 - 44 [ ]

45 - 54 [ ] 55 - 59 [ ] 60 - 64 [ ] 65 and above [ ]

7. Are you:

Male [ ] Female ? [ ]
(please tick one box)

Please turn over

PART B: PLEASE GIVE INFORMATION ABOUT ALL THE TRIPS YOU MADE LAST DAY. Please li
Remember to include return journeys separately in addition to outward journeys. Do not

1 Trip no.	2 What was the purpose of your trip ? 1. To/from Work 2. On employer's business 3. To/from school or college 4. Shopping/ personal business 5. Social/ recreational 6. Giving a lift 7. Other (please specify)	3 Where did you go to ? Please give a precise address (including post code if you know it). If home, write HOME.	4 At what time did you set out on this trip ?	5 How long did this trip take you ? (in minutes)	6 How much of this time involved waiting ? (in minutes)	7 How much of this time involved walking ? (in minutes)
1						
2						
3						
4						
5						
6						
7						
8						
9						

WHEN YOU HAVE RECORDED ALL THE TRIPS

trips in the order that they were made.
trips of less than 1/4 of a mile.

8	9	QUESTIONS 10 - 12 TO BE ANSWERED BY BUS AND TRAIN USERS ONLY.		
		10	11	12
ɪas the main method of . used for this trip ? ; (give service number(s)) ɪin (name station where ɪt on the train) :i · driver · passenger .or cycle ɪal cycle .k ɪ used more than one sed method of travel hem in the order that ɪere used	How much did this trip cost you ? (in pence) Include bus fares, train fares and parking costs but <u>not</u> car operating costs such as petrol	How many Public Transport vehicles did you use ?	Did you use a pass that allows you free or reduced travel ? (YES/NO, if YES please specify eg Scholar's pass, OAP pass or Job seeker)	Did you make use of 1. Metrocard 2. Saverstrip 3. Day Rover 4. Any other special type of ticket ? (please specify)

ƆE YESTERDAY GO TO PART C (OVERLEAF)

PART C Lastly we wish to ask you some simple questions about your views of Public Transport (by which we mean bus and train).

1. How important to you are the following aspects of travel by Public Transport ? (Please tick one box for each aspect of travel)

	Very important	Important	Quite important	Not very important	Unimportant
Fare	[ ]	[ ]	[ ]	[ ]	[ ]
Speed	[ ]	[ ]	[ ]	[ ]	[ ]
Daytime frequency (Mon - Sat, 7am - 6pm)	[ ]	[ ]	[ ]	[ ]	[ ]
Early morning frequency (Mon - Sat, before 7am)	[ ]	[ ]	[ ]	[ ]	[ ]
Evening frequency (Mon - Sat, after 6pm)	[ ]	[ ]	[ ]	[ ]	[ ]
Sunday frequency	[ ]	[ ]	[ ]	[ ]	[ ]
Nearness of bus stop/station	[ ]	[ ]	[ ]	[ ]	[ ]
Availability of a seat	[ ]	[ ]	[ ]	[ ]	[ ]
Comfort	[ ]	[ ]	[ ]	[ ]	[ ]
Reliability	[ ]	[ ]	[ ]	[ ]	[ ]
Safety	[ ]	[ ]	[ ]	[ ]	[ ]
Availability of information	[ ]	[ ]	[ ]	[ ]	[ ]
Politeness of staff	[ ]	[ ]	[ ]	[ ]	[ ]

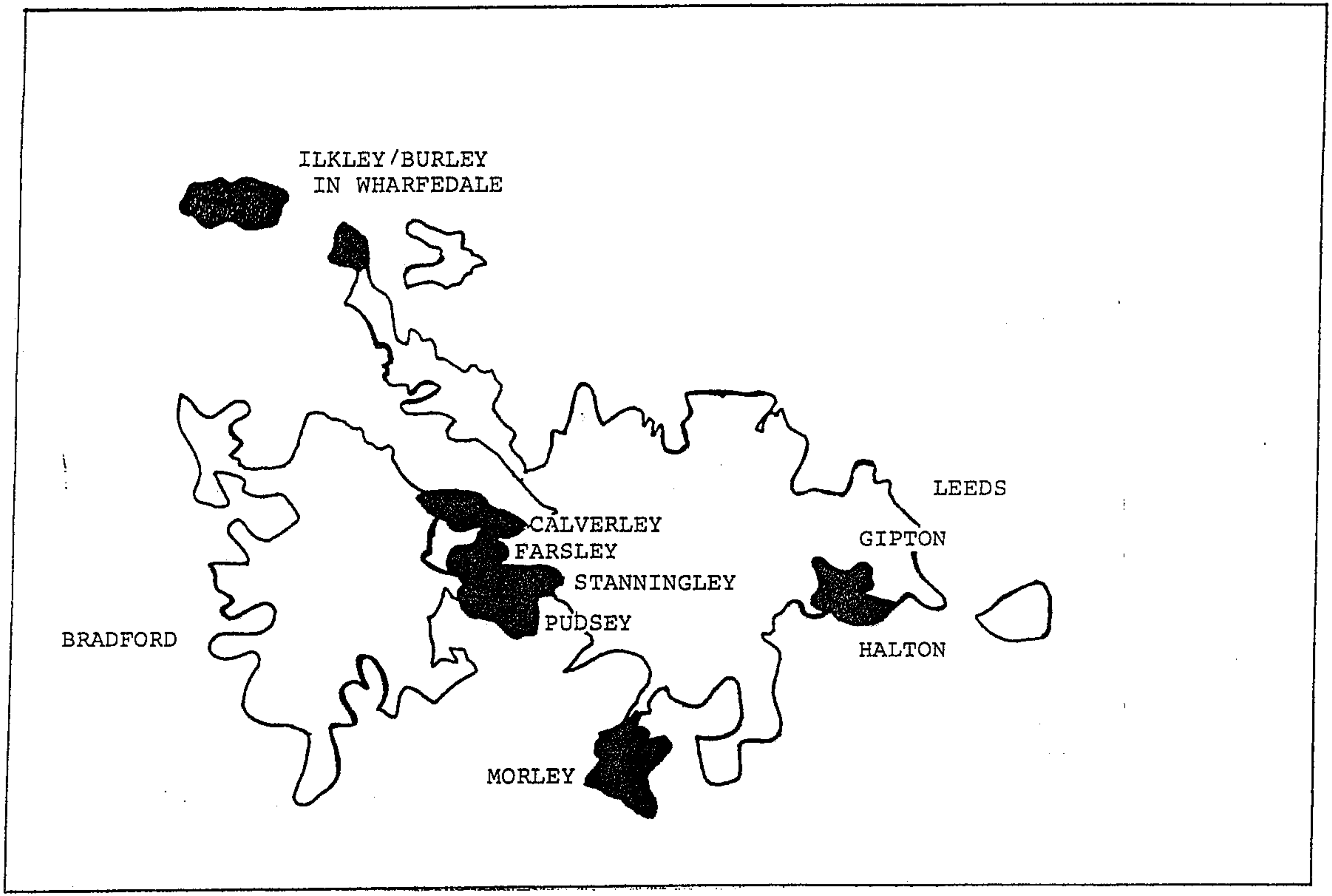
2. How well does Public Transport in your area cater for your needs with regards to these aspects of travel ? (Please tick one box for each aspect of travel)

	Very well	Well	Satisfactorily	Not very well	Poorly
Fare	[ ]	[ ]	[ ]	[ ]	[ ]
Speed	[ ]	[ ]	[ ]	[ ]	[ ]
Daytime frequency (Mon - Sat, 7am - 6pm)	[ ]	[ ]	[ ]	[ ]	[ ]
Early morning frequency (Mon - Sat, before 7am)	[ ]	[ ]	[ ]	[ ]	[ ]
Evening frequency (Mon - Sat, after 6pm)	[ ]	[ ]	[ ]	[ ]	[ ]
Sunday frequency	[ ]	[ ]	[ ]	[ ]	[ ]
Nearness of bus stop/station	[ ]	[ ]	[ ]	[ ]	[ ]
Availability of a seat	[ ]	[ ]	[ ]	[ ]	[ ]
Comfort	[ ]	[ ]	[ ]	[ ]	[ ]
Reliability	[ ]	[ ]	[ ]	[ ]	[ ]
Safety	[ ]	[ ]	[ ]	[ ]	[ ]
Availability of information	[ ]	[ ]	[ ]	[ ]	[ ]
Politeness of staff	[ ]	[ ]	[ ]	[ ]	[ ]

3. If you have any comments about recent changes to Public Transport services in your area please give them below in the space provided.

THANK YOU VERY MUCH FOR YOUR HELP

Please fold the questionnaire and return, along with the forms completed by other members of your household in the FREEPOST envelope provided. No stamp is required.



KEY — EXTENT OF LEEDS-BRADFORD BUILT UP AREA

AREAS SURVEYED

FIGURE 2
AN ESTIMATE OF THE CHANGE IN CONSUMER SURPLUS IN WEST YORKSHIRE AS A RESULT OF BUS DEREGULATION.

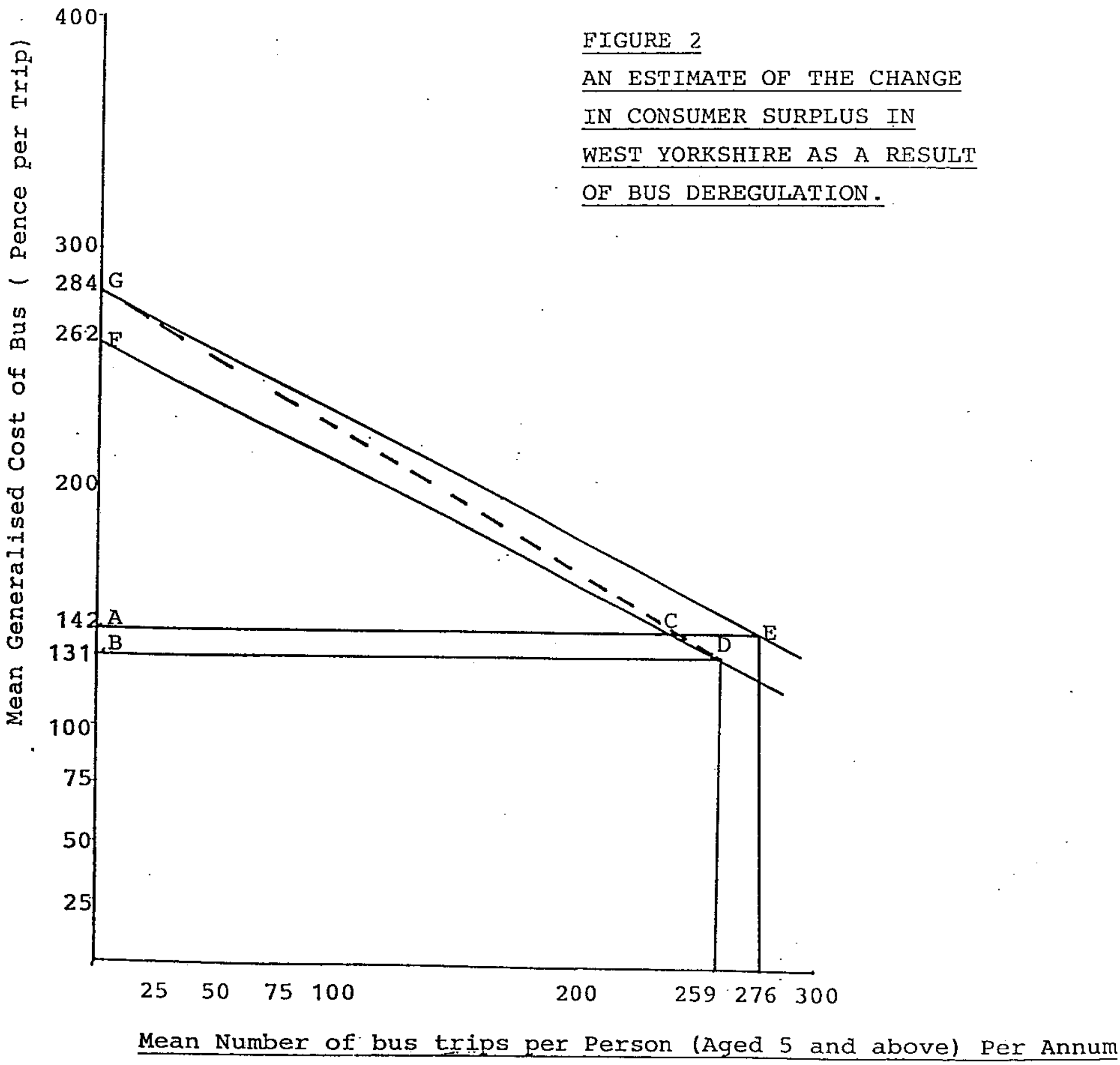


FIGURE 3 CHANGES IN ATTITUDES AS A RESULT OF BUS DEREGULATION

A = ALL USERS B = BUS USERS