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January 1991

**EVALUATION OF THE USE AND NON-USE
BENEFITS OF PUBLIC TRANSPORT**

**REPORT N°2
APPLICATION OF THE METHOD**

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ABSTRACT

In this paper, we present results of a survey designed to discover the value people place on the retention of a bus service. The survey consisted of two parts; a travel diary, and a follow-up interview designed to explore respondents' reactions to removal of the bus services and the willingness to pay for its retention. The survey was undertaken in two contrasting areas: Hawksworth, in Leeds, a low income area of predominantly Council housing and Rainow, in Cheshire, a village with high car and home ownership. Most respondents in Hawksworth were regular bus users; the reverse was the case in Rainow.

Typically, it appeared that bus users enjoy a consumer surplus on their journeys of the order of 100% with a higher value for the small number of work journeys in Rainow. Non-use values appear to be very significant, with a higher valuation amongst non-users than users. On average, residents were willing to pay some 60 pence per week to preserve the route as a whole. In Hawksworth, the corresponding values were 50 pence for the specific route serving the estate, and 75 pence for the network as a whole. It was generally agreed that services to workplaces, shops, schools and medical facilities were the highest priority, with weekday peak and weekday busy time services taking priority over Saturdays, evening and Sundays. In terms of priority groups, pensioners were always ranked first; in general these were followed by the unemployed and children; non-users in Hawksworth however ranked the unemployed last.

The practical use of these results will be considered in a further project looking at actual and potential ways for ranking services for subsidy.

INTRODUCTION

This is the second Working Paper reporting on a project on the Community Valuation of Local Public Transport Services. In Working Paper 309 the development of the methodology is discussed in detail; as is the adopted technique. In this paper we review the application of the methodology in two survey areas.

Section 1 details the methodology. Section 2 describes the survey areas and sample populations and the conduct of the survey. In Section 3 the values of use and non-use benefits obtained are presented. Section 4 examines additional issues raised in the interviews.

1. SURVEY METHODOLOGY

The development process is described elsewhere (Bristow et al, 1991). This paper is concerned with the technique deemed most suitable and its application in two surveys. The technique developed combines elements of self-completion and personal interview approaches. Values for use and non-use benefits of public transport are extracted.

1.1 Detailed Methodology

There are four main steps, culminating in an interview with the participating household. These are as follows:

- (a)*Introductory Letter* - a letter is sent by post to each household in the selected sample. This letter is brief, informing the reader that a survey is being carried out in the area and that a surveyor will call on them in the next few days. This letter is intended to allay the suspicions that might otherwise be aroused by the appearance of a stranger on the doorstep. A copy of the letter may be found in Appendix 1.1.
- (b)*Initial Personal Contact* - the main objective is to persuade the household to take part in the survey. Where they agree, a seven day travel diary is left for each member of the household to complete. This includes children of an age to make independent trips. A sample diary page, and explanation are contained in Appendix 1.2.

The other objective at this stage is to obtain some basic data on the household, eg numbers of people, children, and cars that make up the household; also whether anyone in the household is a regular user of public transport. This data is gathered - if possible - whether the household agrees to take part or not. This allows later testing for non-response bias to take place.

- (c)Collection of the diaries - in most cases by hand - and an interview with all household members is arranged for a future date. Collection by hand can also function as a prompt to those who may have forgotten to complete the diaries.

(d) Interview with all household members, where feasible. This is based in part on information extracted from the diaries. The interview is structured around the household and its behaviour. The interview covers the following areas:

- (i) Establish that all members of the household are present
- (ii) Distribute charts to each person; these display the diary information on one page
- (iii) Establish whether the travel reported in the diaries represented a normal week - insofar as there is a "normal" week.
- (iv) Go through each person's trips, asking what they would have done if their current mode (or modes) of travel had been unavailable, and covering questions such as:
 - whether the trip would be made at all
 - any change in destination
 - alternative mode(s)
 - cost of chosen alternative
 - any time penalty.

Responses are recorded on a chart.

- (v) Where a respondent has reported any use of local public transport, these trips are discussed in detail to establish the willingness to pay for each trip made. Respondents are asked for a reaction to fare increases of up to 100% above current fare levels; if they still would use the service at this fare, then an open-ended question on the fare at which they would stop using it was asked. Again responses are recorded on a chart (examples of all charts used during the course of the interview can be found in Appendix 1.3) and include:
 - fare level at which each trip would cease
 - details of alternative action.

The general guidelines for these questions and those that follow can be found in Appendix 1.4 where there is a copy of the interview form. It should be stressed that this was used only as a structure by interviewers.

- (vi) Opinions on local public transport and use by relatives and visitors.
- (vii) What kind of impact service withdrawals might have.
- (viii) Ranking exercise in which the respondent is asked to assess priorities for public transport funding in terms of access to facilities, concessionary fares and periods of operation. Self-completion sheets can be found in Appendix 1.5.
- (ix) Discussion of non-use impacts of public transport
 - followed by an exercise in which points are allocated between five classes of non-use benefits (see Appendix 1.6).
- (x) Willingness to pay for non-use benefits asked in the context of a threat of service withdrawal. This is first asked as an open willingness to pay question. If no response values are suggested, an iterative bidding process is used instead.

Interviews were tape recorded, as a back up to notes taken during the interview. This allowed verbatim transcription of a selection of interviews, as a check on the accuracy of the notes, and also to provide greater illumination of peoples views and comments.

2. SURVEY AREAS AND SAMPLE POPULATION

The survey technique is quite detailed and time consuming both for interviewer and respondents. The number of households covered in this final survey stage was necessarily limited by resource constraints since the initial intention had been to use self-completion questionnaires but this proved impractical (see Bristow et al, 1991). The interview has an exploratory role as well as eliciting values. It was decided to

test the approach in two contrasting areas, partly to see how the results differed but primarily to test the technique for general applicability.

2.1 Survey Areas

(a)Hawksworth, Leeds: Hawksworth is a fairly deprived area in north west Leeds some 3¹/₂ miles distant from the city centre, comprising mainly council housing with owner occupied fringes. There are a number of small shops in the areas.

Two bus services run through the estate; the number 50 provides a 15 minute day time (30 minutes in the evenings) frequency into Leeds city centre, the 73 providing two buses an hour at an uneven headway to Bramley. Generally fare levels in Leeds are reasonable; a ticket giving unlimited travel within West Yorkshire for a week was available at a cost of £6.40. The single fare from the estate to Leeds was 50p during the peak; 35p off-peak.

(b)Rainow, Cheshire: A village some 3 miles from the nearest urban centre, Macclesfield. It is an area of high home and car ownership. Rainow has few facilities, a shop cum post office, a primary school and three pubs providing the main features. The village has an attractive location on the edge of the Peak National Park.

The E23 bus service to Macclesfield operates on a 20 minute frequency during the day, reducing to an hourly headway in the evenings, with 5 buses running on a Sunday. There are also 2 buses a day that connect Rainow with New Mills, the E24. Fare levels are higher than in Leeds. A one way trip from Rainow to Macclesfield costing 70p; returns are available at a discount, £1.20. OAP's qualify for a pass (which must be purchased at a cost of £1) which entitles them to half price travel. There are no alternative bus routes to Macclesfield, a walk of 2 miles to Hurdsfield finds the nearest.

The two areas contrast in many ways:

- urban/rural
- car ownership levels
- fare levels and concessions
- local public transport network
- access to alternative bus routes
- income and socio economic indicators.

This gives an opportunity to test the technique in vastly differing circumstances.

2.2 Survey Samples

The samples were randomly drawn from household lists derived from the electoral register.

<u>Number of households</u>	<u>Hawksworth</u>	<u>Rainow</u>
Contact letters	88	52
Refusals	10	11
Non-contacts	32	8
Drop outs	16	9
Completions	27	24
Response rate - total	34%	46%
Response rate - contacts	53.5%	54.5%

The response rates are particularly satisfying when concentrating on those households where contact was made, at over 50% in both areas. The length of the survey process did not then prove to be an important deterrent to respondents.

The Hawksworth estate was the more complex area to survey; 8 of the households in the sample proved to be derelict or empty properties. The non-contact rate is very high, despite a minimum of 3 calls at each address, due partly to a marked reluctance to open the door to strangers.

2.3 Survey Conduct

The number of calls needed to each household necessitated intensive use of staff time. The initial doorstep contact was all important; needing to engage the respondents interest and commitment in the space of a few minutes. Resource constraints dictated the need for the project researchers to undertake a high proportion of the contact and interview work. This had the virtue of providing first hand experience of the performance of the technique.

For the remaining interviews and contacts two research students were recruited. Training consisted of going through the interview with a member of the research team, attending an interview as an observer and carrying out an interview in the field under observation.

The initial interviews were carried out by two people, one carrying out the interview; the other playing an observers role. This procedure was adopted to ensure a consistency of approach in future solo interviews. Discussions after the interviews proved to be most helpful in this respect.

2.4 Sample Interview

The following interview was carried out with a 3 person household comprising a single parent female aged 33, and her son (11) and daughter (5). The household does not have access to a car. The respondent works part-time as a warden in sheltered accommodation. Her net monthly income is £400. Table 2.1 below summarises the information from the interview.

The trips made during the diary period were typical, except the trip to the dentist which is made about four times a year. The respondent tries to go out "somewhere" with the children at weekends. The two shopping trips are routine. In the event of a bus being unavailable the trip to the dentist could have been

made on foot. For the trip to the town centre the only perceived alternative was an expensive taxi ride. The trip to the local supermarket has been made in the past by walking there and returning by taxi at a cost of £1.70. The respondent would not have taken a day out to the same location by bus but would have gone elsewhere if a bus had not been available.

Table 2.1 Sample Interview Responses

Total bus trips in diary (4)	Fare paid (ret)	Journeyative- N°purpose to bus	Altern of Alt	Cost Max WTP	Alternative	
Trip 1	1.30	50Dentist including son	Walk (15min)	-	1.80	Walk
Trip 2	1.40	50Shopping city centre	Taxi	7.40	2.00	Shop elsewhere eg Trip 3
Trip 3	0.80	50Shopping local s/market	Walk/ taxi	1.70 (25 min)	2.00	Walk, catch taxi back
Trip 4	2.40	743Day out with 2 children	None	-	4.00	Go elsewhere
Total	5.90				9.10	9.80

The value of each trip in terms of the maximum willingness to pay (WTP) is shown in the penultimate column. The total "value" of the four trips amounts to £8.80, a consumer surplus (CS) of £2.90. If the fare level to town rose above £2.00, this trip would be dropped, and all shopping done at the local supermarket. The trip to the supermarket by bus would be susceptible to a switch to taxi or at the least, returning from the supermarket, with shopping bags, by taxi.

These results provide a realistic insight into the respondent's current use benefits from public transport.

When the discussion turned to non-use benefits the respondent was aware that she contributed to the support of bus services via her household rates and through the new community charge. She expressed concern for other people, notably children, having access to public transport. Interestingly she felt that the elderly who currently have free travel, should be expected to contribute something (about 10p/trip) towards their travel. In the light of services being withdrawn totally she was willing to pay up to £1/week more to ensure the preservation of her local service for people other than herself.

3. USE AND NON-USE VALUES OF PUBLIC TRANSPORT

This section presents the results obtained from the interviews, the values placed on trips made and the non-use values of public transport. Further information from the interviews follows in Section 4. The survey areas are discussed in turn.

3.1 Rainow

3.1.1 Use Values

The 24 households where an interview took place reported on 29 one way bus journeys. Although limited, it is interesting to examine the willingness to pay by journey purpose, see Table 3.1 below.

Table 3.1 Rainow - willingness to pay for bus trips by journey purpose

Purpose	Average fare	Average WTP	Average CS as a CS	N	% fare	trips
To/from work	50	150	100	200	4	
To/from education	35	10	0	0		1
Shopping	47.14	90	42.9	96.4	14	
Visits	35.8	62	26.2	70		6
Personal business	47.5	95	47.5	100		4
Mean	44.8	91.3	46.5	103.7	29	

There are very few trips by bus reported by the Rainow sample. It is therefore interesting to discuss them almost on an individual basis. The four work trips were made by a man who runs a business on the Hurdsfield Estate, at other times his wife gives him a lift to/from the office as he does not drive. The bus takes him, virtually, door to door and he views it almost as a taxi service and is willing to pay accordingly. Trips by children for education purposes are free - paid for by the education authority - a school bus service is provided: so this aspect of travel is not particularly relevant to this study.

The shopping and visit trips are mainly made by female pensioners at the concessionary rate. The remainder are made by women paying the full fare.

Respondents were asked firstly to give a willingness to pay for evening trips. Only one such trip was recorded; and the person was willing to pay twice as much (70p to 140p) to secure that trip. When considering the trips made on the whole route, the average individual willingness to pay for all trips in total was 183.1p, an average of 46.5p per trip.

3.1.2 Ranking of Priorities

Table 3.2 shows the ranking arising from the question "Bus services provide access to many facilities.

Which do you consider it to be most important for buses to serve?".

Table 3.2 Priorities for facilities to be served by bus

Rank	Mean score	Bus users	Mean score	Non users	score	Mean All
1	2.00	Shops	2.30	Work places	2.39	Work places
2	2.83	Work places	2.70	Shops	2.58	Shops
3		Doctors surgery	3.85	Schools	3.94	Doctors surgery
4	4.00	Hospitals	4.18	Doctors surgery	4.03	Schools
5	5.00	Schools	4.37	Hospitals	4.30	Hospitals
6 =	5.83	Leisure	5.52	Leisure	5.58	Leisure
7		Friends home	5.96	Relatives home	6.03	Relatives home
8	6.33	Relatives home	6.67	Friends home	6.51	Friends home
Cases		6		27		33

There is some variation in responses between users and non-users of bus services. Bus users place the highest priority on access to shopping facilities, perhaps reflecting the fact that nearly half the bus journeys reported were shopping trips. Non-users place a higher priority on access to work places possibly because this is the only journey they can imagine making by bus and so reflects their own travel priorities rather than actual usage of the service.

The low ranking for friends and relatives homes' may reflect the fact that these are often either walkable or beyond the scope of the bus service. Respondents may have been thinking of their own service rather than in general.

The E23 provides access to medical facilities which again may be reflected in the ranking.

Table 3.3

Rank	Ave score	Bus users	Ave scoreNon-users	score	Ave All
1	1.50	OAP	1.24OAP		1.29 OAP
2	3.17	Unemployed	3.00Unemployed	3.03	Unemployed
3	3.50	Teenagers	3.44Children	3.52	Children
4	3.67	Housewives	3.84Teenagers	3.77	Teenagers
5	3.83	Children	4.47Housewives	4.26	Housewives
6	4.33	Working adults	4.72Working adults	4.64Working adults	
Cases		6	25		31

There is greater agreement between users and non-users with respect to priority groups for low fares (Table 3.3). The exception being the greater priority given by non-users to cheap fares for children and young people. This may reflect the fact that - in this sample - non-users are more likely to reside in households containing children.

There appeared to be a general perception amongst those with neither cars nor children; that children did not need the bus service as their parents ferried them around. In households with both children and cars this pattern of behaviour could indeed be observed. However, parents wanted the bus service to be available for their children to use in the future, when older and more independent.

An interesting factor is the position of the unemployed people in second place. This suggests an element of altruism and also a priority not reflected in cheap fares schemes. The 1985 Transport Act excludes the unemployed from eligibility for concessionary fares schemes. However, commercial schemes are legitimate and exist in at least one area - Tyne and Wear.

The final ranking exercise examined periods of operation and these results are presented in Table 3.4.

Table 3.4 Priorities for subsidy by time period

	Users	Non-users	All
Monday to Friday Peak <0930 1600-1800	1.48	1.67	1.52
Monday to Friday Daytime	2.11	2.17	2.12
Monday to Friday Evenings	3.40	3.17	3.35
Saturday	3.12	3.17	3.13
Sunday	4.76	4.83	4.77
Cases	25	6	31

The rank order is the same for users and non-users. Users put a slightly greater emphasis on peak period services while non-users consider evening services to be slightly more important. The low ranking for Sunday services is to be expected - no-one travelled by bus on a Sunday. Moreover, the Sunday service is perceived to be less useful now the first bus runs at midday, than when a morning service was available giving access to church services. This was seen as important not just for people in Rainow wishing to attend services in Macclesfield but also for residents of Macclesfield and Hurdsfield who wished to come to the Rainow services. The Sunday service is perceived to be of use to visitors to the areas, especially walkers, but not to the local population.

3.1.3 Non-Use Values

Table 3.5 shows the non-use values obtained; questions on willingness to pay were asked firstly in relation to evening services and secondly about the route as a whole.

Table 3.5 Average use and non-use values of individuals per week (p) - Rainow

		User values	Cases	Non-user values	Cases	All	
Consumer surplus							
Evening	70	1		-			
Route		138.75	6	-			
Non-use							
Evening	8.33	1(5)		71.15		26(17)	59.37
Route		41.67	6(3)	161.15		26(9)	138.75
Total Value		224.81		161.15			178.70

(Figures in parentheses indicate the number of respondents who gave a zero value).

As expected users gave a high priority to their own use relative to non-use values, approximately 80% of their total value consists of consumers surplus.

More surprisingly is the relatively high value non-users give to the bus service when compared with the total value derived by users. This may be influenced by a number of factors.

- (i) Relatively low number of trips made each week by users; 4 one way trips, keeps the consumers surplus per week down.
- (ii) Relative wealth, bus users are generally less well off than the population as a whole; in this example three users were pensioners.

Although the sample is small it is interesting to follow up these issues together with others that may influence the non-use value of an individual, such as age, sex, occupation, presence of children in the household. The expected relationships would be as follows:

- (i) Age - difficult to predict; older people may have a stronger sense of the value of public transport, having lived through times when it was the most important form of transport. On the other hand, pensioners rarely have much in the way of discretionary income.
- (ii) Sex - women are traditionally more dependent on bus services than men and therefore might value it more highly. In this sample this is perhaps less true than usual; there are a large number of two car households and 2 households where the wife is the main or sole user of a single car; so the influence of sex is less predictable. Another possibility is that women who do not work outside the home and spend the bulk of their time within the village will be more aware of the role of the bus service to the community and value it accordingly. However, this could influence the value either way, depending on the individual's perception of the bus service and its level of use.

- (iii)Occupation - this aspect is partly covered above, in that those who are at home all day might be expected to form opinions based on observation. On the other hand those who work might expect to have a higher level of discretionary income.
- (iv)Children - the presence of children in the household might be expected to increase reported non-use values, as an investment for future use for those children.

Table 3.6 reflects respondents priorities within non-use values; respondents were given 100 points to allocate between 5 specified non-use categories. It was intended to shed light on the relative importance of non-use benefits.

Table 3.6 Priorities within Non-Use Values

Av. score	Users (6)	Av. score	Non-users (27)	Av. score	All (33)
38.3	Accessibility	38.2	Environment and congestion	35.3	Environment and congestion
22.5	Environment and congestion	21.9	Standby	19.5	Linkage
21.7	Community	15.2	Accessibility	19.0	Stand-by
11.7	Relatives and friends	14.3	Relatives and friends	13.9	Relatives and friends
5.8	Stand-by	10.3	Community	12.3	Community
100		100		100	

Priorities vary considerably between users and non-users. Users score the linkage effect very highly - this could reflect the difficulty involved in separating their own use benefits, from the existence of the link. The next highest scores were on the environmental impact and congestion and the community as a whole. Stand-by picked up the lowest number of points understandably as those who use a service could not view it as an alternative mode for many trips. The allocation to relatives and friends is fairly low; possibly because they are often within walking distance or reside outside the area.

Non-users give the main priority to the problems of the environment and congestion; their lowest to the community. This is a little odd as when asked if they were willing to pay to preserve the service, most cited the community or groups within it as the reason. However, this question was a general one and it appears that respondents are taking into account general problems that are not apparent within Rainow.

Stand-by was the second most important reason even though many had never used it in this way. It could be said that self interest is dominant here.

3.2 Hawksworth

3.2.1 Use Values

Respondents in Hawksworth gave willingness to pay data on a total of 133 bus trips. Table 3.7 shows willingness to pay broken down by journey purpose.

Table 3.7 Hawksworth - willingness to pay for bus trips by journey purpose

	Average Fare	Average WTP	Average CS	CS as a % Fare	No Cases
To/from work	44.9	81.1	36.2	86.2	24
To/from education	43.2	81.8	38.6	157.3	28
Shopping	23.7	60.7	36.4	98.2	42
Visit	0	40.0	40.0	-	1
Leisure	39.2	83.7	44.6	112.6	17
Other	29.1	52.1	23.0	56.3	21
Average	34.2	70.2	35.8	106.3	133

The figures reveal a high priority is given to trips to school, which might be thought a little strange where education authorities are obliged to provide transport for distances in excess of 3 miles. However, free travel is only obtained if the school attended is within a defined area. This sample contains 2 households where parents pay for travel to take their children to a school outside the catchment area; one of the mothers concerned was prepared to pay almost any amount to ensure that her children continued to travel to their current school by bus.

The next highest priority goes to leisure trips, again an unexpected result, perhaps indicating that leisure trips are made by people with higher levels of discretionary income than other types of bus trip. Moreover, the alternative mode is most likely to be a taxi at a higher cost.

3.2.2 Hawksworth - ranking of priorities

Table 3.8 Priorities for facilities to be served by bus - Hawksworth

Rank	Ave score	Bus users	Ave score	Non-users	Ave score	All
1	2.0	Work places	2.22	Work places	2.07	Work places
2	3.11	Schools 2.67	2.22	Schools 2.96	3.52	Schools
3	3.26	Hospitals	3.22	Shops	3.52	Shops
4	3.45	Doctors surgery 4.11	3.22	Hospital surgery 3.54	3.52	Hospital surgery
5	3.65	Shops 4.33	3.22	Doctors surgery 3.72	3.52	Doctors surgery
6	6.30	Relatives homes 5.67	3.22	Relatives homes 6.10	3.52	Relatives homes
7	6.79	Friends homes 6.89	3.22	Leisure 7.00	3.52	Leisure
8	7.05	Leisure 7.50	3.22	Friends homes 7.00	3.52	Friends homes
Cases		19		8		27

There is a considerable agreement on priorities between those who use bus services and those who did not in the week surveyed. The main priority is given to access to work places and schools - the day's major activities. Bus users rate access to medical facilities slightly higher than access to shopping facilities: perhaps because there are some shops in the area while medical facilities are more distant. Those who use public transport, would then feel more dependent upon such services for medical trips which though rarer than shopping trips may be viewed as more important for bus access due to their relative inaccessibility. Non-users reverse these preferences perhaps because they are thinking of the most common trips made.

Table 3.9 Priority groups for low fares - Hawksworth

Rank	Av. score	Users	Av. score	Non-users	Av. score	All
1	1.63	OAP	1.67	OAP	1.64	OAP
2	2.39	Unemployed	2.33	Children	3.08	Unemployed
3	3.72	Children	3.78	Housewives	3.26	Children
4	4.17	Housewives	3.89	Working adults 4.04	4.04	H/wife, work adult
5	4.33	Working adults 4.50	3.89	Teenagers 4.19	4.19	Working adults
6	4.53	Teenagers	4.62	Unemployed	4.52	Teenagers
Cases		20		8		28

There is a clear consensus on the need to provide elderly people with low cost bus travel. There is however a great divergence of opinion between users and non-users on the status of the unemployed. Bus users give the unemployed a high priority, while non-users place them last. This suggests that views are highly polarised.

Table 3.10 Priorities for subsidy by time period - Hawksworth

	Users		Non-users		All
Monday to Friday Peak <0930 1600-1800	1.53		1.56		1.54
Monday to Friday Daytime	2.16		1.67		2.0
Monday to Friday Evenings	3.37		2.89		3.21
Saturday	3.53		2.67		3.25
Sunday	4.22	4.00		4.15	

There is a high degree of agreement as to which periods of operation are most important - weekday peak and daytime services. Non-users then rank Saturdays while users consider evenings to be marginally more important. This could arise if non-users make occasional bus trips - as Saturday then becomes the most likely travel time as car parking in Leeds on Saturdays is perceived to be difficult.

3.2.3 Non-use values

Table 3.11 Average use and non-use values per week (p) - Hawksworth

	Non-users		Users		All	
	values	Cases	values	Cases	values	
<u>Non-use</u>						
WTP route	58.3	6(3)	45		20(12)	48.1
WTP network	150.0	5(2)	57.5	20(9)		76.0
<u>Use</u>						
CS route			103.5		25(2)	73.1
CS network			199.6		25(0)	142.6
Total value	150.0		257.1			218.6

(network)

Users report higher total values, almost 80% of which is made up of use value. Non-users do appear to be willing to pay for the service but the sample is very small compared to the users.

Table 3.12 Priorities within non-use values

Av. score	Users	Av. score	Non-users	Av. score	All
26.2	Relatives and friends	26.7	Stand-by	24.1	Relatives and friends
26.0	Accessibility	20.6	Environment and congestion	22.9	Accessibility
15.2	Stand-by	19.4	Relatives and friends	18.8	Stand-by
15.0	Community	17.2	Community	15.7	Community
12.5	Environment	16.1	Accessibility	15.0	Environment
100		100		100	

There is a disparity between users and non-users in their assessment of the importance of various non-use impacts. Users place the greatest priority on use related effects, eg use by relatives and friends and accessibility. Non users see the buses most important non-use function as providing an alternative mode of transport, and in relation to environmental and congestion issues.

3.3 Comparison of results

The two areas are markedly different in the levels of reported bus use; in Rainow only 22% respondents had travelled by bus in the week of the survey, while the corresponding figure in Hawksworth was 70%.

The Hawksworth sample provided the bulk of reported bus trips. Typically, it appears that bus users enjoy a consumer surplus on their journeys of the order of 100% of the fare paid. Users in Hawksworth derive a consumer surplus of £2.00 a week on average; the figure of £1.83 in Rainow is very similar. Non-use values appear to be significant. On average, residents were willing to pay some 60p per week to preserve the route as a whole. In Hawksworth the corresponding values were 48p for the specific route serving the estate and 76p for the network as a whole. These results would appear to indicate a significant difference in responses between the two samples; however Table 3.13 reveals a different

interpretation.

Table 3.13 Non-use values, pence per week

	Users		Cases		Non-users		Cases		All
<u>Rainow</u>									
evening	8.3		6(5)		71.1		26(17)	59.4	
route		41.7		6(3)		161.1		26(9)	138.7
<u>Hawksworth</u>									
route		45.0		20(12)	58.3		6(3)		48.1
network	57.5		20(9)		150.0		5(2)		76.0

Figures in parentheses represent the number of zero values

Table 3.13 disaggregates the values to give non-use values for users and non-users separately. The major variation, it is now clear, occurs between users and non-users; with non-users reporting the higher values. This can be explained in part by the role played by use values which typically form 80% of users total values; as illustrated in Table 3.14.

Table 3.14 Users' values

	Rainow Cases		Hawksworth Cases	
Consumer surplus	70	1	103.5	25(2)
Evening/route	183.1	6	199.6	25(0)
Non-use value				
Evening/route	8.3	6(5)	45	20(12)
Route/network	41.7	6(3)	57.5	20(9)
Total value	224.8	6	257.1	25
CS as a % total value	81.4%		77.6%	

Figures in parentheses represent the number of zero values

As users have already expressed their willingness to pay in terms of fares for their own use, they may then be financially constrained when asked to give a non-use value. Moreover, non-users tend to have higher incomes than users and thus a greater ability to pay.

It was generally agreed that services to workplaces, shops, schools and medical facilities were the highest priority, with weekday peak and weekday daytime services taking priority over Saturdays, evenings and Sundays. In terms of priority groups, pensioners were always ranked first; in general these were followed by the unemployed and the children; non-users in Hawksworth however ranked the unemployed last. There was some variation in priorities between those who use buses and those who do not, possibly reflecting their different perceptions as to needs and use. For example, in Rainow, bus users consider access to shops to be most important while non-users see workplaces as the priority.

In terms of the confidence we have in the results the first point to make is that because of the very labour intensive way in which we found it necessary to undertake the survey, we were unable to obtain anything approaching the sample size we had originally intended. However, we are able to measure the mean valuations with reasonable precision. 95% confidence intervals ranged from $\pm 28\%$ for the mean weekly total value (use plus non-use) of 210 pence across all respondents through to $\pm 51\%$ for the mean non-use value of non-users of 160 pence per week. We are unable to say much about how the values break down by person type or type of area although the variation in non-use values appears to be between users and non-users rather than between areas. The average value for non-users in Rainow was 161p and 150p in Hawksworth. However, users in both areas gave much lower non-use values of around 50p. No clear pattern emerged as to how benefits varied by journey purpose.

A second issue is the degree of confidence we have in our results. There are a number of reasons for thinking that strategic bias is not a serious problem in our survey. First, the literature on public goods and the contingent valuation method contains many tests for the presence of strategic bias, and in most cases concludes it was not present. Secondly, we believe that the detail in which we examined the alternatives available will have inclined respondents to truthful answers. Thirdly, in general the services in question were not seen as under threat and we were seen very much as independent researchers (often our interviewers were assumed to be students). Clearly a survey on behalf of a local authority or transport operator might arouse more suspicion. We also guarded against starting point bias (by using existing fares as the starting point) and payment vehicle bias (in the context of an interview, we found it much easier to handle the sensitive issues regarding rates and community charge than in a self completion questionnaire). Social norm bias was guarded against by getting respondents to build up to a valuation by ranking alternative possible motives for subsidy in a detached manner. Overall, then, we would have a reasonable degree of confidence in our results.

Given this, what do we conclude to be the policy implications of our study? Clearly, the way in which the survey was undertaken would make it expensive to duplicate this study in every area in which the level and use of bus subsidies was under consideration. Nevertheless, we do consider that the methodology we have developed would be worth wider application by local authorities and Passenger Transport Executives, to build up experience of how values vary according to the context of the service.

4. INTERVIEWS

In this section, we examine comments made by respondents during the course of the interviews that cast light on the values they gave; firstly on issues raised by the interviewer, secondly on other aspects of public transport provision.

4.1 Service removal

Here we look at respondents perceptions of who would have problems if service withdrawals occurred.

4.1.1 Rainow - Removal of evening service

22 of the 24 households interviewed gave an opinion, the frequency with which certain issues were mentioned are given in Table 4.1.

Table 4.1 Effects of removal of evening service in Rainow

14 young people
3 older people
3 drinkers
2 shift workers

When considering the situation of young people (under 18), comments were generally sympathetic, without an evening service it was thought they would be too restricted in their movements. However, others said that their problems would not be severe because:

"parents tend to act as taxi drivers"

"younger people with more money than we have" - this comment from a Company Director

"young go down to town in each others cars".

The small number of mentions for elderly people reflects the fact that older people tend to stay in at night, although not necessarily by choice! One lady commented that as you get older and slow down you know you cannot run away. Another lady who attends evening classes in the winter months shares a taxi with a friend rather than catch a bus.

It was seen to be important by the 3 households who mentioned it, that drinkers be able to get home by bus; 2 of these households had used the bus when going out for a drink; a third consisted of two school teachers concerned that their pupils were not tempted to drink and drive. This appears to be an issue only considered by those with direct experience of it.

4.1.2 Rainow - complete service withdrawal

Table 4.2 Effects of complete service withdrawal in Rainow

11 older people
9 young
6 people without cars
3 women
5 me personally

Comments range from "hardly touch us if no bus service, speaking selfishly it had no bearing on our decision to come and live here" and "No problem - except if the car breaks down and need a spare part - get a taxi" to an old lady who was concerned that she would be "troubling other people for shopping" and would have problems getting to the doctor in Macclesfield and obtaining repeat prescriptions. Another elderly lady said "I should find it very restrictive, limited number of visits to Macclesfield - once a week by taxi". She also felt she would have to depend on her daughter who lives in Macclesfield and has a car for help.

The majority of respondents suggested at least one group of people who would be adversely affected by the withdrawal of the bus service.

4.1.2 Use by others in the household

Everyone who mentioned a concern for others within the household mentioned their children - whatever their age.

1 household mentioned adult son who uses the bus when going for a drink
2 households mentioned used by their children in the past
5 households looked forward to their children using the bus in the future when older.

Parents therefore like to think that their children will gain in independence through the presence of a bus service.

4.1.4 Option value

9 households in Rainow expected to use the bus in unusual circumstances; usually car breakdowns; with anticipated use running from 2 to 30 trips a year. The majority of households viewed the bus service very much as a last resort, as typified by the comment - "scrounging a lift is the first option - if all else fails spend money".

Other households thought the bus unsuitable for anticipated use; one lady's son had suffered a heart attack a few weeks prior to the interview and she had taken a taxi to the hospital. Another respondent said he would rather walk or take a taxi depending on the circumstances and weather conditions - "I walk the dog farther than that". A lady said that she would take a taxi to go shopping, as it is a lot quicker and avoids the need to plan ahead: however her first alternative would be to try to get a lift. Others stressed

that the bus was unsuitable for their travel needs through timing or routing or simply that their destination is too far away.

The main point to emerge is that when cars are off the road for short periods the first option is usually to try to get a lift, taxis are also an important alternative due to their extra convenience and speed at a reasonable cost. In some cases walk or cycle are considered and trips are rescheduled for when the car is available.

Although people like to think "there is always the bus", it appears that they are unlikely to actually use it in circumstances where the preferred mode is unavailable.

4.1.5 Environmental and congestion effects

Comments on this issue were obtained from all 24 households. When asked if buses had a positive or a negative impact overall in the areas of congestion and pollution, 18 households could see a hypothetical advantage in the use of buses over cars as there would then be fewer vehicles on the roads.

However, there were many reservations expressed, the main issue being the exhaust fumes expelled by bus. This was reflected in comments such as:

"I've noticed over the years the standard of maintenance has declined ... dirtier and more visible exhaust fumes"

"Cars pollute but some of the diesel on these buses, terrible black smoke, and lorries, they get away with it".

In all ten households mentioning this issue, buses are perceived as having "dirty" exhaust fumes. If bus services are to be perceived as environmentally friendly, it is important that the vehicles be well maintained to reduce the visible air pollution.

Other people pointed out that it was not car users who travelled by bus - so the impact of bus services on the number of vehicles using the road was minimal. Although almost all agreed that environmental and congestion problems were worsening - only one woman thought that she might give up her car in the future when her children were older: or now if the frequency was enhanced to 15 minutes. Most thought the bus service either inconvenient or inappropriate to their travel needs: particularly for the journey to work.

Four households considered that buses added to the congestion problem in Macclesfield. In the village area congestion was not perceived to be a problem, indeed tractors were thought to slow down the traffic more than buses. The minibuses on the route are seen to be as capable as any vehicle at managing the hills.

4.1.6 Accessibility

This is a slightly abstract concept relating to the benefits of the existence of a semi-fixed link to Macclesfield, in providing access to the larger community. Comments centred on Rainow's dependence on other areas to supply most facilities.

"nothing here is there? People in Rainow like to think of themselves as separate, but there is not even a newspaper shop"
 "village only exists because there is a link".

One woman in her 20's related that Rainow had five shops when she was born. She also said that surrounding areas had lost their post offices - so that if the Rainow Post Office were to close it would not just be local residents that would be affected.

A few people commented that Rainow would be isolated without the bus service; others thought otherwise due to the prevalence of cars in the village.

4.1.7 Community

Comments of one sort or another were obtained from every household; ranging from concern to indifference: "I would do all I could to keep the service" to "never exercised my mind". As when asked to consider the effects of service withdrawal the main concern was for the elderly:

Table 4.3 Impacts on the community of bus service withdrawal

Frequency of mention	Area of concern
14	older people
6	young people
2	women
4	people without cars
5	maintain "mixed" community

An interesting feature here is the wish to preserve the structure of the village; there was particular concern for the "natives" often elderly people who have always lived in Rainow:

"I'd hate to think that the village would be populated by young people with cars" - this came from a young car owning "incomer".

People volunteered to sign petitions (2) and attend public meetings (2). One lady who currently uses the bus only on rare occasions, said that she would consider using it more often, perhaps to go shopping.

4.1.8 Lifts

The importance of the availability of lifts in Rainow emerged clearly from the interviews. When respondents were asked what they would do if their usual mode was unavailable, obtaining a lift instead was often the first option. 8 households mentioned that they gave lifts to people, perhaps arranging to take someone shopping or just stopping to pick people up at the bus stop or walking down the hill. Drivers cannot avoid passing the bus stop on their way to Macclesfield and they know that anyone waiting there wants to go towards Macclesfield; so it is a simple thing to offer a lift, drivers can be confident that they will not be asked to go out of their way. Respondents said that they would only pick

up people they know either personally or by sight: which in such a small community with so few bus users may well cover any local resident.

Other lift giving is more organised, one woman has an elderly female neighbour who finds bus use difficult; especially the walk up the hill to the bus stop. The respondent often arranges to take her into town, with the neighbour on the other side sharing the load. This respondent also reported some more formal "car sharing"; a small group go swimming regularly, sharing a car to the leisure centre. She also described the car sharing procedure adopted by Rainow Women's Institute, when numbers for an outing are known, they try to minimise the number of vehicles going. This process means that non-drivers can be sure of a lift while drivers do not have to drive on every occasion.

Another respondent said that he knew of people who shared cars to work, 2 to a remote location and 2 to Macclesfield.

Two people also reported being asked for lifts in urgent circumstances; one man was flagged down by a lady trying to get to a hospital appointment (a bus had failed to turn up), while a lady was asked to pick up a prescription for a sick child whose mother could not leave it.

Although elderly bus users do benefit from lifts, these tend to be one way with the return journey made by bus. Moreover, elderly people are reluctant to ask for lifts since they know that they cannot return the favour and they value their independence.

4.1.9 Alternative solutions to the existing bus service

When asked if they were willing to pay anything to preserve the bus service, a number of respondents suggested alternative solutions to providing additional subsidy to the bus company.

Three people suggested that a dial-a-ride scheme would be better than the current scheduled service; one lady thought it would be a more efficient use of resources; while another mentioned the advantage that it would be able to carry wheelchairs.

Four households raised the idea of taxi sharing, pointing out that 3 people in a taxi could travel into town at a similar cost to the bus. In similar vein 2 people suggested organised lift giving or car sharing.

One respondent thought of the removal of the bus service

"If that happened I think you might get a better community spirit, the village might get together and say right let's get our own bus; which has happened in other communities".

This man also thought that it should be possible for operators with a single vehicle to bid to run subsidised services.

One man felt that he would rather "sponsor" an individual by paying their fares than contribute to a fund to keep the bus service going.

On lady taking into account perhaps that the demand for travel is really a demand for goods or facilities located elsewhere, said that she would be prepared to pay £15 a year to preserve the village shop.

4.2 Hawksworth

4.2.1 Perception of the local service

The majority of the respondents interviewed found the local bus services reliable and satisfactory. Prior to the survey there had been a number of changes to the number 50 service, providing a more frequent service and greater access to areas beyond Leeds. A number of people commented on these changes, perceiving them as beneficial. Three respondents reported the local service to be unreliable ("bunching" or "pull-outs"), dirty and the drivers to be lacking care and courtesy for passengers. Two of these respondents were infrequent users of the local service.

4.2.1 Removal of evening services

The general impression received from those participating in the survey was that a reduction or withdrawal of evening services would create little or no problem for them or others in their household. This lack of concern about possible threats to evening services was due largely to the fact that few of those interviewed use the local services in the evening. There was a limited expression of concern for two groups - teenagers and shift workers. The use of the bus by people going out for a drink was mentioned by several respondents although in two instances this provoked the view that "buses shouldn't be subsidised to give people pleasure!".

4.2.2 Withdrawal of all services

The prospect of the total withdrawal of the local bus service was viewed with much greater concern by those interviewed. No-one supported the withdrawal of services. It was evident from the comments made during the interviews that the local bus service provides many benefits to the community.

The most frequently cited effects of the loss of the service was access to cheaper shopping. This was mentioned more frequently by female respondents than male respondents and by elderly respondents than younger respondents. There are few shops on the Hawksworth estate and they tend to be expensive and lack variety. The number 50 service provides access to the city centre, to the Headingley district shopping centre and to a local supermarket where many people "do their big shop". As well as the higher prices and reduced choice locally a number of people regard the once or twice weekly trip to town as a day out, a chance to get off the estate - an opportunity to enjoy themselves. To this group of people the denial of access to the city centre would be either a major loss of pleasure or a search for an expensive alternative. For one woman, the trip to town is so important that she indicated a consumer surplus of £2/trip.

In the event of the service being withdrawn those who recognised the value of public transport for accessibility to shopping facilities was divided on their likely response. About a third considered that they would have to shop locally. These were typically OAP's who had no access to a car and who couldn't afford to travel by taxi. The second group consisted of those who would be able to get a lift or use a car to travel to the same destinations. The third and largest group consisted of those who could/would adopt a variety of strategies. The strategies mentioned included

- walk to other bus route
- walk in/taxi back
- taxi both ways
- change destination (walk and/or taxi)
- combine shopping trips with other trips.

The second effect of service withdrawal would be to make days out by bus more difficult. The local bus service provides access to other bus services and the rail network, providing those people without cars access to other parts of the city/region. Two respondents regularly visit Roundhay Park and Temple Newsam by bus and two other respondents occasionally travel to other cities to shop. A number of respondents had elderly parents or friends living on the estate who with the free-pass system used the buses extensively for days out around the region. Whilst these destinations could be reached via other bus services these would make the trips out by bus less common and less attractive and more expensive. Those who do use the local service for day trips out would either not make the trips at all or travel on other routes to different destinations.

The third activity affected by the total withdrawal of the local bus services is travel to and from work. Those who travel to and from work by public transport found the idea of no public transport unbelievable and where they were dependent upon public transport, a potentially drastic impact on their lives. The most frequently mentioned alternative to the local bus service was either to try and get a lift from a friend or neighbour or else walk to a stop served by a different bus route.

4.2.3 Use by others in the household

Only two of the interviews were at households where no member of the household or some person visiting the household used the local bus service. About a third of the households had children who used the local buses either to travel to/from school or to travel to/from city centre or other friend's houses. Indeed concern for the welfare of the children in the household was often placed higher than the welfare of the adults, both in terms of access to facilities and the possible dangers of walking alone at night-time.

4.2.4 Option value

The sample of respondents included three people who did not ordinarily use the local service but due to personal injury or their car being repaired had made use of the local service in the diary week. Surprisingly two of these respondents failed to perceive the value which the local service provided in such situations. Instead they regarded the availability of the local bus service as useful for their **immediate** dilemma but not as a more general **security** against such eventualities either for themselves or other people.

Overall nearly all of the respondents had used the local bus service at some time in the previous six months, thereby appreciating the value of preserving a bus service even when they used it intermittently

or not at all.

4.2.5 Environmental and congestion effects

Many of the respondents were ambivalent about the environmental benefits of public transport. In several instances it was stated that buses give rise to pollution in the form of diesel exhausts.

4.2.6 Accessibility and community effects

The value of public transport as a means of accessibility to a range of city centre and inter-region facilities has previously been discussed. A notable feature of the Hawksworth area surveyed was the proportion of extended families living in the estate. In many cases, parents and their children and various aunts and uncles and grandparents lived in close proximity to each other. This closeness of family groups means that there is a high level of inter-dependence between family members. In travel terms lift sharing, errands and car-borrowing are daily routines. Such interdependencies would help to soften any impacts arising from the reduction or removal of bus services. At the same time these interactions make it extremely complicated to trace through the possible consequences or effects of service alteration.

5. CONCLUSIONS

In the original grant application we stated that this project was exploratory. We knew that measuring both the use and non-use benefits of public transport would be difficult, and that extensive piloting would be necessary. We hoped that at the end of this process we would be able to design a self completion questionnaire to collect the necessary information. Both our own experience of stated preference techniques and the widespread use of questionnaires to administer the contingent valuation approach to environmental valuation in the United States encouraged us in this respect.

In the event, after extensive piloting we were not satisfied that a self completion questionnaire could adequately address the complexity of the issues on which we were seeking information. We were also very worried by the low response rate and the lack of any information about non-respondents implied by this method. We therefore designed a survey based around a self completion travel diary, followed by an interview to explore the alternatives to current modes of transport, the priorities seen for the use of subsidies and to obtain the relevant valuations.

The method developed is labour-intensive and requires well-trained and experienced interview staff. The travel diary allows preparation of the interview questions prior to the interview and full briefing of the interviewer. This helps to ensure and maintain control of the quality and reliability of the survey data.

Whilst such an approach reduces the total number of people who can be surveyed compared to a self completion questionnaire, in our view that the amount of detail which is derived from an interview and the ability to check and recheck responses and valuations makes the approach worthwhile.

Even with a highly interactive interview approach, there are many problems to be overcome in trying to find out why and how much people value local public transport services. Whilst people can easily understand the idea of use-benefits and option-values, non-use benefit categories are more problematic. Asking people to imagine a situation where local services are reduced or removed and/or what they

would do in such a situation requires time; time for people to fully appreciate and understand what is being said, time to consider what options they really have open to them and time to learn what their real responses are. Whilst we as researchers have thought long and hard about some of the issues, we frequently fail to appreciate that not everyone is as concerned or involved in "transport issue" as we are and may not at the outset have perfectly formed preferences and values. Moreover people continually recall past events or bring in new information to the discussion which affect their understanding of the issue being discussed.

Overall an interview approach which alternated between structured questions and informal conversation worked best; the former directing the respondents attention to specific issues, the latter allowing the interviewer and interviewee to find a means of discussing the issues in a way that was meaningful to the respondent. We call such an approach a "negotiated" interview.

Overall we found differences in the ease with which people seemed able to provide use and non-use values for individual services, for the network and for non-use benefits of public transport. The figure below shows a summary of the differences.

	USE BENEFITS		NON-USE BENEFITS	
	Service Network			
No access to car: one bus service	–	–	?	
No access to car: many services	?	–		?
Access to car: use bus	–	–		?
Access to car: use bus occasionally	–	?		?
Access to car: never use bus	?	?		–

? = difficult _ = relatively easy

Overall we found it easier to elicit use-benefits than non-use benefits except where the respondent never used buses. In the other categories, where people use buses then there were some problems in trying to separate out what was a use-benefit to the individual and what was a non-use benefit. Where people make some use of buses it would appear more sensible to try and obtain a total economic value for the maintenance of bus services rather than trying to partition separate benefit categories. This is not to say that people did not understand the concept of non-use benefits, rather that they found it difficult to assign a monetary value to such benefits separate from any use-benefits they gain from having a bus service or network. This is in stark contrast to the studies reported in the environmental literature which often present non-use benefits disaggregated into option, existence and bequest values which have been obtained with no apparent difficulty (or words to this effect).

Even so, we found good evidence of user benefits from bus services averaging some 100% of revenue and willingness to pay of non-users averaging around 150p a week. The average values obtained in Rainow and in Hawksworth were surprisingly similar, given the very clear differences in the socio-economic characteristics of the two areas and the much higher usage and dependency on the buses in the

Hawksworth survey. We feel that such figures however, which can be broken down by time of use, day of week and person type begins to provide some guidance for public transport authorities on appropriate subsidy rules for public transport services. The way in which such values might be used in practice is the subject of ongoing research.

APPENDIX 1.1

INTRODUCTORY LETTER

APPENDIX 1.2

TRAVEL DIARY

APPENDIX 1.3

**TRIP PATTERN CHART
BUS USE CHART
ALTERNATIVE MODE CHART**

APPENDIX 1.4

FINAL VERSION INTERVIEW SCHEDULE

APPENDIX 1.5

PRIORITY IDENTIFICATION Self Completion Sheets