OXERA

OXFORD ECONOMIC RESEARCH ASSOCIATES

OFFICE OF FAIR TRADING

CONSUMER SURVEY REPORT

SEPTEMBER 2003

Blue Boar Court
Alfred Street
Oxford OX1 4EH
Tel: +44 (0) 1865 253000
Fax: +44 (0) 1865 251172
Email: Enquiries@oxera.co.uk

Contents

1. Introduction

OXERA has been commissioned by the Office of Fair Trading (OFT) to analyse consumers' valuation of different aspects of taxi services,[1] to enable calculations of the effect of taxi regulation on consumer welfare.

The main variables that drive consumer welfare are price and waiting times. This research has also identified a number of quality-related factors that are important for consumers. This report presents the results of two surveys of consumers that have been undertaken: the first, the revealed-preference (RP) survey, was designed to collect information about individuals' actual choices in relation to their usage of taxi services; the second uses stated-preference (SP) techniques to examine and quantify consumers' tastes and preferences. These techniques involve respondents choosing between hypothetical alternatives. Their choices can then be analysed to produce quantitative estimates of their valuations of the different attributes involved.

This research has been carried out in partnership with TNS, which contributed to the design of both the RP and the SP questionnaires and undertook all the fieldwork, and Dr Mark Wardman and Dr Gerard Whelan, both of the Institute of Transport Studies at the University of Leeds. Dr Wardman was responsible for the design and specification of the SP survey, while Dr Whelan was primarily involved in the analysis of the data.

The report is structured as follows:

- section 2 describes the methodology and results of the RP survey;
- section 3 describes the methodology and results of the SP survey and analysis;
- section 4 draws the results together and concludes;
- appendix 1 presents the details of the sampling methodology of the RP survey;
- appendix 2 presents the full module of questions that respondents were asked in the RP survey;
- appendix 3 presents the full questionnaire that was used for the SP survey.

[1] For the purposes of this report, when the term 'taxi' is used, this refers to both hackney carriages and PHVs.

2. Revealed-preference Survey

The RP survey gathered information from consumers about their preferences in relation to taxi services and their recent usage of taxis. This survey is discussed in this section. The second survey, the SP survey, gathered information to be used to undertake an analysis of the relative valuations of the attributes (commonly known as 'conjoint analysis'), and is described in detail in section 3.

There were two main reasons for conducting the RP survey:

- to gather information on the *factors that influence consumer welfare* which could be analysed in its own right. This information was used to supplement the preliminary conclusions drawn from the review of the literature—see the accompanying OXERA report, 'Taxi Markets Literature Review'. In this context, respondents were asked about price, quality of service, waiting time, metering, and design of the vehicle; and

- to *inform the design of the SP survey*. The timing of the surveys was designed so that the RP survey was carried out in advance of the SP fieldwork, allowing the important choice variables to be more accurately identified for the conjoint analysis. The details of how the RP survey results were incorporated into the design of the SP survey are given in section 3.

2.1 Methodology

OXERA worked with TNS to design and undertake the RP survey. A module of taxi-related questions was included in TNS's regular Omnibus survey for April. Respondents were surveyed at home during face-to-face interviews and fieldwork was undertaken between April 9th and April 13th 2003.

To control for the effects of sampling variation, the data was weighted, which gave a base number of 2,060 respondents, 2,000 respondents in Great Britain and 60 in Northern Ireland. A full description of the methodology and sampling process is given in appendix 1.

2.2 Questionnaire design

Due to time constraints on each individual topic in the Omnibus and on the overall interview length, it was necessary to focus the questions on specific factors. These constraints are imposed to prevent interviewee fatigue and therefore to maintain the quality of the responses throughout the questionnaire.

Certain factors had been identified as important for consumers in the light of the literature review—price being a principal one. Waiting time is another, although the relevance of

waiting times was not uniformly recognised as a significant factor in the literature. Some papers recognised that waiting time is an important measure of the quality of service (see, for example, Douglas[2]); however, few attempts have been made to measure the significance of waiting time in terms of consumer welfare. Other time-related factors, such as the total expected journey time, have, on occasion, been identified as relevant.[3]

There are many other factors that could also be expected to affect consumer welfare through their effect on the quality of service or perceived quality of service. These include physical factors such as the type of vehicle used as a taxi and its cleanliness, as well as intangible factors, such as the driver's knowledge of the area. It is notable from the literature that there have been few, if any, attempts to measure the importance of these additional attributes. Existing research either ignores these quality measures altogether, or, where they are addressed, it is presumed that a measure of waiting time is the predominant factor. The questions designed for the RP survey therefore sought to develop an understanding of consumers' appreciation of these factors, and to identify which of them warranted further investigation in the SP survey.

The opening questions in the survey asked respondents to rate how important nine taxi-related factors were to them. These questions were designed to verify the importance of these factors. The full RP questionnaire is presented in appendix 2.

The questions that followed aimed to gather information relating to a specific journey that respondents had taken. Rather than asking questions in relation to a typical taxi journey they might have taken, it was considered more robust to ask questions in relation to their most recent taxi journey. The questions could then be related to an actual specific journey and the context of that journey, rather than a hypothetical, typical, journey. Furthermore, as people's memory fades over time, it was considered necessary to limit the responses to taxi journeys that had been taken in the month preceding the interview date. Although this may have meant that the survey did not collect information from all the individuals who use taxi services, the time-limitation factor was designed to ensure that the quality of responses was high and that the survey collected accurate responses related to actual journeys that respondents had taken. Of the total sample of 2,060 respondents, there was an almost 50:50 split between those who had taken a taxi in the preceding month and those who had not.

The respondents who had taken a taxi were asked a series of questions about their most recent journey, while those who had not were asked questions seeking to identify their reasons for not using taxis.

[2] As early as 1972, Douglas presented a model of the taxi markets in which consumer welfare was modelled as a function of price and waiting times. Douglas, G.W. (1972), 'Price Regulation and Optimal Service Standards', *Journal of Transport Economics and Policy*, **iv**, 116–27. Toner and Mackie later used that model to quantify the effects on consumer welfare of changes to the regulatory regime. Toner, J.P. and Mackie, P.J. (1992), 'The Economics of Taxicab Regulation: A Welfare Assessment', paper presented at the Sixth World Conference on Transport Research, Lyon.

[3] Toner and Mackie (1992) presented some calculations of valuation of in-vehicle time in addition to their estimates of walking and waiting time.

The taxi users' questions related to the time of their journey, its cost, the time they had to wait, and the method of hiring the taxi (ie, the means by which they had caught the taxi: hailed from the street; caught at a rank; or booked by telephone). Questions were also asked identifying those factors that led the respondents to choose that particular method of hiring rather than an alternative and in relation to alternative forms of transport that were available to the respondent for that journey.

Finally, those respondents who had not taken a taxi were asked to identify a situation where they had considered taking a taxi, but had not, and the reasons for this.

2.3 Results

This section sets out the quantitative results of the RP survey in relation to:

- respondents' usage of taxis;
- the reasons underlying consumers' choices; and
- factors relevant for consumer welfare.

2.3.1 Usage of taxis

Table 2.1 to 2.4 provide information on respondents' usage of taxi services. These results do not purport to show nationally representative patterns of taxi usage. The data gathered in the RP survey related only to respondents' most recent taxi journey, provided that this had been in the month that preceded the interview. The results therefore do not take into account the frequency with which respondents used taxis, and the likelihood that frequent users would have used several different methods of hiring a taxi.

The RP survey asked respondents about their use of taxis according to one of four methods of hiring: hailed on the street; caught at a rank; booked by phone/went to a minicab office for immediate use; or booked by phone in advance. The majority of the taxis booked by phone are likely to have been private-hire vehicles (PHVs), although some hackney carriages can also be booked by telephone, and there is therefore likely to be some overlap in this segment. For the purposes of this research, the important distinctions to be drawn are between the results in relation to hackney carriages hired at ranks or hailed from the street (which are affected by entry regulations) and taxis hired through other methods (which are not affected by restrictions on entry).

Table 2.1: Method of catching the most recently used taxi, by sex and age (%)

	Total	M	F	16–24	25–34	35–44	45–54	55+
Hailed	4	5	4	8	7	5	2	2
Rank	6	6	6	11	7	6	5	4
By phone immediate	11	10	12	19	12	9	14	7
By phone in advance	27	27	28	33	34	28	26	22
No taxi in last month	48	48	48	27	37	49	50	60
Don't know	3	3	3	2	2	3	2	4
Total (No.)	**2,060**	**1,004**	**1,056**	**275**	**368**	**410**	**279**	**728**

Source: RP Survey, Q2.

Taxi usage is remarkably similar for men and women. Not only had the same proportion of men and women used taxis over the month preceding the interviews, but there were

also no significant differences in the type of taxi used. Given these, the remainder of this report does not provide any analysis by gender.[4]

As is to be expected, taxi demand declines with age. 71% of 16–24 year olds had used a taxi in the preceding month, whereas only 36% of those aged 55+ had done so. This usage pattern arises in each segment of the taxi market, except for taxis booked by phone for immediate use, which were most often used by those in the 45–54 age group.

Table 2.2: Method of catching the most recently used taxi, by region (%)

	North East	North West	Yorkshire and Humberside	East Midlands	West Midlands	East England	London	South East	South West	Wales	Scotland	Northern Ireland
Proportion of respondents who had not used a taxi in the preceding month:												
	29	40	57	63	47	49	53	55	60	48	37	48
Of those who used a taxi in the previous month:												
Hailed	15	6	3	7	3	1	16	13	8	12	11	3
Rank	6	12	18	20	14	11	10	19	16	9	8	12
By phone immediate	10	22	15	20	10	21	39	27	17	14	28	48
By phone in advance	69	61	64	54	72	67	35	41	59	66	53	36
Total (No.)	**91**	**235**	**171**	**123**	**168**	**167**	**254**	**259**	**177**	**111**	**179**	**64**

Source: RP Survey, Q2.

Some caution should be taken with this data as it shows only the patterns of the most recent taxi journey that respondents had taken. It therefore does not take into account whether respondents who use taxis regularly use different forms of hiring a taxi, nor whether the last journey was representative of the respondent's taxi usage in general. Nevertheless, Table 2.2 highlights some notable regional differences in the patterns of taxi usage. The level of taxi usage overall is highest in the North East region, where 71% of respondents had used some form of taxi in the month preceding the interviews. The highest proportion of respondents who had not used taxi services in the preceding month was in the East Midlands (63%), the South West (60%), Yorkshire and Humberside and the South East (both 57%).

There were also differences in the methods used to hire taxis. As was expected, the proportion of respondents who caught a hackney carriage in the street by means of hailing

[4] Other research into taxi usage has concluded that women use taxis more than men, see for example, DETR (2001), 'Transport Statistics: Taxi and PHV use in GB', March.

was highest in London, and was lowest in East England, where only 2% of respondents had hailed a hackney carriage in the street.

The proportion of taxi users who had caught taxis at a rank was highest in Yorkshire and Humberside (20%) and the South East (19%); only 6% of respondents in the North East caught their last taxi at a rank.

There was also significant variety in terms of phone booking across the UK. In Northern Ireland, half of the taxi users had phoned for a taxi for immediate use, whereas in the North East, only 8% did so. However, respondents in the North East were the most likely to book in advance by phone, along with those in the West Midlands.

The following two tables highlight the spread of demand for taxi services over different times of the day and different lengths of waiting time. These show differences in the usage patterns between hackney carriages and taxis booked by phone, with a greater proportion of taxis hailed or caught at ranks being after 23:00 hours (43% for the street-hailed segment, 30% for ranks, 19% of taxis booked by phone for immediate use).

Table 2.3: Taxi usage by time of day (%)

	Hailed	Rank	By phone immediate	By phone in advance	Total
0301–0700	6	0	4	4	**4**
0701–1200	14	17	20	23	**21**
1201–1800	20	32	23	20	**22**
1801–2300	18	20	33	38	**32**
2301–0300	43	31	19	14	**20**

Base: All adults who had taken a taxi in the last month.
Source: RP Survey, Q3.

Table 2.4: Waiting time by time of day (minutes)

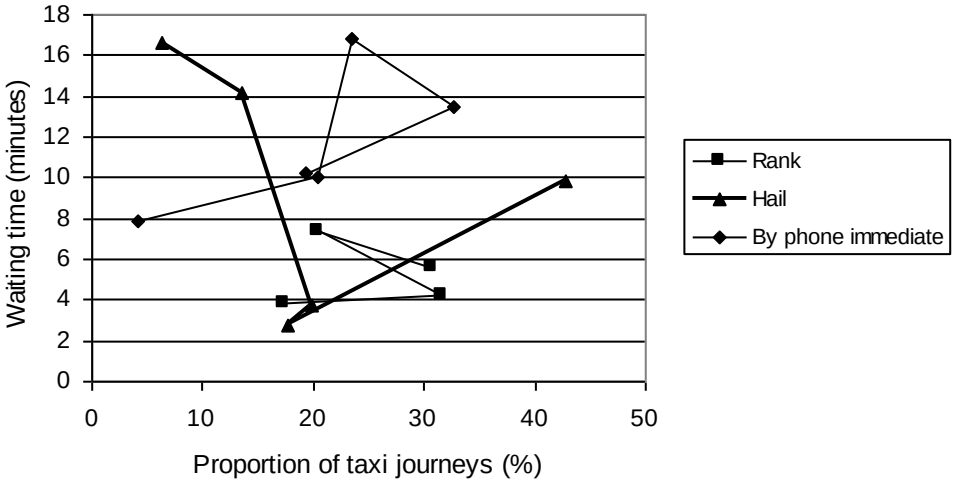
	Hailed	Caught at rank	By phone immediate	By phone in advance[1]	Total
0301–0700	16.6		7.9	7.2	**8.8**
0701–1200	14.2	3.8	10.0	7.4	**8.0**
1201–1800	3.7	4.2	16.8	9.6	**9.8**
1801–2300	2.8	7.4	13.5	9.7	**10.0**
2301–0300	9.8	5.6	10.2	9.9	**9.2**
Total	**8.5**	**5.2**	**12.7**	**9.1**	**9.3**

Base: All adults who had taken a taxi in the last month
Note: [1] Waiting time calculated in relation to the time for which the taxi was booked.
Source: RP Survey, Q2 and Q3.

The information on waiting times also indicates the complexity of the relationship between supply and demand. Figure 2.1 presents information from Tables 2.3 and 2.4 to show that a higher demand (proxied as the proportion of journeys in a particular time period) does not always correspond to a higher waiting time. This is because waiting time

reflects the interactions between demand and supply at any particular time, and the data from the RP survey does not show how supply changes during the day.

Figure 2.1: Waiting time and taxi demand by time of day



Source: RP Survey, Q2 and Q3.

2.3.2 Reasons underlying consumption decisions

Reasons for choosing between methods of hiring taxis

Respondents who had taken a taxi within the month before the survey were asked which factors were relevant to their decisions on how to hire the taxis they used, whether to hail a taxi, to catch it at a rank, or to book it by phone. The results reinforce the *a priori* expectations that consumers' decisions about their methods of hiring taxis are determined largely by the context of the journey. In particular, regardless of the type of taxi taken, that choice was made on the basis that it was the quickest or the most convenient way to catch a taxi.

From the results of the RP survey, it also appears that price does not play a significant role in decisions about what method they use to hire taxis.

Even though people who book taxis by phone are able to phone a number of companies to compare prices, only 2% of respondents cited this as a reason for doing so rather than a hailing a taxi on the street or going to a taxi rank. Only 4% of respondents said that they had chosen to book a taxi by phone rather because it was the cheapest way to take a taxi. Furthermore, less than 2% of respondents who had taken a hackney carriage had tried but failed to book a taxi over the telephone. On the other hand, 29% of those respondents who had booked a taxi by phone stated, as a reason for doing so, that there was no taxi rank or hailing service in the area. These results suggest that operators of hackney carriages do not face significant price pressure from those consumers who could switch between hackney carriages that operate in the hail and rank segments and taxis that operate in the phone-booking segment.

As well as showing relatively limited interaction between the rank and hail segments of the market and the phone-booked segment, the results also show limited interaction between the rank and the street-hailed segments. For example, only 7% of respondents

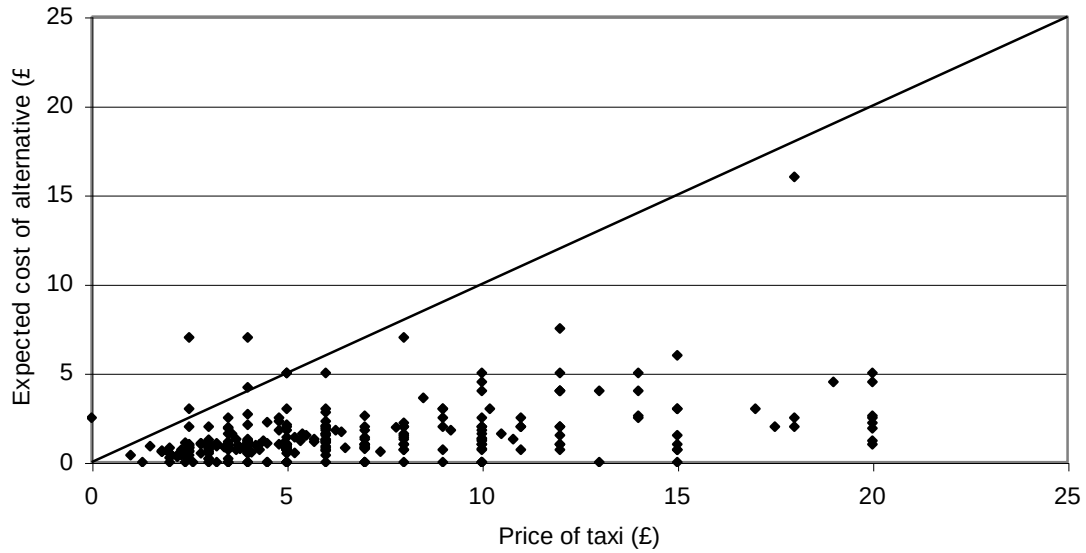
hailed a passing taxi when the respondents were on their way to a taxi rank, while just 3% had hailed a taxi to avoid queues at the nearest rank.

The finding that respondents' decisions about which type of taxi to take are driven largely by the context of their journey rather than factors such as price is an important result and was highly relevant for the design of the SP survey because it emphasised the need to set up the choice contexts very carefully (see section 3.2).

Price of taxis relative to price of alternative forms of transport

Taxi users already pay significantly more for taxis than they expect to pay for alternative forms of transport that were available. This is shown in Figure 2.2, which presents information on the prices paid for respondents' most recent taxi journeys, mapped against the price they would have expected to pay for their preferred alternative form of transport for that particular journey. As this shows, the vast majority of respondents fall below the diagonal (45 degree) line drawn on the chart. In other words, the price that respondents paid for their most recent taxi journey is greater, in some cases significantly so, than the price they expected to pay for their preferred alternative form of transport. While it is not possible to draw any conclusions about how consumers would adjust their behaviour in response to a change in relative prices, this does indicate that taxis provide significant benefits over alternative transport forms, which justify the prices consumers are willing to pay.

Figure 2.2: Taxi price against the expected price of preferred alternative transport form



Note: Expected cost of alternative was asked for those who would have taken a public bus/tram, coach or train/tube instead of the taxi.
Source: TNS RP data, Q4 and Q7b,

Reasons for not taking a taxi

The RP survey was also used to gather information about the reasons why respondents choose not to take taxis. All respondents, whether or not they had taken a taxi in the preceding month, were asked about a recent situation when they had considered taking a

taxi, but had instead decided to take an alternative form of transport. Respondents were able to give more than one reason for not taking a taxi.

The price of taxis was cited by 23% of respondents as a reason for not taking a taxi, although there was significant regional variation. The percentage of respondents giving price as a reason not to take a taxi was lowest in the North East (11%) and North West (9%) and highest in Northern Ireland (31%) and London (39%).

The second most frequently cited factor was that the waiting time for taxi was too long (15%). Again, there was significant regional variation. In each of the South West, Wales and Scotland, less than 10% of respondents gave this as a reason for not taking a taxi. At the other extreme, 43% of respondents in Northern Ireland gave waiting time as a reason for not taking a taxi.

There were two other factors given by 10% of respondents as a reason for not taking a taxi. The first was that public transport was more convenient. This was highest in London, where 19% of respondents gave this as a reason, and lowest in Northern Ireland, where none of the respondents considered public transport to be more convenient. The second factor was that respondents had not been able to book the taxi for the time needed.

Two further questions were posed to those respondents who had not taken any form of taxi in the month preceding the interviews, which attempted to identify separately why they had not taken a taxi. The responses showed that the reasons for not taking a taxi apply equally to hackney carriages in the rank and hail segments of the market as they do to PHVs booked by phone. The predominant reason given for not using a taxi was that the respondent had a car available to use instead. Price was cited by 14% of respondents—highest in Yorkshire and Humberside (approximately 25%), and lowest in the North West (<5%).

2.3.3 Factors relevant for consumer welfare

Table 2.5 presents a summary of the factors that respondents were asked to rate in order to ascertain which might be more important for consumer welfare. Safety of the vehicle is the most highly rated factor.

Table 2.5: Welfare factors identified in the RP survey (%)

	Low (1–4)	Med (5–6)	High (7–10)
Importance of:			
Safety of the vehicle	2.4	3.9	93.7
Driver's knowledge of the area	3.0	5.4	91.6
Cleanliness of the vehicle	3.7	6.7	89.7
Convenience of the service	3.8	7.7	88.5
Waiting time	5.6	8.4	86.0
Price	4.6	10.0	85.4
The taxi being metered	11.1	10.1	78.9
The total journey time door to door	9.9	17.2	72.9
The traditional look/design of a 'Black cab'	53.3	20.0	26.7

Source: RP Survey, Q1.

The literature examining consumer welfare in relation to taxi services has to a great extent focused on the issues of price and waiting time as the key determinants of welfare—see the accompanying OXERA Paper, 'Taxi Markets Literature Review'. In relation to the pricing factors, consumers rate the overall price they have to pay as more important than whether the price is metered.

With regard to waiting time and total journey time, the former is shown to be the more significant factor in consumer welfare. This supports previous research (Toner and Mackie, 1992), which found that consumers' valuations of waiting times were significantly higher than those of in-vehicle time.

One of the most notable results from Table 2.5 is that more respondents rated quality-of-service measures, such as cleanliness and driver's knowledge, as highly important than did so for price. This result led these factors to be included as attributes to be tested in the context of the SP survey.

Consumers do not appear to rate highly whether the taxi is of a London-style 'Black cab' design. However, this result was not fully supported by the subsequent results that were derived from the SP survey (see section 3.3), which found that, when specifically compared against other types of vehicle (such as people carriers), respondents were prepared to pay a premium for a Black cab. In addition, a breakdown of the overall RP rating by region reveals that a significantly higher proportion of respondents from London than elsewhere value the look/design of the Black cabs.[5]

2.4 Implications of the RP results for SP design

The main implications drawn from the RP survey for the designs of the SP survey were the following.

- Across the country, the RP survey showed that more respondents booked taxis by phone than hailed hackney carriages on the street or caught at ranks for their most recent journey. Therefore, to obtain reliable results for the rank and hail segment users in the SP, it was necessary to over-sample those who use the rank and hail segments.

- The average waiting time of just over nine minutes concealed a relatively wide spread of waiting times. To ensure that realistic scenarios were offered, it was therefore decided to present scenarios that were linked to the time that respondents had actually waited in a recent journey.

[5] On June 4th 2003, Transport for London announced that, following its review of the regulations that cover the design of hackney carriages in London, it has been decided that vehicles must continue to be able to complete a full turn within a radius of just over 7 metres, which in effect limits the type of vehicle that can be used to the Black cab design.

- Consumers' choices about how to hire taxis (phone, rank, or hail) are largely determined by the context of the journey. It was therefore important that the SP designs gave respondents realistic options based on choices between the same type of taxi.

- The RP highlighted a number of quality-of-service factors that warranted exploration in the SP. The SP designs therefore explored respondents' preferences covering a range of quality-of-service issues as well as price and waiting time.

3. Stated-preference Survey

3.1 Introduction

The primary source of data used in this analysis was an SP survey of individuals undertaken by TNS.[6] SP exercises offer individuals choices between hypothetical alternatives characterised by a number of relevant attributes. The choices made indicate the relative importance that individuals attach to the various attributes, and suitable statistical analysis of the choices enables empirical estimates of the importance of the attributes to the individuals. In this research, monetary valuations of the attributes were obtained (see section 3.3 for the results).

SP approaches have a number of advantages over methods based on RP data obtained from actual choices in the market place.

- SP methods avoid the data limitations often apparent in real-world market places:
  - there can be large correlations between key variables, reducing the precision with which their separate effects can be estimated. For example, there will be a high correlation between walking and waiting time if the taxi ranks which are more popular, because of their more convenient location, are also better served;
  - there may be insufficient variation in variables which are of interest, making it difficult to obtain reliable estimates of their effect. For example, the taxi fare may not vary between different ranks or between hailing a taxi and catching it at a rank.
- SP methods offer trade-offs between variables which contain more information and hence provide more precise estimates than for real-world situations. Actual choices between different taxi ranks might provide little information about choices if, for example, hackney carriages using the more convenient ranks charge the same as those using less convenient ones, or if the waiting times do not differ between ranks. These factors can be introduced and controlled by using SP methods.
- SP methods also provide more information than RP methods, since each person is asked to make a series of choices, rather than the single choice of the RP context.
- SP methods can be used when no actual market exists or when the attributes to be considered are outside the range of respondents' current experience. For example,

[6] The design of the SP survey was undertaken by Dr Mark Wardman, Reader in Transport Economics, and Dr Gerard Whelan, Senior Research Fellow, both of the Institute of Transport, University of Leeds, in partnership with OXERA and TNS.

respondents can be given a choice between two operators when, in the consumers' actual experience, only one taxi operator is available—and hence there is no real-life choice.[7]

- The SP design can ensure that what are termed 'soft' or secondary variables are not dominated by the key influences on choice. An example is the treatment of car type or driver quality, the effects of which may not be discerned alongside the key influences of walking time, waiting time and fare.

- There is no measurement error in the model, since the independent variables are presented to individuals 'with certainty'. In RP contexts, respondents might not recall, for example, the fare they paid or how long they had to wait.

SP techniques are an accepted method for analysing travel behaviour, particularly since the pioneering UK value of time study conducted for the Department of Transport in the early 1980s.[8] They have since been widely used in a large number of different contexts, and a number of studies have found a reasonable degree of correspondence between RP and SP models.[9]

3.2 Design procedures

The advantages of SP stem from its approximation to a laboratory-controlled experiment. Although there is no control over the responses provided by individuals, there is *exact* control over the stimuli offered to respondents. The guiding principle in the design of SP experiments is to exploit the benefits that accrue from this ability to control the attributes and their levels.

The SP exercises in this research took the conventional form of pair-wise comparisons. This form of widely used SP exercise involves presenting respondents with two options, where they can choose one or the other (ie, they have a discrete choice). An example

[7] As shown from the results of the RP survey, in many circumstances people do not have a choice as to whether to use a hackney carriage or a PHV. That choice is predetermined by the context of the journey.

[8] MVA Consultants, ITS, University of Leeds and TSU, University of Oxford (1987), 'The Value of Travel Time Savings', Policy Journals, Newbury, UK.

[9] Bradley, M. and Gunn, H. (1990), 'Stated Preference Analysis of Values of Travel Time in the Netherlands', Transportation Research Record, No. 1285, 78–89. Hague Consulting Group and Accent (1999), 'The Value of Travel Time on UK Roads', prepared for the Department of the Environment, Transport and the Regions. Louviere, J.J., Hensher, D.A and Swait, J.D. (2000), *Stated Choice Methods: Analysis and Application*, Cambridge University Press. Oscar Faber TPA (1993), 'Setting Forth: Revealed Preference and Stated Preference Technical Note', prepared for the Scottish Office. Oscar Faber and ITS University of Leeds (1995), 'East Coast Main Line High Speed Demand Forecasting', prepared for Railtrack. TPA (1992), 'Trans-Pennine Rail Strategy Study: Model Calibration and Validation Report', prepared for GMPTE, Merseytravel, SYPTE, WYPTE, Cheshire CC, Derbyshire CC, Humberside CC, Lancashire CC and Peak Park. Wardman, M. (1986), 'Route Choice and the Value of Motorists' Travel Time: Empirical Findings', Working Paper 224, ITS, University of Leeds. Wardman, M. (1988), 'Comparison of Revealed Preference and Stated Preference Models of Travel Behaviour', *Journal of Transport Economics and Policy*, **22**, 71–91. Wardman, M. (2001), 'Public Transport Values of Time', Working Paper 564, ITS, University of Leeds.

where respondents had to choose between hailing a hackney carriage or going to a rank is as follows.[10]

Hail		**Go to taxi rank**	
Walk time to suitable place:	2 minutes	Walk time to rank:	3 minutes
Fare:	£6	Fare:	£5
Waiting time:	1 minute	Waiting time at rank:	1 minute
Car type:	Saloon car	Car type:	Saloon car

This form of discrete-choice SP is used because it is the simplest for respondents to undertake and because it corresponds most closely to real-life decision-making. It is therefore expected to provide more reliable responses than methods based on ranking or rating.

A number of inter-related choices are involved in designing an SP experiment:

- deciding upon the choice context;
- deciding upon the number of variables with which to describe each alternative;
- selecting the number of levels that each variable takes;
- assigning absolute values to the levels;
- determining the number of choices to offer individuals;
- adopting a statistical design procedure;
- testing the design using simulation;
- adjusting the design in light of the simulation results and repeating the simulations.

These factors are each discussed in the following sections.

The design of SP exercises is as much art as science, however, and there are few rules on which all practitioners agree. From a common starting point, any number of final designs could be arrived at, depending on the outcome of a large number of decisions that have to be made. Searching for the 'optimal' design can be very time-consuming and is far beyond the resources available for most projects. That said, a procedure which, by means of 'trial and error', seeks to improve designs on an iterative basis soon experiences diminishing marginal returns. The methods for testing the designs are discussed in section 3.2.7.

3.2.1 Deciding upon the choice context

As the purpose of the study was to estimate the relative valuation of a number of attributes related to the usage of taxi services, an abstract choice context was used. In

[10] The fares were linked to the amounts that respondents had actually paid for a previous journey. The SP design then imposed a fixed absolute difference in fare between the two alternatives (see section 3.2.4).

such contexts, the alternatives do not need to correspond precisely with a real-world choice context. Instead, the influences on respondents' choices should be limited to only those variables presented to respondents and should not be influenced by factors unknown to the analyst.[11] This can be achieved by offering choices between, say, two PHV services (labelled A and B) which are specified to differ solely in terms of, for example, walking time, waiting time and fare.

As highlighted above in relation to the RP survey, hackney carriages can also be booked by phone, providing a degree of overlap between the service provided by hackney carriages and that provided by PHVs. However, as the main focus of the research is the impact of the restrictions on hackney carriages in relation to the rank and hail segments, the design of the SP scenarios focused on this issue and were designed in order to gather information on respondents' choices specifically between PHVs (termed 'minicabs' in the questionnaire) and hackney carriages, which were defined in the questionnaire as those taxis that can be hailed in the street or caught at ranks.

To cover the range of issues of interest to this study, a number of SP choice contexts were used. Most issues were able to be covered by using the abstract choice approach and offering current PHV users 'within-PHV choices' and offering hackney carriage users 'within-hackney-carriage choices'. This had the advantage not only of avoiding extraneous influences, but also of realism, basing the choice context on the market with which the respondent is most familiar.

However, there were some issues, such as vehicle and driver quality and the underlying preferences between PHV and hackney carriage, which made it necessary to use a 'between-mode' exercise offering choices between a PHV and a hackney carriage. This can be done realistically because, by definition, respondents will be familiar with at least one of the alternatives.

The contexts used in this research offered choices between:

- PHV and hackney carriage;
- different ranks (within-hackney-carriage choice);
- hailing and rank hire (within-hackney-carriage choice);
- different PHV companies.

3.2.2 Selecting the number of variables

The alternatives in SP exercises are typically characterised by between three and five attributes. Too many attributes complicate the exercise for the respondent and can lead to lower-quality SP responses. In particular, if too much information is provided to the respondents, they may simply ignore some attributes in order to simplify their choices. On the other hand, too few attributes may make the purpose of the exercise quite

[11] When the main purpose of the SP work is to forecast demand, the choice scenarios need to be related as closely as possible to real-world scenarios.

transparent, and hence encourage strategic responses, or it may simply be unrealistic. Again, an adverse impact on the quality of the SP responses would be expected.

To examine taxi-related preferences, four attributes were chosen to characterise each alternative. This enabled those attributes that the literature had shown to be the principal factors that influence consumer welfare to be examined, in addition to the other quality-of-service related factors that were identified through the RP survey. Restricting the number of attributes to four maintained a manageable exercise and avoided the use of too many different designs.

The main variables examined by this research were fare, waiting time both at home and at the rank, walking time, vehicle cleanliness, driver quality, car type, unreliability in terms of early arrivals, late arrivals and no shows, and metering/charging issues.

3.2.3 Selecting the number of levels

The standard statistical design principles adopted in this study imposed a relatively low limit on the number of levels that an attribute could take. Almost all SP exercises contain attributes with a maximum of five levels, with three or four being typical. This is because increasing the number of levels tends to increase the number of comparisons required by the design procedure. Limiting the number of levels that the respondent has to consider also aids familiarity in what is an hypothetical situation.

In addition, the precision with which the relative valuations (the coefficients of regression) are estimated depends upon, among other factors, the amount of variation in the attribute. Increasing the number of levels that an attribute can take can increase the amount of variation in that attribute, and hence allow results to be obtained in which a greater degree of confidence can be placed.

In this study, variables have been specified at five levels to accommodate the many different categories of driver quality and vehicle cleanliness.

3.2.4 Assigning absolute values to the levels

A fundamental issue when selecting the absolute values of the times and costs to offer individuals is that, even in an abstract-choice context, the values are as realistic as possible. This means that, where necessary, they relate to currently experienced levels. Where the attributes are not currently experienced, the chosen levels must be believable. For example, in most circumstances it would be highly unrealistic for PHVs to be made more expensive than hackney carriages.

The starting point of choosing the levels is therefore to determine reasonable values for situations currently experienced and what the reasonable variation around this level would be. This is relatively straightforward for the walking and waiting time and quality-of-service variables. The results of the RP survey were also used as a guide for setting the levels of the attributes. In some cases, however, it is essential to offer different values to individuals according to their current circumstances. This is the case with fares in this study. Those making longer journeys will have to be offered higher fares for realism. Given that the SP survey was automated, customising the fare levels to individuals' actual circumstances was relatively straightforward. The survey contained some initial RP-type questions, providing information on the amounts paid by the respondent for an actual journey. If respondents could not recall how much they had paid, the base price used in

the SP was based on the median price paid in the RP survey, namely £5. The SP designs then specified variations around those prices.[12]

In addition, when there is a wide range of values that people experience in their real-world choices, it is important to seek to ensure that the scenarios offered represent realistic situations. For example, the RP survey showed that waiting times for a taxi can vary between a few seconds and well over an hour. To offer respondents who would only wait a short time period for a taxi a choice based on waiting 30 minutes would not be realistic. The PHV/hackney carriage choice scenario therefore offered respondents who had waited less than 15 minutes for their reference journey choices based on relatively short waiting times, whereas those who had waited longer than 15 minutes were offered choices based around longer waiting times.[13]

Another issue central to the selection of the attribute levels is that the choices offered must involve trade-offs between attributes. For example, in the choice between different ranks, the walking time to the more remote rank must be higher. The scenario must then include a range of compensating lower fares or better waiting times in order to obtain reliable estimates of the relative importance of these three attributes. It is also essential to ensure that the trade-offs are realistic. In part, this is a function of selecting a sensible choice context, but the manner in which the fieldwork is carried out is also important, as care needs to be taken to explain to the respondents the scenario and why the attributes vary as they do.

It is also sensible to offer more familiar rounded values of attributes. There are no 'hard and fast' rules; common sense judgement was applied when setting the levels used for attributes such as walking and waiting time, which are typically small. For example, it was considered preferable to offer values of 2, 5 and 8 minutes of waiting time rather than 2½, 5 and 7½ minutes. Similarly, it was considered preferable to ensure that time-related attributes differed between alternatives by more than one minute in order to reduce the chances that they were effectively treated as the same and the difference ignored.

In summary, however, there are no definite rules in determining the absolute values of attributes—it is primarily a matter of judgement.

3.2.5 Determining the number of choices to offer

The total number of choices in an SP design is determined through the statistical design rules by the number of attributes included and the number of levels that each of them takes. However, it is not necessary to offer individuals all the comparisons contained in the design.

If too many comparisons are offered, data quality can be expected to fall, as respondents will find the exercise repetitive and boring. On the other hand, offering too few

[12] The variations were specified as absolute amounts, not percentages.
[13] See Q19 in the SP questionnaire, appendix 3.

comparisons is essentially wasteful of data. Most SP exercises offer between 9 and 12 pair-wise comparisons. To obtain the coverage of attributes that was needed for the current research, given the sample size, it was decided to offer each individual two SP exercises: one based around their current type of taxi, and the other involving a choice between PHV and hackney carriage.

The first exercise that respondents were offered was the within-mode choices—ie, the PHV–PHV choice scenario and the two hackney carriage–hackney carriage scenarios. Approximately a third of the sample answered each of these. From the 25 alternatives available in these exercises, respondents were offered 12. The second SP exercise related to the PHV–hackney carriage choice scenario. As everyone in the sample was offered this exercise, they were each given just six choices, again randomly selected from the 25 potentially available.

3.2.6 Selecting a statistical design procedure

Having chosen the attributes and the number of levels that they can take, and assigned absolute values to the levels, a procedure is needed for combining the absolute levels that make up each alternative.

A conventional design procedure was followed, which is used in the vast majority of SP studies. The key feature of this procedure is that it produces orthogonal designs where the attributes are independent of each other. The aim of achieving this zero correlation between the attributes is to obtain coefficient estimates that have higher t-ratios and in which more confidence can therefore be placed than if there were correlation between the attributes.

An iterative process can be involved; once the attributes have been combined, amendments may be made to either the number of levels or to the absolute values in order to produce a better design. For example, the rules to be followed by the orthogonal design procedure may imply that, in some cases, a PHV is more expensive than a taxi, or that a particular rank involves somewhat longer walking and waiting time than another. In such instances, sensible amendments to the design are made.

3.2.7 Testing the design using simulation techniques

This is an important procedure, aimed at testing the adequacy of the SP design from a statistical perspective conditional on expectations of the valuations of the attributes that individuals might reasonably possess.

This procedure involves the creation of synthetic data which mimics how respondents would react to the SP exercise given pre-specifications of:

- weights for each attribute, reflecting their relative importance or valuation;
- the form of utility function, which combines the various attributes into an overall attractiveness of each alternative;
- error terms representing the unobserved influences upon individuals' choices.

The synthetic choice data is then analysed to produce estimates of the parameters of each attribute in the utility function. These parameter estimates can be compared with the values used to create the data and the precision of the parameter estimates can be assessed.

The error terms representing unobservable influences upon choice, such as those variables not explicitly included in the SP exercise or errors in individuals' SP responses, are unknown but will determine the overall goodness of fit of the model. In the simulation testing, the level of error that is allowed to influence choices was selected so that a model goodness of fit was achieved which was similar to that typically achieved in practical studies. Such a goodness of fit is a ρ^2 statistic of around 0.1.

Testing a design for data that contains much less error than might exist in practice is of limited practical use, since that design could only provide robust results if there were an atypically small amount of noise in the SP responses. This would lead to the erroneous conclusion that the design was satisfactory. Similarly, including too much noise in the synthetic data could produce poor simulation results and would imply that what is otherwise a perfectly acceptable design is unsatisfactory.

The utility function used in the simulation procedure is of the conventional linear form. The parameters in the utility function, which determine the values of time and other attributes, are selected to cover a range of possibilities. They are based on any previous available evidence and expectations as to the reasonable range of values that individuals might possess.

The testing of the design involves:

- comparing the actual values used to create the synthetic data with the estimates of those values obtained from analysis of the synthetic data;
- assessing whether the coefficient estimates are sufficiently precise—ie, whether they have satisfactory t-ratios;
- repeating the simulation testing across the identified range of parameter values.

The number of 'individuals' upon which the simulation is based is chosen to be similar to the expected sample size in the actual study. There is little point testing an SP exercise on a sample size that is much larger than is expected to be obtained, since this will result in a false impression of how precise the coefficient estimates might be expected to be. Similarly, if the design is tested on a smaller number of observations than intend to be collected, the likely precision of the coefficient estimates will be understated.

The designs used in this study were tested with simulation to ensure that they are satisfactory and, where necessary, to improve them. The procedure tests only the statistical properties of the design and cannot test its realism, nor can it cast any light on possible problems of response bias—the adequacy of the design is tested conditional upon individuals responding according to their true preferences. Subsequent piloting addresses issues relating to how individuals interpret the SP exercise and identifies problems in wording, explanation and realism.

3.2.8 Amending designs in the light of simulation results

If the simulation tests indicate that the design is not satisfactory, the design is amended and the testing procedure is repeated on the modified design. For example, a common problem is that one of the independent variables is found to have poor t-ratios, particularly compared with the other variables, and the problem is typically that it does not exhibit sufficient variation. The solution to the problem is to increase the range of the variable, although constraints of realism need to be borne in mind.

The designs used in this study were tested with simulation to see whether they were satisfactory and, if not, where they needed to be improved. One initial SP design for the choice between different taxi ranks was rejected because of generally unsatisfactory results, particularly poor precision of the waiting time coefficient and a tendency for large proportions of respondents to choose the nearer rank. This ran the risk that, in practice, too many respondents would choose the nearer rank, which would have had adverse implications for the modelling process.

The design was amended by specifying the more distant rank to generally have a higher waiting time but always making it the cheaper option. In this way the choices involve clearer trade-offs between variables; shorter walking times and less waiting time could be purchased through higher taxi fares.

All other designs were found to be satisfactory from this statistical perspective and did not require amendment.

3.2.9 Pilot exercise

Once the initial design of the questionnaire had been completed, a pilot exercise was undertaken.[14] The main aims were to ensure that:

- the questionnaire successfully collected information about the respondents' reference journey (the price and waiting time of which fed into the subsequent SP exercises);
- the routing in the questionnaire worked;
- the descriptions of the SP exercises were sufficiently well explained and the researchers were able to understand and explain the scenarios;
- respondents understood what they were being asked to do;
- respondents understood the attributes; and
- respondents were making choices based on an assessment of all the attributes in the scenario, and that their choices were not dominated by just one attribute.

Interviews for the pilot and for the main fieldwork were carried out as hall tests by TNS field staff. In this form of survey, individuals were approached on the street and taken to a room or hall where the survey was conducted using a laptop computer.

The results of the pilot exercise showed that the questionnaire was working successfully, and no major changes were made to it before the main fieldwork was undertaken.

3.2.10 Sampling frame and fieldwork

The survey set out to complete a total of 500 interviews in eight locations across Great Britain. This sample size was selected on the basis that it would allow a number of types

[14] The pilot fieldwork was undertaken in Oxford on May 17th 2003.

of disaggregation to be applied to the data, enabling different potential drivers of choice decisions to be investigated (see section 3.3 for a description of the results).

The locations for the sampling points—ie, the location of the hall tests—were determined taking into account the following factors:

- to gather information from respondents in Scotland and Wales;[15]
- to include local authorities across England, including large metropolitan areas and local authorities with smaller populations;
- to include at least one London district;
- to include local authorities with different patterns of regulation;[16] and
- to exclude local authorities where unmet-demand studies had been undertaken for the council.

Taking into account the above factors, the local authorities/areas listed in Table 3.1 were selected as locations to hold the hall tests.[17]

Table 3.1: Sampling points for SP survey

Local authority/area	Population	Number of hackney carriages restricted?	How many licences?	No. of licences per 1000 population
Aberdeen	211,910	Yes	915	4.3
Newport	137,047	No	–	–
Hammersmith, London	165,242	No	–	–
Basingstoke	152,624	Yes	46	0.3
Winchester	107,256	No	–	–
Middlesbrough	134,769	Yes	190	1.4
Liverpool	439,237	Yes	1,417	3.2
Walsall	253,345	Yes	92	0.4

3.3 Results

The principal objective of the work is to define a consumer choice function for the use of taxis, which would allow consumers' relative valuations to be compared. The primary methodology is a conjoint analysis using the results from the SP survey, analysed in a logit framework. This is a probabilistic approach that provides an indication of the impact of different aspects of the service in question on consumers' consumption decisions.

[15] Information on Northern Ireland was collected in the RP survey.
[16] In effect this limited the sampling frame to those local authorities that had responded to the OFT's survey in 2002.
[17] Fieldwork was successfully carried out between May 24th and June 4th 2003.

3.3.1 Model development

Each individual is faced with two options for each choice that they make in the survey. By examining the attributes of each choice, a and b, the consumer makes a selection based on the option that gives the greatest overall expected utility,[18] either U_a or U_b. By systematically choosing between a and b, the respondents are implicitly stating their relative valuations of each of the attributes presented to them.

The development of the models is based upon the multi-nomial logit (below).

$$P_i = \frac{\exp(U_i)}{\sum_n \exp(U_n)}$$

where:

P_i is the probability that the individual will choose option i;
n is the number of choice options;
U_i is the utility of choosing option i, which is a function of the characteristics of the individual and the attributes of the taxi service.

The objective of the models is to identify the factors that determine consumers' usage of taxis, and their relative valuation of different aspects of the taxi service.

Choice models

During model development, the analysis takes specific account of:

- taste variation between individuals;
- correlations between choice alternatives;
- problems due to the non-independence of observations.

The first choice models estimated are relatively straightforward models, as described by the multinomial logit above, from each SP survey. The analysis is then expanded to allow for different market segments to have different tastes and preferences. Interacting the market segments with the attributes described in the survey allows money-metric valuations for different market segments to be obtained.

Market segmentation analysis

In order to examine preferences and taste variation across different market segmentations, the respondents' socio-economic characteristics were included in the modelling. The market segmentations tested were: age; income; time of day the taxi was caught; and car ownership. These same market segmentations are tested for in all the SP surveys detailed in this report, using likelihood ratio tests, as described below.

[18] Utility refers to the satisfaction or pleasure that a consumer derives from the consumption of the service.

In order to estimate the differences in valuations between market segmentations, dummy variables were created for each segmentation and the attribute to be examined was interacted with each dummy variable.

There are two well-documented approaches to analysis by market segmentation. The first involves an application of the likelihood ratio test and the second involves estimating specific coefficients for each segmentation.[19] To undertake the likelihood ratio test, the data is classified into market segments and separate models are estimated with identical specifications for each segment. The hypothesis that the coefficients are the same across segments would then be tested.

$$H_0 : \beta^1 = \beta^2 = ... = \beta^g$$

where β^g are the coefficients for market segment g = 1, … G.

The null hypothesis of equal coefficients is rejected if:

$$-2\left[L_N(\hat{\beta}) - \sum_{g=1}^{G} L_{Ng}(\hat{\beta}^g) \right] > \chi^2_{df}$$

where

- $L_N(\hat{\beta})$ is the final log-likelihood of the pooled model;
- $L_{Ng}(\hat{\beta}^g)$ is the final log-likelihood of the segment *g* model;
- df is the degrees of freedom $\sum_{g=1}^{G} K_g - K$, where K_g is the number of coefficients in the segment *g* model.

The advantage of the likelihood ratio test is that it is simple to compute; however, if there are many segmentations, the number of observations for each model can become small and the application of the model to forecasting can become complex.

The alternative approach to the likelihood ratio test is to use segment-specific coefficients on the attribute values. This can be done in an absolute or incremental way.

$$U_i = \beta_i^{Segment_1} D^{Segment_1} X_i + \beta_i^{Segment_2} D^{Segment_2} X_i + .. + \beta_i^{Segment_n} D^{Segment_n} X_i$$

$$U_i = \beta_i X_i + \beta_i^{Segment_2} D^{segment_2} X_i + .. + \beta_i^{Segment_n} D^{segment_n} X_i$$

[19] Ben-Akiva, M. and Lerman, S.R. (1985), *Discrete Choice Analysis*, Cambridge: MIT Press.

where $D^{segment_n}$ is equal to 1 for observations in segment n, otherwise zero.

The equation below shows the absolute specification in which a separate coefficient is estimated for each segment. If there is a model constant, only n – 1 constants can be specified. To examine differences between segments, the coefficients and standard errors should be compared using an asymptotic t-test:

$$\frac{\beta_i^{Segment_1} - \beta_i^{Segment_2}}{\sqrt{var(\beta_i^{Segment_1}) + var(\beta_i^{Segment_2})}}$$

The equation above shows an incremental approach to testing market segmentations. Here, one or more segmentations are selected as the base and other segmentations are examined relative to that base. In the example shown, the coefficient for the base segment is given by β_i and the coefficient for segment 2 is $\beta_i + \beta_i^{Segment_2}$.

Accounting for repeat observations

Each individual made several choices for each SP question they answered. The multinomial logit function described above assumes that each observation is independent (each observation is a choice between two different levels of the attributes). Having several choices from each individual reduces the informational content of the dataset and leads to non-independent observations. This does not bias the coefficient itself, but it does create an upwards bias on the t-statistic, implying a greater degree of significance than is actually present.

The standard-error problems associated with the repeat-choice nature of SP data are addressed using jack-knife techniques, as recommended by Cirillo, Daly and Lindveld.[20] The approach suggested is to systematically omit a small fraction of the data creating sub-samples of the data, to estimate a series of models using the sub-samples and then to compute the required coefficient estimates and standard errors from these models. This re-sampling procedure allows non-biased estimates of the standard error to be obtained, which, in turn, allows accurate estimates of the significance of the coefficients to be calculated using a standard t-statistic.

To undertake a jack-knife routine, the sample is divided into R groups and form R jack-knife sub-samples, where deleting one of the groups from the sample forms each sub-sample.

The jack-knife variance estimate is formed as follows:

[20] Cirillo C., Daly A. and Lindveld C. (2000), 'Eliminating bias due to the repeated measurements problem in SP data', in J.D. de Ortuzar (ed), 'Stated Preference Modelling Techniques', PTRC Perspectives 4, PTRC Education and Research Services Ltd, January.

$$v_j = \frac{R-1}{R}\sum_{r=1}^{R}(t_j - t)^2$$

where t_j is the estimate produced from the replicate with the jth group deleted, and t is the estimate produced from the full sample.

The unbiased t-statistic is then calculated as:

$$t = \frac{\hat{\beta}}{se(\hat{\beta})}$$

where $\hat{\beta}$ is the estimated value of the coefficient and se($\hat{\beta}$) is the standard error obtained from the jack-knife procedure. This t-statistic can be interpreted in the standard way.

3.3.2 Results of the SP analysis

Each SP survey is designed to test a certain hypothesis that consumers value an attribute differently under different circumstances or when they have different socio-economic characteristics.

The scenarios that were set, and the group of respondents to whom these exercises were given, are summarised in Table 3.2. Each respondent was given two SP exercises during their interviews: the first was linked to a recent journey they had taken and about which details were collected in the opening questions; the second was a purely hypothetical scenario.

Table 3.2: Summary of the SP exercises and respondents

	Scenario	Respondents
	1st SP exercise	
SP1	Flag down vs. rank	Those who had recently hailed a hackney carriage
SP2	Rank vs. rank	Those who had recently hired a hackney carriage from a rank
SP3	PHV vs. hackney	Those who had recently hired a PHV for immediate use
SP4	PHV vs. PHV	Those who had recently booked a PHV in advance
	2nd SP exercise	
SP5	PHV vs. hackney	Those previously asked SPs 1, 2 or 4
SP6	PHV vs. PHV	Those previously asked SP3

SP1: Flag down versus rank

The first SP survey, SP1, estimates a simple multinomial logit, without interactions, to obtain initial estimates of respondents' valuations of waiting time, walking time and different car types.

SP1 offered respondents a choice between hailing a hackney carriage or waiting at a rank. The survey was designed to test whether consumers have a preference between the two methods of obtaining a hackney carriage. It also generated valuations of waiting time and

walking time, as well as whether customers would be willing to pay extra for different types of vehicle.

Relative values are obtained for attributes by taking the ratio of the marginal utilities with respect to the 'quality of service' attribute and the relevant fare coefficient.

The utility function for each option was specified as:

$$U = \alpha_0 + \alpha_1 Fare + \beta Wait + \delta Walk + \gamma_1 PC + +\gamma_2 MB + \gamma_3 BC$$

Where, *Fare* is the cost of the journey, *Wait* is the amount of waiting time in minutes, *Walk* is the amount of walking time to the rank in minutes, *PC* is 'people carrier', *MB* is 'Mercedes Benz' and *BC* is 'Black cab'.

Table 3.3: SP1 model results

	Original estimates	Jack-knife estimates
Alternative-specific constant (ASC)	0.972 (5.6)	0.966 (4.6)
Fare (pence)	–0.004 (–3.4)	–0.004 (–3.0)
Walk (minutes)	–0.154 (–6.5)	–0.151 (–5.4)
Wait (minutes)	–0.083 (–4.3)	–0.081 (–4.1)
People carrier	0.283 (1.6)	0.283 (1.9)
Mercedes	0.520 (3.0)	0.517 (3.3)
Black cab	0.656 (3.8)	0.651 (4.0)
Log likelihood (constants)	–863.36531	
Final log likelihood	–759.25627	
Number of observations	1513	

Note: t statistics shown in brackets.

The model shows a good fit for a logistic regression with a ρ^2 of 0.27. (Values of ρ^2 between 0.2 and 0.4 are indicative of extremely good model fits for logistic regressions.)[21]

The 'Original estimates' column contains coefficients and t-statistics (in brackets) for the straightforward multinomial logit, which may be biased, as discussed in section 3.3.1. The 'Jack-knife estimates' column provides estimates of the coefficients and t-statistics when a re-sampling jack-knife routine has been run to provide unbiased estimates of the significance of the coefficients.

t-statistics are provided in brackets and show whether or not a coefficient is significant. The critical values are dependent on the size of the dataset. However, as a rule of thumb,

[21] Louviere, J.J. (2000), *Stated Choice Methods: Analysis And Applications*, Cambridge University Press.

in large datasets (such as here), an explanatory variable is statistically significant if its t-statistic exceeds 1.96 using a 5% significance level test.

A positive coefficient indicates that consumers' utility increases the more they have of the explanatory variable, whereas a negative coefficient indicates utility is diminished when more of the explanatory variable is present. The coefficients in Table 3.3 show intuitively correct signs, with utility decreasing as fare, walking time and waiting time increase. The size of the coefficient gives consumers' relative valuation of each attribute. In this example, consumers are less sensitive to price than they are to waiting times and walking times.

The coefficients on each of the vehicle type dummies show that consumers' utility is increased (as the coefficient has a positive sign) by having a people carrier, Mercedes or Black cab over a standard saloon (the dummy for standard saloon is omitted so each of the coefficients are relative to a standard saloon). The constant term is labelled as ASC (alternative-specific constant). In choice modelling, the constant is attached to one choice and can be interpreted as an inherent preference for one option over another. In SP1, the constant is attached to the hailing option and is significant. This implies that, in this exercise, respondents showed an inherent preference for hailing a taxi over waiting at a rank. A valuation of this preference can be undertaken by dividing the coefficient on the constant (0.996 from the unbiased jack-knife estimates) by the coefficient on fare (–0.004). There is a strong preference of £2.41 towards hailing rather than waiting at a rank, and this can be seen in respondents' high relative valuation of walking time compared with waiting time in Table 3.4.

The money-metric valuations are calculated by dividing the coefficient of the attribute in question by the coefficient on fare. For example, for walking time, the relative attribute value is calculated as –0.151/ –0.004 = 36.86.[22] Table 3.4 gives the relative attribute valuations of walking time, waiting time and the availability of people carriers, Mercedes and Black cabs.

Table 3.4: SP1 relative attribute values

Walk (p/minute)	Wait (p/minute)	People carrier (p)	Mercedes (p)	Black cab (p)
36.86	19.76	68.97	125.95	158.72

Note: All attributes were significant at the 5% level, except people carrier.

When examining the significance of vehicle types, Mercedes and Black Cabs were found to be significant at 5%, with respondents willing to pay £1.26 and £1.59 respectively for different vehicle types over and above a standard saloon. The people carrier option was not significant, which may reflect the relatively low frequency of demand for vehicles capable of carrying more than four occupants.

[22] Differences between the table and the text in the calculations for relative attribute values appear as a result of rounding.

SP2: Rank versus rank

SP2 offers respondents a choice between two ranks, one with a longer waiting time and walking time but a lower price. The survey is designed to test how respondents value waiting time and walking time.

Analysis of the market segmentations using likelihood ratio tests (as described in section 3.3.1) showed only household income to be significant. Household income was broken down into five bands:

- under £10,000 per annum;
- £10,001–£20,000 per annum;
- £20,001–£50,000 per annum;
- £50,001+ per annum;
- income unknown.

Individuals were allocated a dummy variable depending on which income band they fell into. The level of fare was interacted with each of the dummy variables to enable relative valuations for each income group to be obtained. Not all the dummy variables can be included, otherwise the model would exhibit perfect multi-collinearity, so one band has to be dropped and the estimated coefficients are relative to the missing band. In this instance income less than £10,000 per annum was excluded and all income coefficients reflect the preferences of respondents relative to those respondents with incomes under £10,000 per annum.

The full utility function for each option was specified as:

$$U = \left(\alpha_0 + \sum_{i=1}^{n} \alpha_i D_i \right) \text{Fare} + \beta \text{Wait} + \delta \text{Walk} + \gamma_1 \text{PC} + + \gamma_2 \text{MB} + \gamma_3 \text{BC}$$

where D is the vector of income dummy variables which are interacted with the fare variable; and PC is ‘people carrier’, MB ‘Mercedes Benz’ and BC ‘Black cab’. Using this specification of the utility function the fare coefficient for each market segmentation is given as the sum of the base fare coefficient (for those with income under £10,000 per annum) plus the fare coefficient for the relevant income band. For example, from the results shown in Table 3.5, the fare coefficient for a respondent with an income of between £20,001 and £50,000 per year is: –0.0148 + 0.0103 = –0.0045

Table 3.5: SP2 model results

	Original estimates	Jack-knife estimates
ASC	1.3940 (5.9)	1.3878 (5.8)
Fare		
Base (pence)	–0.0152 (15.2)	–0.0148 (7.4)
Income £10–£20k	0.0059 (5.9)	0.0053 (1.8)
Income £20–£50k	0.0107 (10.7)	0.0103 (5.2)
Income >£50k	0.0141 (7.1)	0.0124 (2.5)
Unknown income	0.0087 (8.7)	0.0083 (4.2)
Wait (minutes)	–0.1356 (5.2)	–0.1329 (4.7)
Walk (minutes)	–0.0908 (5.0)	–0.0881 (4.9)
People carrier	–0.4027 (2.3)	–0.3894 (1.9)
Mercedes	–0.2010 (1.1)	–0.1921 (1.4)
Black cab	–0.3335 (1.9)	–0.3114 (1.3)
Log likelihood (constants)	–903.1266	
Final log likelihood	–781.0971	
Number of observations	1,850	

Note: t statistics shown in brackets.

The model shows a reasonable fit to the data (ρ^2=0.14).

The coefficients on each of the income interactions show that those with incomes above £10,000 per annum are less sensitive to price. For example, the fare coefficient for those with an income of between £20,001 and £50,000 per year is: –0.0148 + 0.0103 = –0.0045, compared with –0.0148 for those with incomes less than £10,000 per annum.

The ASC favours the nearest rank with frequent services and a higher price, but there are arguably counterintuitive preferences for vehicle types other than saloons, as they have negative signs that were not present in SP1. The jack-knife estimates of the standard errors show that they are not significant at the 5% confidence level, and hence the relative attribute values are not displayed in Table 3.6.

Table 3.6: SP2 relative attribute values (p/minute)

	Waiting time	Walking time
Base (income <£10k)	8.98	5.95
Income £10k–£20k	13.99	9.27
Income £20k–£50k	29.53	19.58
Income >£50k	55.38	36.71
Income unknown	20.45	13.55

When the jack-knife procedure was run the interaction between fare and income £10,000–£20,000 became insignificant. The results are included because when the income dummy variables were tested as a group using the likelihood ratio test, they were significant as a whole in explaining respondents' choices.

Table 3.6 shows that the higher the respondent's income, the higher the values of walking and waiting time. Respondents earning over £50,000 per annum were not at all sensitive to cost and therefore have very high values of time.

A large proportion of respondents did not reveal their income and hence a dummy variable was included to control for observations where the income was not known.

The values of waiting time are of a similar magnitude to those found by Toner and Mackie:[23]

- waiting time: 7.4p/min up to 23p/min;
- walking time: 7.8p/min to 25p/min;
- in-vehicle time: 2.1p/min.

SP3: Private hire versus hackney carriage

SP3 offered respondents a choice between two types of taxi: a PHV and a hackney carriage. The survey was designed to test whether consumers value having a metered fare or not, and whether they would be willing to pay for better drivers and cleaner vehicles.

Analysis of the market segmentations using likelihood ratio tests (as described in section 3.3.1) showed only household income above £10,000 per annum to be significant. The utility function for each option was specified as:

$$U = \left(\alpha_0 + \sum_{i=1}^{n} \alpha_i D_i\right) Faremet + \left(\alpha_1 + \sum_{i=1}^{n} \alpha_i D_i\right) Fareunmet + \left(\alpha_2 + \sum_{i=1}^{n} \alpha_i D_i\right) Fare\,\mathrm{var} + \beta Wait + \delta WaitLong + \gamma_{1i} Clean_i + \gamma_{2i} Driver_i$$

where:

- *D* is a vector of market segmentation dummy variables (in this case, income);
- *Faremet* is the fare paid on a meter;
- *Fareunmet* is the fare paid to an unmetered taxi;
- *Farevar* is the expected price when the fare is variable between two prices;
- *Wait* is the expected waiting time for respondents who waited less than 15 minutes;
- *Waitlong* is the expected waiting time for those who waited longer than 15 minutes;
- *Clean* is a vector of dummy variables describing the cleanliness of the taxi;
- *Driver* is a vector of dummy variables describing the qualities of the driver of the taxi.

The levels of the cleanliness variables are given in Table 3.7.

[23] Toner, J.P. and Mackie, P.J. (1992), 'The Economics of Taxicab Regulation: A Welfare Assessment', paper presented at the Sixth World Conference on Transport Research, Lyon.

Table 3.7: Cleanliness variables

Name	Description
Clean1	Very clean, less than 3 years old
Clean2	Quite clean, less than 3 years old
Clean3	Very clean, 4–10 years old
Clean4	Quite clean, 4–10 years old
Clean5	Quite clean, over 10 years old
Clean6	Grubby interior, over 10 years old

The levels of the driver quality variables are given in Table 3.8.

Table 3.8: Driver quality variables

Name	Description
Drive1	Excellent driving, good knowledge of route and destination
Drive2	Excellent driving, poor knowledge of route and destination
Drive3	Acceptable driving, good knowledge of route and destination
Drive4	Acceptable driving, poor knowledge of route and destination
Drive5	Bad driving, good knowledge of route and destination
Drive6	Bad driving, poor knowledge of route and destination

Using this specification of the utility function, the fare coefficient for each market segmentation is given as the sum of the base fare coefficient plus the fare coefficient for the relevant market segmentation. Table 3.9 show the coefficients for the model specified above.

Table 3.9: SP3 model results

	Original estimates	Jack-knife estimates
Constant	–0.230 (–0.4)	–0.203 (–0.3)
Faremet	–0.003 (–3.49)	–0.003 (–3.0)
Fareunmet	–0.003 (–3.19	–0.003 (–2.6)
Farevar	–0.004 (–3.82	–0.004 (–3.1)
Fmet_income<10	–0.002 (–3.15)	–0.002 (–1.9)
Funmet_income<10	–0.003 (–3.26)	–0.003 (–2.2)
Fvar_income<10	–0.003 (–2.95)	–0.003 (–2.1)
Wait	–0.010 (–0.56)	–0.008 (–0.5)
Waitlong	–0.074 (–4.14)	–0.067 (–1.4)
Clean3	0.023 (0.09)	0.023 (0.1)
Clean4	0.071 (0.36)	0.073 (0.4)
Clean5	–0.141 (–0.86)	–0.136 (–1.0)
Clean6	–0.333 (–1.18)	–0.311 (–1.1)
Drive2	–0.441 (–0.83)	–0.472 (–1.0)
Drive3	–0.566 (–1.13)	–0.588 (–1.2)
Drive4	–0.893 (–0.92)	–0.940 (–1.0)
Drive5	–1.524 (–1.38)	–1.562 (–1.5)
Drive6	–1.265 (–2.59)	–1.265 (–2.7)
Log likelihood (constants)	–1,104.0289	
Final log likelihood	–1,031.6048	
Number of observations	1,685	

Note: t statistics shown in brackets.

The model has a ρ^2 of 0.117, which is adequate for a logistic regression.

The three fare variables capture individuals' reactions to different types of fare: metered, unmetered and variable. They all have a negative sign, indicating that consumers' utility falls as price increases. Testing the coefficients for a significant difference between all three does not reveal a significant preference between the types of fare offered.

The coefficients on the worst driver quality and cleanliness variables are negative, indicating that consumers are prepared to pay to avoid poor drivers and dirty vehicles, although only the worst driver quality variable is significant and none of the cleanliness coefficients was significant.[24] Significant negative coefficients indicate that consumers dislike that factor relative to the base case.

[24] Both clean1 and clean2 were included in the base group as there was insufficient variation in the data to enable the model to run when clean2 was included as a separate variable.

The waiting time was split into two variables. One for those who had waited less than 15 minutes (wait) and one for those who had waited longer than 15 minutes (waitlong) for their last journey from the initial RP-style questions at the start of the survey. The intention was to capture the non-linearity of consumers' valuations of waiting times. The model finds that those who wait longer than 15 minutes have a lower level of utility than those who wait less than 15 minutes.

The ASC is insignificant, implying that there is no inherent preference for respondents to choose either PHVs or hackney carriages. Relative attribute values can be obtained for reliability and punctuality by taking the ratio of the marginal utilities with respect to the 'quality of service' attribute and the relevant fare coefficient. Relative attribute values for each market segmentation are shown in Table 3.10.

Table 3.10: SP3 relative attribute values (pence)

	Wait	Waitlong	Clean3	Clean4	Clean5	Clean6	Drive2	Drive3	Drive4	Drive5	Drive6
Faremet											
base	2.53	20.89	–7.19	–22.59	42.27	96.28	146.16	182.22	291.35	483.79	391.93
income<10	1.46	12.11	–4.17	–13.09	24.49	55.79	84.69	105.59	168.82	280.32	227.10
Fareunmet											
base	2.74	22.69	–7.81	–24.53	45.91	104.57	158.75	197.91	316.44	525.45	425.68
income<10	1.31	10.83	–3.73	–11.70	21.90	49.89	75.73	94.42	150.96	250.67	203.08
Farevar											
base	2.27	18.78	–6.47	–20.31	38.00	86.56	131.41	163.83	261.94	434.95	352.37
income<10	1.24	10.24	–3.53	–11.07	20.72	47.20	71.65	89.33	142.82	237.16	192.13

Note: Only those results that are in bold text were significant at the 5% level.

Three different fares were presented in this survey and attribute valuations are displayed for each fare type: metered, unmetered and variable. The three sets of valuations are consistent with each other and are not statistically different from each other.

The results for the base category (those with income above £10,000 per annum) show a low valuation of waiting time for short periods of less than 15 minutes, but a much higher valuation for longer periods, of around 21p per minute. Those with incomes below £10,000 per annum had consistently lower valuations of waiting time, driver quality and vehicle cleanliness.

In Table 3.10, only the very worst driver quality was significant and respondents showed a very large negative response to poor driving and poor cleanliness in vehicles. This result indicated that, given a choice between a taxi with 'Excellent driving, good knowledge of route and destination' and one with 'Bad driving, poor knowledge of route and

destination', respondents earning over £10,000 per year would pay between £3.52 and £4.26 to hire the former.[25]

SP4 and SP6: Private hire versus private hire

SP4 and SP6 both offered respondents a choice between two PHV firms, one of which is always on time but charges a higher price, and another which is sometimes late or early but charges less. Only respondents whose last taxi journey was booked in advance answered SP4; those whose last journey was for a taxi booked over the phone for immediate use answered SP6. Otherwise the construct of the exercises was identical. The survey is designed to test how respondents value the reliability and punctuality of PHVs.

A number of different market segmentation dummy variables were interacted with the fare variable to allow the valuations of reliability between different groups of respondents to be explored in more depth. This segmental analysis showed that respondent income was not found to have a significant impact on choice. The utility function for each option was therefore specified as:

$$U = \left(\alpha_0 + \sum_{i=1}^{n} \alpha_i D_i \right) \text{Fare} + \beta \text{Early} + \delta \text{Late} + \gamma \text{NoShow}$$

where D is a vector of the market segmentation dummy variables specified above and Early, Late and NoShow are dummy variables for the punctuality of the taxi. The alternative-specific constant was not specified in this SP because there should be no systematic choice between the two options.

Table 3.11: Model results SP4—booking in advance

	Original estimates	Jack-knife estimates
Fare (pence)	–0.0039 (–3.39)	–0.0039 (–2.97)
Early (percent)	–0.0311 (–3.67)	–0.0314 (–4.58)
Late (percent)	–0.0471 (–5.39)	–0.0466 (–6.34)
No-show (percent)	–0.1153 (–4.26)	–0.1148 (–4.51)
Log likelihood (constants)	–548.1551	
Final log likelihood	–522.8889	
Number of observations	959	

Note: t statistics shown in brackets.

[25] Had the intermediate results proved significant it would have been possible to derive valuations for the separate components of driving quality and route knowledge included in this quality variable. For example, it would have been possible to derive a valuation for acceptable driving over bad driving, given good knowledge of the route as the difference between the valuations (£4.83 – £1.82 = £3.01).

Table 3.12: Model results SP6—booking for immediate use

	Original estimates	Jack-knife estimates
Fare (pence)	–0.0039 (–2.82)	–0.0038 (–3.33)
Early (percent)	–0.0316 (–3.12)	–0.031 (–3.76)
Late (percent)	–0.0546 (–5.25)	–0.0538 (–6.26)
No-show (percent)	–0.1698 (–5.36)	–0.1665 (–6.73)
Log likelihood (constants)	–418.0590	
Final log likelihood	–391.1599	
Number of observations	836	

Note: t statistics shown in brackets.

Relative attribute values for advance bookings and for booking for immediate use are shown in Table 3.13.

Table 3.13: SP4 & SP6 relative attribute values (pence)

	Each percent early	Each percent late	Each percent no show
Advance bookings	8.1	12.0	29.4
Bookings for immediate use	8.2	14.2	43.8

Different market segmentations were analysed, but this revealed that a number of segmentations showed an unreasonably high valuation of reliability. These results are therefore not presented. The relative attribute values for the overall group of respondents show that they are prepared to pay 8p to reduce the chance that their taxi will arrive early by one percentage point, and between 12p and 14p to reduce the risk of it arriving late. There is an even stronger willingness to pay to reduce the risk of a 'no show', with the relative valuations at 29p for advance bookings and 44p for immediate bookings to reduce the risk of a no show by one percentage point.

SP5: Private hire versus hackney carriage

SP5 is similar to SP3 in that it offers respondents a choice between two types of taxi: a PHV and a hackney carriage. This survey is designed to test whether the fact that a respondent hails a taxi from home has a significant impact on consumers' valuations of different fares and time. The survey also controls for the availability of a car and whether this affects relative valuations.

Analysis of potential market segmentations using likelihood ratio tests showed the following market segmentations to be significant:

- booking the taxi at home or out in town;
- time of day (daytime, evening, night);
- age of respondent (<30, 30–60, >60 years).

Each of these market segmentation dummy variables was interacted with the fare variable to allow more accurate valuations of punctuality to be collected.

The utility function for each option was specified as:

$$U = \left(\alpha_0 + \sum_{i=1}^{n} \alpha_i D_i\right) Faremet + \left(\alpha_1 + \sum_{i=1}^{n} \alpha_i D_i\right) Fareunmet + \left(\alpha_2 + \sum_{i=1}^{n} \alpha_i D_i\right) Farevar + \beta Wait + \gamma_{1i} Clean_i + \gamma_{2i} Driver_i$$

where:

- *D* is a vector of market segmentation dummy variables (in this case, availability of a car and whether the respondent was at home or not);
- *Faremet* is the fare paid on a meter;
- *Fareunmet* is the fare paid to an unmetered taxi;
- *Farevar* is the expected price when the fare is variable between two prices;
- *Wait* is the expected waiting time;
- *Clean* is a vector of dummy variables describing the cleanliness of the taxi;
- *Driver* is a vector of dummy variables describing the qualities of the driver of the taxi.

The levels of the cleanliness and driver quality variables are defined in Tables 3.7 and 3.8 above.

Using the above specification of the utility function the fare coefficient for each market segmentation is given as the sum of the base fare coefficient plus the fare coefficient for the relevant market segmentation. The results of the above multinomial logit are shown in Table 3.13.

Table 3.13: SP5 model results

	Original estimates	Jack-knife estimates
Constant	–0.836 (–1.4)	–0.781 (–1.3)
Fare metered	–0.003 (–2.9)	–0.003 (–2.3)
Fare unmetered	–0.004 (–3.3)	–0.003 (–2.6)
Fare variable	–0.003 (–3.0)	–0.003 (–2.4)
Fare metered (away)	0.001 (2.2)	0.001 (1.6)
Fare unmetered (away)	0.001 (1.9)	0.001 (1.5)
Fare variable (away)	0.001 (0.7)	0.001 (0.6)
Fare metered (nocar)	–0.003 (–4.0)	–0.003 (–2.9)
Fare unmetered (nocar)	–0.002 (–2.9)	–0.002 (–2.4)
Fare variable (nocar)	–0.002 (–2.7)	–0.002 (–2.3)
Wait	–0.045 (–2.4)	–0.042 (–2.0)
Clean3	0.253 (0.9)	0.257 (0.9)
Clean4	0.226 (1.1)	0.234 (1.1)
Clean5	–0.135 (–0.8)	–0.132 (–0.8)
Clean6	–0.305 (–1.0)	–0.278 (–0.8)
Drive2	–0.318 (–0.6)	–0.372 (–0.7)
Drive3	–0.142 (–0.3)	–0.196 (–0.4)
Drive4	–0.506 (–0.5)	–0.611 (–0.6)
Drive5	–0.937 (–0.8)	–1.044 (–0.9)
Drive6	–0.752 (–1.5)	–0.784 (–1.6)
Log likelihood (constants)	–1,201.8756	
Final log likelihood	–1,025.4789	
Number of observations	2,169	

Note: t statistics shown in brackets.

The model has a ρ^2 of 0.325, which signifies a very good fit for a logistic regression.

The ASC is insignificant, implying that there is no inherent preference for respondents to choose either a hackney carriage or a PHV. As in SP3, there is no statistical difference between the types of fare and their impact on consumers' utility, those catching a taxi away from home are less sensitive to fare than those booking from home.

Individuals without access to a car are highly sensitive to fare compared with car users. This may well be due to the correlation between car ownership and income.

Relative attribute values for each market segmentation are shown in Table 3.14.

Table 3.14: SP5 relative attribute values (pence)

	Wait	Clean3	Clean4	Clean5	Clean6	Drive2	Drive3	Drive4	Drive5	Drive6
Faremet										
base	**14.17**	–86.28	–78.48	44.24	93.35	124.98	65.67	205.09	350.58	263.35
away	**26.41**	–160.82	–146.27	82.47	174.00	232.96	122.41	382.27	653.44	490.86
no car	**7.66**	–46.67	–42.45	23.93	50.50	67.61	35.53	110.94	189.64	142.46
Fareunmet										
base	**12.16**	–74.06	–67.37	37.98	80.14	107.29	56.37	176.05	300.94	226.06
away	**20.85**	–126.94	–115.47	65.10	137.35	183.89	96.63	301.76	515.81	387.48
no car	**7.27**	–44.25	–40.25	22.69	47.88	64.11	33.69	105.20	179.82	135.08
Farevar										
base	**13.44**	–81.86	–74.46	41.98	88.57	118.58	62.31	194.59	332.62	249.86
away	**16.70**	–101.68	–92.49	52.14	110.02	147.30	77.40	241.70	413.16	310.36
no car	**7.86**	–47.87	–43.54	24.55	51.79	69.34	36.43	113.78	194.50	146.10

Note: Only those results that are in bold text were significant at the 5% level.

Attribute valuations are displayed by fare type: metered, unmetered and variable. The negative valuations are due to having a positive coefficient on clean3 and clean4, which are divided by a negative fare coefficient. All the cleanliness and driver quality variables are statistically insignificant, and therefore the relative valuations should not be relied upon.

The results for the base category (those at home with a car) show a valuation of waiting time between 12p and 15p/minute. No statistical difference was found between the different types of fare: metered, unmetered and variable.

Respondents without access to cars had consistently lower valuations of waiting times, in line with having expectations of transport times based on public transport. However, they also had a greater negative response to driver quality and vehicle cleanliness than those with access to a car.

4. Conclusions from the SP survey

This section draws together the results of the estimates of respondents' valuations from the six SP exercises reported in section 3.

4.1 Valuations of waiting time

Of the six SP exercises, four provided estimates of respondents' valuation of waiting time in the different scenarios presented. The statistically significant estimates that were generated are presented in Table 4.1.

Table 4.1: Values of waiting time (p/minute)

		Value of waiting time
SP1 (flag down vs. rank)	Base (entire SP1 sample)	20
SP2 (rank vs. rank)	Base (income <£10k)	9
	Income £10k–£20k	14
	Income £20k–£50k	30
	Income >£50k	55
	Income unknown	20
SP3 (PHV vs. hackney)		**waitlong**[1]
Faremet	base (income >£10k)	21
	income<10	12
Fareunmet	base (income >£10k)	23
	income<10	11
Farevar	base (income >£10k)	19
	income<10	10
SP5 (PHV vs. hackney)		**wait**
Faremet	base (home and with car)	14
	away	26
	no car	8
Fareunmet	base (home and with car)	12
	away	21
	no car	7
Farevar	base (home and with car)	13
	away	17
	no car	8

Note: [1] SP3 enabled analysis of non-linearities in respondents' valuations of waiting time. These results relate to 'waitlong', the waiting time variable for those who were asked about choices involving waiting times of between 15 and 25 minutes. None of the estimates of valuations for the shorter waiting times was significant.

The valuations of waiting time presented in Table 4.1 provide a set of estimates that correspond to expectations. For example, the lowest valuations of waiting time were estimated in SP5, which found that those respondents without access to a car had valuations of only 7p–8p/minute. This compares with a range of valuations from 16p to 26p/minute for respondents who were considering a journey when they were away from home, and between 12p and 14p/minute for the base case, which, for SP5, represents

those respondents who were considering a journey from their home, and had access to a car.

People without access to a car can be expected to have lower valuations of waiting time because their alternative for the taxi journey would be to go by public transport rather than by private car. Their valuations would incorporate their expectations of the relatively longer transport times based on public transport. Valuations for waiting times away from home can be expected to be higher than those for people starting their journeys from home for a number of reasons, including, for example, the greater likelihood that people will be able to use the waiting time to do something else when they are at home and the probability that people will be in the comfort of their own homes during the waiting time.

The results from SP2 show that respondents' valuations of waiting time rise in accordance with their income: the higher their income, the higher their valuation of waiting time, rising to a maximum of 55p/minute for the highest income earners.

SP3 provides further evidence that those with lower incomes value their time lower than others. In that scenario, the same income groups as proved significant in SP2 were tested, but, of these, only the estimate for those on the lowest incomes was significant. Respondents in the higher income groups are therefore included in the base case in these results. Respondents in the lowest income group valued waiting time at approximately half the value that the others in the analysis placed on it.

While the results do not provide a single overall figure for the valuation of waiting time, a value of 20p/minute is a reasonable central estimate based on this research. The range of 8–30p/minute would include all but one of the estimates produced, and most of the estimates (18 out of 21) lie between 8 and 25p/minute.[26]

4.2 Valuation of walking time

Two of the SP exercises provided estimates of valuations of walking time, SP1 in a hail versus rank choice scenario, and SP2 in a rank versus rank scenario. The estimates of the valuation of walking time are presented in Table 4.2.

[26] This range corresponds with that found by Toner, J.P. and Mackie, P.J. (1992), 'The Economics of Taxicab Regulation: A Welfare Assessment', paper presented at the Sixth World Conference on Transport Research, Lyon.

Table 4.2: Valuation of walking time (pence/minute)

SP exercise	Significant attributes	Walking time
SP1	Base (entire SP1 sample)	37
SP2	Base (income <£10k)	6
	Income £10k–£20k	9
	Income £20k–£50k	20
	Income >£50k	37
	Income unknown	14

The range of the estimated values for walking times is between 6p and 37p/minute. As for waiting times, the valuation of walking times is as would be expected in relation to respondents' income.

The relative valuation of walking time and waiting time is different in SP1 compared with SP2. Those respondents who answered SP1 valued walking time (37p/minute) more highly than they valued waiting time (20p/minute), whereas, in SP2, walking time was found to be valued less highly than waiting time for each of the groups for which significant estimates were identified.

The demographics of the two samples have been explored and there are no significant differences between the two groups of respondents in terms of either their characteristics or the purpose of their journeys that could explain this difference. The reason for the difference in valuations may therefore derive from the inherent preferences of those who answered exercise 1 (respondents who had hailed a hackney carriage) and those who answered exercise 2 (respondents who had hired a hackney carriage from a rank) and the manner in which respondents were selected to answer the different exercises.

SP1 was posed to those who had answered questions about a taxi journey where they had hailed a hackney carriage from the street, whereas SP2 applied to those who had answered questions about a journey where they had hired a hackney carriage from a rank. It is possible that people who have hailed hackney carriages dislike walking more than those who have shown that they are prepared to walk to a rank. If so, the sampling and selection process for the two exercises would have automatically selected those with a relatively higher dislike of walking, and therefore a higher valuation of walking time, to answer SP1.

4.3 Valuation of quality

The SP survey explored a range of quality attributes that could have been expected to affect consumer welfare. These included driver quality and knowledge, the type of vehicle and its quality and cleanliness, and the reliability of the PHV companies.

4.3.1 Driver quality

The SP3 exercise was designed to establish separate estimates of respondents' valuations of driver quality in terms of the standard of driving (excellent, acceptable or bad) and the drivers' knowledge of the route and destination (good or poor).

The results of this exercise show that respondents' tastes are not distributed linearly across the range of driver quality measures included. Indeed, the estimates of consumers'

valuations of excellent and acceptable driving and of good knowledge of the route and destination were not significantly different from zero. The only significant measure of driver quality was the very worst combination of driving quality and driver knowledge, 'drive6'. This result shows that, given a choice between excellent driving and a taxi driver with good knowledge of route and destination and bad driving with poor driver knowledge of route and destination, respondents would pay between £1.92 and £4.26 to take the higher-quality taxi. Table 4.3 shows the results from SP3 estimating how much respondents valued avoiding the very worst quality of driver, relative to the highest quality.

Table 4.3: SP3 relative attribute values (pence)

	drive6
Faremet	
Base	392
income<10	227
Fareunmet	
Base	426
income<10	203
Farevar	
Base	352
income<10	192

Given that only one measure of respondents' valuation of driver quality was found to be significant, it is not possible to provide estimates of how much they value the two components that were incorporated in the attribute (driving standards and knowledge), nor how respondents valued, for example, acceptable driving over bad driving.

4.3.2 Vehicle type and cleanliness

The SP designs enabled different types and quality of vehicle to be valued. SP1 explored respondents' preferences in relation to vehicle type in a hail/rank scenario, and SP3 and SP5 explored preferences in relation to vehicle quality, calibrated in terms of the cleanliness of the vehicle (very clean, quite clean or grubby) and its age (<3 years, 4–10 years, >10 years old).

Table 4.4 presents the results from SP1 relating to vehicle type. This data can be interpreted as how much respondents would be prepared to pay to travel in a vehicle of the type specified relative to what they would be prepared to pay for a journey in a saloon car. The estimates for the three types of vehicle are jointly statistically significant, but when examined separately, the estimate of the valuation for the people carrier proves to be insignificant. This estimate should therefore not be used on a stand-alone basis.

Table 4.4: SP1 relative attribute values (pence)

Vehicle type	**pence**
People carrier	69
Mercedes	126
Black cab	159

None of the estimates for vehicle quality (ie, cleanliness and age) was found to be significant in either of the two exercises in which they were included. The results therefore do not show that respondents would be prepared to pay additional amounts for improvements in cleanliness or age of the vehicle.

The results relating to driver and vehicle quality suggest that consumers do value certain minimum standards. However, provided that standards do not fall below minimum levels, consumer welfare may not be increased by stringent regulatory measures that seek to raise quality standards above these minimum levels.

4.3.3 Valuation of performance

Finally, the SP survey explored respondents' appreciation of the quality of service as measured in terms of the companies' punctuality. The two scenarios in which this was explored were set up so that the choice was between two PHV companies, the time of day of the journey could be taken into account (day/night), and whether the journey was immediate (SP6) or booked in advance (SP4).

Table 4.5 sets out the results obtained. The figures in the table should be interpreted as how much respondents would be prepared to pay to reduce the chance of the PHV arriving early, late or not at all by 1 percentage point. The attributes of punctuality for PHVs were specified in terms of the expected percentage of times that the PHV is either late or early. For example, it may be late 10% of the time, or early 5% of the time. Therefore the relative attribute values show the valuation in pence for each expected percentage point change in punctuality. For example, consumers booking a PHV in advance (SP4) would be willing to pay 8p to reduce the chance of it arriving early by 1 percentage point.

Table 4.5: Performance attribute values (pence)

	Each percent early	Each percent late	Each percent no show
SP4 (PHV booked in advance)	8	12	29
SP6 (PHV for immediate use)	8	14	44

These results again provide intuitively sensible valuations. Although care needs to be taken when comparing results from different SP exercises, those from SP6 reflect patterns similar to the results from SP4 in relation to the relative valuations of the early/late/no show preferences.

As shown in Table 4.5, respondents are not indifferent to a PHV arriving early, and during the day would be prepared to pay 8p to reduce the probability of the taxi driver arriving early by one percentage point. Respondents would be prepared to pay more to reduce the risk of a PHV arriving late (12p–14p) than they would to reduce the risk of it arriving early.

To reduce the risk of a no show, respondents would be prepared to pay between 29p and 44p, roughly two to three times the amount they would be willing to pay to reduce the chance of the PHV arriving late.

4.3.4 Comparison of SP and RP results on quality of service

The results of the RP showed that there were a number of factors that respondents rated as very important, however the SP has shown that this does not translate into willingness to

pay for quality regardless. While this may appear to be inconsistent, the findings of the SP do not in fact contradict the findings of the RP.

If respondents are asked how important a group of quality of service factors are, it is likely that they will all be important or very important. This can provide a useful starting point for analysis, although the data is not as informative as asking respondents to trade the quality measures off against other measures, notably price, as was done in the SP analysis. While respondents may feel that all quality-of-service factors are important—it is unlikely they would say that any factor of quality of service is unimportant—this is not the same as stating that they would be willing to pay for increases in quality-of-service.[27]

[27] This pattern of results has been observed in previous research in the transport arena. In a study conducted by ITS conducted for the Office of Passenger Rail Franchising (the Strategic Rail Authority's predecessor), the results showed that there was an expectation of minimum quality standards and levels of cleanliness, and that respondents were not willing to pay more for them. Oscar Faber (1996), 'Rolling Stock Quality Improvements and User Willingness to Pay', Report to the Office of Passenger Rail Franchising, November. ITS found similar results in qualitative work looking at purchases of new cars. Here, respondents felt it was the government's responsibility to legislate for vehicle emissions and that they were unwilling to pay more for low-emission vehicles. ITS, University of Leeds, (2000), 'Factors influencing buyers' decisions when purchasing new cars', Final Report to the Department of the Environment, Transport and the Regions, March.

Appendix 1: RP Survey and Sampling Method

The RP survey gathered information through TNS' General Omnibus Survey for April 2003. This enabled OXERA to include a module of questions in a pre-existing survey. As the main features of the survey were already in place, this technique provides an efficient means of conducting an *ad hoc* piece of research which involved gathering information from a large number of individuals.

The respondents were selected from a minimum of 134 sampling points by a random allocation method—described in more detail below. Respondents were interviewed at home in face-to-face interviews and the quality of the data recorded was back-checked following procedures that met the requirements of the Market Research Society Interviewer Quality Control System.

The sampling method was designed and developed by TNS. Using 1991 UK Census small-area statistics and the Post Office Address File, the area 'GB South of the Caledonian Canal' was divided into 600 areas of equal population. From these 600 areas, a master sampling frame of 300 sample points was selected to reflect the country's geographical and socio-economic profile. The areas within each Standard Region were stratified into population density bands, and, within band in descending order, by percentage of population in socio-economic Grades I and II.

To maximise the statistical accuracy of Omnibus sampling, sequential waves of fieldwork were allocated systematically across the sampling frame to ensure maximum geographical dispersion. The 300 primary sampling units were allocated to 12 sub-samples of 25 points each, with each sub-sample in itself being a representative drawing from the frame. For each wave of Omnibus fieldwork, a set of sub-samples was selected so as to provide the number of sample points required (typically around 139 for 2,000 interviews). Across sequential waves of fieldwork, all sub-samples were systematically worked, thereby reducing the clustering effects in questionnaires used in two or more consecutive weeks.

Each primary sampling unit was divided into two geographically distinct segments, each containing equal populations, as far as possible. The segments comprise aggregations of complete postcode sectors. Within each half (known as A and B halves), postcode sectors were sorted by the percentage of the population in socio-economic groups I and II. One postcode sector from each primary sampling unit was selected for each Omnibus, alternating on successive occasions between the A and B halves of the primary sampling unit, again to remove clustering effects. For each wave of interviewing, each interviewer was supplied with two blocks of 70 addresses, drawn from different parts of the sector. Addresses were contacted systematically with three doors being left after each successful interview. To ensure a balanced sample of adults within effective contacted addresses, a quota was set by gender.

Appendix 2: RP Questionnaire

OFT Taxi RP survey—Final questionnaire

Now a few questions about taxi services. By this I mean either private hire vehicles or minicabs, which are usually pre-booked by telephone; or hackney carriages, which can pick passengers up in the street or at taxi ranks.

Q.1 I am going to read out a list of features of a taxi service, and I would like you to tell me how important to you they are on a scale of 1–10 where 1 means not at all important and 10 means very important. You can mention any number in between. So how important to you is...

...the driver's knowledge of the area
...the safety of the vehicle
...the convenience of the service
...the price
...the time you have to wait
...the total journey time door-to-door
...the cleanliness of the vehicle
...being able to see the fare on a meter increase as you go along
...the traditional look\design of a 'black cab' (London cab)

01: – 1 – Not at all important
…
10: – 10 – Very important
(DK)

Q.2 Thinking of the taxi journeys you have made IN THE LAST MONTH, how did you obtain the taxi on the LAST OCCASION?

01: I hailed one from the street
02: I caught one at a taxi rank
03: I booked by phone\went into a minicab office for immediate use
04: I booked by phone in advance
05: I have not taken a taxi in last month
(DK)

(route: if 05 coded at Q.2 go to Q.10, others go to Q.3)

Q.3 Still thinking about your MOST RECENT taxi journey, what time of day was that taxi journey?

01: 3:01–7:00 in the morning
02: 7:01–12:00 in the morning
03: 12:01–18:00 in the afternoon
04: 18:01–23:00 in the evening
05: 23:01–03:00 at night
(DK)

Q.4 And how much did the journey cost?

Q.5 How long did you have to wait for the taxi? Please tell me in minutes.

Q.6a If for some reason you had been unable to take a taxi for that journey, which of the following alternative forms of transport would you have preferred to take for that journey instead of taking a taxi?

01: Public bus\tram
02: Coach
03: Train\tube
04: Private car
05: Motorbike
06: Bicycle
07: Would walk instead
08: Other (please specify)
09: None\No other alternative possible
(DK)

(route: if coded 09 or DK at Q.6a go to Q.9a, others go to Q.7a)

Q.7a If you had travelled by (INSERT METHOD CODED AT Q.6a), how long would the journey have taken? Please tell me in minutes.

(route: if coded 01, 02, or 03 at Q.6a go to Q.7b, others go to routing before Q.9a)

Q.7b And what would have been the cost of that journey?

(route: if coded 01 at Q.2 go to Q.9a)
(route: if coded 02 at Q.2 go to Q.9b)
(route: if coded 03 at Q.2 go to Q.9c)
(route: if coded 04 at Q.2 go to Q.9c)

Q.9a You said that for your most recent taxi journey, you hailed a taxi in the street. Why did you choose to hail a taxi from the street rather than at a taxi rank or by booking over the phone? Please mention all that apply.

01: It was the most convenient way to catch a taxi
02: I saw the empty taxi passing while I was on my way to a taxi rank
03: There was a long queue at the nearest rank
04: It was the quickest way to catch a taxi
05: I did not know where to find a taxi rank
06: I prefer to take an official taxi than to book a minicab over the phone
07: I prefer to take a metered taxi
08: It was a guarantee that the driver had good local knowledge
09: I had tried but failed to book a taxi over the phone
10: Other reason (please specify)
(DK)

– MULTICHOICE

Q.9b You said that for your most recent taxi journey, you caught the taxi at a rank. Why did you choose to catch the taxi at a rank rather than hailing a taxi from the street or phoning for a taxi? Please mention all that apply.

01: It was the only option as I caught the taxi at a train station\airport
02: The rank was conveniently located
03: I prefer to take an official taxi than to book a minicab over the phone
04: I had tried and failed to hail a taxi on the street
05: There was hardly any queue at the rank
06: It was the quickest way to catch a taxi
07: I prefer to take a metered taxi
08: It was a guarantee that the driver had good local knowledge
09: I had tried but failed to book a taxi over the phone
10: Other reason (please specify)
(DK)

– MULTICHOICE

Q.9c You said that for your most recent taxi journey, you either booked the taxi over the phone, or went into a minicab office for immediate use. Why did you choose to book a taxi in this way rather than hailing a taxi on the street or going to a taxi rank? Please mention all that apply.

01: It was the cheapest way to take a taxi
02: There was no taxi rank nearby
03: I was able to book the taxi for the time I needed it
04: I had very little chance of hailing a passing taxi
05: I was able to phone several companies to get a good price quote
06: I prefer to know how much the journey will cost in advance
07: It was the quickest way to catch a taxi
08: I had tried but failed to catch a taxi on the streets
09: There was no taxi rank or taxi hailing service in the area
10: Other reason (please specify)
(DK)

Q.10 Thinking about the last time you considered taking a taxi but chose not to, what form of transport did you use?

01: Public bus\tram
02: Coach
03: Train\tube
04: Private car
05: Motorbike
06: Bicycle
07: Walk
08: I had no reason to consider taking a taxi
09: Other (please specify)
(DK)

(route: if coded 08 at Q.10, see Q.14, others ask Q.11)

Q.11 How long did the journey take, door to door? Please tell me in minutes.

(route: if coded 01, 02, or 03 at Q.10 go to Q.12b, others go to Q.12c)

Q.12b How much did the journey cost?

Q.12c If for some reason you had been unable to travel by (INSERT METHOD CODED AT Q.10) and had to take a taxi, how much would the taxi have cost?

Q.12d How long would the taxi journey have taken? Please tell me in minutes.

– MULTICHOICE

Q.13 From the following list, which of the reasons given were relevant to your decision not to take a taxi?

01: I was not able to book the taxi for the time I needed it
02: I had very little chance of hailing a passing taxi
03: I had tried but failed to catch a taxi on the streets
04: There was no taxi rank or taxi hailing service in the area
05: Public transport was more convenient
06: I did not know any local minicab companies
07: Taxi would have been too expensive
08: Waiting time for a taxi was too long
09: Other reason (please specify)
(DK)

(route: if coded 05 at Q.2 ask Q.14, others go to N.S.)

DO NOT FOR NEXT QUESTION

Q.14 What is the MAIN reason that you have not used Private hire vehicles, i.e. minicabs in the last month?
INTERVIEWER: IF RESPONDENT SAYS ‘NO NEED’, ASK ‘Why is that?’

01: They are too expensive
02: The waiting time is too long
03: I am concerned about the safety of the minicab drivers\the vehicles they use
04: I have a Private or Company car available
05: A bus\tram\coach\tube is available
06: I prefer to walk\cycle
07: Other reason (please specify)
(DK)

Q.15 What is the MAIN reason that you have not used hackney Carriages in the last month?

INTERVIEWER: IF RESPONDENT SAYS ‘NO NEED’, ASK ‘Why is that?’

01: They are too expensive
02: I prefer to know the journey cost in advance
03: The waiting time is too long
04: I have a Private or Company car available
05: A bus\tram\coach\tube is available
06: I prefer to walk\cycle
07: Other reason (please specify)
(DK)

Appendix 3: SP Questionnaire

Q.1 I'd like to ask you a few questions about taxi services. By this I mean either private hire vehicles or minicabs, which are usually pre-booked by telephone, or hackney carriages, which can pick passengers up in the street or at taxi ranks.

First, have you used a taxi in this area IN THE LAST THREE MONTHS?
01.Yes (GO TO Q.2)
02.No (SCREEN OUT)

(If used a taxi in the last three months)

READ OUT/MULTI CODE

Q.2 Thinking of all the taxi journeys you made IN THE LAST THREE MONTHS, in which way or ways did you obtain a taxi. Did you…

01 Hail a hackney carriage from the street
02 Catch a hackney carriage at a taxi rank
03 Book a minicab by telephone for immediate use or
04 Book a minicab by telephone in advance?
05 (None of these)

IF MORE THAN ONE OF 01–04 CODED AT Q.2
Q.3 INTERVIEWER—CONFIRM WHICH TYPE OF TAXI JOURNEY YOU WILL BE ASKING ABOUT.

(show list of options chosen at Q.2)

01 Hail a hackney carriage from the street
02 Catch a hackney carriage at a taxi rank
03 Book a minicab by telephone for immediate use
04 Book a minicab by telephone in advance

MAIN QUESTIONNAIRE

(If hailed a hackney carriage from the street in the last 3 months—only code 1 at Q.2 OR code 1 at Q.3)
INTRO:
I will now ask you a few questions about a specific taxi journey. Please answer about the most recent journey in which you hailed a hackney carriage from the street.

(If caught a hackney carriage at taxi rank in last 3 months—only code 2 at Q.2 OR code 2 at Q.3)
INTRO:
I will now ask you a few questions about a specific taxi journey. Please answer about the most recent journey in which you caught a hackney carriage at a taxi rank.

(If took a minicab in the last month—only code 3 or only code 4 at Q.2, OR code 3 or code 4 at Q.3)

INTRO:
I will now ask you a few questions about a specific taxi journey. Please answer about the most recent journey in which you took a minicab.

Q.4 Thinking about that journey, who paid for the journey—did you pay for the whole journey yourself, did you share the cost with someone else, or did someone else such as an employer pay?

01. Self—paid all
02. Shared costs with someone else
03. Other person paid all
04. Employer paid all
05. Other answer

Q.5 What was the total cost of the journey?

INTERVIEWER—IF COST WAS SHARED, RECORD TOTAL COST AT THIS QUESTION

IF DON'T KNOW, PROBE FOR ANOTHER JOURNEY WHERE COST IS KNOWN.
IF NO JOURNEY IN LAST 3 MONTHS WHERE COST IS KNOWN, ENTER <Don't know>
(Don't know)

(If code 2 at q.4)
Q.6 How much did you pay yourself?

IF DON'T KNOW, PROBE FOR ANOTHER JOURNEY WHERE COST IS KNOWN AND AMEND Q. 5.
IF NO JOURNEY IN LAST 3 MONTHS WHERE COST IS KNOWN, ENTER <Don't know>
(DK)

(IF 'Don't know' AT Q.5 or Q.6)
Q.7 Could you tell me roughly how many miles was the journey?
(Don't know)

ASK ALL
Q.7a Could you tell me how long you had to wait for the taxi? Please tell me in minutes.
(Don't know)

{*Summary variable—price paid by respondent for journey*
PRICE
IF Q.4 ne 2 PRICE=Amount from Q.5
IF Q.4 ne 2 AND Q.5=Don't know PRICE=£5.00
IF Q.4 = 2 PRICE = Amount from Q.6
IF Q.4=2 AND Q.6=Don't know PRICE=£5.00
IF Q.5 <£1.50 OR Q6 <£1.50 PRICE=£1.50}

{Summary variable—time waited by respondent for journey
WAITING
IF Q7a<=15 WAITING=SHORT
IF Q7a>15 WAITING=LONG
IF Q7a = dk, WAITING=SHORT}

ASK ALL
INTERVIEWER—CONFIRM TYPE OF JOURNEY RESPONDENT IS ANSWERING ABOUT.
Q.8
01. hackney carriage HAILED FROM THE STREET
02 hackney carriage CAUGHT AT A TAXI RANK
03 Minicab booked by telephone FOR IMMEDIATE USE
04. Minicab booked by telephone IN ADVANCE

Q.9 Thinking about that taxi journey, where did the taxi journey start from?
01. Home
02. Work—usual workplace
03. Work—other location in course of work
04. Railway station/ Coach station/ Airport
05. Friend's or relative's house
06. Place of education
07. Shops/shopping centre
08. Restaurant/pub/other eating or drinking location
09. Place of entertainment eg cinema, theatre
10. Doctor/hospital/dentist or other medical location
11. Sports centre/sports field/other sports location as participant
12. Other town centre
13. Other—(write in)

Q.10 And where did the taxi journey end?
01. Home
02. Work—usual workplace
03. Work—other location in course of work
04. Railway station/ Coach station/ Airport
05. Friend's or relative's house
06. Place of education
07. Shops/shopping centre
08. Restaurant/pub/other eating or drinking location
09. Place of entertainment eg cinema, theatre
10. Doctor/hospital/dentist or other medical location
11. Sports centre/sports field/other sports location as participant
12. Other town centre
13. Other —(write in)

Q.11 Did you make the journey for business purposes or on your own behalf, that is, because you personally wanted or needed to, or were you mainly taking or accompanying someone else such as a child, relative or friend?

01. Respondent made journey for business

02. Respondent made journey on own behalf
03. Accompanying someone else

Q.12 What time of day was the taxi journey?
01. 03:01–07:00 in the morning
02. 07:01–12.00 in the morning
03. 12:01–18:00 in the afternoon
04. 18:01–23:00 in the evening
05. 23:01–03:00 at night
DK

{SUMMARY VARIABLE—TIME OF DAY
TIMESUM
IF Q.12=1 OR 2 OR 3 TIMESUM = <daytime>
IF Q.12=4 OR 5 TIMESUM=<evening or night>}

Q.13 Were you travelling by yourself, or with another person or other people?
01 By myself
02 Other people

(if 02 at Q13 ask q.13b)
Q.13b How many passengers were there in total?
02. 2 passengers
03. 3 passengers
04. 4 passengers
05. 5 passengers
06. 6 or more passengers

Q.14 What were the main reasons why you took a taxi for that journey, rather than an alternative form of transport? PROBE What else?

(IF TAXI JOURNEY WAS BY HACKNEY CAB, HAILED DOWN (code 1 at Q.8)):

FLAG DOWN VS. RANK COMPARISON

Q.15 I am now going to give you a number of different scenarios. In each one I am going to ask you to choose which of the two alternatives you prefer.

In making your choices, I would like you to imagine that you are planning a journey in a hackney cab, similar to the journey you have just told me about. Imagine that it is during the <TIMESUM> and you can choose either to hail a taxi in the street, or to walk to a taxi rank.

In each of the situations I will offer you, the fare, the time it will take you to walk to a suitable place or to the taxi rank, the time you would expect to wait for a taxi, and the type of car you would expect it to be will vary for the two options.

SHOW EXAMPLE SCREEN:

Hail a taxi		Go to taxi rank	
Walking time to suitable place:	2 minutes	Walking time to rank:	3 minutes
Fare:	<PRICE>+£1	Fare:	<PRICE>
Waiting time:	1 minute	Waiting time at rank:	1 minute
Car type:	Saloon car	Car type:	Saloon car

Please note that the fare shown relates to the amount you would pay yourself.

If you hail a taxi, the walking time to get to a suitable place is less than the walk to the taxi rank, and the waiting time for a taxi is generally lower than at the taxi rank. In return taxi drivers tend to charge extra for picking up passengers in the street.

Imagine that there are no other differences between the two options, other than those described in each example.

In each situation please say whether you would choose to hail a taxi on the street, or go to the taxi rank.

(12 OUT OF THE FOLLOWING 25 COMPARISONS PRESENTED TO RESPONDENT. SELECT 12 AT RANDOM)

	1 Hail a taxi				2	Go to rank		
	Walk time to suitable place:	Fare:	Waiting time:	Car type:	Walk time to rank:	Fare:	Waiting time at rank:	Car type:
a.	2 mins	<PRICE>*	1 min	Saloon car	3 mins	<PRICE>*	1 min	Saloon car
b.	2 mins	<PRICE>*	3 mins	Saloon car	5 mins	<PRICE>*	3 mins	Saloon car
c.	2 mins	<PRICE>*	1 min	Saloon car	7 mins	<PRICE>*	5 mins	People carrier
d.	2 mins	<PRICE>*	1 min	Saloon car	12 mins	<PRICE>*	8 mins	Mercedes
e.	2 mins	<PRICE>	3 mins	Saloon car	7 mins	<PRICE>	10 mins	London-style 'black cab'
f.	2 mins	<PRICE> + 50p	1 min	Saloon car	3 mins	<PRICE>	3 mins	London-style 'black cab'
g.	2 mins	<PRICE> + 50p	3 mins	Saloon car	5 mins	<PRICE>	5 mins	Saloon car
h.	2 mins	<PRICE> + 25p	1 min	Saloon car	7 mins	<PRICE>—25p	8 mins	Saloon car
i.	2 mins	<PRICE> + 25p	3 mins	Saloon car	12 mins	<PRICE>—25p	10 mins	People carrier
j.	2 mins	<PRICE> + 25p	1 min	Saloon car	7 mins	<PRICE>—25p	1 min	Mercedes
k.	2 mins	<PRICE> + £1	3 mins	Saloon car	3 mins	<PRICE>	5 mins	Mercedes
l.	2 mins	<PRICE> + £1	1 min	Saloon car	5 mins	<PRICE>	8 mins	London-style 'black cab'
m.	2 mins	<PRICE> + £1	1 min	Saloon car	7 mins	<PRICE>	10 mins	Saloon car
n.	2 mins	<PRICE> + 50p	3 mins	Saloon car	12 mins	<PRICE>—50p	1 min	Saloon car
o.	2 mins	<PRICE> + 50p	1 min	Saloon car	7 mins	<PRICE>—50p	3 mins	People carrier
p.	2 mins	<PRICE> + £1.50	3 mins	Saloon car	3 mins	<PRICE>	8 mins	People carrier
q.	2 mins	<PRICE> + £1.50	1 min	Saloon car	5 mins	<PRICE>	10 mins	Mercedes
r.	2 mins	<PRICE> + £1.50	3 mins	Saloon car	7 mins	<PRICE>	1 min	London-style 'black cab'
s.	2 mins	<PRICE> + £1	1 min	Saloon car	12 mins	<PRICE>—50p	3 mins	Saloon car
t.	2 mins	<PRICE> + £1	1 min	Saloon car	7 mins	<PRICE>—50p	5 mins	Saloon car
u.	2 mins	<PRICE> + £1	1 min	Saloon car	3 mins	<PRICE>	10 mins	Saloon car
v.	2 mins	<PRICE> + £1	1 min	Saloon car	5 mins	<PRICE>	1 min	People carrier
w.	2 mins	<PRICE> + £1	3 mins	Saloon car	7 mins	<PRICE>	3 mins	Mercedes
x.	2 mins	<PRICE> + £1	1 min	Saloon car	12 mins	<PRICE>—50p	5 mins	London-style 'black cab'
y.	2 mins	<PRICE> + £1	3 mins	Saloon car	7 mins	<PRICE>—50p	8 mins	Saloon car

	Choose:	**1**	**Hail a taxi**
		2	**Go to taxi rank**
		(98	**Can't choose / No preference)**

NOW GO TO Q.19

(IF TAXI JOURNEY BY HACKNEY CAB FROM A TAXI RANK (code 2 at Q.8):

RANK VS. RANK COMPARISON

Q.16 I am now going to give you a number of different scenarios. In each one I am going to ask you to choose which of the two alternatives you prefer.

In making your choices, I would like you to imagine that you are planning a journey in a hackney cab, similar to the journey you have just told me about. Imagine that it is during the <TIMESUM> and you can choose to pick up a taxi at either Rank A or Rank B.

In each of the situations I will offer you, the fare, the time it will take you to walk to the taxi rank, the time you would expect to wait for a taxi, and the type of car you would expect it to be will vary for the two options.

SHOW EXAMPLE SCREEN:

Rank A		**Rank B**	
Walk time to rank:	1 minute	Walk time to rank:	5 minutes
Fare:	<PRICE>+£1	Fare:	<PRICE>
Waiting time at rank:	2 minutes	Waiting time at rank:	3 minutes
Car type:	Saloon car	Car type:	Saloon car

Please note that the fare shown relates to the amount you would pay yourself.

Taxi rank A is nearer to you; it is busier and so better served by taxis, so the waiting times tend to be shorter. As a result, the fares from Rank A are usually higher. Taxi rank B is further away from you; it is less busy so less well served by taxis, so the waiting times are usually higher.

Imagine that there are no other differences between the two options, other than those described in each example.

In each situation please say whether you would choose to go to Rank A or Rank B.

12 OUT OF THE FOLLOWING 25 COMPARISONS PRESENTED TO RESPONDENT. SELECT 12 AT RANDOM.

	Answer categories for all questions:		
	Choose:	**1**	**Rank A**
		2	**Rank B**
		(98	**Can’t choose / No preference)**

	Rank A				Rank B			
	Walk time to rank:	Fare:	Waiting time at rank:	Car type:	Walk time to rank:	Fare:	Waiting time at rank:	Car type:
a.	1 minute	<PRICE>	2 mins	Saloon car	5 mins	<PRICE>	0 mins	Saloon car
b.	1 minute	<PRICE>	2 mins	Saloon car	8 mins	<PRICE>	2 mins	Saloon car
c.	2 mins	<PRICE>	2 mins	People carrier	10 mins	<PRICE>	8 mins	Saloon car
d.	2 mins	<PRICE>	2 mins	Mercedes	12 mins	<PRICE>	5 mins	Saloon car
e.	3 mins	<PRICE>	2 mins	London-style ‘black cab’	10 mins	<PRICE>	10 mins	Saloon car
f.	1 minute	<PRICE>+50p	2 mins	London-style ‘black cab’	8 mins	<PRICE>	5 mins	Saloon car
g.	1 minute	<PRICE>+50p	2 mins	Saloon car	10 mins	<PRICE>	10 mins	Saloon car
h.	2 mins	<PRICE>+25p	2 mins	Saloon car	12 mins	<PRICE>–25p	0 mins	Saloon car
i.	2 mins	<PRICE>+25p	2 mins	People carrier	10 mins	<PRICE>–25p	2 mins	Saloon car
j.	3 mins	<PRICE>+25p	2 mins	Mercedes	5 mins	<PRICE>–25p	8 mins	Saloon car
k.	1 minute	<PRICE>+£1	2 mins	Mercedes	10 mins	<PRICE>	2 mins	Saloon car
l.	1 minute	<PRICE>+£1	2 mins	London-style ‘black cab’	12 mins	<PRICE>	8 mins	Saloon car
m.	2 mins	<PRICE>+£1	2 mins	Saloon car	10 mins	<PRICE>	5 mins	Saloon car
n.	2 mins	<PRICE>+50p	2 mins	Saloon car	5 mins	<PRICE>–50p	10 mins	Saloon car
o.	3 mins	<PRICE>+50p	2 mins	People carrier	8 mins	<PRICE>–50p	0 mins	Saloon car
p.	1 minute	<PRICE>+£1.50	2 mins	People carrier	12 mins	<PRICE>	10 mins	Saloon car
q.	1 minute	<PRICE>+£1.50	2 mins	Mercedes	10 mins	<PRICE>	0 mins	Saloon car
r.	2 mins	<PRICE>+£1.50	2 mins	London-style ‘black cab’	5 mins	<PRICE>	2 mins	Saloon car
s.	2 mins	<PRICE>+£1	2 mins	Saloon car	8 mins	<PRICE>–50p	8 mins	Saloon car
t.	3 mins	<PRICE>+£1	2 mins	Saloon car	10 mins	<PRICE>–50p	5 mins	Saloon car
u.	1 minute	<PRICE>+£2	2 mins	Saloon car	10 mins	<PRICE>	8 mins	Saloon car`
v.	1 minute	<PRICE>+£2	2 mins	People carrier	5 mins	<PRICE>	5 mins	Saloon car
w.	2 mins	<PRICE>+£2	2 mins	Mercedes	8 mins	<PRICE>	10 mins	Saloon car
x.	2 mins	<PRICE>+£1.50	2 mins	London-style ‘black cab’	10 mins	<PRICE>–50p	0 mins	Saloon car
y.	3 mins	<PRICE>+£1.50	2 mins	Saloon	12 mins	<PRICE>–50p	2 mins	Saloon car

NOW GO TO Q.19

(IF TAXI JOURNEY BY MINICAB FOR IMMEDIATE USE (code 3 at Q.8)):

PRIVATE HIRE VS. HACKNEY COMPARISON

Q.17 I am now going to give you a number of different scenarios. In each one I am going to ask you to choose which of the two alternatives you prefer.

In making your choices, I would like you to imagine that you are planning a journey in a taxi, similar to the journey you have just told me about. Imagine that it is during the <TIMESUM> and you can choose to take a either minicab or a hackney carriage.

In each of the situations I will offer you, the fare, the time you would expect to wait for a taxi, the cleanliness and age of car you would expect it to be, and the quality of driver you would expect will vary for the two options.

SHOW EXAMPLE SCREEN:

Minicab/private hire		**hackney**	
Waiting time:	5 minutes	Waiting time:	1 minute
Car:	Very clean, less than 3 years old	Car:	Very clean, 4–10 years old
Driver:	Excellent driving, good knowledge of route and destination	Driver:	Acceptable driving, good knowledge of route and destination
Fare:	<PRICE>, metered	Fare:	<PRICE> + 50p, metered

Please note that the fare shown relates to the amount you would pay yourself.

The hackney cab journeys are always metered so there is a set price for the journey. The minicab journeys are sometimes metered, sometimes not. Some minicab drivers will charge more than others for the same journey.

Imagine that there are no other differences between the two options, other than those described in each example.

In each situation please say whether you would choose a minicab or a hackney.

[IF WAITING=SHORT]
(12 OUT OF THE FOLLOWING 25 COMPARISONS PRESENTED TO RESPONDENT. SELECT 12 AT RANDOM)

	Option 1– **PHV**				Option 2**—** **hackney**			
	Waiting Time:	Car:	Driver:	Fare:	Waiting Time:	Car:	Driver:	Fare:
a.	5 minutes	Very clean, 4–10 years old	Excellent driving, poor knowledge of route and destination	<PRICE>, metered	1 minute	Very clean, less than 3 years old	Excellent driving, good knowledge of route and destination	<PRICE> + 50p, metered
b.	8 minutes	Grubby interior, over 10 years old	Bad driving, good knowledge of route and destination	<PRICE>, metered	5 minutes	Quite clean, less than 3 years old	Acceptable driving, good knowledge of route and destination	<PRICE> + £1, metered
c.	10 minutes	Quite clean, 4–10 years old	Acceptable driving, poor knowledge of route and destination	<PRICE>, metered	2 minutes	Quite clean, less than 3 years old	Acceptable driving, good knowledge of route and destination	<PRICE> + £1.50, metered
d.	12 minutes	Quite clean, over 10 years old	Bad driving, poor knowledge of route and destination	<PRICE>, metered	3 minutes	Quite clean, 4–10 years old	Excellent driving, good knowledge of route and destination	<PRICE> + £2, metered
e.	15 minutes	Quite clean, over 10 years old	Acceptable driving, good knowledge of route and destination	<PRICE>, metered	3 minutes	Very clean, 4–10 years old	Excellent driving, good knowledge of route and destination	<PRICE> + £2.50, metered
f.	8 minutes	Quite clean, over 10 years old	Acceptable driving, poor knowledge of route and destination	<PRICE>—£1, metered	3 minutes	Very clean, 4–10 years old	Acceptable driving, good knowledge of route and destination	<PRICE> + 50p, metered
g.	10 minutes	Very clean, 4–10 years old	Bad driving, poor knowledge of route and destination	<PRICE>—£1, metered	3 minutes	Very clean, less than 3 years old	Excellent driving, good knowledge of route and destination	<PRICE> + £1, metered
h.	12 minutes	Grubby interior, over 10 years old	Acceptable driving, good knowledge of route and destination	<PRICE>—£1, metered	1 minute	Quite clean, less than 3 years old	Excellent driving, good knowledge of route and destination	<PRICE> + £1.50, metered
i.	15 minutes	Quite clean, 4–10 years old	Acceptable driving, good knowledge of route and destination	<PRICE>—£1, metered	5 minutes	Quite clean, less than 3 years old	Excellent driving, good knowledge of route and destination	<PRICE> + £2, metered
j.	5 minutes	Quite clean, over 10 years old	Bad driving, good knowledge of route and destination	<PRICE>– £1, metered	2 minutes	Quite clean, 4–10 years old	Acceptable driving, poor knowledge of route and destination	<PRICE> + £2.50, metered
k.	10 minutes	Quite clean, over 10 years old	Acceptable driving, good knowledge of route and destination	Between <<PRICE> –75p> and <<PRICE> + 75p>, not metered	5 minutes	Quite clean, 4–10 years old	Excellent driving, good knowledge of route and destination	<PRICE> + 50p, metered
l.	12 minutes	Quite clean, over 10 years old	Excellent driving, poor knowledge of route and destination	Between <<PRICE> –75p> and <<PRICE> + 75p>, not metered	2 minutes	Very clean, 4–10 years old	Excellent driving, good knowledge of route and destination	<PRICE> + £1, metered
m.	15 minutes	Very clean, 4–10 years old	Bad driving, good knowledge of route and destination	Between <<PRICE> –75p> and <<PRICE> + 75p>, not metered	3 minutes	Very clean, less than 3 years old	Acceptable driving, good knowledge of route and destination	<PRICE> + £1.50, metered

n.	5 minutes	Grubby interior, over 10 years old	Acceptable driving, poor knowledge of route and destination	Between <<PRICE> –75p> and <<PRICE> + 75p>, not metered	3 minutes	Quite clean, less than 3 years old	Acceptable driving, good knowledge of route and destination	<PRICE> + £2, metered
o.	8 minutes	Quite clean, 4–10 years old	Bad driving, poor knowledge of route and destination	Between <<PRICE> –75p> and <<PRICE> + 75p>, not metered	1 minute	Quite clean, less than 3 years old	Excellent driving, good knowledge of route and destination	<PRICE> + £2.50, metered
p.	12 minutes	Quite clean, 4–10 years old	Bad driving, good knowledge of route and destination	Between <<PRICE>—£1.50> and <<PRICE> + £1.50>, not metered	3 minutes	Quite clean, less than 3 years old	Acceptable driving, good knowledge of route and destination	<PRICE> + 50p, metered
q.	15 minutes	Quite clean, over 10 years old	Acceptable driving, poor knowledge of route and destination	Between <<PRICE>—£1.50> and <<PRICE> + £1.50>, not metered	1 minute	Quite clean, 4–10 years old	Acceptable driving, good knowledge of route and destination	<PRICE> + £1, metered
r.	5 minutes	Quite clean, over 10 years old	Bad driving, poor knowledge of route and destination	Between <<PRICE>—£1.50> and <<PRICE> + £1.50>, not metered	5 minutes	Very clean, 4–10 years old	Excellent driving, good knowledge of route and destination	<PRICE> + £1.50, metered
s.	8 minutes	Very clean, 4–10 years old	Acceptable driving, good knowledge of route and destination	Between <<PRICE> –£1.50> and <<PRICE> + £1.50>, not metered	2 minutes	Very clean, less than 3 years old	Excellent driving, good knowledge of route and destination	<PRICE> + £2, metered
t.	10 minutes	Grubby interior, over 10 years old	Excellent driving, poor knowledge of route and destination	Between <<PRICE>—£1.50> and <<PRICE> + £1.50>, not metered	3 minutes	Quite clean, less than 3 years old	Excellent driving, good knowledge of route and destination	<PRICE> + £2.50, metered
u.	15 minutes	Grubby interior, over 10 years old	Bad driving, poor knowledge of route and destination	Two–thirds of the time <<PRICE>>; one third of the time the driver adds £1.50.	2 minutes	Quite clean, less than 3 years old	Excellent driving, good knowledge of route and destination	<PRICE> + 50p, metered
v.	5 minutes	Quite clean, 4–10 years old	Acceptable driving, good knowledge of route and destination	Two–thirds of the time <<PRICE>>; one third of the time the driver adds £1.50.	3 minutes	Quite clean, less than 3 years old	Excellent driving, good knowledge of route and destination	<PRICE> + £1, metered
w.	8 minutes	Quite clean, over 10 years old	Excellent driving, poor knowledge of route and destination	Two–thirds of the time <<PRICE>>; one third of the time the driver adds £1.50.	3 minutes	Quite clean, 4–10 years old	Excellent driving, good knowledge of route and destination	<PRICE> + £1.50, metered
x.	10 minutes	Quite clean, over 10 years old	Bad driving, good knowledge of route and destination	Two–thirds of the time <<PRICE>>; one third of the time the driver adds £1.50.	1 minute	Very clean, 4–10 years old	Acceptable driving, good knowledge of route and destination	<PRICE> + £2, metered
y.	12 minutes	Very clean, 4–10 years old	Acceptable driving, poor knowledge of route and destination	Two–thirds of the time <<PRICE>>; one third of the time the driver adds £1.50.	5 minutes	Very clean, less than 3 years old	Acceptable driving, good knowledge of route and destination	<PRICE> + £2.50, metered

[IF WAITING=LONG]
(12 OUT OF THE FOLLOWING 25 COMPARISONS PRESENTED TO RESPONDENT. SELECT 12 AT RANDOM)

As above, with the following waiting times:

	Option 1 **Minicab/private hire** Waiting Time:	Option 2 **hackney** Waiting Time:
a.	15 minutes	10 minute
b.	18 minutes	15 minutes
c.	20 minutes	12 minutes
d.	22 minutes	12 minutes
e.	25 minutes	12 minutes
f.	18 minutes	12 minutes
g.	20 minutes	12 minutes
h.	22 minutes	10 minute
i.	25 minutes	15 minutes
j.	15 minutes	12 minutes
k.	20 minutes	15 minutes
l.	22 minutes	12 minutes
m.	25 minutes	12 minutes
n.	15 minutes	12 minutes
o.	18 minutes	10 minute
p.	22 minutes	12 minutes
q.	25 minutes	10 minute
r.	15 minutes	15 minutes
s.	18 minutes	12 minutes
t.	20 minutes	12 minutes
u.	25 minutes	12 minutes
v.	15 minutes	12 minutes
w.	18 minutes	12 minutes
x.	20 minutes	10 minute
y.	22 minutes	15 minutes

	Answer categories for all questions:		
	Choose:	**1**	**Minicab/private hire**
		2	**hackney cab**
		(98	**Can’t choose / No preference)**

NOW GO TO Q.20

(IF TAXI JOURNEY WAS BY MINICAB, BOOKED IN ADVANCE (code 4 at Q.8):

PRIVATE HIRE VS. PRIVATE HIRE COMPARISON

Q.18 I am now going to give you a number of different scenarios. In each one I am going to ask you to choose which of the two alternatives you prefer.

In making your choices, I would like you to imagine that you are planning to book a taxi journey in advance, similar to the journey you have just told me about. Imagine that it is during the <TIMESUM> and you can choose to book a taxi with either Company A or Company B.

In each of the situations I will offer you, the fare and the proportion of taxis that you would expect to arrive early, on time or late, or not to show up at all, will vary for the two options.

SHOW EXAMPLE SCREEN:

Taxi company A		**Taxi company B**	
Fare:	<PRICE> + 30p	Fare:	<PRICE>
Early:	Never	Early:	10 times out of 100
On time:	Always	On time:	75 times out of 100
Late:	Never	Late:	10 times out of 100
No show:	Never	No show:	5 times out of 100

Please note that the fare shown relates to the amount you would pay yourself.

Arriving early means that the taxi arrives between 5–15 minutes before the booked time.
Arriving late means that the taxi arrives 5–15 minutes after the booked time.
Arriving on time means that the taxi arrives within 5 minutes of the booked time.

Imagine that there are no other differences between the two options, other than those described in each example.

In each situation please say whether you would choose Company A or Company B.

(12 OUT OF THE FOLLOWING 25 COMPARISONS PRESENTED TO RESPONDENT. SELECT 12 AT RANDOM.)

	Option A					Option B				
	Fare	Early	On Time	Late	No Show	Fare	Early	On Time	Late	No Show
a.	<PRICE> + 30p	Never	Always	Never	Never	<PRICE>	10%	75%	10%	5%
b.	<PRICE> + 30p	Never	95%	5%	Never	<PRICE>—30p	25%	53%	20%	2%
c.	<PRICE> + 30p	Never	88%	10%	2%	<PRICE>—70p	20%	47%	25%	8%
d.	<PRICE> + 30p	5%	95%	Never	Never	<PRICE>—30p	20%	53%	25%	2%
e.	<PRICE> + 30p	5%	90%	5%	Never	<PRICE>—70p	10%	72%	10%	8%
f.	<PRICE> + 30p	5%	83%	10%	2%	<PRICE>	25%	50%	20%	5%
g.	<PRICE> + 30p	10%	90%	Never	Never	<PRICE>—70p	25%	47%	20%	8%
h.	<PRICE> + 30p	10%	85%	5%	Never	<PRICE>	20%	50%	25%	5%
i.	<PRICE> + 30p	10%	78%	10%	2%	<PRICE>—30p	10%	78%	10%	2%
j.	<PRICE> + 70p	Never	Always	Never	Never	<PRICE>—30p	20%	52%	20%	8%
k.	<PRICE> + 70p	Never	93%	5%	2%	<PRICE>—70p	10%	60%	25%	5%
l.	<PRICE> + 70p	Never	90%	10%	Never	<PRICE>	25%	63%	10%	2%
m.	<PRICE> + 70p	5%	95%	Never	Never	<PRICE>—70p	25%	60%	10%	5%
n.	<PRICE> + 70p	5%	88%	5%	2%	<PRICE>	20%	58%	20%	2%
o.	<PRICE> + 70p	5%	85%	10%	Never	<PRICE>—30p	10%	57%	25%	8%
p.	<PRICE> + 70p	10%	90%	Never	Never	<PRICE>	10%	63%	25%	2%
q.	<PRICE> + 70p	10%	83%	5%	2%	<PRICE>—30p	25%	57%	10%	8%
r.	<PRICE> + 70p	10%	80%	10%	Never	<PRICE>—70p	20%	55%	20%	5%
s.	<PRICE> + £1.30	Never	98%	Never	2%	<PRICE>—70p	25%	48%	25%	2%
t.	<PRICE> + £1.30	Never	95%	5%	Never	<PRICE>	20%	62%	10%	8%
u.	<PRICE> + £1.30	Never	90%	10%	Never	<PRICE>—30p	10%	65%	20%	5%
v.	<PRICE> + £1.30	5%	93%	Never	2%	<PRICE>	10%	62%	20%	8%
w.	<PRICE> + £1.30	5%	90%	5%	Never	<PRICE>—30p	25%	45%	25%	5%
x.	<PRICE> + £1.30	5%	85%	10%	Never	<PRICE>—70p	20%	68%	10%	2%
y.	<PRICE> + £1.30	10%	88%	Never	2%	<PRICE>—30p	20%	65%	10%	5%
z.	<PRICE> + £1.30	10%	85%	5%	Never	<PRICE>—70p	10%	68%	20%	2%
aa.	<PRICE> + £1.30	10%	80%	10%	Never	<PRICE>	25%	42%	25%	8%

	Answer categories for all questions:
	Choose: 1 Taxi company A **2 Taxi company B** **(98 Can't choose / No preference)**

NOW GO TO Q.19.

SECOND SP EXERCISE

(IF Codes 1, 2 or 4 AT Q.8)

PRIVATE HIRE VS. HACKNEY COMPARISON

Alternate respondents to get Version A or Version B of the introduction wording:

Q.19 VERSION A—TRAVELLING FROM HOME

Now I'd like you to imagine that you are travelling from home, and you are telephoning for a taxi to pick you up as soon as possible. You can choose between two companies—one is a minicab or private hire firm and the other is a hackney firm.

In each of the situations I will offer you, the fare, the time you would expect to wait for a taxi, the cleanliness and age of car you would expect it to be, and the quality of driver you would expect will vary for the two options.

SHOW EXAMPLE SCREEN:

Minicab/private hire		**hackney**	
Waiting time:	5 minutes	Waiting time:	1 minute
Car:	Very clean, less than 3 years old	Car:	Very clean, 4–10 years old
Driver:	Excellent driving, good knowledge of route and destination	Driver:	Acceptable driving, good knowledge of route and destination
Fare:	<PRICE>, metered	Fare:	<PRICE> + 50p, metered

Please note that the fare shown relates to the amount you would pay yourself.

The hackney cab journeys are always metered so there is a set price for the journey. The minicab journeys are sometimes metered, sometimes not. Some minicab drivers will charge more than others for the same journey.

Imagine that there are no other differences between the two options, other than those described in each example.

In each situation please say whether you would choose a minicab or a hackney.

VERSION B—OUT IN TOWN

Now I'd like you to imagine that you are out in town, and you are looking for a taxi to pick you up as soon as possible. You can either ring a minicab or private hire firm to come and collect you, or you can pick up a hackney cab at a taxi rank which is close by.

In each of the situations I will offer you, the fare, the time you would expect to wait for a taxi, the cleanliness and age of car you would expect it to be, and the quality of driver you would expect will vary for the two options.

SHOW EXAMPLE SCREEN:

Minicab/private hire		hackney	
Waiting time:	5 minutes	Waiting time:	1 minute
Car:	Very clean, less than 3 years old	Car:	Very clean, 4–10 years old
Driver:	Excellent driving, good knowledge of route and destination	Driver:	Acceptable driving, good knowledge of route and destination
Fare:	<PRICE>, metered	Fare:	<PRICE> + 50p, metered

Please note that the fare shown relates to the amount you would pay yourself.

The hackney cab journeys are always metered so there is a set price for the journey. The minicab journeys are sometimes metered, sometimes not. Some minicab drivers will charge more than others for the same journey.

Imagine that there are no other differences between the two options, other than those described in each example.

In each situation please say whether you would choose to phone for a minicab or go to a hackney rank.

[IF WAITING=SHORT]
(6 OUT OF THE FOLLOWING 25 COMPARISONS PRESENTED TO RESPONDENT. SELECT 6 AT RANDOM)

[CHOICE SCENARIOS SAME AS Q17 ABOVE]

[IF WAITING=LONG]
(6 OUT OF THE FOLLOWING 25 COMPARISONS PRESENTED TO RESPONDENT. SELECT 6 AT RANDOM)

[CHOICE SCENARIOS SAME AS Q17 ABOVE]

	Answer categories for all questions:		
	Choose:	**1**	**Minicab/private hire**
		2	**hackney cab**
		(98	**Can’t choose / No preference)**

NOW GO TO Q.21

(IF TAXI JOURNEY WAS BY MINICAB, IMMEDIATE USE (code 3 at Q.8))

PRIVATE HIRE VS. PRIVATE HIRE COMPARISON

Q.20 Now I'd like you to imagine that you are planning a journey by taxi, and that you are making an advance booking. You can choose to book a taxi with either Company A or Company B.

In each of the situations I will offer you, the fare and the proportion of taxis that you would expect to arrive early, on time or late, or not to show up at all, will vary for the two options.

SHOW EXAMPLE SCREEN:

Taxi company A		**Taxi company B**	
Fare:	<PRICE> + 30p	Fare:	<PRICE>
Early:	Never	Early:	10 times out of 100
On time:	Always	On time:	75 times out of 100
Late:	Never	Late:	10 times out of 100
No show:	Never	No show:	5 times out of 100

Please note that the fare shown relates to the amount you would pay yourself.

Arriving early means that the taxi arrives between 5–15 minutes before the booked time.
Arriving late means that the taxi arrives 5–15 minutes after the booked time.
Arriving on time means that the taxi arrives within 5 minutes of the booked time.

Imagine that there are no other differences between the two options, other than those described in each example.

In each situation please say whether you would choose Company A or Company B.

(6 OUT OF THE FOLLOWING 25 COMPARISONS PRESENTED TO RESPONDENT. SELECT 6 AT RANDOM)

[Choice options as for Q18]

	Answer categories for all questions:		
	Choose:	**1**	**Taxi company A**
		2	**Taxi company B**
		(98	**Can't choose / No preference)**

Q.21 Now some more general questions. In the last year, how often have you travelled by taxi—please include journeys with either minicabs or hackney carriages?
01. Every day
02. Five or six times a week
03. Three or four times a week
04. Once or twice a week

05. Two or three times a month
06. Once a month
07. Once every couple of months
08. Three or four times in the last year
09. Once or twice in the last year

Q.22 Do you, or does anyone in your household, at present own or have continuous use of a car or a van?

INCLUDE ANY PROVIDED BY EMPLOYERS IF NORMALLY AVAILABLE FOR PRIVATE USE BY RESPONDENT
PROBE WHETHER RESPONDENT, OTHER PERSON OR BOTH

01. Yes—respondent only
02. Yes—other household member only
03. Yes—respondent and other household member
04. No

(IF CODE 1–3 AT Q.22)

Q.23 How many vehicles in all?

01. One
02. Two
03. Three
04. Four or more

ASK ALL

Q.24 Can I check, do you yourself hold a full driving licence valid in Great Britain to drive a car?
INCLUDE: INTERNATIONAL PERMITS/OTHER LICENCES VALID IN THE UK
EXCLUDE: DISQUALIFIED DRIVERS
01. Yes
2. No

ASK ALL

Q.25 What was your age last birthday?
IF REFUSED/DON'T KNOW AT Q.25

Q.26 INTERVIEWER—ESTIMATE AGE GROUP OF RESPONDENT
Age of respondent
1 18–24
2 25–34
3 35–44
4 45–54
5 55–64
6 65–74

7 75+

ALL

Q.27 INTERVIEWER CODE SEX OF RESPONDENT
1. Male
2. Female

Q.28 Which of these descriptions applies to what you were doing in the last week, that is, in the seven days ending last Sunday?

01 In full-time paid work (30+ Hours Per Week)
02 In part-time paid work (8–29 Hours Per Week)
03 In part-time paid work (Under 8 Hours Per Week)
04 Retired
05 Still At School
06 In Full Time Higher Education
07 Unemployed (Seeking Work)
08 Not In Paid Employment (Not Seeking Work)

Q.29 Which member of your household is the Chief Income Earner, that is the person with the largest income, whether from employment, pensions, state benefits, investments or any other sources ?
01 Respondent
02 Respondent's Spouse\Partner
03 Other Adult

Q.30 Working status of Chief Income Earner (CIE)
01 Employed
02 Self-Employed
03 Not Working, Dependent On State Benefit, Chief Wage Earner (CWE) In Household
04 Not Working, Dependent On State Benefit, No Chief Wage Earner In Household
05 Not Working, Other Income

Q.31 COLLECT OCCUPATION OR PREVIOUS OCCUPATION DETAILS OF CIE OR IF CIE NOT WORKING AND THERE IS A CWE, COLLECT CWE DETAILS What is the type of firm where the CIE\CWE works ?

Q.32 What is the job actually done by the CIE\CWE ?

Q.33 What is the title, rank, grade, etc of the CIE\CWE ?

Q.34 Is the CIE\CWE self-employed ?

01 YES
02 NO

Q.35 How many people work there altogether ?

Q.36 How many is the CIE\CWE responsible for ?

Q.37 DOES THE CIE OR CWE HAVE ANY QUALIFICATIONS (SUCH AS APPRENTICESHIPS, PROFESSIONAL QUALIFICATIONS, UNIVERSITY DEGREES, DIPLOMAS ETC.)
Does the CIE or CWE have any qualifications ?
01 YES
02 NO

Q.38 Enter qualifications

Q.39
ENTER ANY OTHER RELEVANT DETAILS TO ASSIST CLASSIFICATION OF OCCUPATION AND INDUSTRY. IF NO FURTHER DETAILS PRESS 'OK'

CODE ALL THAT APPLY

Q.40 This list shows various possible sources of income. Can you please tell me which kinds of income you (and your spouse/partner) receive?

01. Earnings from employment or self-employment
02. Pension from a former employer
03. State Pension
04. Child Benefit
05. Income Support
06. Other State Benefits
07. Tax Credits
08. Interest from savings etc.
09. Other kinds of regular allowance from outside the household
010. Other sources e.g. rent
011. No source of income

(ALL EXCEPT CODE 11 AT Q.40)

Q.41 Will you please look at the screen again and tell me which group represents the total income of your household from all these sources before deductions for income tax, National Insurance etc. ENTER BAND

	WEEKLY	MONTHLY	ANNUAL
1	Less than £20	Less than £86	Less than £1,040
2	£20 less than £40	£86 less than £173	£1,040 less than £2,080
3	£40 less than £60	£173 less than £260	£2,080 less than £3,120
4	£60 less than £80	£260 less than £347	£3,120 less than £4,160
5	£80 less than £100	£347 less than £433	£4,160 less than £5,200
6	£100 less than £120	£433 less than £520	£5,200 less than £6,240
7	£120 less than £140	£520 less than £607	£6,240 less than £7,280
8	£140 less than £160	£607 less than £693	£7,280 less than £8,320
9	£160 less than £180	£693 less than £780	£8,320 less than £9,360
10	£180 less than £200	£780 less than £867	£9,360 less than £10,400
11	£200 less than £240	£867 less than £1,040	£10,400 less than £12,480
12	£240 less than £280	£1,040 less than £1,213	£12,480 less than £14,560

13	£280 less than £320	£1,213 less than £1,387	£14,560 less than £16,640
14	£320 less than £360	£1,387 less than £1,560	£16,640 less than £18,720
15	£360 less than £400	£1,560 less than £1,733	£18,720 less than £20,800
16	£400 less than £450	£1,733 less than £1,950	£20,800 less than £23,400
17	£450 less than £500	£1,950 less than £2,167	£23,400 less than £26,000
18	£500 less than £550	£2,167 less than £2,383	£26,000 less than £28,600
19	£550 less than £600	£2,383 less than £2,600	£28,600 less than £31,200
20	£600 less than £650	£2,600 less than £2,817	£31,200 less than £33,800
21	£650 less than £700	£2,817 less than £3,033	£33,800 less than £36,400
22	£700 or more	£3,033 or more	£36,400 or more

follow-up for higher incomes
(IF Q.41 = £700 or more per week)
Q.42 Could you please look at the next screen and give me the total income of your household as an annual amount from this list? ENTER BAND
ANNUAL INCOME

1	£36,400 less than £37,000	14	£49,000 less than £50,000
2	£37,000 less than £38,000	15	£50,000 less than £55,000
3	£38,000 less than £39,000	16	£55,000 less than £60,000
4	£39,000 less than £40,000	17	£60,000 less than £65,000
5	£40,000 less than £41,000	18	£65,000 less than £70,000
6	£41,000 less than £42,000	19	£70,000 less than £75,000
7	£42,000 less than £43,000	20	£75,000 less than £80,000
8	£43,000 less than £44,000	21	£80,000 less than £85,000
9	£44,000 less than £45,000	22	£85,000 less than £90,000
10	£45,000 less than £46,000	23	£90,000 less than £95,000
11	£46,000 less than £47,000	24	£95,000 less than £100,000
12	£47,000 less than £48,000	25	£100,000 or more
13	£48,000 less than £49,000		

ASK ALL
Q.43 Can I check, how easy did you find it to answer the questions about taxis? Do you have any comments on these questions? PROBE What else?
THANK YOU VERY MUCH FOR YOUR TIME
Q.44 INTERVIEWER—WRITE IN YOUR COMMENTS ON THIS INTERVIEW. HOW RELIABLE DO YOU THINK THE RESPONDENT'S ANSWERS ABOUT TAXI CHOICES WERE?