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THE EFFECTS OF PARKING CONTROL ON DESTINATION CHOICE.

- PILOT STUDIES

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ABSTRACT

TURVEY, I.G. (1985) The Effects of Parking Control on Destination Choice - Pilot Studies. Working Paper 218, Institute for Transport Studies, University of Leeds.

The aim of the project has been to develop a methodology to study the process of destination choice resulting from changes in parking control. A number of alternative approaches have been utilised such as 'before' and 'after' interviews and/or questionnaires using stated preference techniques. These techniques have been piloted in free standing towns in the North of England where parking policy change has been identified as a possibility. Further study may be possible at these sites over a period of time using panel techniques.

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1. INTRODUCTION

1.1 BACKGROUND

In response to changes in parking controls it may be postulated that the driver will alter his parking habits and behaviour to minimise the effects of such a change on himself. Changes in parking control which especially affect peak period travel, such as the parking location, mode chosen (Gantvoort, 1984) and the time of the trip (May, 1985) are frequently analysed. However, other effects of change such as the frequency of visit and the choice of the final destination, may have particular relevance to off peak and particularly shopping journeys. There is often concern over lost trade as a result of destination changes so providing both the pressure for parking improvements and the opposition to parking restrictions. Little is known, however, about the extent to which drivers do change destination in response to changes in parking control. Such information would be useful to:

(1) Design controls which avoid unnecessary adverse effects.
(2) Assess the merits of expenditure on parking facilities designed to attract customers.

The Institute for Transport Studies, funded internally by the University of Leeds, is involved in developing a methodology to study such destination choice resulting from changes in parking control. Initially, it was important to identify the first and second order effects of a possible change in policy and to decide how best to measure such an effect.

First order effects particularly relevant to peak period parking are:

1) Changes in the parking location.
2) Changes in the mode of travel.
3) Changes in the time of travel.
4) Changes in the frequency of visit.
5) Changes in the choice of the final destination.

NB: (4) and (5) are also relevant to off peak journeys (especially shopping).

Second order effects of a change of policy may be:

1) Changes in the level of through traffic (and congestion effects).
2) Changes in walk times.
3) Changes in pedestrian vehicle conflicts.
4) Changes in the degree of supressed demand.

Through traffic and congestion effects along with the occurance of pedestrian-vehicle conflicts fall outside the bounds of this project, as do business effects. However, as far as off-peak shopping travel is concerned then all the first order effects may

be identified through walking times and further direct interview/ questionnaire techniques. Such methods enable some degree of information to be collected regarding work in the CBD may well allow identification of any business effects and changes in the degree of supressed demand where perceived supply is exceeded by expressed demand to park.

It was initially proposed to use a combination of 'before' and 'after' surveys of implemented changes with purely hypothetical stated preference techniques. However, the project was set a time limit of 12 months for survey development and within this time contraint it proved impossible to obtain study site parking information sufficiently early to be able to plan our studies. Also, few authorities in the North of England planned to even consider parking policy changes within the duration of our study and lack of finance and time precluded a wider search for suitable sites over the rest of the country.

1.2 OBJECTIVES OF THE PROJECT

1. Identify free standing towns in the North of England which plan to introduce parking policy changes before September/ October 1985.

2. Construct a survey instrument to identify and attempt to quantify first order effects of any change in parking policy, especially variations in destination choice.

3. Conduct pilot studies using the chosen survey method.

4. Carry out before and after studies in a free standing town where a poliy change has taken place.

5. Make recommendations for further research relevant to the Transport and Road Research Laboratory proposed programme of research into parking policy.

6. Should time permit, Utilise survey data together with local authority occupancy and accumulation data/inventory data to develop a predictive model of choice between alternatives. The model to be based on time, cost and the attractiveness of alternative options and to be tested at several locations.

1.3 CURRENT RESEARCH

The most comprehensive source of literature references available is the IRRD system. A search was initiated in early October 1984 from the University library in two specific areas of Transportation research:

(1) TRAFFIC RESTRAINT AND PARKING
(2) DESTINATION CHOICE SURVEYS.

The words or phrases underlined were the keywords used in each

search which were to appear in either the title or abstract of a relevant article. These keywords were selected from the IRRD index and yielded 200 of the most recent articles, dating back to about 1980.

A further manual search, back to 1976, was made of the GLC ACOMPLIS bibliography and current transport periodicals held at the University of Leeds.

Although no single article was found which related directly to off peak changes in parking control and consequent effects on destination choice, references were identified which have some bearing on this project. The references fall into 3 broad areas:

(1) Traffic restraint involving parking control.
(2) Behavioural survey techniques.
(3) Modelling techniques (destination choice, parking).

1.3.1 TRAFFIC RESTRAINT (PARKING)

Delays, accidents, increased travel costs, noise, smells, damage to the urban fabric, trade loss etc. have all been seen to emanate from increased traffic congestion (Payne, 1984) and gradually there has become a common acceptance that restraint or control measures must be introduced in the major towns and cities. The tactics which may be employed by an authority to control parking may be identified as those affecting on street supply, off street supply in activity centres, pricing, enforcement and adjudication, fringe and corridor parking, and marketing (Direnzo, 1981). Figure 1.1 describes the methods that may be employed under each of these general headings.

To achieve the urban goals specified by Payne six general categories may be considered when assessing the likely impacts of parking policy (McShane, 1982). They are:

(A) Healthy economic climate, and a business community able to suppport local employment needs.

(B) Most efficient use of existing transportation, land and other public resources.

(C) Ease of mobility and accessibility of resources.

(D) Equity of resource distribution and preferential allocation of some resources.

(E) Environmental goals, especially reduced air pollution and the related goal of minimised energy consumption.

(F) Enhanced amenity and cultural attractiveness (preservation of character).

Typically categories (B) and (C) tend to be those goals identified by the majority of transport planners. Environmental,

amentiy and attractiveness related goals are less quantifiable

FIGURE 1.1 PARKING RESTRAINT MEASURES

SOURCE: DIRENZO (1981)

PARKING MANAGEMENT TACTIC	EXAMPLE
ON-STREET SUPPLY	o RESIDENTIAL PARKING PERMITS
	o CAR POOLING
OFF-STREET SUPPLY	o CONSTRUCTION OF NEW PARKING FACILITIES
	(1) PRIVATELY OWNED
	(2) MUNICIPALLY OWNED
	o INTRODUCTION OF PARKING ZONES (DISC SCHEMES)
FRINGE PARKING	o PARK AND RIDE
	o CAR POOLING
PRICING	o INCREASE PARKING RATES
	o DIFFERENTIAL PRICING PROGRAMS
	(1) SHORT TERM PARKING (2) GEOGRAPHICAL (3) TEMPORAL (4) CAR SHARING
	o FREE PARKING
	o PARKING TAX
ENFORCEMENT	o AGGRESSIVE TICKETING
	o WHEEL CLAMPING
	o TOWING
MARKETING	o MONTHLY PARKING CONVENIENCE STICKERS
	o ADVERTISING

and rely on attitudinal and behavioural studies to demonstrate policy effectiveness. It is in this area of behavioural research particularly relating to parking policy changes that little is known. No studies have been revealed, for example, that look at public reaction to policy changes. An understanding of the decision making process involved in deciding where to park and at what centre, for say a shopping trip, is important in the final assessment of the validity of any parking policy. No work has been done in this area.

Quantitative assessment of individual parking facilities is well documented. Parking at superstores (Aitken, 1977) (Kelly, 1979) and Universities (Ratcliffe, 1985) are discussed in terms of how best to satisfy demand and ways of minimising additional pressure on the highway network. Studies have also been conducted of municipal parking facilites. Kunze (1981) carried out a study of the impacts of substantial parking fee increases in downtown Chicago. Commuter traffic was found to decrease by 72% with an associated increase in short stay municipal parking. These changes in parking patterns were still evident 17 months after the change in parking policy. Whilst it was observed that a substantial element of commuter traffic was transferred to public transport no investigation was made into the parking habits of off peak shoppers who it may be assumed were attracted to the centre as a direct result of the increased availability of spaces. The main aim of reducing peak congestion had been achieved here and it was felt unnecessary to consider wider implications. The response of the London Borough of Redbridge to the same commuter problems in the peak was to consider a two fold approach (Andrews, 1985). Firstly bigger and better car parks at commuter stations were planned. These 'gateway' car parks were thought to be fundamental in persuading commuter traffic to transfer from car to public transport. The second strand was an expansion of an already tested parking zone concept comprising working day waiting restrictions, parking meters and free parking bays. Problems of cost and enforcement were evident with both solutions. Wright (1982) suggests that the relationship between enforcement effort and driver compliance is potentially unstable. When compliance falls the traffic wardens need more time to deal with each vehicle (because of writing out a ticket). Their rate of coverage is reduced and as a result non-complying drivers are less likely to be caught. Compliance falls a little further, and so on. The solution in Redbridge was to adopt a trial scheme using waiting restrictions which operated for just one hour during the middle of the day. This would best suit the small traffic warden force and was intended to deter all-day commuter parking without seriously inconveniencing residents. It was found that commuters tended to respect waiting restrictions more than other parkers and although intense enforcement was required when the 'zone' was introduced it could be reduced after a matter of a few weeks.

Disc zone parking as employed in Harrogate, North Yorkshire and Cork City, Ireland, has the advantages of being low cost, maintenance and vandal free and very flexible. In Cork,

O'Cinneide (1977) found that the introduction of a disc system had the effect of reducing the volume of traffic entering the disc zone area because of the displacement of long term parkers. This increased the supply of short term spaces. Once again this appears to have achieved the goals of reducing peak congestion and increasing the attractiveness of the centre to short term parkers. No studies have been carried out which seek to examine the effectiveness of such a scheme when enforcement breaks down or becomes impracticable for economic reasons. For commuter traffic it is largely assumed that parking restrictions of whatever form will lead to an increase in ridesharing or the use of public transport (Higgins, 1985). For the off peak shopper these options may not be so attractive and the implications for the centre may be more widespread than transport related in terms of the impacts of reduced trip making on the economic welfare of the community. This idea is supported by Gantvoort (1984) when studying the effects of a parking restraint measure on mode choice. He concludes that where motorists have a public transport alternative, then public transport is only a 2nd choice. The quality of public transport is often a deterrent to its use.

1.3.2 BEHAVIOURAL SURVEY TECHNIQUES

On site surveys of parking facility accumulation, duration of stay and usage are well documented and described in Chapter 2. However information about the behaviour patterns of parkers is necessary for a detailed understanding of parking requirements. Pearce (1979) acknowledges that commuters and shoppers are notoriously impatient and so speed and simplicity are essential elements in the design and implementation of questionnaires/ interviews. To supplement ticket sales records parkers were asked just two questions.

(1) Why did you come to .....?
(2) How many people came to ..... with you?

This enabled trip purpose, number of vehicles parking, duration of stay, occupancy of each car, occupancy of car park to be determined. The technnique was designed for use in multi-storey car parks and achieved at low cost, a high response rate in excess of 88%. In order to assess the implications of possible pricing policies on car parking demand, relationships between prices and the use of the car parks were investigated. Factors however, such as income levels, local commercial activity, car ownership and availability of on-street parking which are of importance in determining parking demand, were not considered. Short term indicators such as the price of parking, petrol and public transport were used instead. Multiple linear regression tests suggested that of these three the price of parking was by far the most important (indeed simple linear regression of parking price against use was also acceptable). As a result short term parking demand showed a steady predicted growth of 2% per annum. For long term parking demand the growth was for a forecasted increase of 30% over the next two years for the centre

studied. However Saturday parking was found to be less sensitive to price than was long term weekday parking. Assuming the same inflation rate of 10%, an increase of 7% in long term parking demand was expected to occur over the same two year period.

Another survey technique which aims at combining traditional data collection with a behavioural assessment is VISTA (or VISTAPARK), a micro computer based video analysis system developed by Wootton Jeffreys and Partners (Brown, 1982). Seen as an alternative to conventional registration matching techniques 'VISAPARK' was used by West Sussex County Council to supplement parking inventory data with classfied vehicle counts, duration of stay data and behavioural information. The cost of such a system may be prohibitive for most parking survey work and hence the reliability of panel technqiues and mail return questionnaires is important if a qualitative rather than quantitative assessment of policy change is to be made. Galin (1980) suggests that provided the applied mail-return questionnaire is mainly factual and of a short and easy-to-fill format, the respondents form an unbiased sample of the population surveyed. The latter should be about three times the desired sample of respondents (when reminder letters and other follow up methods are not used). Furthermore Galin found that larger distribution allows late responses to be discarded, still resulting in an unbiased sample. In the design of attitudinal or behavioural questionnaires then the work of Oppenheim (1966) is foremost, especially in the emphasis placed on the need to study and control bias by comparing socio-econoimc characteristics of respondents and the population at large and by comparing early and late responses.

Panel studies are seen by Smart (1984) as the only studies which truely permit studies of individual change. They may be needed not only for counting the freuency of changes but also for research on the dynamics and causation of relationships. Also in work carried out by Tyne and Wear County Council in 1983 it was found that panel studies were a more economic and accurate form of data collection than the usual data collection and modelling techniques of the 1970's, often involving single sample surveys, periodic surveys and continuous measurement.

1.3.3 MODELLING TECHNIQUES

The act of making a trip requires the person involved to make several choices. For example, the mode of travel to use, the route to take and the location of the final destination. The estimation of origin-destination matrices and the simulation of route choice are therefore fundamental to the development of comprehensive traffic management models. It is often difficult and expensive to measure such data and therefore a number of estimation methods are utilised in estimating origin-destination flows in the peak hour for example (Brennan, 1977), or by simulating trip choice (Robertson, 1984), or by using traffic counts (Haver, 1981). Car driver route choice has also been investigated by a number of researchers, most notably Duffell (1983) who considered 'rat running' phenomenon in Hertfordshire,

Polak (1981) who used simulation and gaming techniques to predict route choice and Heywood (1985) who describes survey techniques used to assess the impact of traffic management measures on drivers route choice. On the basis that the car driver becomes a pedestrian when he/she leaves the vehicle, and accepting that a pedestrian is more likely to choose the shortest path route for a trip due to the physical effort required when walking and fewer constraints to movement, the work of Seneviratne (1985) is important also in the development of traffic management models. Seneviratne analysed the factors affecting the choice of route of pedestrians. An understanding of pedestrian issues of this sort is important in determining reasons for driver destination choice and parking location choice relative to that final destination. Robertson (1979) describes how the choice of route, mode, origin and destination may be calculated and simulated by trip assignment methods where travellers are free to choose between alternatives. Langdon (1983) looks at the methods of estimating choice probabilities between multiple alternaitves and identifies models (such as the logit and multinominal probit) which are particularly suitable. Typically route choice and origin-destination data is utilised in conventional transport assignment models. Eldin (1981) took this approach one step further and considered the interaction between parking supply, by type and location, and the vehicular traffic assigned to an urban street network. The model was structured to include a generalised cost function, route choice and traffic assignment, and consisted of four zones, two of which contain parking facilitites. Implementation of the model on a hypothetical network indicated that the minimum route changes according to the parking management scheme applied to each zone. Consequently, significant changes are observed in the assigned link volume in two cases tested. Case 1 represented the current parking conditions where illegal parking was present due to a weak system of parking control and regulation. In case 2, parking was assumed to be fully controlled in the two central zones. It was suggested that this may be achieved by:

(1) Eliminating free and illegal parking.
(2) Increase on street meters by 75%.
(3) Increase off street supply by 300%.

Such attempts at modelling changes in parking policy are rare. Models do however look at parking requirements, particularly at centres of traffic attraction. A parking requirement prediction model, based on shopping centre size and car ownership in catchment area, has been developed and evaluated by Codd (1983). A gravity model was selected for development because it could be easily calibrated from survey data using multiple linear regression analysis. The study concluded that there was little to justify existing parking standards. Moreover it was determined that parking requirements appear to be well correlated with 'groups of shops' acting collectively although such groups may be made up of single shops separated from each other by short distances. Also, the variable 'gross floor area' was assessed to be a better predictor variable than 'effective floor area'. Codd

goes on to identify factors, not modelled, which were having an effect and so helped render his model only marginally more accurate than the use of simple sliding scale parking standards.

If driver choice is also to be modelled then the techniques to be utilised have been largely confined to the use of logit models. Most practical transport modelling has used the simplified model approach such as the multinominal logit model or more recently the 'state of the art' hierarchical logit (Langdon, 1983). The need to supply some behavioural simplifying assumptions has proven a more effective course here than the extended use of a more sophisitcated multinominal probit which may be often affected by extraneous errors. Against this, Bonsall (1980) sought to extend the influence of parking policy beyond the minor role which it existed in conventional parking submodels. A hierarchical logit model was proposed based on the work of Williams (1977) and Ortuzar (1980). However a 'discrete' choice model was preferred as it was better suited to the bunched nature of city centre parking stock. The model output shows how parking policies (such as charges, location of facilities and the split between long and short stay spaces) will affect peak period modal split, road congestion and parking capacity usage. Therefore from an input of an origin-destination matrix, a detailed network assignment and a dynamic record of parking accumulation was output. The work was conducted within an existing simulation-assignment package (SATURN) at the Institute for Transport Studies, University of Leeds (Hall, 1980). Whilst the model was calibrated on data which related to: duration of stay, preferential parking facilities available, timing of journeys, location of car park, journey distance, access to car at work and a number of other variable no aspect of enforcement was included in the model. O'Cinneide (1982) adapted the existing stage of parking models covering specific aspects of the parking problem and created a model which attempted to describe the detection and prosecution process defined by:

$$P(\text{punishment}) = P(\text{detection}) \cdot P(\text{prosecution}) \cdot P(\text{fine}).$$

Inherent in such a model, the question of the probability of a parker doing so illegally and the probability of him being detected in such a case, is discussed. From this, the perceived risk of detection is derived and an 'aversion' (to being punished) factor is calculated.

Most of the models outlined look at specific aspects of parking, usually for the peak period. Behavioural choice elements in the models are restricted by the availability of data and the perceived need to examine the wider issues of parking policy change as part of area wide traffic managment schemes. Furthermore the literature has not revealed any significant developments in the understanding of the relationships between off peak shopper destination choice and the variety of parking policy changes which may be implemented under the guise of urban traffic restraint.

1.4 OUTLINE OF THE REPORT

The following chapters deal with:

(I) A resume of the various methods by which parking data is collected (Chapter 2).

(II) A shortlist of suitable sites for further study and the proposed format for further work (Chapter 3).

(III) A review of the pilot studies conducted in Leeds in 1984 giving an appraisal of the formulated questions and an insight into the methodology adopted (Chapter 4).

(IV) A discussion of the background to and results of studies carried out in Rotherham (Chapter 5) and Knaresborough (Chapter 6).

(V) An appraisal of survey costs and methods of analysis (Chapter 7).

(VI) Conclusions from the project (Chapter 8).

(VII) Recommendations for further work (Chapter 9).

(VIII) References.

This section compiles lists of references, from a number of subject areas, which may be useful in future studies of this kind.

(A) Survey design
(B) Traffic restraint (parking)
(C) Parking (general)
(D) Parking surveys
(E) Origin/destination surveys
(F) Modelling techniques

2. PARKING SURVEYS

Few towns experience no traffic congestion and car parking problems. Streets designed to cope with traffic prior to the motor car age now have to cater for large volumes of vehicles. Resultant effects influence the extent to which the motor car is provided for in the town. These effects fall into four areas:

(1) ENVIRONMENTAL EFFECTS

Aesthetic deterioration is often associated with parked vehicles and direction signs or signs for vehicle control. This may cause an environmental disamenity (Howarth, 1982), (TEST, 1967).

(2) BUSINESS EFFECTS

Commercial interests consider that they are directly affected by the parking situation and it is often regarded that packed kerbs are necessary visual evidence of trade prosperity (Weaver, 1983). The net result is that business communities often view parking controls with contempt.

(3) ACCESSIBILITY AND CONGESTION

Traffic congestion is an important consideration affecting the viability of any shopping centre. In direct conflict to (2) above, one way of reducing congestion is to control parking at the roadside and so enhance capacity (Aitken, 1977), (Gillen, 1978).

(4) ACCIDENTS

Vehicles parked at, or manoevering into or out of, kerb parking spaces can be an important cause of accidents (Hallquist, 1980), (Todd, 1980).

Parking surveys are carried out in order to obtain the information necessary to provide an assessment of the parking problem in the area(s) being studied. Types of survey fall into two categories: parking supply and parking usage surveys (Carr, 1979):

2.1 PARKING SUPPLY SURVEYS

Parking supply surveys are concerned with obtaining detailed information regarding those on-street and off-street features which influence the provision of parking space, the existing situation with regard to parking space, and how it is controlled. There are three main inventories:

(1) An on-street space inventory.
(2) An off-street space inventory.
(3) A street regulation inventory.

2.2 PARKING USAGE SURVEYS

The main components are:

(I) CONCENTRATION STUDIES (Burton, 1960)

- Determines where vehicles park and also the actual number parked at any given instant at all locations within the survey area. E.g. cordon counts, patrol surveys.

(II) DURATION SURVEY (Hague, 1980)

- Determines the length of time that vehicles are "stored" within the survey area.

(III) INTERVIEW SURVEYS (Oppenheim, 1973) (Burton, 1960)

- These are the most expensive and comprehensive of parking surveys and normally involve interviewing motorists at their place of parking regarding:

  - o The origin of trips just completed
  - o Primary destinations
  - o Trip purpose

Concentration and duration data may also be collected during this survey along with personal particulars of the driver, e.g. sex, age, status, etc.

2.3 OTHER PARKING SURVEY TECHNIQUES

(I) ORIGIN/DESTINATION SURVEYS

An evaluation of trip origins and destinations in relation to a facility enables catchment areas to be defined and some indication of parking demand for the various trip purposes to be estimated. Origins/destinations have been estimated from flows and link volumes (Bell, 1983) and by simulating trip choice (Robertson, 1984). However, more conventionally it is by household interview (Bovy, 1983) or roadside interview (Withrington, 1984) that such data is obtained. The emphasis of such surveys has tended toward the analysis of route choice characteristics (Heywood, 1985), (Robertson, 1979) for the car driver, or the pedestrian (Seneviratne, 1985). Further analysis of both modes, origins and destinations, when the main mode is by car may indicate a rationale by which changes in parking control, affecting ultimate activity and parking destinations, can be assessed.

(II) THE PARK AND VISIT SURVEY (May, 1985)

The park and visit survey was designed to measure time spent searching for parking spaces and walking from them to a final destination. In addition, it provides a measure of the need to search for parking spaces and hence of the amount of searching traffic, and also provides an alternative source of journey times on a selected route.

(III) VEHICLE FOLLOWING SURVEY (May, 1985)

The vehicle following survey was designed to detect vehicles searching for parking spaces and record the time which they spent doing so. It provides information on the amount of through traffic at certain points and an indirect measure of travel time.

2.4 PARKING INDICES

Data from parking surveys may be used to generate a number of parking indices for planning and assessment purposes.

(I) PARKING ACCUMULATION

- The number of parked vehicles in an area at a specified time.

(II) PARKING VOLUME

- The number of vehicles in a specified time period. The parking duration is the time a vehicle spends parked at a particular location.

(III) PARKING TURNOVER

- The rate of use of parking spaces.

$$\text{PARKING TURNOVER} = \frac{\text{PARKING VOLUME}}{\text{NUMBER OF SPACES}}$$

(IV) PARKING INDEX

- A measure of the use of street length expressed as a percentage of the theoretically available 6m lengths of kerb space (P) actually occupied by parked vehicles (p).

$$\text{PARKING INDEX} = \frac{100 \times p}{P} \ \%$$

Therefore, conventional survey techniques explain the current situation and the relationship between the supply of, and demand

for parking spaces, at any one time. This however, only expresses part of the overall parking situation. If the 'costs' of non-compliance with on-street parking regulations are to be estimated then the business, environmental, accessibility and accident consequences have in some way to be measured. In order to achieve this aim then origin/destination surveys, vehicle following and park and visit studies provide an assessment of the congestion and ease of access effects associated with searching traffic and walk back times. Interviews also supply further behavioural and attitudinal data which is invaluable if a total view of the parking situation is to be achieved.

3. CASE STUDIES

3.1 SELECTION OF SUITABLE SITES

In planning a project, which has a maximum time constraint of 12 months, one of the major problems is that of obtaining information on intended changes in parking policy sufficiently early to be able to plan the 'before' surveys. Therefore, in October 1984, about 20 local authorities were contacted in the North of England to determine if freestanding towns within their domain were suitable for our study. The search was limited to the North of England to minimise survey travel costs, and for the same reason (and to aid the analysis procedure) the ideal town size was deemed to be of a population of about 25,000-85,000. Appendix 3 shows the range of local authorities that were contacted.

A shortlist of possible study towns was drawn up and is given in Table 4.1. A follow up letter was then sent to all the authorities responsible for shortlisted towns. The letter gave a brief outline of the terms of reference of the project and the proposed timetable and stressed the need to gain the following data items at the earliest possible date:

(1) A timetable for the introduction of any policy changes. E.g. time restrictions, price control, new restraint measures etc.

(2) Numbers of spaces to be affected in relation to the total parking stock.

(3) Recent inventory and parking usage (occupancy and accumulation) survey reports.

(4) Evidence of past levels of activity.

(5) Information relating to alternative parking locations.

(6) Current site maps/plans.

The response to the letter was good. All the authorities concerned were willing to discuss further the parking situation in their areas. By mid November the 13 shortlisted towns had been reduced to six possible case study sites. Namely:

(1) Rotherham
(2) Leeds
(3) Castleford
(4) Knaresborough
(5) Harrogate
(6) Huddersfield

Otley, Ilkley and Ripon were rejected due to the vague nature of the parking policy review which was planned for early 1985. Similarly, in York, a review of city parking was planned to take

TABLE 3.1 POSSIBLE CASE STUDY SITES

SITE	POPULATION	PARKING DATA AVAILABLE	ANTICIPATED CHANGE	SURVEYS PILOT	SURVEYS BEFORE	SURVEYS AFTER	ABANDONED	REASON WHY ABANDONDED/COMMENTS	CONTACT
BARNSLEY, SOUTH YORKSHIRE	74,730	YES	INTRODUCTION OF PARKING METERS				*	INTRODUCTION OF NEW POLICY NOT UNTIL SPRING 1986	MR BUNDY BARNSLEY 203232
ROTHERHAM, SOUTH YORKSHIRE	84,770	YES	INTRODUCTION OF PARKING METERS	*	*	*			MR HUNT ROTHERHAM 382121
SHEFFIELD SOUTH YORKSHIRE	511,860	YES	ENCOURAGE SHORT STAY AND MULTI-STOREY USE				*	CENTRE TOO LARGE. NO SPECIFIC DATE FOR INTRODUCTION	MISS SAUNDERS SHEFFIELD 734192
LEEDS WEST YORKSHIRE	500,200	NO	CARD PARKING SCHEMES PLANNED	*			*	CENTRE TOO LARGE. POLICY DROPPED	LEEDS 463136
CASTLEFORD, WEST YORKSHIRE	37,650	YES	INTRODUCTION OF PAY AND DISPLAY				*	INTRODUCED 1/10/84 RETROSPECTIVE SURVEYS NOT POSSIBLE DUE TO MINERS STRIKE	MR LAU WAKEFIELD 370211
WAKEFIELD, WEST YORKSHIRE	58,490	NO	CARD PARKING SCHEME PLANNED				*	POLICY DROPPED	MR LAU WAKEFIELD 370211
KNARESBOROUGH, NORTH YORKSHIRE	11,780	YES	1) REVIEW OF DISC PARKING SCHEME 2) TOURIST PARKING	*	* * (TOURIST)				MR WINDLE HARROGATE 68966
HARROGATE, NORTH YORKSHIRE	64,620	YES	1) REVIEW OF DISC PARKING SCHEME 2) NEW ASDA STORE				*	ASDA STORE NOT OPEN UNTIL 11/85	MR WINDLE HARROGATE 68966
OTLEY, WEST YORKSHIRE	8,715	NO	POLICY REVIEW				*	VAGUE PROPOSALS NO TIME SCALE	MR WILSON WAKEFIELD 367111
ILKLEY, WEST YORKSHIRE	24,062	NO	POLICY REVIEW				*	VAGUE PROPOSALS NO TIME SCALE	MR WILSON WAKEFIELD 367111
RIPON, NORTH YORKSHIRE	11,952	NO	POLICY REVIEW				*	VAGUE PROPOSALS NO TIME SCALE	MR WALKER WAKEFIELD 367111
YORK, NORTH YORKSHIRE	99,787	NO	REVIEW OF POLICY OVER NEXT 5 YEARS				*	TIME SCALE TOO LARGE	MR LEWIS YORK 59881
HUDDERSFIELD, WEST YORKSHIRE	130,000	YES	NO CHANGE - POSSIBLE CONTROL SITE				*	NOT REQUIRED IN PILOT STAGES	MR BEAUMONT WAKEFIELD 367111

place over the next 5 years and it was anticipated that should parking controls be altered, then a radical change was unlikely. In Leeds and Wakefield car parking schemes, proposed for 1985, met with political opposition and so these cities were of little further value to our study. Leeds, however, was retained as a possible site for pilot study work. In South Yorkshire both Barnsley and Sheffield had been potential sites for survey work. The stock of parking meters was due to be vastley expanded in Barnsley in mid 1985 and Sheffield expected to adopt a policy of encouraging short stay and multi-storey car park use in the city centre. Both schemes were abandoned early in 1985 when political and business influence was exerted to discourage policy reforms which may deter trips by car to the central area. The then current coal miners strike had reduced travel to the centre of most towns in Yorkshire, and this policy reversal was a reflection of the wider impacts of the miners action.

The remaining six towns (with the exception of Leeds) all had populations below the desired maximum limit of 85,000.

3.2 CASE STUDY SITES

(A) The six selected sites for case study work were reduced to the following:

(1) Leeds - pilot study work
(2) Rotherham - 'before' and 'after' studies
(3) Knaresborough - before survey, tourist survey.

In addition, Harrogate was retained as a possible site if time was available towards the end of the project. A new Asda superstore due for opening in October/November 1985 was planned to provide 200 free parking spaces close to the centre. This would be useful to study in terms of any re-location of parkers after the superstore was opened. A decision on Harrogate was deferred until closer to the opening date.

(B) The remaining two towns - Huddersfield and Castleford - were not studied. Huddersfield, where no policy change was ever anticipated, is still attractive as a control study site providiing that similar case study sites can be matched in terms of topography, demography etc. No such conditions existed in the remaining study areas and as the terms of reference really demand pilot work to develop a survey methodology there was little point in going into a large town were public interest was not already aroused by an iminent policy change.

In many ways Castleford was an ideal site for study. Prior to 1984 parking in the small centre (population 37,650) was free. However in October 1984 pay and display car parks were introduced (20p per hour) and a simultaneous pedestrianisation of part of the central area reduced free on street parking facilities by about 20%. This meant a

real reduction of 5% due to a 1984 spare capacity at peak times of 15%. The introduction of both schemes was too early to permit before and after studies by ITS. However retrospective questionnaires or interviews were discussed, and provisionally timetabled for November 1984 and January 1985. The effect of the miners strike on Castleford was to reduce trips, especially shopping trips, to the town centre by up to 50%. This deemed the policy effects negligible at that time due to the numbers of free spaces still available on-street. No study was therefore carried out.

3.3 PROJECT TIMETABLE

The organisation of survey work was planned as follows:

FIGURE 3.1 PROJECT TIMETABLE

	TIME	SURVEYS	SURVEY TYPE	ANALYSIS/OTHER
1984	OCTOBER NOVEMBER DECEMBER			COLLECTION OF PARKING DATA, SELECTION OF SITES, LITERATURE SEARCH. FORMULATION OF QUESTIONS.
1985	JANUARY	LEEDS PILOT STUDY	INTERVIEW	
	FEBRUARY	LEEDS PILOT STUDY	QUESTIONNAIRE (RP)	
	MARCH	ROTHERHAM (BEFORE)	INTERVIEW/ QUESTIONNAIRE (RP)	PILOT SURVEYS
	APRIL	*		ROTHERHAM SURVEYS
	MAY			
	JUNE	KNARESBOROUGH	QUESTIONNAIRE (RP)	
	JULY	ROTHERHAM (AFTER)	POSTAL (RP)	KNARESBOROUGH
	AUGUST	KNARESBOROUGH (TOURIST)	INTERVIEW	ROTHERHAM
	SEPTEMBER			FINAL REPORT/KNARESBOROUGH

NOTES:

1) RP = REPLY PAID
2) * = INTRODUCTION OF NEW PARKING POLICY IN ROTHERHAM
3) A CONTINUED EFFORT WAS MADE TO LOCATE FURTHER SITES WHERE A CHANGE IN PARKING POLICY WOULD ENABLE USEFUL BEFORE AND AFTER STUDIES TO BE CARRIED OUT.

4. PILOT STUDIES (LEEDS)

4.1 INTERVIEW

A questionnaire was compiled and a series of interviews were conducted on Friday 8 February 1985 at the Schofields NCP car park in central Leeds. Although it was recognised that future surveys would be conducted mainly at grade, the main priority here was to gauge public reaction to specific questions and to identify problems in presentation and questionnaire design.

The car park had two advantages for pilot studies:

(1) It is very compact and allows easy transfer of survey staff between park levels. This minimises the time taken to locate and approach parking motorists.

(2) It has a high turnover of vehicles. On an average weekday afternoon a car parks every 75 seconds. This determines that the interviewer can be kept involved for the whole of the survey period.

Also, being under cover, interviews are not interrupted by bad weather and are made more attractive to both survey staff and the parking public. Motorists were approached on parking or on returning to their cars in the period 12 noon to 4.30 p.m. The interview format is given in Appendix 4(A).

4.2 REPLY PAID QUESTIONNAIRES

The same location and survey times were used to distribute reply paid questionnaires to both parking and returning drivers on Monday 11 February 1985. This format involved approaching the respondent and explaining in a comprehensive yet concise way:

(1) The objectives of the study
(2) The involvement of the University and ITS
(3) How the questionnaire should be filled in and returned to the University.

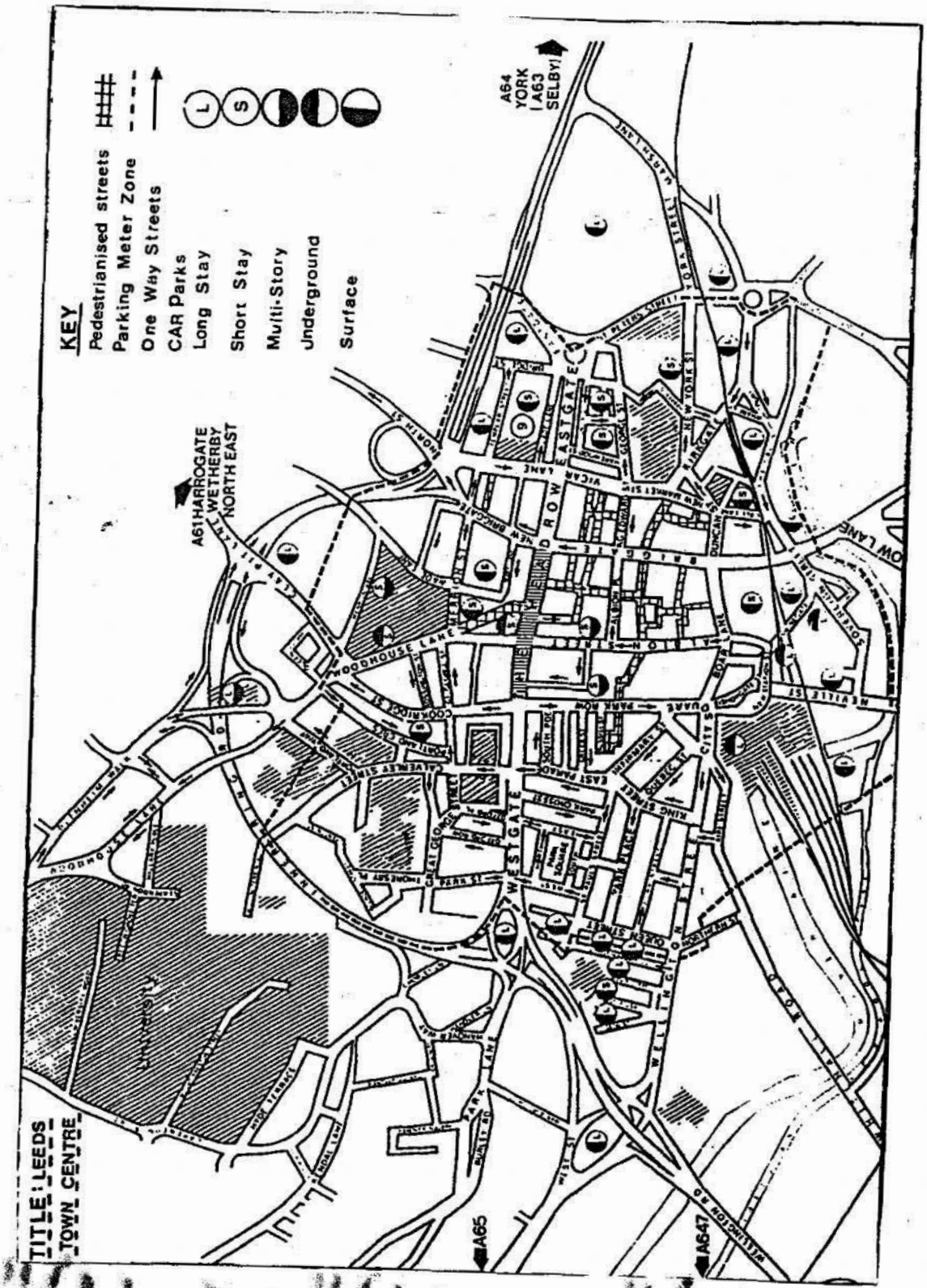
In addition survey staff were asked to collect information relating to vehicle type, number of occupants, and time of day etc. (Section 1 of Appendix 4(B)). The questionnaire format (Section 2 onwards) is given in Appendix 4(B). For both the interview and the questionnaire reference was made to the parking locations given in Figure 4.1.

4.3 APPRAISAL OF METHODOLOGY

4.3.1 INTERVIEW (excluding Section 3)

Despite all the advantages of using a multistorey car park and the fact that parking was seen as an important issue in terms of supply and cost, by Leeds public, the interviews conducted were not a success. Of those respondents approached on entry to the

FIGURE 4.1 PARKING LOCATIONS IN THE CENTRE OF LEEDS



car park only 10% completed the full interview. 4% completed the full interview when leaving the car park. In total 62% of those approached refused to take part in a survey. Of the remaining 38%, 4 out of 5 decided that they did not wish to complete the interview. Although some problems were experienced in dealing with individual questions (see 4.3.3) perhaps the major factor in such a high failure rate was due to the 9.5 minute average time taken to complete the interview. Refusals during completion tended to occur around the 4 minute mark.

Acknowledging the problem of time taken in completion it was decided to continue interviews on a sectional basis to test how appropriate individual questions were. For each of the sections of questions used (Section 3; questions 1, 2, 4, 9, 10, 11; questions 1, 5, 6, 7, 8) the response time was 4 minutes or less. As a result terminations in the middle of a sectional interview were reduced from 82% to 8.8%.

4.3.2 REPLY PAID QUESTIONNAIRE

The introduction given by survey staff to respondents whilst handing over a questionnaire to be returned to the University by 'Freepost' took approximately two minutes to complete. This allows for the distribution of between 18 and 22 questionnaires per hour per person. 39% of the 200 questionnaires were returned over a period of 5 weeks (30% were returned within 2 to 3 weeks). In general the quality of response was very good. It should also be noted, when referring to Appendix 4(B), that the actual format of the distributed questionnaires was as an A5 booklet. This both improved the presentation of the 'package' and aided the ease of distribution. The questionnaire content remained the same on both counts. This A5 format was subsequently used in the Rotherham and Knaresborough surveys.

4.3.3 APPRAISAL OF QUESTIONS

Where a question is not referred to then no problems were encountered in interpreting the responses given.

(1) In general the response to 'why have you chosen to shop in the centre of ...', was very vague. For example: 'live here' or 'good facilities'. If a more concise answer is required, then a stated preference version using the answers given in this work as a basis for the formulation of options, would be more effective.

(2) When asked 'why did you chose to park at this location' the main reply was 'nearness to shops'. However a further answer was often supplied: it was the 'most convenient space' should be included in the list.

(3) Whilst the options given in question 5, 6, 7, 8, are comprehensive, other replies are to be expected depending on the centre involved. In Leeds 'search for a meter space' was often used as an alternative reply. It was not

perceived as a variation of 'search longer for a cheaper space'.

For questions 5, 6, 7, 8 there was often confusion over 'are there any of these options that you would never consider'. It is difficult to judge from the questionnaire if no options applied or if the question was not understood.

(4) The map question continually caused respondents problems. Much encouragement and pressure had to be put on the respondent to complete this question in the interview stages. Always the desire was for a map that was of a larger scale and which had shops and other land mark marked on.

(5) The questions about walk time were well answered but it was generally perceived that the furthest from a location that a person would ever consider parking and walking would be 7-10 minutes, depending upon terrain.

(6) For the frequency of visit to a centre then the main difficulty arose due to people needing more divisions between 'more than twice per week' and 'more than twice per month'. For example: twice per fortnight is not always once per week.

(7) There was a basic problem in getting people to give their home address. None of those being interviewed were willing to supply this information and only 50% of those involved in the reply paid survey gave a home address. A price incentive by which a person has to give a contact address to qualify may resolve this problem.

(8) Respondents are very wary of answering questions about the cost of travel. They also tend to make wild guesses based seemingly on no rational judgement. This proved to be a very time consuming element of the interview format.

(9) Nobody indicated that they made more trips to the central area than they did 12 months ago. The vast majority of responses indicated an unchanged pattern of trip making. Of those who indicated that they made less trips than 12 months ago, the main reason was that their children were getting older and get fed up more easily. Hence the reduction.

In Appendix 4 a number of maps of Leeds centre are presented to show the variety of approaches that may be used when asking a respondent to indicate his/her trip pattern on a map/diagram. The outer limit of any map should be restricted by either the location of central area parking facilities and/or the map distance able to be covered by 15 mintues walk time (whichever is the greater).

5. CAR PARKING IN ROTHERHAM

5.1 BACKGROUND

Rotherham, with a population of over 84,000, is located twelve miles south of Barnsley and thirteen miles west of Doncaster to the south of the county of South Yorkshire. The town is also close to the M1 motorway which separates it from the city of Sheffield, six miles to the south west. Market day is on both a Monday and a Saturday and early closing is on a Thursday.

The town centre is compact and to a large extent pedestrianised with all parking facilities forming a radial collar around the CBD. Figure 5.1 shows the location of parking facilities. No charge has ever been made in Rotherham for on-street parking, but, off-street parking has been subject to a charge for a number of years with the exception of the Main Street car park (there are still approximately 100 free spaces there). A number of car parks are 'short stay' with a pay and display ticket machines. The multi-storey car park is long stay with some permit parking facilities. There are 160 on-street parking spaces and 1781 off-street parking spaces (including the privately owned Hillards superstore). Parking meters affecting the 160 on-street spaces were introduced in early April 1985 with a charge of 10p/hr.

Table 5.1 indicates the use of the parking facilities from survey data taken in June 1984. For a typical Tuesday in that month maximum occupancy (98%) occurred between 9.30 a.m. and 10 a.m., and remained above 93% up until 12 noon. Although more recent survey data was not available it was anticipated that on days other than market days the numbers of trips (and therefore the numbers of parked cars) to the central area in April 1985 had been reduced due to the effects of the miners strike of the time.

FIGURE 5.1 PARKING FACILITIES IN THE CENTRE OF ROTHERHAM

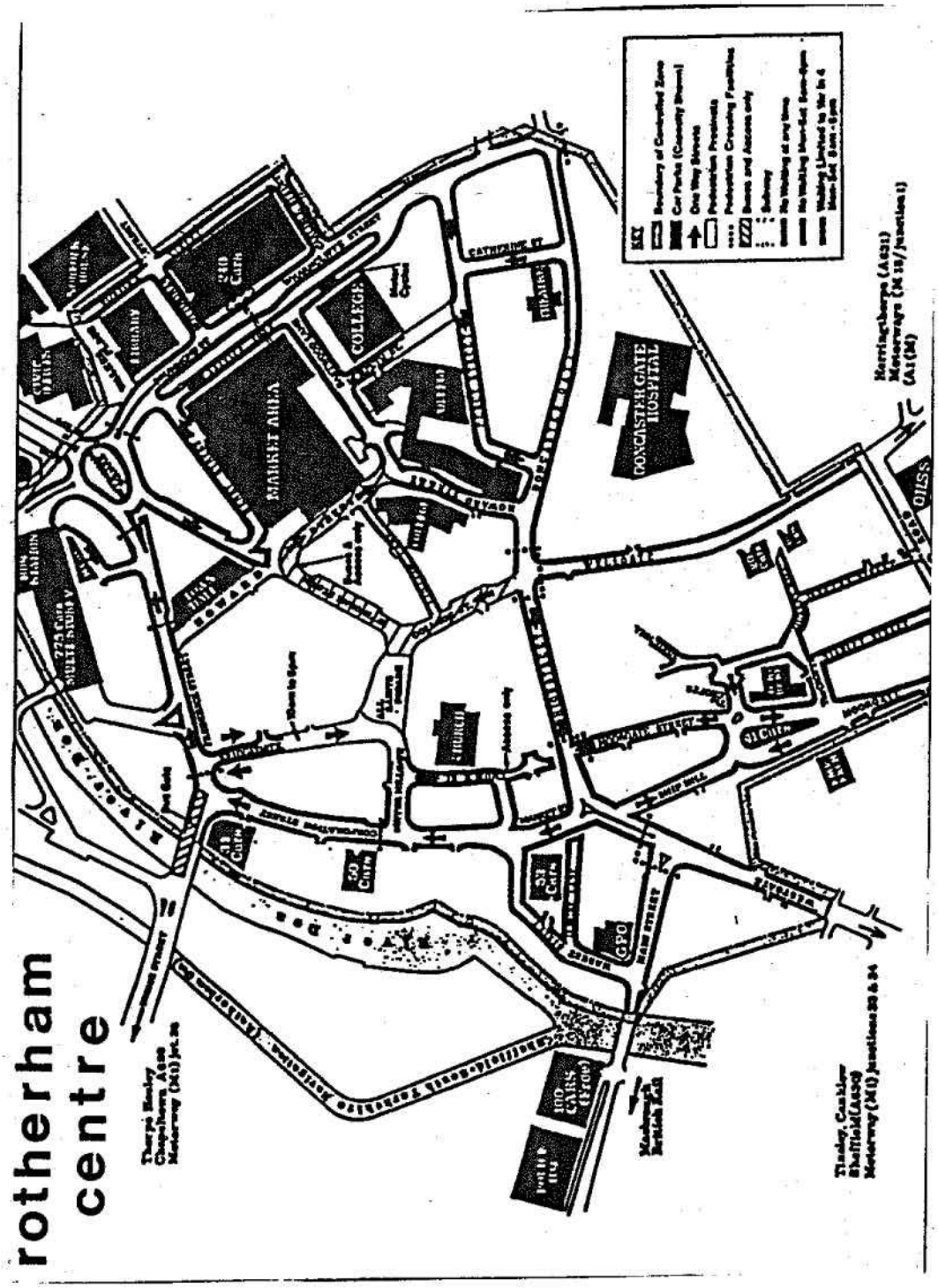


TABLE 5.1 CAR PARKING IN ROTHERHAM (TUESDAY 26.6.84)

LOCATION	NUMBER OF SPACES	CONTROL	OCCUPANCY (10am-4pm)	AV. DURATION OF STAY (MINS) (10am-4pm)
ON STREET:				
CORPORATION ST	43	FREE	100%	45
MOORGATE	19	FREE	75%	39
SHIP HILL	32	FREE	82%	38
MARKET SQUARE	2	FREE	114%	40
+ OTHERS	64	FREE	-	-
TOTAL ON STREET:	160 SPACES			
OFF STREET:				
DRUMMOND ST	240	25p/2 hrs	71%	71
DOMINE LANE	53	25p/2 hrs	98%	65
CORPORATION ST (BOTTOM)	34	25p/2 hrs		
CORPORATION ST (MIDDLE)	50	25p/2 hrs	112%	76
THE CROFTS	41	25p/2 hrs	127%	142
HILLARDS	400	FREE*	-	-
MULTISTOREY	775	30p/day	19%	340
+ POLICE STATION	100	FREE	-	-
+ NORFOLK HOUSE	88	25p/2 hrs	-	-
TOTAL OFF STREET:	1781 SPACES			

+ PARKING FACILITIES NOT SURVEYED (OUTSIDE MAIN TOWN CENTRE COLLAR)
* PURCHASE HAS TO BE MADE IN STORE

SOURCE OF DATA: ROTHERHAM TOWN COUNCIL, PARKING SURVEYS JUNE 1984.

5.2 BEFORE STUDY

Prior to the introduction of parking meters in April 1985, a series of interview/questionnaire surveys were carried out at the major on and off street parking locations surrounding the town centre. Appendix 5(a) contains the list of questions which were asked. Each survey was structured such that questions were organised into three sections:

(A) SECTION 1:

To be completed by the interviewer. Questions relate to:

- Day, date, time
- Location
- Parking type
- Vehicle type
- Number of occupants

(B) SECTION 2:

Initially it was envisaged that this section would be conducted in an on site interview format. From initial reaction it was decided that this was not a practical proposition and this section along with Section 3 was given out in a reply paid format accompanied by an on site verbal introduction to the questionnaire. Questions relate to:

- Trip purpose
- Trip origin
- Duration of stay
- Reason for choice of location
- Frequency of trip
- Variations in trip making
- Status, household characteristics.

(C) SECTION 3: Reply paid format.

It was decided to ask the interviewee to complete a further series of reply paid questions if it was deemed that he/she was interested in the issues raised and therefore likley to return the questionnaire. A £25 free draw incentive was also used. The respondent was informed of the prize draw at the end of the questionnaire not on site before he/she had agreed to take further part in the survey.

In fact both sections two and three were conducted in this way for the majority of the survey period. Questions relate to:

- Perception of walk distance/time
- Perception of journey cost
- Alternative choice of journey options given
- Variations in parking policy
- Respondents address.

A map of the central area of Rotherham was enclosed for use in answering the questions about walk distance and alternative parking locations.

Four survey staff were used each day, for three days from 10 a.m. to 4 p.m.

i.e. Monday 4/3/85 (market day)

Tuesday 5/3/85
Wednesday 6/3/85

The staff were organised such that they each covered a designated parking area.

e.g.:
(i) The Crofts and Domine Lane (off street)
(ii) The two car parks on Corporation Street (off street)
(iii) Drummond Street (off street)
(iv) Ship Hill/Moorgate and Corporation Street (on street).

After conducting surveys at all these sites on the Monday morning it was decided that the survey method ought to be revised to overcome the high numbers of people who were refusing to take part in the initial interview. Also very few cars were parked towards the lower end of Corporation Street (both on and off street) and hence, subsequently this car park was not surveyed. This then enabled surveys to be carried out at the long stay multi-storey car park (Monday p.m.) and also at the privately owned Hillards superstore car park (Wednesday p.m.).

At the multi-storey car park another variation on the survey method was employed. Only section 3 of the full interview/questionnaire was attached with the reply paid envelopes to the windscreens of parked cars. Table 5.2 shows the distribution of questionnaires and the numbers of returns and refusals that accrued.

TABLE 5.2 BEFORE SURVEY RETURNS BY LOCATION AND DAY

LOCATION	SPACES	QUESTIONNAIRES		RETURNS		REFUSALS
OFF STREET						
CORPORATION ST (TOP)	34	17	*	12	(71%)	11
CORPORATION ST (MIDDLE)	50	153		41	(27%)	1
DOMINE LANE	53	218		62	(28%)	13
THE CROFTS	41	113		25	(22%)	1
DRUMMOND STREET	240	240		117	(49%)	17
MULTI STOREY	775	100	**	16	(16%)	(84)
HILLARDS SUPERSTORE	400	119	+	56	(47%)	5
ON STREET						
CORPORATION STREET	43	24		24	(56%)	3
MOORGATE	19	19		10	(53%)	5
SHIP HILL	32	12		20	(63%)	2
MARKET ST	11	2		2	(100%)	-
BY DAY:						
MONDAY 4/3/85	307	104	(33.8%)	(46 AM + 3		= 49)
TUESDAY 5/3/85	377	132	(35%)		5	
WEDNESDAY 6/3/85	385	133	(35%)		5	
	1069	369	(34.5%)			

NOTE: ** MONDAY PM ONLY (WINDSCREEN, REPLY PAID)
* MONDAY AM ONLY (INTERVIEW + QUESTIONNAIRE)
+ WEDENSDAY PM (ALL REPLY PAID)

5.3 AFTER SURVEY

Following the installation of parking meters and the associated price adjustments at off street car parks, a follow up survey was conducted in July 1985. The work was carried out by an MSc student at the Institute for Transprot Studies, University of Leeds and the form of his questionnaire is given in Appendix 5(B). Of those respondents who indicated their address on the orginal survey forms, then one hundred were sent the after questionnaire and a reply paid envelope. Further details of the survey and the use of this panel technique are given in the student's dissertation (Raine, 1985).

5.4 RESULTS

5.4.1 BEFORE STUDY

1069 questionnaires were distributed during the three survey days. 34.5% of these were returned as complete. This figure may have been inflated had the performance of the interview and windscreen distribution methods been higher. Only 16% of the questionnaires attached to windscreens in the multi-storey car park were returned, often poorly and/or partially completed. In the interview situation the refusal rate on approach was 40%. Of the rest only 53% completed what was a six minute interview.

From the 369 returns (56% were completed by male drivers), it was revealed that 76% of trips to all central area car parks had originated from Rotherham postal districts. 15% came from Sheffield. When asked for a reason for the choice of parking location 36% gave 'nearness to shops' as the main issue with 'ease of access' (26%) second. 'Availability of spaces' was cited by 12% of respondents. 55% of parkers stayed for less than one hour and 85% stayed less than two hours. 75% of respondents said that they visited the centre at least twice per week. When asked if parking conditions in Rotherham had changed over recent years, 27% said yes, conditions had improved. 35% said conditions had deteriorated. Where a respondent was unhappy with his/her parking location and an alternative more desirable facility was indicated, the major reasons for not moving to the latter were 'too expensive' (12%) and 'no spaces available' (22%). Respondents were largely only prepared to walk for 15 minutes from their parking location to final destination. Only 7% of respondents would be prepared to walk further.

The reactions to being asked the cost of the current trip were varied. 32% refused to answer the question. 17% failed to include the cost of petrol in their initial estimation and this accounts for the cost variations which range from 1p to £30.

When faced with the stated preference questions that dealt with future restrictions to parking in the centre of Rotherham, responses were good. A doubling of the parking cost at a particular location would result in 24% paying the increased cost, 29% searching for a cheaper alternative and 24% parking

further from the centre and walking in. Only 7% would consider visiting another centre.

5.4.2 AFTER STUDY

From one hundred of the original respondents selected to take part in the after study, 61 replied to the postal questionnaire. Table 5.3 summarises their responses:-

TABLE 5.3 ACTUAL REACTIONS TO PARKING CHANGES

	REACTION	%
(A)	PARK AT ALTERNATIVE LOCATION	19.7
	PARK AT SAME LOCATION	80.3
(B)	VISIT TOWN CENTRE LESS OFTEN	6.6
	NO CHANGE IN FREQUENCY OF VISIT	93.4
(C)	VISIT ALTERNATIVE CENTRE MORE OFTEN	9.8
	VISIT ALTERNATIVE CENTRE LESS OFTEN	4.9
	NO CHANGE	85.3

From these results it can be noted thta although over 80% of respondents have been totally unaffected by the introduction of parking meters, in their trip making habits, a number of respondents may have altered their frequency of trip making to the central area of Rotherham. The reason for this may involve elements of shopping choice rather than just the effects of parking control. One obvious effect is that the introduction of parking meters has not increased trip making to the centre. Further than this it is difficult to compare the expressed reactions of respondants in the before study with the follow up questionnaire 'actual' reactions because simply the policy changes implemented do not compare on a scale with the stated preference options offered in the former case. The lack of interest in parking policy changes as an issue to users of the central area is also reflected by the low (61%) response rate to the follow up study.

Of the alternative centres, Sheffield (34%), Doncaster (14%), Worksop (14%), Maltby (5%) and Barnsley (2%) were the main alternatives. However the Asda superstore to the South East of the Rotherham centre was also given as a possible alternative for shopping by 13% of respondents. Should the present space not be available 55% of respondents indicated that they would be willing to search for an alternative central space. 26% said that they would be likely to park further from the centre and walk in. Again, 7% of respondents expressed the view, that given such an option then they would be likely to transfer to another centre.

If parking prices throughout the centre of Rotherham were doubled then the percentage of drivers likely to seek an alternative trip location increased to 13%. 26% were willing to pay the additional cost and 34% thought that they may attempt to find a cheaper non central space. Given a major restriction of spaces within the centre 21% of respondents would go elsewhere, 23% would search for a space in the centre and 31% would park further from the centre and walk in.

For all the questions relating to potential parking restrictions then a change of mode, especially to bus, was not a favourable option. 28% of respondents identified park and ride as an option that they would not consider.

The introduction of a 'prize draw' if the respondent completed the full questionnaire/interview did not increase the total percentage of returns. However the number of persons giving their home address, and therefore enabling us to contact them in the future rose by 15% compared to the Leeds pilot surveys.

6. CAR PARKING IN KNARESBOROUGH

6.1 BACKGROUND

Knaresborough is situated 19 miles north of Leeds and in the county of North Yorkshire. York lies 17 miles to the east and Harrogate 3 miles to the west. Other surrounding towns include Wetherby, Ripon and Boroughbridge. Knaresborough is a small market town with a population of 11,780 and, during the summer months especially, is a tourist centre attracting people to the castle ruins and gardens, river and markets. The cattle market is held on a Thursday and the central market on a Wednesday. Early closing is Thursday.

The central area has a number of parking facilities, mostly off street, each having different requirements from the others. Figure 6.1 shows the location of the central area car parks. The main facilities are:

(1) Market Place
(2) York Place
(3) Fisher Street
(4) Castleyard

Table 6.1 also describes the distribution of parking spaces at these and other on and off street facilities.

A survey of parking conducted by the council of the Borough of Harrogate found that in the central area bounded by High Street/ Gracious Street and Cheapside, parking spaces operated at, or very close to maximum capacity throughout the survey. Parking in this area is confined to the disc zone, Fisher Street car park and Castleyard, and with the exception of the latter is controlled parking. The total number of vehicles recorded in this area during the four days of the survey was 6160, 88% of which parked for a period up to 2 hours, 3.5% for 8 hours or more and an even distribution of the remainder parking between these limits in Fisher Street car park and Castleyard.

North of the High Street is restricted to uncontrolled on-street parking and suffers from an overspill of short stay parkers from the central area. Of the total number of vehicles recorded in this area 76% parked for 2 hours or less and 5% for 8 hours or more. Data obtained for this area shows a significant influence of the market day traffic - with an increase in the number of parked vehicles of the order of 50%. Similar findings occur for the uncontrolled on-street parking east of Gracious Street. The York Street car park tends to be utilised by visitors/tourists, mainly on Wednesday and was included in our surveys. The same is true of the Conyngham Hall/Waterside car parks but to a lesser extent. For example, the peak average occupancy observed at Conyngham Hall in the 1984 council survey was 6 cars (on Saturday), which compared to its total capacity of 450 cars is insignificant. For this reason the Conyngham Hall/Waterside car parks were only studied in our August 1985 surveys which were

aimed at identifying tourist influences within the town. Table 6.2 indicates the main findings of the 1984 Council surveys in terms of car park occupancy levels.

The Institute for Transport Studies carried out two studies in the centre of Knaresborough in June and August 1985 prompted by the likelihood of a local authority review of the current disc and pay parking controls in an attempt to:

(1) Make more effective the control of the disc areas
(2) Control central area overspill
(3) Cater better for tourists in peak season (through better signing).

The ITS surveys were hybrids of the reply paid questionnaire format used in Rotherham with the June 1985 work looking at destination choice in the central area and the August 1985 interviews based on the same questionnaire but targeted at tourists and not residents.

TABLE 6.1 PARKING SPACES IN KNARESBOROUGH AND CONTROL

LOCATION	SPACES		CONTROL
OFF STREET			
MARKET PLACE	70		DISC +
YORK PLACE	240		FREE *
FISHER STREET	118		FREE *
CONYNGHAM HALL	450		FREE
WATERSIDE	100		70p ALL DAY
CASTELYARD	86		100p ALL DAY
	1064		
ON STREET			
HIGH STREET	18		DISC +
STATION ROAD	11		DISC +
KIRKGATE	12		DISC +
FINKLE STREET	5	67	DISC +
CASTLEGATE	2		DISC +
CHEAPSIDE	10		DISC +
BRIGGATE	9		DISC +
WELLINGTON STREET	4		FREE
BREWERTON STREET	14		FREE
YORK PLACE	12		FREE
BACK PARK PLACE	47		FREE
ILES LANE	18		FREE (O/S)
STOCKDALE WALK	18		FREE (O/S)
KING JAMES ROAD	25		FREE (O/S)
PARK CREST	13	234	FREE (O/S)
PARK CLOSE	8		FREE (O/S)
PARK DRIVE	9		FREE (O/S)
STOCKWELL ROAD	17		FREE (O/S)
WINCUP AVENUE	35		FREE
WINCUP CLOSE	6		FREE
WINCUP GROVE	8		FREE (O/S)
	301		

NOTE: * FREE PARKING EXCEPT WEDNESDAY, THEN 50p ALL DAY
\+ DISC PARKING. FREE BUT LIMITED TO 1 HOUR
(O/S) ONE SIDE ONLY

TOTAL SPACES = 1365

FIGURE 6.1 PARKING LOCATIONS IN THE CENTRE OF KNARESBOROUGH

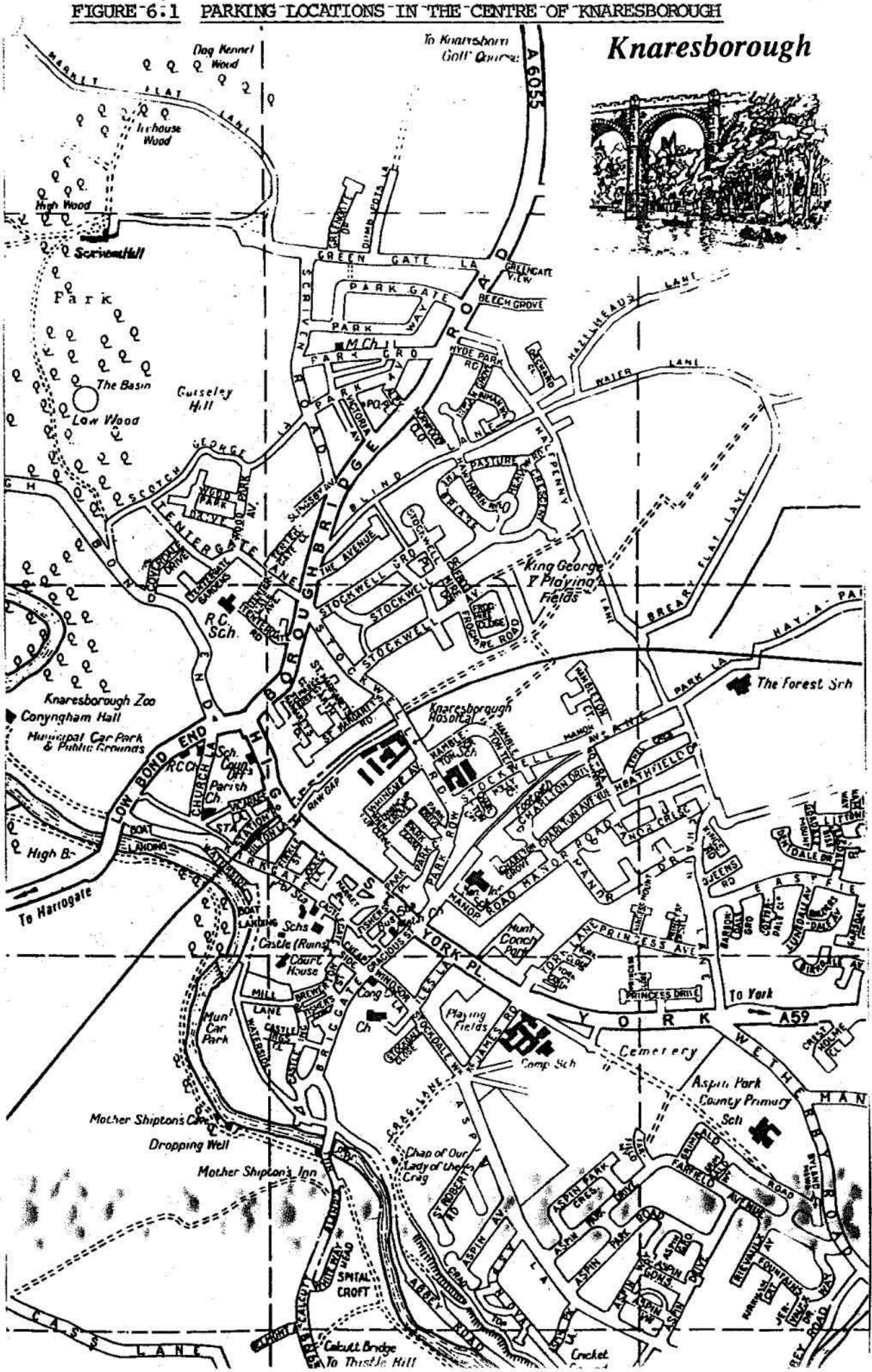


TABLE 6:2 CAR PARK OCCUPANCY LEVELS

CAR PARK	DAY OF SURVEY	MAX NO.OF SPACES	CARS PER SPACE PER DAY	AVERAGE OCCUPANCY PERIOD 08.30 - 19.00	AVERAGE OCCUPANCY PERIOD 10.30 - 14.30
MARKET PLACE (DISC)	TUES	70	8.26	55.9 (80%)	66.1 (94%)
	WED		-	-	-
	FRI		10.02	67.0 (96%)	72.5 (103%)
	SAT		10.84	67.2 (96%)	73 (104%)
FISHER STREET	TUES	118	2.74	91.7 (78%)	103.4 (87%)
	WED		2.69	97.4 (82%)	118.0 (100%)
	FRI		3.06	98.7 (84%)	113.0 (96%)
	SAT		2.97	90.3 (76%)	107.6 (91%)
CASTLEYARD	TUES	86	1.89	67.2 (78%)	78.0 (91%)
	WED		2.24	76.4 (89%)	81.4 (95%)
	FRI		2.44	69.5 (81%)	75.6 (88%)
	SAT		2.37	63.3 (74%)	73.4 (85%)
YORK PLACE	TUES	240	0.09	4.8 (2%)	4.4 (2%)
	WED		0.27	16.0 (7%)	18.6 (8%)
	FRI		0.15	9.2 (4%)	10.6 (4%)
	SAT		0.20	9.8 (4%)	13.0 (5%)
CONYNGHAM HALL	TUES	450	0.01	1.6 (0.4%)	2.2 (0.5%)
	WED		0.04	3.9 (0.8%)	5.0 (1.1%)
	FRI		0.01	1.3 (0.3%)	1.6 (0.4%)
	SAT		0.07	4.1 (0.9%)	6.0 (1.3%)

SOURCE: COUNCIL OF THE BOROUGH OF HARROGATE PARKING SURVEYS NOVEMBER 1984

6.2 THE MAIN SURVEYS (JUNE 1985)

No prize draw was offered in any of the Knaresborough surveys and the format was generally that of the reply paid questionnaire version used in Rotherham. Several changes were made to question content and presentation and these are given in Appendix 6(A). However three versions of the questionnaire were given out in random order. The latter two were derivatives of the former and involved changing the map question (15) in version 2 and also reversing the order of the options given in Q11 to Q14 in version 3. A total of 1092 questionnaires were given out, of which 595 were version 1, 299 were version 2 and 198 were version 3.

Three survey staff were used to distribute the questionnaires at the off street car parks. Namely York Place, Fisher Street and Castle Yard. Two further persons covered the disc parking area of the market square (except Wednesday), and the on street parking facilities. The survey took place on Tuesday, Wednesday and Friday, the 18, 19 and 21st June 1985. from 10 a.m. to 4 p.m.

A brief introduction was given to each respondent whilst handing out the questionnaire and an entry was made on a separate sheet regarding location, parking, type, time, number of occupants, sex of driver, etc.

6.3 TOURIST INTERVIEWS

It was noted during the main surveys that Knaresborough was a tourist centre, especially during the summer months, and that specific car parks were frequented by visitors to the town. In a one day survey conducted on Wednesday 21st August 1985, tourists were approached at the York Place and Conyngham Hall car parks and an on site interview took place which was constructed as a short version of the previous questionnaire and aimed purely at visitors to the town. The interviewer asked the respondent if he/she was a visitor/resident to the area. If they were of the former he went on:

(1) Why have you chosen to visit Knaresborough today?
(2) Why have you chosen to park at this location today?
(3) Have you planned your trip to and route around Knaresborough?
(4) How far in terms of walk time are you willing to park from the facilities that you wish to visit?
(5) What would you have done if parking charges had been doubled?
(6) What would you have done if a space had not been available here?
(7) What would you have done if changes in Knaresborough were introduced at all car parks?
(8) What would you have done if there was a major restriction of parking spaces throughout Knaresborough?
(9) Status
(10) Age.

The interviewer also collected data relating to sex of driver,

number of occupants, location, parking type etc and then went on to ask the above questions 'open ended'. The questions were kept as short as possible so that the duration of the interview could be less than 15 minutes. No map question was included to avoid confusion and time delays incurred by the respondent trying to interpret the map. From the main surveys it had become evident that tourists had little knowledge of street patterns or terrain.

The interviews took place between 10 a.m. and 3.30 p.m. using one survey person at each car park. Appendix 6(B) describes the interview format.

6.4 RESULTS

6.4.1 MAIN SURVEYS

40% of the questionnaires were returned by 12/7/85 (three weeks after the completion of the survey), with the distribution amongst the 3 versions used being:

- Version 1 39%
- Version 2 (Version 1 with new 'map' question) 45%
- Version 3 (Version 2 with reversal of options in Q11-Q14). 35%

From the whole survey there were only 31 refusals. This gives the total number of approaches to the public as 1123 and makes the percentage of returns from approaches 38%. The percentage of refusals from approaches is just under 3%.

88% of the questionnaires were handed out on car entry to car parks/parking facilities. Of the total, 61% of questionnaires were handed to drivers who were male.

Table 6.3 shows the distribution of the questionnaire by day, parking location, parking type, number of occupants in the car and sex.

Table 6.4 shows how the three versions of the questionnaire were distributed.

Table 6.5 gives car occupancy data for the vehicles which were appraoched during the course of the study. This shows that on market days car occupancy may be expected to be 18% higher than on the highest other weekday.

52% of those parking around the central area gave the reason for their choice as the 'nearness to shops'. Only 9% stated that they could always find places available. This reflects both the demand for parking spaces in the central area and also the willingness to search for spaces. 56% of all parkers typically stay for less than 1 hour with 18% staying in excess of 2 hours. 33% visit Knaresborough at least twice a week.

When asked if there were other car parks that the driver would

like to use; 73% said yes with 68% indicating that the market place would be their ideal location. The main reason for not using this facility was that it was always full (43%). The limit for walking to the centre from a parking location appears to be 15 minutes - only 5% of respondents would be willing to walk further.

When asked about their reactions to changes in parking policy only 28 out of 430 respondents (7%) indicated that they would consider either parking further from the centre and catching a bus; visit another centre by bus or change their means of transport but still visit Knaresborough. When given the option of parking costs doubling 17.6% were willing to pay the increased cost; 21% preferred to search for a cheaper space in the centre and 37.6% said that they would divert to another centre. Alternative centres are typically; Harrogate (62%); Ripon (10%); Boroughbridge (9%); York (9%); and Wetherby (9%).

If no space had been available at the particular location in question 44.5% were willing to search for a vacant space. 32.8% would be willing to park further from the centre and walk in and 13% of drivers would go elsewhere.

Given a doubling of parking charges throughout the centre of Knaresborough then the number of drivers willing to go elsewhere was seen to more than double to 27%. Only 14% were willing to pay the increased price. 38.3% said that they would search for a cheaper non central parking space. For the final option of a major restriction in parking facilities in the centre of Knaresborough; again 27% of drivers expressed a preference to go to an alternative centre. 32% would be willing to search for a cheaper non central space and walk into the town and 24.6% would still wish to search for a longer period in an attempt to find a central parking space.

Therefore from the survey it would seem that between 13% and 27% would be likely to change final destinations; depending on the severity of the restriction imposed on parking in the centre of Knaresborough. It appears that those willing to search for a cheaper alternative were the drivers who would choose to move to the alternative centre (rather than those choosing to park further from the centre and walk in) as greater restrictions are imposed.

TABLE 6.3 QUESTIONNAIRE DISTRIBUTION

% IN BRACKETS

(1) BY DAY

TUESDAY	18/6/85	397	(35.4%)	
WEDNESDAY	19/6/85	380	(33.8)	MARKET DAY
FRIDAY	21/6/85	346	(30.8)	

(2) BY PARKING LOCATION

	Incl. refusals		Excl. refusals		
YORK PLACE	200	(17.8)	194	(17.8)	NOT FRIDAY
FISHER STREET	382	(34.0)	372	(34.1)	
MARKET PLACE	430	(38.3)	421	(38.6)	NOT WEDNESDAY
CASTLEYARD	93	(8.3)	87	(8.0)	
PARK ROW	16	(1.4)	16	(1.5)	
CHEAPSIDE	2	(0.2)	2	(0.2)	
TOTAL	1123		1092		

(3) BY PARKING TYPE

OFF STREET FREE	392	(34.9)
OFF STREET PAY	300	(26.7)
ON STREET DISC	431	(38.4)

(4) BY NUMBER OCCUPANTS IN CAR

1	572	(50.9)
2	387	(34.5)
3	98	(8.7)
4	49	(4.4)
5	8	(0.7)
6	1	(0.1)
7	0	(0)
8	1	(0.1)

7 MISSING

(5) BY SEX

MALE	691	(61.7)
FEMALE	429	(38.3)

TABLE 6.4 DISTRIBUTION OF THE 3 VERSIONS OF THE QUESTIONNAIRE

BY PARKING LOCATION AND DAY

DAY	TUESDAY				WEDNESDAY				FRIDAY			
QUESTIONNAIRE TYPE / PARKING LOCATION	(1)	(2)	(3)	T	(1)	(2)	(3)	T	(1)	(2)	(3)	T
* YORK PLACE (FREE)	22	9	6	37	89	48	20	157				
FISHER STREET (FREE)	46	28	14	88	86	45	23	154	62	32	36	130
CASTLEYARD (FREE)	30	11	9	50	22	10	5	37				
PARK ROW (FREE)					11	3	2	16				
MARKET PLACE (DISC)	119	61	33	213					107	51	50	208
CHEAPSIDE (DISC)					1	1		2				
TOTAL FREE	98	48	29	175	33	13	7	53	62	32	36	130
TOTAL PAY					175	93	43	311				
TOTAL DISC	119	61	33	213	1	1		2	107	51	50	208
TOTAL	217	109	62	388	209	106	50	366	169	83	86	338
REFUSALS		(9)			(14)					(8)		

NB: * PAY ON WEDNESDAY

(1) VERSION 1 — 595 DISTRIBUTED

(2) VERSION 1 + DIFFERENT MAP QUESTION — 299 DISTRIBUTED

(3) VERSION 2 + REVERSED Q11-14 — 198 DISTRIBUTED

T SUB-TOTAL

1092

TABLE 6.5 CAR OCCUPANCY

(a)

OCCUPANCY	TUESDAY M	TUESDAY F	TUESDAY T	WEDNESDAY M	WEDNESDAY M	WEDNESDAY T	FRIDAY M	FRIDAY F	FRIDAY T
1	117	109	226	60	66	126	120	100	220
2	95	29	124	124	50	174	67	22	89
3	17	10	27	29	19	48	14	9	23
4	12	4	16	20	6	26	5	2	7
> 4	3	1	4	5	1	6	4	3	7
TOTAL		397			380			346	

NOTE: M MALE
F FEMALE
T TOTAL

(B) HENCE, PERSONS VISITNG CENTRE IN SURVEYED CARS:

OCCUPANCY	TUESDAY M	TUESDAY F	TUESDAY T	WEDNESDAY M	WEDNESDAY F	WEDNESDAY T	FRIDAY M	FRIDAY F	FRIDAY T
1	117	109	226	60	66	126	120	100	220
2	190	58	248	248	100	348	134	44	178
3	51	30	81	87	57	144	42	27	69
4	48	16	64	80	24	104	20	8	28
>4	18	5	23	27	5	32	20	15	35
TOTAL		642			754			530	
NO VEHICLES		397			380			346	
AV. NO. PERSONS/ VEHICLE		1.62			1.98			1.53	

Within the analysis of the 436 full returns from the Knaresborough study it was also possible to observe the effects of varying the wording of the stated preference and map questions. 35% of questionnaires containing a different wording of the stated preference questions were returned and 45% of the questionnaires with an alternative map question were completed in full and returned in the post paid envelopes.

(1) STATED PREFERENCE QUESTIONS

Within the main survey 198 out of 1092 distributed questionnaires had the order of the discrete options presented in each of 4 questions, looking at the effects of potential changes in parking policy, reversed. The aim was to assess the extent to which option order affected the respondents expressed reaction to change. It appears from our results that such a change of question format has no effect on expressed reactions. Table 6.6 compares the views expressed by respondents for the relevant questions for both version 1 and 2, and version 3 of the questionaire. None of the changes were significant and variations in response may in some way be attributed to the variation in sample sizes used e.g. version 1 + 2, 894 questionnaires (366 replies), version 3, 198 questionnaires (70 replies).

Equally, there was no change in the reaction that few people (less than 7%) would consider using bus either to park further from the centre and ride in, or to visit Knaresborough or another centre. Although no respondent in version 3 of the questionnaire specified York or Wetherby as an alternative centre for shopping, Harrogate (75%), Boroughbridge (14%) and Ripon (10%) were all quoted by roughly the same proportion of drivers as in the other replies.

(2) MAP QUESTIONS

The two vesions of the map question were of the form:

(A) Please mark on the map with a (X) the furthest from * (the places that you have visited in Knaresborough today) that you would ever consider parking.

(B) Please draw a boundary line which encloses all the furthest points from * (the places that you have visited in Knaresborough today) that you would ever consider parking.

Version (A) was used in 793 out of the 1092 questionnaires distributed. In analysis the distance between the furthest parking location and final destination was measured. This gave a range of walking distances of between 100 yds and 1.4 miles for the version (A) and 250 yds to 1.8 miles for version (B). Perception of time taken to walk these distances was also greater for version (B). Table 6.7 shows comparative results.

TABLE 6.6 COMPARISON OF STATED PREFERENCE RESPONSE (% RESPONSE)

CHANGE OF POLICY QUESTION	DOUBLING OF PARKING FEE AT LOCATION		NO SPACES AVAILABE AT LOCATION		DOUBLING OF PARKING FEE ALL OVER KNARESBOROUGH		MAJOR RESTRI OF SPACES KNARESBOR	
RESPONSE	VERSION 1, 2	VERSION 3	VERSION 1, 2	VERSION 3	VERSION 1, 2	VERSION 3	VERSION 1, 2	VER
PAY INCREASED PRICE	18	15			14	6		
SEARCH LONGER FOR A CENTRAL SPACE	21	24	45	34	38	43	24	
PARK FURTHER FROM THE CENTRE AND WALK IN	38	39	33	33			32	
VISIT ANOTHER CENTRE BY CAR	15	13	13	7	27	23	27	

TABLE 6.7 COMPARISON OF WALK TIMES FROM PARKING LOCATION TO FINAL DESTINATION (% RESPONDENTS)

WALK TIME (MINUTES)	VERSION (A)	VERSION (B)
< 5 (MINS)	49.5%	37.8%
6-10	32.0%	41.4%
11-15	14.0%	17.2%
>15	4.5%	3.6%

Although the differences in perceived walk times are not significant it is interesting to note that in general, version (B), the boundary line method, gave longer walk distances. Correspondingly respondents of the version (B) questions also tended towards longer perceived walk times. What is not clear is to what extent the perception of time to walk a map distance is related to knowledge of terrain or individual motivation and constraints (available time, degree of baggage, presence of children etc). From a survey viewpoint it is easier to interpret the version (A) questions where an actual parking location has been identified. This avoids having to make value judgements as to the validity of sections of any boundary line. However, the respondent may prefer the latter approach. It is quicker to answer and results in an obvious visual impact. For these reasons it is difficult to assess the benefit of the two methods. A person with a good knowledge of the area would quite easily cope with version (A). A tourist would struggle. It is unclear as to whether the version (B) boundary line approach would be any better answered by a visitor to an area, who did not have a comprehensive knowledge of either local facilities or terrain. Perhaps the answer is to supply a good quality map indicating on it parking facilities and landmarks very clearly. Then it should be possible to utilise the version (A) questions.

6.4.2 TOURIST INTERVIEWS

The tourist interviews at Conyingham Hall and York Place took approximately 6 minutes to conduct and this resulted in two refusals during the course of an interview. 8 other approaches were rejected prior to the start of an interview. This 13% refusal rate was much lower than that experienced in Rotherham and was due to two factors:

(1) The interview was of a shorter duration with concise questions.

(2) Respondents were all tourists who generally had more time at their disposal to answer questions, than did shoppers who were possibly returning to work or going to pick up the children etc.

55% of respondents went to Knaresborough to visit the market and cited their choice of parking location as either 'the first seen' (31%) or 'no room elsewhere' (38%). 93% of tourists indicated that they would not be willing to walk for more than 10 minutes from a parking space to their desired destination. This is much less than respondents in the main survey. The majority of tourists had little idea of the location of parking facilities. It is therefore surprising that 51% of them said that this was at least their fourth visit to the centre. As tourists the choice of visiting an alternative centre given stated parking contraints was not attractive. Rather than go elsewhere a tourist was more likely not to make the journey at all if he/she had prior knowledge of high parking costs or difficulties in parking. If the parking cost was doubled at a particular facility only 14% would not have come to Knaresborough. 81% would have searched and parked elsewhere. If charges were increased at all car parks in the centre then 50% of respondents would not have made the trip. 20% would pay the increased cost and 7% would search for a non central cheaper space. If faced with a restriction of parking availability in Knaresborough then 56% would not have decided to visit the centre. 27% would still have come and would have searched for a space within 10 minutes walk of the market square. 10% may have decided to visit another centre such as Harrogate.

Therefore, for a tourist, the main aim of visiting Knaresborough was to see the market. They were most likely to park at the first available space that they saw, even if this involved some searching. If faced with parking problems which they had prior knowledge of, they were more likely to abandon the trip rather than go to an alternative town.

7. SURVEY COSTS

Each of the survey methods tested have varying associated costs which are useful for comparison purposes.

7.1 THE REPLY PAID QUESTIONNAIRE

(A) Assume 1000 questionnaires are printed and that the response rate is expected to be 35%, 40% or 45%, i.e. 350, 400, 450 returns respectively. These 3 values will be the criteria against which this method is assessed.

(B) PRINTING

A4 originals reduced to A5, stapled and collated into an 8 page booklet (1000 minimum)

(1) Rank Zerox	£141.00
((2) I.T.S.	£290.00*)

NB: * 20p per booklet x 1000 = £200
+ 3 person days to collate = £90
£290

(C) PRINTING OF FRONT PAGE DATA SHEETS

A4 (5p) x 1000 = £50 — £50.00

(D) ENVELOPES (A5)

per 1000	£10.00
+ collating (1 day)	£30.00

(E) FREEPOST

2nd class mail (13p) plus 1/2p fee per return

If: 350 returns = 13.5 x 350 =	£47.25
400 returns = 13.5 x 400 =	£54.00
450 returns = 13.5 x 450 =	£60.75

(F) STAFF

Reply paid questionnaires are able to be distributed @ 15/hour

∴ 1000 12 person days @ £3/hour
(12 x £15) + (£3 lunch hour x 12)
= £216 = £216.00

(G) TRAVEL

For between 4 and 6 survey staff over the required period of 2-3 days at sites up to 30 miles away

Assume: £100.00

(H) MISCELLANEOUS

Stationery, pens, clip boards, letters of authority, jackets etc — £15.00

TOTAL: 35% : £609.25
40% : £616.00
45% : £622.75

NB: 1 person day = 9.30-3.30 with 1 hour lunch.

7.2 LONG INTERVIEW

This version of the interview is designed to yield the same volume of data as the reply and questionnaire.

(A) PRINTING

8 sheets x 350 required x 5p =		£140.00
8 sheets 400 required x 5p =		£160.00
8 sheets 450 required x 5p =		£180.00

(B) PRINTING OF FRONT DATA SHEET

350 x 5p =	£15.50
400 x 5p =	£16.00
450 x 5p =	£16.50

(C) COLLATING, STAPLING

2 person days = 2 x £30 = £60.00

(D) TRAVEL

As before £100.00

(E) STAFF

Assume that interviews of this length can be carried out at the rate of 4 per hour:

∴ 350 returns will take approx. 17.5 person days = £315.00
400 returns will take approx. 20.0 person days = £360.00
450 returns will take approx. 22.5 person days = £405.00

(F) MISCELLANEOUS

As before £15.00

TOTAL : 350 = £645.50
400 = £711.00
450 = £776.50

7.3 SHORT INTERVIEW

This version of the interview takes the basic questions and ignores the more time consuming elements. As a result the questionnaire length and response time is reduced.

(A) PRINTING

2 sheets x 5p = 10 x 350 =	£35.00
10 x 400 =	£40.00
10 x 450 =	£45.00

(B) PRINTING OF FRONT DATA SHEET

5 x 350 =	£15.50
5 x 400 =	£16.00
5 x 450 =	£16.50

(C) COLLATING/STAPLING

1 person day = £30.00

(D) TRAVEL

As before £100.00

(E) STAFF

Assume that interviews of this form can be carried out at the rate of 8/hr

∴ 350 returns will take approx. 8.75 person days = £157.50
400 returns will take approx. 10 person days = £180.00
450 returns will take approx. 11.25 person days = £202.50

(F) MISCELLANEOUS

As before £15.00

TOTAL : 350 = £353.00
400 = £381.00
450 = £409.00

7.4 POSTAL QUESTIONNAIRES

Assume 20% returns (Oppenheim, 1973)

(A) LONG VERSION (as A5 reply and questionnaire booklet)

(I) PRINTING

∴ 2000 questionnaires will yield 350 - 450 returns

PRINTING COST = £242.00

(II) ENVELOPES

4000 = £40.00

(III) POSTAGE OUT

2000 x 13 = £260.00

(IV) POSTAGE IN (FREEPOST)

350 x 13.5 =	£47.25
400 x 13.5 =	£54.00
450 x 13.5 =	£60.75

(V) COLLATING

1 person day = £30.00

TOTAL : 350 = £619.25
400 = £626.00
450 = £632.75

(B) SHORT VERSION (as short interview)

	(I)	PRINTING 2000 x 2 x 5p =	£200.00
	(II)	ENVELOPES	£40.00
AS (A)	(III)	POSTAGE OUT	£260.00
	(IV)	POSTAGE IN	£47.25 £54.00 £60.75
	(V)	COLLATING 2 person days	£60.00

TOTAL : 350 = £607.25
400 = £614.00
450 = £620.75

7.5 SUMMARY

TABLE 7.1 SURVEY COSTS (£'s) OF THE VARIOUS METHODS TESTED

METHOD	NUMBER OF RETURNS 350	400	450
1. REPLY PAID QUESTIONNAIRE	609.25	616.00	622.75
2. LONG INTERVIEW	645.50	711.00	776.50
3. SHORT INTERVIEW	353.00	381.00	409.00
4. POSTAL QUESTIONNAIRE - LONG	619.25	626.00	632.75
5. POSTAL QUESTIONNAIRE - SHORT	607.25	614.00	620.75

The reply paid questionnaire compared to the long interview has advantages in terms of cost and also in terms of the volume of occupancy data which may be collected on site at the time of the survey. It is only if few questions need to be asked that the interview technique is of value, and if the interview takes no more than 5-6 minutes. The postal questionnaire does not yield any on site information and hence only becomes of value in panel studies when a follow up survey is used. Here the response rate may be as high as 70% (Raine, 1985).

All the survey methods identified require several additional costs:

For example:

(1) Survey supervision
(2) Coding of data
(3) Computing time
(4) Building overheads.

For coding and analysis it was found beneficial to draw up an individual coding manual for each survey and punch the data from Fortran coding forms. In this way transcription errors were kept to a minimum and the process of data verification and validation was less time consuming. Frequency charts for each variable and cross tabluations of specified variables were then extracted from the data set using SPSSX.

8. CONCLUSIONS

8.1 SURVEY METHODS

8.1.1 INTERVIEWS

Interviews took place at both the Leeds pilot stage and also in the initial Rotherham studies. In each case problems of the following nature were identified.

(1) RESPONSE TIME

Evidence suggests that the time taken in conducting an interview must not exceed 4 - 5 minutes. The respondent may be often 'paying' for the interview time if approached when parking the car and therefore not anxious to answer questions. Also, if approached when returning to the car the respondent may be near the limit of his time allowance and hence interested in not incurring an excess parking cost. A further important element is the respondents perception of the importance of parking issues. If current or anticipated parking policy does not evoke interest or comment then it will be difficult to complete even a 4 minute interview to a satisfactory standard.

(2) LOCATION

It is easier to secure completed interviews in covered car parks thus avoiding the adverse effects of the elements.

(3) BIAS

The interviewers used need to be trained both in the presentation of the interview to retain a high degree of objectivity and also in the selection of random samples. The old and women with children and/or shopping may often be intimidated by the interviewer and respond to his/her questions whilst typically working age males appear more confident and able to reject an aproach by the interviewer.

From the Rotherham study the refusal rate on approach was 40%. Of the rest only 53% completed what was a six minute interview. In Leeds 80% of respondents failed to complete a nine minute interview. However when the time required to respond was reduced to less than 5 minutes 71% completed the questions.

8.1.2 INTERVIEW/REPLY PAID QUESTIONNAIRE

It was proposed in Rotherham to ask a respondent having just completed an on site interview, if he/she would consider taking home a further reply paid questionnaire. The refusal rate was over 80%. Parking was not an issue in Rotherham as it was in Leeds. If this approach is to be adopted then the interviewers must be persuasive and persistent and the public must have some inherent interest in the subject.

8.1.3 REPLY PAID QUESTIONNAIRE

This proved to be perhaps the most efficient method of questionnaire completion. Three variations have been attempted, namely:

(1) Short introduction by survey staff whilst handing over the questionnaire.

(2) Short introduction by survey staff. Questionnaire to include a 'prize' for full completion.

(3) Short introduction by survey staff. Questionnaire to include a prize for full completion. Respondent told of prize prior to being given the questionnaire. In (2) the respondent was only told of the prize in a letter at the front of the questionnaire and would choose to accept or reject the offer of a questionnaire without prior knowledge of the prize.

The introduction of a 'prize' appears to make little difference to response rates if not mentioned in the introduction. In all cases about 40% responded. The effect of the 'prize' was to increase the percentage of respondents who gave their home address from 50% to 65%. By telling the respondent of a prize prior to him/her completing the questionnaire then the refusal rate fell from 5.5% to 4.2%. (Perhaps not significantly enough to justify the bias which may have been incurred by the quality of response from people interested solely in the prize draw). Certainly if the parking situation is of sufficient weight to generate public feeling then the inclusion of a 'prize' in such a survey would not be warranted.

8.1.4 WINDSCREEN DISTRIBUTION

In the Rotherham surveys section 3 of the questionnaire, in a reply paid envelope was attached to the windscreens of cars in the multi-storey car park. Despite a 'prize' being offered only 16% of questionnaires were returned. This method may only be of use when manpower is restricted and interviews/reply paid questionnaires are not practicable.

8.1.5 POSTAL QUESTIONNAIRES

Further work needs to be conducted on the use of panels to 'follow up' the effects of policy changes. From a small sample, 61% of the original respondents replied to a follow up questionnaire (approximately 24% of those originally approached).

8.2 GENERAL CONCLUSIONS

8.2.1 LOCATION

The car park/parking facility location and type affects the attitudes and response of both survey staff and the public.

Undercover parks away from the elements enable a lengthier discourse to take place and generally a more pleasant attitude to develop.

For at grade car parks them the physical dimensions of the facility are also important. A long narrow car park results in much time being taken up by survey staff in walking between parking cars to reach respondents. The result is that the more compact the facility the fewer staff are required.

8.2.2 PUBLIC AWARENESS

If the public are informed about an issue then response will be prompt, infomative and concise.

8.2.3 ATYPICAL FACTORS

Atypical factors affecting trips to the central area should be avoided. For example; bad weather, holiday periods, strikes affecting the economic welfare of local residents, etc.

8.2.4 PILOT STUDIES

It is important to utilise current local authority data to plan survey strategy. However, pilot surveys at specific locations enable particular problems to be resolved prior to the full survey, and for previous survey data to be validated. This will save time and money in staff utilization and resourse commitment.

8.2.5 PROBLEM QUESTIONS

Apart from the rewording of certain questions to overcome ambiguity, only two areas seem to pose specific problems:

(1) Map questions:
A good quality map of scale large enough to show particular land marks/shops is required so that the respondent can easily identify his/her current position and trip route.

(2) Travel cost questions:
Respondents tend to be either reluctant to answer or unable to perceive total travel costs.

When included in a questionnaire, or more particularly in an interview format, these types of questions can be a considerable cause for delay and confusion, often resulting in incomplete answers or a refusal to continue further.

Overall the stated preference questions were well answered. However, in the sites studied, very few people (less than 1 in five) stated that they would ever consider moving to an alternative centre for shopping. In the majority of these cases the alternative centre was another town, not a suburban shopping centre. Perhaps the emphasis of the questionnaire needs to be looked at here, or perhaps the policy changes investigated do not

merit a change in parking location. Further work is required in this area at a site where substantial policy changes are anticipated.

8.2.6 DURATION OF RETURNS (REPLY PAID FORMAT)

From the reply paid questionnaires 40% of initial contacts tend to respond. 25% of these were returned within 7 days and a further 10% over the next week. It took a further week for the remaining 5% to be accounted for. However even after this period of 21 days (which was used as a cut off) a number of questionnaires, up to a maximum of a further 5%, were returned over the next 4 weeks i.e. up to seven weeks from the completion of the survey.

8.2.7 SURVEY COSTS

Chapter seven looks at survey costs in terms of the required number of returns. In terms of achieving the maximum data for the minimum cost then the reply paid format seems to be the most cost effective. This is particularly true if you consider that survey staff can distribute (and introduce) at least 18 questionnaires per hour. Assuming a 40% response, this gives a return of 7.2 completed questionnaires per hour. In an interview situation it is difficult to approach more than nine persons per hour. At best one may expect a 70% success rate in achieving full interviews and this results in a success rate of 6.3 complete interviews per hour. However to survey at least 10% of the parking population many more survey staff would have to be employed than for the reply paid format and this would drastically increase survey costs.

8.2.8 DESTINATION CHOICE

The surveys have revealed that the choice of going to an alternative destination given anticipated changes in parking control depends largely on the trip purpose. For tourist trips the respondents were likely to have little knowledge of the area and parking facilities available and therefore were prepared to accept an element of parking constraint and park at the first suitable space, even if this involved some degree of searching. In these cases adequate local authority signing would be of great benefit. For shoppers then as parking constraints become gradually imposed it is likely that drivers initially willing to search for a space will turn to an alternative centre for their shopping needs. However, whilst between 7% and 22% of parkers may have been expected to transfer to an alternative centre for shopping (Rotherham before study) from expressed/anticipated responses, in reality it is the frequency of trip that is likely to be affected more. There will be a need in future work to differentiate between the various needs and types of shopping trips and to look at trip frequencies for each of the expressed trip purposes. From the Rotherham Study only 6% of respondents said that they visited the centre less often as a result of policy changes. Over 80% of all respondents claimed to have

been totally unaffected in their trip making habits by the introduction of parking meters. Specific reasons for any change in trip frequencies were not identified.

9. RECOMMENDATIONS FOR FURTHER WORK

(1) Locate a centre which is free standing and has a planned date for the implementation of some drastic change in parking control.

(2) Develop stated preference questions to a more concise form and pilot.

(3) Develop a large panel study to look at responses and fall off.

(4) Examine the socio economic classification of respondents.

(5) Select a number of fairly close similar sized centres from a major connurbation. Identify shoppers who live a similar distance from two or more of these centres and examine the reason(s) for the choice of one centre for the shopping trip in preference to the others.

(6) Consider types of shopping trip. The type of shopping will influence the centre visited. Changes in parking policy may affect the frequency of certain shopping trips rather than merely having the effect of transferrring the trip to an alternative centre. Travel diaries may be useful here.

(7) Consider the effects of new or recently developed central superstores, with free or cheap parking available. The use of such parking facilities may provide the shopper with a parking choice which is outside the bounds of local authority control and may render policy changes uneconomic. Therefore, the movement of parkers between parking facilities within a centre is as useful as identifying those who transfer to an alternative centre.

REFERENCES

The following reference list covers the main subject areas required for an overview of the project brief. The subject areas considered are:-

(A) SURVEY DESIGN
(B) TRAFFIC RESTRAINT (PARKING)
(C) PARKING (GENERAL)
(D) PARKING SURVEYS
(E) ORIGIN/DESTINATION SURVEYS
(F) MODELLING TECHNIQUES

(A) SURVEY DESIGN

1. Oppenheim, A.N. (1973) Questionnaire Design and Attitude Measurement. Heinemann, London.

2. Hyman, H. (1963) Survey Design and Analysis. Free Press, USA.

3. Moser, C.A. et. al. (1971) Survey Methods in Social Investigation. Heinemann, London.

4. Back, M (1981) Microcomputers and transportation Planning - A Survey Management Information System. Traffic Engineering and Control. 22 (4).

5. Mackett, R.L. (1980) The Survey Strategy and Questionnaire Design Components of the Location and Commuting Project. Institite for Transport Studies, TN33, University of Leeds.

6. Tyne and Wear C.C. (1980) Attitudinal Questionnaire, C.A.A.S. Report of Survey. Newcastle, Tyne and Wear.

7. Yates, F. (1971) Sampling Methods for Censuses, Griffin, London.

8. Konijn, H.S. (1973) Statistical Theory of Sample Survey Design and Analysis, North Holland, London.

9. Skelton, N. (1982) Determining Appropriate sample sizes when two means are to be compared. Traffic Engineering and Control. 23(1) p.29-37.

10. Galin, D. (1980) How reliable are mail-return questionnaires for Transportation Engineering Surveys? Traffic Engineering and Control. 21(7) p.370-372.

(B) TRAFFIC RESTRAINT (PARKING)

1. MAY, A.D. (1975) Parking Control - Experience and Problems in London. Traffic Engineering and Control. May, 1975.

2. DEPT. ENVIRONMENT (1976) The Control of Private Non Residential Parking. A Consultation Paper. London.

3. MAY, A.D. (1973) Traffic Management and Restraint by Parking Control in Greater London. Transportation Research Record, 474.

4. GILLEN, A. (1978) Parking Policy, Parking Location Decisions and Congestion. Transportation. March, 1978.

5. MEYER, M.D. et al. (1981) Parking Management as a Component of Urban Transportation Policy in Developing Countries: The Case of Cairo. Traffic Engineering and Control. 22(11), p.604.

6. MILLER, G.K. et al. (1982) Raising Commuter Parking Prices - An Empirical Study. Transportation, June 1982.

7. ELLIOTT, J. et al. (1982) The Collapse of Parking Enforcement in Large Towns - Some Causes and Solutions. Traffic Engineering and Control. June, 1982.

8. McSHANE, M. et al. (1982) Parking Policy and Urban Goals - Linking Strategy to Needs. Transportation. June, 1982. 11, p.131-152.

9. HAWORTH, S. et al. (1982) Car Parking Standards and the Urban Economy. Traffic Engineering and Control. 23(11) p.537.

10. PAYNE, V.S. (1984) Parking and Concepts of Traffic Restraint. Highways and Transportation. April 1984. Vol. 31(4) p.18-21.

11. HALLQUIST, C. et al. (1980) "Woonerf" - Traffic Restraint in Residential Areas. Projektarbete 1980.

12. BAILEY, J.M. (1980) Travel Behaviour of Households in Oxford 1966-76: with particular reference to Traffic Restraint Policy. Transport Studies Unit. Oxford University. CP.146.

13. MAY, A.D. (1981) How far can we go with Traffic Restraint. Surveyor, 56 (4628).

14. DEPT. ENVIRONMENT (1975) Report of the Working Group on Traffic Restraint. HMSO, London.

15. O'CINNEIDE, D. (1977) Traffic Restraint in Urban Areas. Traffic Engineering and Control. Vol. 18(4), p.171-174.

16. O'CINNEIDED, D. (1979) A Note on Problems with the Park System of Parking Control. Traffic Engineering and Control. 20(11) p.548.

17. O'CINNEIDE, D. (1977) Parking Control by the Park System in Cork. Traffic Engineering and Control. 18(4) p.171.

18. GANTVOORT, J. (1984) Effects upon Modal Choice of a Parking Restraint Measure. Traffic Engineering and Control. 25(4) p.198

19. DIRENZO, J.F. et al. (1981) Overview of Implemented Parking Management Tactics. Transportation Research Record, 786. p.1-9.

20. MAY, A.D. AND WARING, D. (1983) The Effects of Wheel Clamps in Central London. Results of the Before Study. WP170. Institute for Transport Studies, University of Leeds.

(C) PARKING (GENERAL)

1. STUTIL, V. (1981) Guidelines for Parking Policies. National Institute for Transport and Road Research, Pretoria, South Africa. Report RT/15/81.

2. BLY, P. et al. (1981) Changing the Cost of travel. Transport Research for Social and Economic Progress: Proceedings of the World Conference on Transport Research. Volume 3. London.

3. STIENSTRA, S. (1979) Less Shopping By Car? Verkeerskunde. Vol. 30, No.12 p589-593.

4. CRAMER, P. (1979) Increasing Parking Fees in the Congested Centres of Towns. DTSCH AUTORECHT. Vol. 48, No. 3, p57-70.

5. WEST YORKSHIRE M.C.C. (1979) West Yorkshire Transportation Studies - Traffic Engineering and Control. Vol. 20(3) p.111-116.

6. BURRAGE, R.H. et al. (1957) Parking. Eno Foundation, USA.

7. HAVERS, G. (1983) Opportunities for New Technology in Parking Meters. Traffic Engineering and Control. 24(6/7) p.319

8. CODD, J. (1983) Parking Requirements at sub-urban shopping centres - An Investigation. Traffic Engineering and Control. 24(3) p.119

9. HOWARTH, S. (1982) Car Parking Standards and Development Control. Traffic Engineering and Control. 23(2) p.53

10. TODD, J. (1980) People as Pedestrian. HMSO. London.

11. WRIGHT, C.C. (1982) The Collapse of Parking Enforecement in Large Towns - Some Causes and Solutions. Traffic Engineering and Control. 23(6) p.304.

12. LEAKE, G.R. (1982) Shopper and Vehicle Characteristics at Large Retail Shopping Stores. Traffic Engineering and Control. 23(1) p.8

13. KUNZE, B. (1981) Impacts of Municipal Parking - Fee Increases in Downtown Chicago. Transportation Research Record, 786. p.21-30.

14. BUTLER, D. (1981) Paying for Parking - which system. Traffic Engineering and Control. 22(7) p.390.

15. KELLY, R. (1979) Parking at a Hyper Market - Six Years On. Traffic Engineering and Control. 20(5) p.257.

16. AITKEN, C.P. (1977) Parking, Traffic Generation and Superstores - An Understatement? Traffic Engineering and Control. 18(4) p.199

17. GERCANS, R. (1984) St. Heliers Car Park Information System. Traffic Engineering and Control. 25(10) p.480

18. DAVIES E. (1968) Traffic Engineering Practice (Ch.8) London.

19. SMITH, W.S. (1955) Traffic Engineering. McGraw Hill. London.

20. ELLSON, P.B. (1969) Dynamic Capacities of Car Parks. TRRL, Dept. Environment. LR 221.

21. BRIERLEY, J. (1972) Parking of Motor Vehicles. Applied Science, London.

22. HATFIELD COLLEGE OF TECHNOLOGY (1966) Traffic and Parking. Hatfield, Hertfordshire.

23. DALBY, E. (1973) Pedestrians and Shopping Centre Layout. Department of the Environment, TRRL. LR 577.

24. LEAKE, G.R. (1981) Parking Demand at Large Retail Shopping Stores. Chartered Municipal Engineer. 109(5) p. 113-117.

25. TRANSPORT AND ENVIRONMENT STUDIES (1967) Park Now, Pay Later - A Study of Offensive Parking in the Heart of London. Automobile Association, London.

26. QUARMBY, D.A. (1967) Choice of Travel Mode for the Journey to Work: Some Findings. Journal of Transport Economics and Policy. September 1967, p. 273-314.

27. ANDREWS, N. (1985) Commuter Parking - One Local Authority's Response. Traffic Engineering and Control 26(5) p. 252-255.

28. KUNER, R. (1983) Downtown Parking Policy Analysis. Transportation Quarterly. 37(4) p. 559-566.

29. SMITH, W.S. (1983) Automobile Parking Trends. Transportation Quarterly. 37(3) p. 431-452.

30. HIGGINS, T.J. (1985) Flexible Parking Requirements for Office Developments: New Support for Public Parking and Ridesharing. Transportation 12, p. 343-359.

31. MILLER, G.K. ET AL (1982) Raising Commuter Parking Prices - An Empirical Study. Transportation 11, p. 105-129.

32. ELLSON, P.B. (1984) Parking: Turnover Capacities of Car Parks. Department of the Environment, TRRL, LR 1126.

33. US DEPT TRANSPORTATION (1979) Fringe Parking Site Requirements. Washington, USA.

34. US DEPT TRANSPORTATION (1979) Estimating Parking Accumulation. Washington, USA.

35. WEST YORKSHIRE MCC (1977) The Standing Vehicle in the Freestanding Towns. WYTCONSULT, Document 433.

36. HOBBS, F.D. (1979) Traffic Planning. Pergamon.

37. O'FIAHERTY, C. (1974) Highways and Traffic. Arnold, London.

38. KIRBY, H.R. (1985) Transport Research at the University of Leeds. Report for 1984. Traffic Engineering and Control 26(3) p. 119-124.

39. GOODWIN, P. (1985) Reasearch at the Transport Studies Unit, Oxford University. Report for 1984. Traffic Engineering and Contorl 26(6).

40. RATCLIFFE, B. (1985) University Car Parking. Traffic Engineering and Control 26(11) p. 540-541.

(D) PARKING SURVEYS

1. CARR, R. ET AL (1979) Monitoring Parking Supply and Usage - A Review of Public Off Street Car Parking in Central London. Greater London Council.

2. BROWN, A. (1982) Parking Surveys and the Use of VISTA in West Sussex. Traffic Engineering and Control 23(12) p. 590.

3. GUNN, H. (1981) Transport Surveys - Design for Efficiency. Traffic Engineering and Control 22(12) p. 640.

4. BANNISTER, L. (1981) Car Ownership and Modal Use: An Analysis of Census Data for a Metropolitan Area. Traffic Engineering and Control 22(7) p. 396.

5. HAGUE, P. (1980) Photographic Parking Duration Surveys. Traffic Engineering and Control 21(3) p. 123.

6. PEARCE, H. (1979) A Question of Parking: Survey, Analysis and Forecasting - Techniques Used in a Study of Off Street Parking. Traffic Engineering and Control 20(8/9) p. 403.

7. DUFFELL, J.R. (1977) Recreation Trip Origins - Use of the Car Registration Plate Technique: An Addendum. Traffic Engineering and Control 18(4) p. 203.

8. BURTON, W. (1960) Conducting a Limited Parking Study. Procedure Manual. Public Administration Service, USA.

9. BURTON, W. (1960) Conducting a Comprehensive Parking Study. Procedure Manual. Public Administration Service, USA.

10. MAY, A.D. AND TURVEY, I.G. (1985) The Design and Conduct of Park and Visit and Vehicle Following Surveys. Institute for Transport Studies, WP 198. University of Leeds.

11. RAINE J. (1985) The Influence of Parking Control on Destination Choice. Institute for Transport Studies. MSc Thesis. University of Leeds (Unpublished).

(E) ORIGIN/DESTINATION SURVEYS

1. WITHRINGTON, P.F. (1984) Questions and Answers from Roadside Surveys - Northamptonshire County Council. Surveyor 28/6/84 Vol 163 (4799).

2. PERLMAN, I. (1983) Origin and Destination Data from Lights on Surveys. Institute of Transportation Engineers Journal, Vol. 53(6) p. 19-22.

3. BUCK, B.W. (1984) Wroxham Traffc Survey - Final Report. Norfolk County Council.

4. BOVY, P.H.L. (1983) Sampling Problems with Origin - Destination Surveys via Household Interviews. Institute Stedebouwkundig (Delft University). June 1983.

5. SARNA, A.C. (1980) Sampling Techniques in Transport Planning. Indian Highways Vol. 8(6) p. 35-48.

6. MACKINTOSH, I. (1976) Collection of Traffic Study Data - Destination Study at North Cote (October 1975). Dept. Transport, Victoria County Roads Board, Australia.

7. BROWNING, P. (1983) New Survey Methods in Transport. Traffic Engineering and Control 24(12) p. 591.

8. BELL, M.G.H. (1983) The Estimation of Origin and Destination Flows and Their Confidence Intervals from Movements of Link Volumes: A Computer Program. Traffic Engineering and Control 24(4) p. 202.

9. HAVER, E. (1981) Origin-Destination Matrics from Traffic Count. Application and Validation on Simple Systems. Traffic Engineering and Control 22(3) p. 118.

10. ROBERTSON, D. (1984) Estimating Origin-Destination Flows by Simulating Trip Choice. Traffic Engineering and Control 25(7/8) p. 358.

11. HEYWOOD, R. (1985) Route Choice in Congested Urban Networks (2 volumes). Institute for Transport Studies WP 209, University of Leeds.

12. SENEVIRATNE, P.N. (1985) Analysis of Factors Affecting the Choice of Route of Pedestrians. Transportation Planning and Technology. Vol. 10, p. 147-159.

13. DUFFELL, J.R. (1983) Car Driver Route Choice - A Perception Study of the 'Rat Running' Phenomenon at St Albans, Hertfordshire. Traffic Engineering and Control 24(11) p. 520-528.

14. POLAK, J. (1981) Route Choice Processes and Travel Time Variability. A Gaming Simulation Approach. Transport Studies Group, Polytechnic of Central London.

15. HEYDECKER, B.G. (1983) Route Choice in Congested Urban Road Networks - 1983 Questionnaire Survey. Institute for Transport Studies, TN 120, University of Leeds.

16. ROBERTSON, D.I. (1979) The Choice of Route, Mode, Origin and Destination by Calculation and Simulation. Dept Environment, TRRL, LR 877.

17. BRENNAN, M.J. (1977) Determining the Peak-hour O-D Matrix for a Town with a Radial Concentric Structure. Traffic Engineering and Control 18(12) p. 579-580.

(F) MODELLING TECHNIQUES

1. SUGIE, Y. (1981) Application of an Equilibrium Model to Short Term Traffic Policies Evaluation. International Association of Traffic and Safety Sciences. Vol. 5, p. 81-90.

2. HARRISON, I. (1981) A Model for Predicting Seasonal Traffic. Traffic Engineering and Control 22(3) p. 122.

3. GOYAL, S. (1979) Two Models for Allocating Car Parking Spaces. Traffic Engineering and Control 19(2) p. 83.

4. KNOFLACHER, H. (1978) A Method for Verifying the Effectiveness of Limited Parking Zones. Traffic Engineering and Control 19(2) p. 82.

5. LANGDON, M.G. (1984) Methods of Determining Choice Probability in Utility Maximising Multiple Alternative Models. Transportation Research Vol. 18(B), No. 3, p. 209-234.

6. YOUNG, W. (1984) A Non-Trade Off Decision Making Model of Residential Location Choice. Transportation Research, Vol. 18(A), No. 1, p. 1-11.

7. O'CINNEIDE, D. ET AL (1982) The Development of a Comprehensive Parking Enforcement Model. University College, Cork (unpublished).

8. ELDIN, M.S.N. (1981) A Combined Parking and Traffic Assignment Model. Traffic Engineering and Control 22(10) p. 524-530.

9. ORTUZAR, J.D. (1980) Modal Choice Modelling with Correlated Alternatives. PhD Thesis, University of Leeds.

10. WILLIAMS, H.C.W.L. (1979) Behavioural Travel Theories, Model Specification and the Response Error Problem. Institute for Transport Studies. WP 116 University of Leeds.

11. HALL, M.D. ET AL (1980) A Simulation-Assignment Model for Evaluation of Traffic Management Schemes. TEC April 1980.

12. TONG R.L.S (1982) Price Elasticity of the Demand for Parking. Institute for Transport Studies - MSc Dissertation. University of Leeds (Unpublished).

APPENDIX 1: STATISTICAL ANALYSIS

Analysis of the survey data was carried out after coding and validation by the use of the SPSSX statistical package. This then allowed the crosstabulation of relevant variables. For example:

(Day) by (Parking Location)
(Parking Location) by (Sex) by (Vehicle Type)
(Journey Purpose) by (Parking Location) by (Day)
(Day) by (Reason for Shopping) by (Parking Location)
(Start Address) by (Parking Location)
(Parking Location) by (Reason for Choice of Location) by (Day)
(Parking Duration) by (Parking Location) by (Day)
(Day) by (Parking Location) by (Frequency of Visit)
(Day) by (Parking Location) by (Yearly Frequency Fluctuations)
(Day) by (Parking Location) by (Seasonal Variations in Conditions)
(Day) by (Parking Location) by (Changes Over Recent Years)
(Day) by (Parking Location) by (Options if Cost at Location Had Doubled)
(Day) by (Parking Location) by (Options if Location Was Not Available)
(Day) by (Parking Location) by (Options if Cost in Centre Had Doubled)
(Day) by (Parking Location) by (Options if Central Spaces Were Restricted)
(Day) by (Status) by (Options if Cost at Location Had Doubled)
(Day) by (Status) by (Options if Location Was Not Available)
(Day) by (Status) by (Options if Cost in Centre Had Doubled)
(Day) by (Status) by (Options if Central Spaces Were Restricted)
(Day) by (Parking Location) by (Options Never Considered in Doubling Location Cost)
(Day) by (Parking Location) by (Options Never Considered in Restricting Location Spaces)
(Day) by (Parking Location) by (Options Never Considered in Doubling Central Costs)
(Day) by (Parking Location) by (Options Never Considered in Restricting Central Spaces)
(Day) by (Parking Location) by (Map Distance)
(Cost) by (Include Petrol)
(Cost Met) by (Status) by (Day)
(Address) by (Status) by (Day)
(Day) by (Parking Location) by (Frequency of Visit to Centre, Over Time)
(Status) by (Sex) by (Reason For Not Parking at Preferred Location)

Also, a frequency distribution table for each variable was produced.

When considering before and after surveys and appropriate sample sizes the following may be relevant:

(A) GENERAL

For any survey the size of the sample depends upon the strength of association which is required to be detected as significant.

In terms of two population means then the following relationship exists:

$$co^2 = \frac{(\mu_2 - \mu_2)^2}{4\ \sigma^2 y}$$

From this definition, it can be derived that:

$$\frac{\mu_1 - \mu_2}{\sigma y/x} = 2\sqrt{\frac{w^2}{1-w^2}} = \Delta$$

Hence, given any value of w^2, it is possible to find the ratio of the absolute difference between population means to the standard deviation of either population where:

μ_1 Mean of Population 1

μ_2 Mean of Population 2

σ Standard Deviation

w^2 Population Index (Proportional reduction in Y variance given the X value)

Δ Absolute Difference of 2 population means, relative to standard deviation of either population

α Probability of Type I Error

β Probability of Type II Error.

For samples of roughly the same size, n, then in terms of the standard error of the difference

$$\frac{|\mu_1 - \mu_2|}{5\ \text{diff}} = \Delta\sqrt{\frac{n}{2}} = \left[Z\ (1 - \alpha/_2) - Z\ (\beta)\right]$$

Where $Z\ (1 - \alpha/_2)$ is the value of the standardised score cutting off the lower $(1 - \alpha/_2)$ proportion of cases

$Z\ (\beta)$ is the standardised score cutting off the lower β proportion of cases.

$$\therefore \quad n = \frac{2\left[\mathcal{Z}\,(1 - \alpha/_2) - \mathcal{Z}\,(\beta)\right]^2}{\Delta^2}$$

$$n = \frac{2\left[\mathcal{Z}\,(1 - \alpha/_2) - \mathcal{Z}\,(\beta)\right]^2}{2\sqrt{\frac{w^2}{1 - w^2}}}$$

For our two surveys at the 95% level, (two tailed) then for various values of n ....

n	w^2	
10	0.16	(0.25)
50	0.038	(0.062)
150	0.013	(0.022)
200	0.009	(0.016)
500	0.004	(0.007)

.... then values for w^2 can be calculated. Figures in brackets give the w^2 values at the 99% level, which obviously gives a poorer level of association.

The sample sizes approximating to the 200 category above giving a good degree of association.

i.e.) for a sample size of 200 at the 95% level then $w^2 = 0.016$ and X accounts for 16% of the variance of Y.

Hence for values of n >5 there is a good degree of association. This applied to aggregate data in both surveys by area and type. It is only when one looks at individual addresses by type etc that the sample size falls and with it the degree of association. To allevaite this problem then the total sample size would have to be more than doubled, given a random sample, and this would give no great increase in association for the aggregate data.

To achieve this, survey costs would more than double, with no real increased benefit to the area wide data, which in terms of a parking study may be regarded as the most important. Also, trivial assocations may be thrown up as significant results when the sample size is very large.

(B) FORMULAE USED FOR STATISTICAL ANALYSIS

1. Means

1.1 Standard deviation

$$s = \sqrt{\sum_{i=1}^{n} \frac{(x_i - \bar{x})^2}{n-1}}$$

x = observed times

$\bar{x}$ = mean of observed times

n = sample size

s = sample standard deviation

1.2 Confidence limit around mean

$$CLM = \bar{x} \pm t \times \frac{s}{\sqrt{n}}$$

where t is the appropriate 2 tailed statistic at 95% confidence for (n-1) degress of freedom.

1.3 Minimum significant difference in the mean

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S^2_p}{n_1} + \frac{S^2_p}{n_2}}} \qquad (1)$$

where

$$Sp^2 = \frac{(n_1 - 1)S^2_1 + (n_2 - 1)S^2_2}{n_1 + n_2 - 2}$$

Suffix 1 indicates "before" data

Suffix 2 indicates "after" data

μ = population mean

Sp^2 = pooled variance.

Assuming that the value of S is the same for before and after data

$$Sp = S_1 = S_2$$

Assuming that the same procedure is adopted in the after survey as in the before then

$$n_1 = n_2$$

If the population means are assumed to be the same before and after then

$$(\mu_1 - \mu_2) = \phi$$

The equation (1) then becomes

$$t = \frac{(\bar{x}_1 - \bar{x}_2)}{\sqrt{\frac{2\ Sp^2}{n}}}$$

$$(x_1 - x_2) = t \times Sp \times \sqrt{\frac{2}{n}}$$

i.e. the minimum significant difference in mean $= t \times Sp \times \sqrt{\frac{2}{n}}$

where t is the appropriate 2 tailed statistic at 95% confidence for (2n - 2) degrees of freedom.

2. Proportions

2.1 Standard deviation

$$Sp = \sqrt{\frac{\hat{p}\ (1-\hat{p})}{n}}$$

where Sp = population standard deviation

$\hat{p}$ = sample proportion as an estimate of population proportion

n = sample size

2.2 Confidence limits around proportion

$$CLP = \hat{p} \pm 1.96 \sqrt{\frac{\hat{p}\ (1-\hat{p})}{n}}$$

2.3 Minimum significant difference in proportion

$$z = \frac{(p_1 = p_2) - (\pi_1 - \pi_2)}{\sqrt{\frac{\pi_1(1-\pi_1)}{n_1} + \frac{\pi_2(1-\pi_2)}{n_2}}}$$

where suffix 1 indicates "before" data

suffix 2 indicates "after" data

π = population proportion

p = sample proportion

n = sample size

Assuming that the population is the same

$$\pi_1 = \pi_2$$

$$\therefore \quad (\pi_1 - \pi_2) = 0$$

$$\therefore \quad 2 = \frac{(p_1 - p_2)}{\sqrt{\frac{\pi_1(1 - \pi_1)}{n_1} + \frac{\pi_2(1 - \pi_2)}{n_2}}}$$

Assuming that $p_1 \sim \pi_1$ and $p_2 \sim \pi_2$ and that

$$n_1 = n_2$$

$$\therefore \quad Z = \frac{(p_1 - p_2)}{\sqrt{\frac{2_p(1 - p)}{n_1}}}$$

$$\therefore \quad p_1 - p_2 = Z \times \sqrt{\frac{2_{p_1}(1-p_1)}{n_1}}$$

Minimum significant difference in proportion $= 1.96 \sqrt{\frac{2_{p_1}(1 - p_1)}{n_1}}$

APPENDIX 2: PARKING PROVISION AND CONTROL

This section looks briefly at the current legislation that governs local authority policy towards car parking. Both on and off street parking facilities are considered in the following manner:

A2.1 : OFF STREET PARKING PROVISION
A2.2 : OFF STREET PARKING OPERATION
A2.3 : ON STREET PARKING MANAGMENT AND CONTROL

A2.1 OFF STREET PARKING PROVISION

(A) PROVISION

- The Road Traffic Regulation Act 1967 (ammended by the Local Government Act 1972) gave powers to the County Council, District, and Parish Councils to provide off street parking places.

- The D.C. is required to obtain consent from the County Council and may appeal if it is not given.

- Parish Councils may provide bicycle and motor cycle parking palces. To provide general parking places consent of the County Council is required.

- Supervisory staff may be employed by all the authorities.

(B) CONTROL

The Transport Act 1978 gave powers to the County Council to regulate the operation of public off-street parking places (as a means of regulating traffic in urban areas) (S.11).

In making orders county councils are required to consult organsiations representative of the disabled. If representations are made by such organisations the County Council is required to send a statement on how parking requirements of the disabled are to be met to the Secretary of State.

Orders may be annulled by either House of Parliament.

Omnibus and Coach Stations

May be provided under similar provisions as those for car parks (S.33 R.T.R.A. 1967).

A2.2 OFF-STREET PARKING OPERATION

Supervisory staff may be employed by C.C., D.C. and P.C. to operate, maintain off street parking places provided by themselves. Road Traffic Regulation Act 1967.

Agency arrangements are also possible whereby the local authorities may agree to undertake maintainance for each other.

A2.3 ON-STREET PARKING MANAGEMENT AND CONTROL

(A) Without Payment

County Councils have powers (R.T.R.A., 1967 S.28A) to make orders authorising the use as a parking place of any part of a road for which they are the H.A. responsible for the maintenance of that road. If they are not the H.A. they are required to obtain the consent of the appropriate H.A.

The C.C. are required to consult the D.C. in which the parking place is to be situated.

Conditions may be attached (and apparatus used) to specify who may use the parking place and at what time.

(B) With Payment

As above: meters or other apparatus may be used to collect payment but the apparatus has to be approved by the Minister for an order to be made to order its use (S.31).

(C) Enforcement

A local authority may appoint with or without remuneration superintendant staff. It may institute proceedings for offences in connection with parking places provided by the authority.

Traffic Wardens appointed by the Police Authority may enforce traffic law under arrangement with the County Council.

APPENDIX 3: PROJECT CONTACTS (AT 1/1/86)

The following contacts have been made during the duration of the project: (those marked * have been particularly useful):

(A) LOCAL AUTHORITIES

* (1) BARNSLEY METROPOLITAN COUNCIL, Town Hall, Barnsley

Tel: Barnsley 203232 ext. 2314 (Mr P Bundy) - Parking
ext. 2824 (Mr D Pendlebury) - Planning

* (2) CLEVELAND COUNTY COUNCIL, Gurney Street, Middlesborough

Tel: Middlesborough 248155 (Mr Milnes) - Transportation

(3) DERBYSHIRE COUNTY COUNCIL, Matlock

Tel: Matlock 3411

(4) DURHAM CITY COUNCIL, Hawthorne Terrace, Durham

Tel: Durham 67131 ext. 18 (Mr Aipchison) - Parking

(5) DURHAM COUNTY COUNCIL, County Hall, Durham

Tel: Durham 64411 ext. 2409 (Mr Newton) - Parking

(6) GREATER MANCHESTER COUNCIL, County Hall, Piccadilly Gardens, Manchester

Tel: Manchester 247-3111 (Mr Bannatyne) - Parking

* (7) HARROGATE TOWN COUNCIL, Technical Services, Westgrove Road, Harrogate

Tel: Harrogate 68966 (Mr Benton) - Chief Engineer
(Mr Isles) - Technical Services
(Mr B Windle) - Parking

(8) HUMBERSIDE COUNTY COUNCIL, Hull

Tel: Hull 867131 ext. 3684 (Mr G Walker) - Parking

(9) KIRKLEES DISTRICT COUNCIL, Huddersfield

Tel: Huddersfield 22133 - Planning

(10) LEEDS CITY COUNCIL, Leeds

Tel: Leeds 463136

(11) LINCOLN CITY COUNCIL, City Hall, Beaumont Fee, Lincoln

Tel: Lincoln 32151

(12) LINCOLNSHIRE COUNTY COUNCIL, County Offices, Newland, Lincoln

Tel: Lincoln 29921 ext. 69 (Mr M Gravin) - Parking

* (13) MERSEYSIDE COUNTY COUNCIL, Metropolitan House, Liverpool

Tel: Liverpool 227-5234 ext. 3038 (Mr Wright) - Parking

(14) MIDDLESBOROUGH BOROUGH COUNCIL, Gurney Street, Middlesborough

Tel: Middlesborough 248155

* (15) NORTH YORKSHIRE COUNTY COUNCIL, Northallerton

Tel: Northallerton 3123 ext. 501 (Mr Wychman) - Traffic

(16) NOTTINGHAM CITY COUNCIL, The Guild Hall, Nottingham

Tel: Nottingham 418561 - Car Parks
48571 (Mr More) - Parking

(17) NOTTINGHAM COUNTY COUNCIL, County Hall, West Bridgeford

Tel: Nottingham 824824 ext. 443 (Mr Grundy) - Parking

(18) ROTHERAM TOWN COUNCIL, Rotherham

Tel: Rotherham 382121 ext. 3182 (Mr N Hunt) - Parking

* (19) SHEFFIELD CITY COUNCIL, Town Hall, Sheffield

Tel: Sheffield 734211 - General
734192 (Ruth Sanders) - Parking Studies

* (20) SOUTH YORKSHIRE COUNTY COUNCIL, County Hall, Barnsley

Tel: Barnsley 286141 - Joint Transportation/
Planning Unit
241484
ext. 2263 (Mr D Morgan) - Traffic
(Mr B Hazelhurst) - Parking
(Mr J Lashmar) - Parking
(Rotherham)

(21) TYNE AND WEAR COUNTY COUNCIL, Sandyford House, Newcastle upon Tyne

Tel: Newcastly 816144 ext. 279 (Mr Charlton) - Parking

* (22) WAKEFIELD DISTRICT COUNCIL, Newton Bar, Wakefield

Tel: Wakefield 370211 ext. 411 (Mr J Lau) - Planning

* (23) WEST YORKSHIRE METROPOLITAN COUNTY COUNCIL, Bishopgarth, Wakefield

Tel: Wakefield 367111 ext. 4211 (Mr D Wilson) - Parking
(Mr D Walker) - Parking
(Mr M Waterhouse) - Planning
ext. 4317 (Mr P Beaumont) - Parking Data

(24) WEST MIDLANDS COUNTY COUNCIL, County Hall, Birmingham

Tel: Birmingham 300-7502 - General
300-7460 (Mr Moseley) - Parking

(25) YORK CITY COUNCIL, St Leonards Place, York

Tel: York 59881 (Mr Lewis) - Assistant City Engineer, Parking
(Mr Shroud) - Dep. Chief Engineer

(B) OTHERS

(1) NATIONAL CAR PARKS LIMITED

Regional Manager (Yorkshire) - Furnival Gate, Sheffield

Tel: Sheffield 24473 (Mr Huxley) - Regional Manager
701895 - Manager's Office

* Leeds 458711 (Mr Lupton) - City Manager

London 4997050

(2) RANK ZEROX (Printing)

Head Office (Leeds) Tel: Leeds 440641

* Copy Bureau, Headrow, Leeds

Tel: Leeds 459585 (John Lamkin) - Account Manager

(3) TRANSPORT STUDIES UNIT, University of Oxford, Oxford

Tel: Oxford 53101 (Phil Goodwin)

NOTE: (6), (13), (20), (23), (24) no longer exist as county wide authorities (from April 1986). Responsibility for parking policy has now passed to the appropriate district authority, invariably under the control of different personnel.

APPENDIX 4(A): LEEDS PILOT SURVEY

FEBRUARY 1985 INTERVIEW

ITS

INSTITUTE FOR TRANSPORT STUDIES

THE UNIVERSITY OF LEEDS
LEEDS LS2 9JT
Tel: (0532) 431751 ext

Director and Professor of Transport Economics: K. M. Gwilliam
Professor of Transport Engineering: A. D. May

PARKING DESTINATION SURVEY

SECTION 1

Q1 Survey Number

Q2 Questionnaire Number

Q3 Day

- Monday ☐
- Tuesday ☐
- Wednesday ☐
- Thursday ☐
- Friday ☐
- Saturday ☐

Q4 Date

Q5 Time (24 hour clock)

Q6 Location _____

Q7 Parking type

- on street legal pay space ☐
- on street legal free ☐
- on street illegal ☐
- off street ☐
- off street free ☐

Q8 Weather

- Rain ☐
- Sunny ☐
- Overcast ☐
- Mist ☐

Other _____

Q9 Vehicle type

- Car ☐
- Van ☐
- Motorcycle ☐

Other _____

SECTION 2

Q1 What is/was the main purpose of your journey?

EDUCATION	☐
WORK	☐
SHOPPING	☐
SOCIAL/RECREATION	☐
OTHER	☐

PLEASE SPECIFY _____

Q2 What was the exact address where you started your car journey?

_____

☐ Q3 (a) Please indicate on the map where you intend to go after you leave the car park

☐ (b) Please indicate on the map where you have been since you parked the car

Q4 Why have you chosen to shop in the centre of Leeds?

Please specify :-

_____

Q5 Why have you chosen to park at this location?

Cheapness/cost	☐
Spaces always available	☐
Good surface facilities	☐
Ease of Access	☐
Nearness to shops	☐
No Vandalism	☐
No reason	☐
Other	☐

Please specify _____

☐ ■ Q6 a) For approximately how long do you expect to leave your car parked at this location?

less than 10 minutes	☐
less than 30 minutes	☐
less than 1 hour	☐
between 1 and 2 hours	☐
between 2 and 4 hours	☐
greater than 4 hours	☐

☐ b) For approximately how long have you been parked at this location?

less than 10 minutes	☐
less than 30 minutes	☐
less than 1 hour	☐
between 1 and 2 hours	☐
between 2 and 4 hours	☐
greater than 4 hours	☐

■ Q7 If you had known that it would cost twice as much to park at this location today, what would you be most likely to do:-

(1) Pay the increased price and attempt to park at the same location ☐

(2) Search longer for a cheaper space ☐

(3) Park further from the centre and walk ☐

(4) Park further from the centre and catch a bus ☐

(5) Change you means of transport (bus, train etc) and still visit Leeds centre ☐

...specify means of transport _____

(6) Visit another centre by car ☐

... specify centre _____

(7) Visit another cenre and change you means of transport ☐

... specify centre _____

... specify means of transport _____

(8) Other _____

■ Are there any of these options that you would never consider?

■ Q8 If you had known in advance that this particular location would not be available what would you be most likely to do?

(1) Search longer for another convenient space ☐

(2) Park further from the centre and walk ☐

(3) Park further from the centre and catch a bus ☐

(4) Change your means of transport and still visit Leeds centre ☐

... specify means of transport _____

(5) Visit another centre by car ☐

... specify centre _____

(6) Visit another centre and change your means of tranpsort ☐

... specify centre _____

...specify means of transport _____

(7) Other ☐

... please specify _____

■ Are there any of these options that you would never consider?

_____

■ Q9 If you had known that charges throughout the centre of Leeds were to be doubled today, what would you be likely to do?

_____

(1) Pay the increased price but still park at this location ☐

(2) Pay the increased price but search longer for a more convenient location ☐

... specify location _____

(3) Search for a non-central parking space which is cheaper and walk ☐

(4) Search for a non-central parking space which is cheaper and catch a bus ☐

(5) Change your means of transport and still visit Leeds centre ☐

... specify means of transport _____

(6) Visit another centre by car ☐

... specify centre _____

(7) Visit another centre and change your means of transport ☐

... specify centre _____

... specify means of transport _____

(8) Other ☐

... Please specify _____

■ Are there any of these options that you would never consider?

_____

Q10 If you had known in advance that the would be a major restriction in parking spaces throughout the centre of Leeds, what would you be most likely to do?

(1) Search for a longer period in an attempt to find a central parking space ☐

(2) Park further from the centre and walk ☐

(3) Park further from the centre and catch a bus ☐

(4) Change your means of transport and still visit Leeds centre ☐

... specify means of transport _____

(5) Visit another centre by car ☐

... specify centre _____

(6) Visit another centre and change your means of tranpsort ☐

... specify centre _____

...specify means of transport _____

(7) Other

... please specify _____ ☐

Q11 What is the furthest from the centre, in terms of walking time, that you would ever consider parking

Up to 5 minutes walk ☐

Up to 10 minutes walk ☐

Up to 15 minutes walk ☐

Greater than 15 minutes walk ☐

Q12 How frequently do you visit the centre of Leeds?

More than once per week ☐

More than once a month ☐

Occasionally ☐

Q13 Are there any times of the year when you visit Leeds more often than normal?

SECTION 3

Q1 Have you parked anywhere else to shop today, please specify

_____

Q2 Will you be parking anywhere else before you get home to do further shopping?

_____ please specify _____

_____

Q3 Is ther any current parking space in the centre of Leeds where you would prefer to parking conditions and/or regulations there were improved?

please specify _____

Q4 In your view do parking conditions vary seasonally in the centre of Leeds?

_____

_____

Q5 Have you noticed a change in parking conditions in the centre of Leeds in the last 5 years?

_____ if yes, please specify _____

_____

Q6 Do you currently make more, or less, or about the same number of trips to the central Area than you did 12 months ago?

More ☐

Less ☐

the same ☐

Please specify _____

_____

Q7 How much do you estimate if has cost you to use and park the car today for this trip, (e.g. petrol, oil etc.). If it cost you nothing write FREE.

_____

_____

SECTION 4

Q1 Sex

- Male ☐
- Female ☐

Q2 Age Group

- 17-24 ☐
- 25-34 ☐
- 35-54 ☐
- > 55 ☐

Q3 Current Status

- Work full time ☐
- Work part time ☐
- Housewife ☐
- Student ☐
- Retired ☐
- Unemployed ☐

Other _____

Q4 Are you the main driver of the vehicle

- Yes ☐
- No ☐

Q5 Address _____

_____

POSTCODE _____

Q6 Telephone _____

APPENDIX 4(B): LEEDS PILOT SURVEY

FEBRUARY 1985 REPLY PAID QUESTIONNAIRE

The questionnaire used was of this content but changed in format. To aid the ease of distribution and the appearance of the questionnaire an A5 booklet was used.

For reply-paid studies an A5 booklet was also used in Rotherham and Knaresborough.

PARKING DESTINATION SURVEY

The Institute for Transport Studies, the University of Leeds, is looking at how changes in parking policy may affect travel patterns and habits.

The self-completion questionnaire which follows relates to your present trip and parking location, and may be answered by ticking the appropriate boxes and/or specifying alternative answers.

A **POST PAID ENVELOPE** is provided for you to return the completed questionnaire at your earliest convenience.

The information will be treated completely confidentially.

Any queries should be directed to Mr. I. Turvey at the address below.

POSTAGE IS FREE. RETURNING THIS QUESTIONNAIRE WILL COST YOU NOTHING

I.G.Turvey

PARKING DESTINATION SURVEY

SECTION 1

Q1 Survey Number ☐☐☐☐

Q2 Questionnaire Number ☐☐☐☐

Q3 Day

M	Tu	W	Th	F	S	Su
☐	☐	☐	☐	☐	☐	☐

Q4 Date ☐☐☐☐8 5

Q5 Time (24 hour clock) ☐☐☐☐

Q6 Location _____

Q7 Parking type

On Street Legal Pay Space	On Street Legal Free	On Street Other	Off Street Pay Space	Off Street Free
☐	☐	☐	☐	☐

Q8 Weather

Sunny	Rain	Overcast	Cold	Mist	Ice	Wind
☐	☐	☐	☐	☐	☐	☐

Other _____

Q9 Vehicle type

Car	Van
☐	☐

Other _____

Q10 Number of car occupants _____

Q11 Other Observations (eg.heavily laden, children present, entry to/exit from car park etc.)

_____

_____

SECTION 2

Q1 What was the main purpose of your journey?

EDUCATION ☐ WORK ☐ SHOPPING ☐ SOCIAL ☐ RECREATION ☐

OTHER ☐ Please specify _____

If this is a shopping journey, why have you chosen to shop in the centre of Leeds?

_____

Q2 What was the exact address where you started your car journey?

_____

Q3 Why did you chose to park at this location today?

Cheapness/cost ☐

Spaces always available ☐

Good surface facilities ☐

Ease of Access ☐

Nearness to shops

No Vandalism

No reason

Other Please specify _____

Other.....
Please Specify
_____
_____

Q4 For approximately how long have you been parked at this location?

lessthan 10 minutes	11to30 minutes	31 minutes to 1 hour	1 to2 hours	2to4 hours	Greater than 4 hours

Q5 If you had known in advance that it would cost twice as much to park at this location today,what would you have done today?

(1) Pay the increased price and attempt to park at the same location.

(2) Search longer for a cheaper space

(3) Park further from the centre and walk

(4) Park further from the centre and catch a bus

(5) Change you means of transport (bus, train etc) and still visit Leeds centre.
... specify means of transport _____

(6) Visit another centre by car
... specify centre _____

(7) Visit another cenre and change you means of transport
... specify centre _____
... specify means of transport _____

(8) Other _____

Are there any of these options that you would never consider?

_____

Q6 If you had known in advance that this particular location would not be available what would you have done today?

(1) Search longer for another convenient space

(2) Park further from the centre and walk

(3) Park further from the centre and catch a bus

(4) Change your means of transport and still visit Leeds centre
... specify means of transport _____

(5) Visit another centre by car
... specify centre _____

(6) Visit another centre and change your means of tranpsort
... specify centre _____
...specify means of transport _____

(7) Other
... please specify _____

Are there any of these options that you would never consider?

_____

Q7 If charges throughout the centre of Leeds were to be doubled , what would you do?

(1) Pay the increased price but still park at this location

(2) Pay the increased price but search longer for a more convenient location
...specify location _____

(3) Search for a non-central parking space which is cheaper and walk

(4) Search for a non-central parking space which is cheaper and catch a bus

(5) Change your means of transport and still visit Leeds centre
... specify means of transport _____

(6) Visit another centre by car
... specify centre _____

(7) Visit another centre and change your means of transport
...specify centre _____
...specify means of transport _____

(8) Other

... Please specify _____

Are there any of these options that you would never consider?

_____

Q8 If there were to be a major restriction in parking spaces throughout the centre of Leeds what would you do?

(1) Search for a longer period in an attempt to find a central parking space

(2) Park further from the centre and walk

(3) Park further from the centre and catch a bus

(4) Change your means of transport and still visit Leeds centre
... specify means of transport _____

(5) Visit another centre by car
... specify centre _____

(6) Visit another centre and change your means of tranpsort
... specify centre _____
...specify means of transport _____

(7) Other
... please specify _____

Are there any of these options that you would never consider?

_____

Q9 Please indicate on the map where you have been since you parked the car.

Q10 (a) What is the furthest from that location, that you would ever consider parking and walk?

(b) How long do you think that it would take you to walk this distance?

Up to 5 minutes	6 to 10 minutes	11 to 15 minutes	Greater than 15 minutes

Q11 How frequently do you visit the centre of Leeds?

More than once per week	More than twice per week	More than twice per month	occasionally

SECTION 3

Q1 Have you parked anywhere else to shop today, please specify

_____

Q2 Will you be parking anywhere else before you get home to do further shopping?
please specify _____

_____

Q3 Is there any current parking space in the centre of Leeds where you would prefer to park?

yes no

If yes, why do you not park there at the moment?

_____

Q4 (a) How much do you think it has cost to use your car and park it today?

_____

(b) Did you include the cost of petrol, oil etc. in this figure

yes no

..If not, how much do you think that this would add?

_____

(c) How much of this cost has been met by someone else? If nothing ,write NIL.

_____

Q5 Are there any times of the year when you visit Leeds more often than normal?

_____

Q6 In your view do parking conditions vary seasonally in the centre of Leeds?

_____

Q7 Have you noticed a change in parking conditions in the centre of Leeds in the last 5 years?
if yes, please specify _____

_____

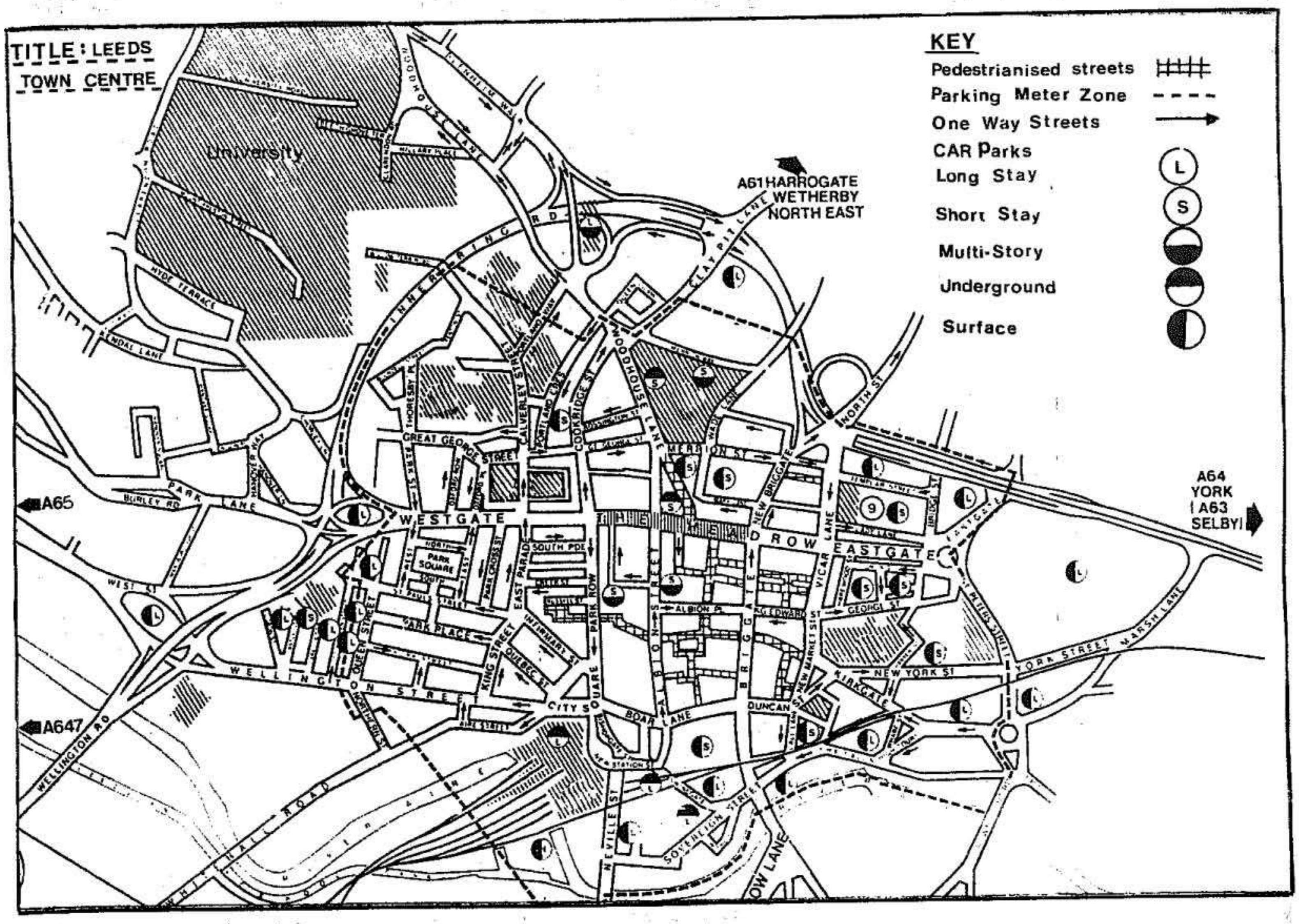
Q8 Do you currently make more, or less, or about the same number of trips to the central Area than you did 12 months ago?

More

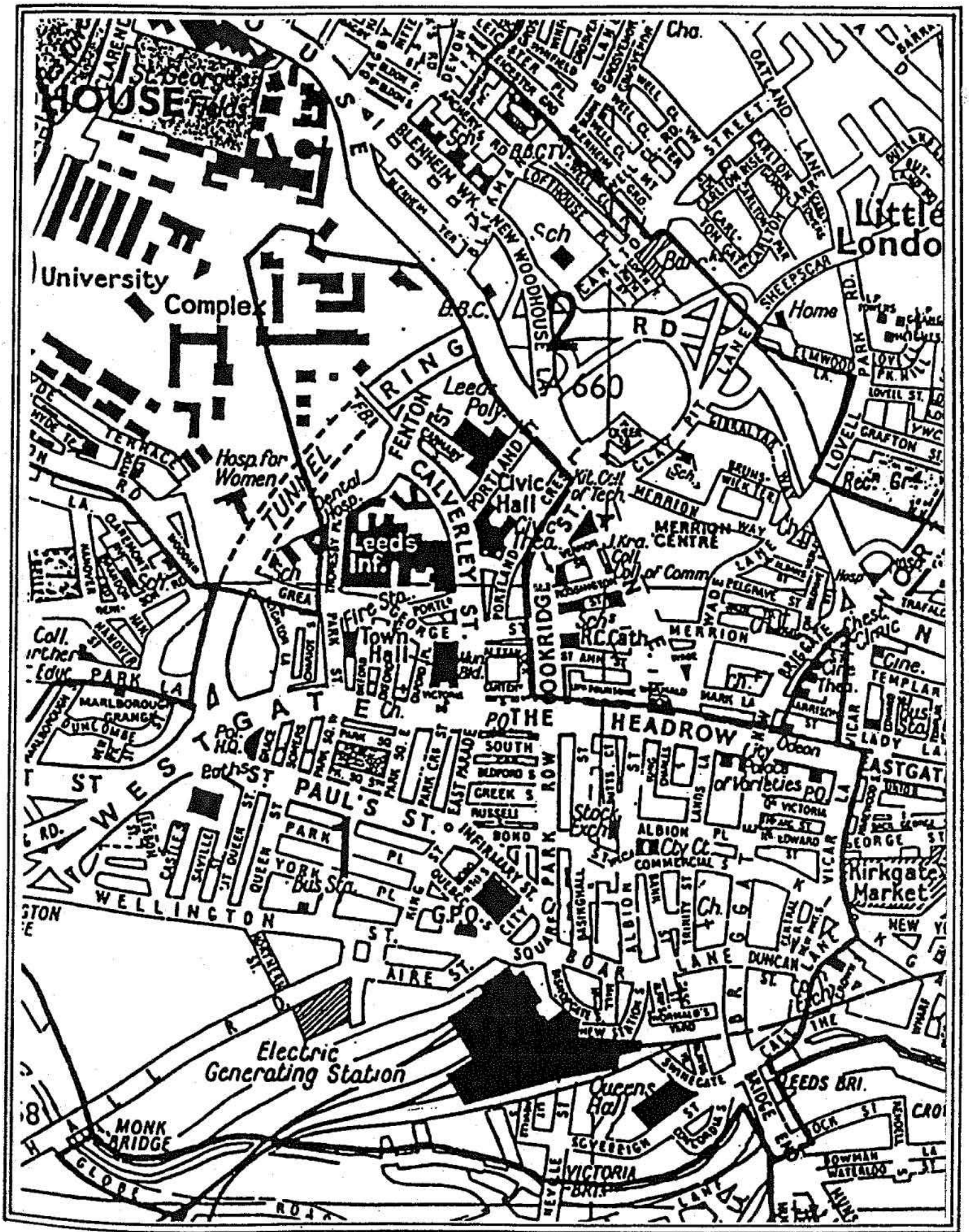
Please specify _____

Less

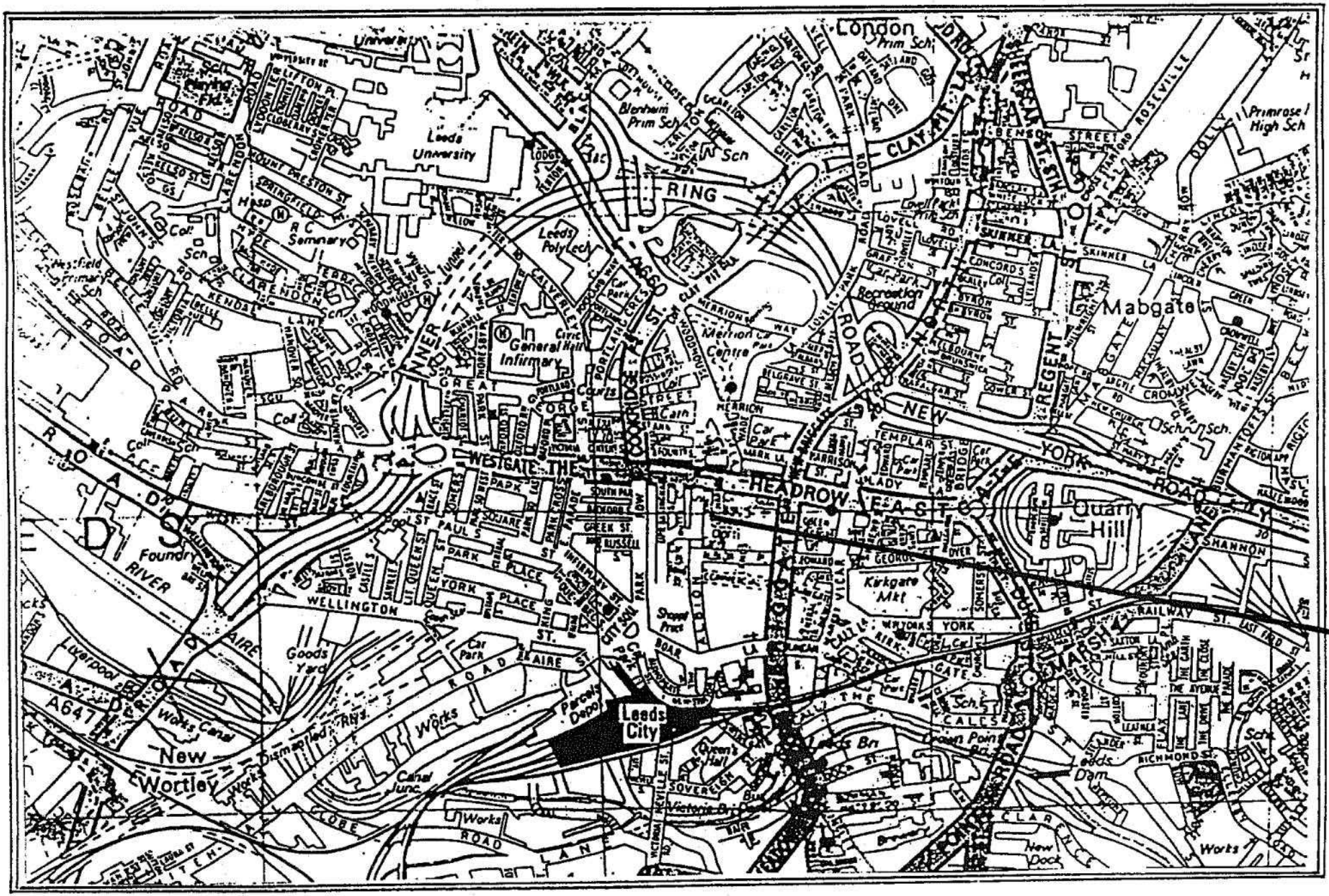
the same


TITLE: LEEDS
TOWN CENTRE
KEY
Pedestrianised streets
Parking Meter Zone
One Way Streets
CAR Parks
Long Stay
Short Stay
Multi-Story
Underground
Surface
L
S
A61 HARROGATE
WETHERBY
NORTH EAST
A64
YORK
(A63
SELBY)
A65
A647
University
INNER RING RD
CLAY PIT LANE
WOODHOUSE LANE
NORTH ST
HYDE TERRACE
KENDAL LANE
PARK LANE
BURLEY RD
WESTGATE
THE HEADROW
EASTGATE
GREAT GEORGE STREET
CALVERLEY STREET
COOKRIDGE ST
MERRION ST
NEW BRIGGATE
VICAR LANE
BRIGGATE
PARK ROW
EAST PARADE
PARK SQUARE
PARK PLACE
KING STREET
QUEEN STREET
INFIRMARY ST
QUEBEC ST
WELLINGTON STREET
CITY SQUARE
BOAR LANE
ALBION PL
DUNCAN
KIRKGATE
NEW YORK ST
YORK STREET
MARSH LANE
GEORGE ST
WEST ST
WELLINGTON RD
WHITEHALL ROAD
NEVILLE ST
SOVEREIGN STREET

central leeds



central leeds



APPENDIX 5(A): THE ROTHERHAM BEOFRE SURVEY

MARCH 1985 INTERVIEW/REPLY PAID QUESTIONNAIRE

ITS

ROTHERHAM SURVEYS

SURVEY NUMBER [R][1]

QUESTIONNAIRE NUMBER [ ][ ][ ][ ]

PARKING DESTINATION SURVEY.

The Institute for Transport Studies, the University of Leeds, is looking at how changes in parking policy may affect travel patterns and habits.

The self-completion questionnaire which follows relates to your present trip and parking location, and may be answered by ticking the appropriate boxes and/or specifying alternative answers.

A **POST PAID ENVELOPE** is provided for you to return the completed questionnaire at your earliest convenience.

The information will be treated completely confidentially.

Any queries should be directed to Mr.I.G.Turvey at the address below.

POSTAGE IS FREE. RETURNING THIS QUESTIONNAIRE WILL COST YOU NOTHING

(March 1985)

Prof. A.D.May

★ **PRIZE DRAW £25 PRIZE DRAW £25 PRIZE DRAW £25 PRIZE DRAW** ★

IF THE QUESTIONNAIRE IS COMPLETED IN FULL THEN YOU WILL BE ENTERED IN A DRAW FOR A £25 CASH PRIZE. THE WINNING NUMBER WILL BE DRAWN IN THE LAST WEEK OF APRIL AND THE WINNING RESPONDENT WILL RECEIVE A CHEQUE FOR £25 BY POST AS SOON AS IS POSSIBLE AFTER THAT DATE.

★ **PRIZE DRAW £25 PRIZE DRAW £25 PRIZE DRAW £25 PRIZE DRAW** ★

INSTITUTE FOR TRANSPORT STUDIES

THE UNIVERSITY OF LEEDS
LEEDS LS2 9JT **Tel: (0532) 431751 ext 7215**

Director and Professor of Transport Economics: K. M. Gwilliam
Professor of Transport Engineering: A. D. May

INSTITUTE FOR TRANSPORT STUDIES

THE UNIVERSITY OF LEEDS
LEEDS LS2 9JT **Tel: (0532) 431751 ext**

Director and Professor of Transport Economics: K. M. Gwilliam
Professor of Transport Engineering: A. D. May

PARKING DESTINATION SURVEY

SECTION 1

■ Q1 Survey Number ☐☐ 1 ☐☐

■ Q2 Questionnaire Number ☐☐☐☐ 3 ☐☐☐☐

■ Q3 Day

M	Tu	W	Th	F	S	Su
☐	☐	☐	☐	☐	☐	☐

7 ☐

■ Q4 Date ☐☐☐☐85 8 8 5 ☐☐☐☐

■ Q5 Time (24 hour clock) ☐☐☐☐ 14 ☐☐☐☐

■ Q6 Location _____ 18 ☐☐☐

■ Q7 Parking type

On Street Legal Pay Space	On Street Legal Free	On Street Other	Off Street Pay Space	Off Street Free
☐	☐	☐	☐	☐

21 ☐

■ Q8 Weather

Sunny	Rain	Overcast	Cold	Mist	Ice	Wind
☐	☐	☐	☐	☐	☐	☐

22 ☐

Other _____

■ Q9 Vehicle type

Car	Van
☐	☐

23 ☐

Other _____

■ Q10 Number of car occupants _____ 24 ☐

■ Q11 Other Observations (eg. heavily laden, children present, entry to/exit from car park etc.) 25 ☐☐

_____

_____

SECTION 2

■ Q1 What was the main purpose of your journey?

EDUCATION ☐ WORK ☐ SHOPPING ☐ SOCIAL ☐ RECREATION ☐ 27 ☐

OTHER ☐ Please specify _____

If this is a shopping journey, why have you chosen to shop in the centre of Rotherham? 28 ☐☐

■ Q2 What was the address where you started your car journey? (The POSTCODE or street name will suffice).

--- 30 ☐☐☐

■ Q3 Why did you chose to park at this location today?

33 ☐

Cheapness/cost ☐

Spaces always available ☐

Good surface facilities ☐

Ease of Access ☐

Nearness to shops ☐

No Vandalism ☐

No reason ☐

Other.....
Please Specify

_____

_____

■ Q4 For approximately how long have you been parked at this location?

Less than 10 minutes	11 to 30 minutes	31 minutes to 1 hour	1 to 2 hours	2 to 4 hours	Greater than 4 hours
☐	☐	☐	☐	☐	☐

34 ☐

■ Q5 How frequently do you visit the centre of Rotherham?

Once per week	More than once per week	More than twice per week	More than twice per month	Occasionally
☐	☐	☐	☐	☐

35 ☐

■ Q6 Are there any times of the year when you visit Rotherham more often than normal?

_____ 36

■ Q7 In your view do parking conditions vary seasonally in the centre of Rotherham? Please specify...

_____ 37

■ Q8 Have you noticed a change in parking conditions in the centre of Rotherham in the last 5 years?
if yes, please specify _____ 38

_____

■ Q9 Is there any current parking space in the centre of Rotherham where you would prefer to park?

yes ☐ no ☐ 39

If yes, why do you not park there at the moment?

_____ 40

■ Q10 Do you currently make more, or less, or about the same number of trips to the central Area than you did 12 months ago?

More ☐ > Please specify _____ 41

Less ☐ _____ 42

the same ☐

◀ ■ Q1 Sex

Male ☐ Female ☐ 43

■ Q11 Current Status

Work full time	Work part time	Housewife	Student	Retired	Unemployed
☐	☐	☐	☐	☐	☐

44

Other _____

■ Q12 How many cars are there in your household? _____ 45

■ Q13 How many drivers are there in your household? _____ 46

Q5 Please indicate on the map where you have been since you parked the car.

Q6 (a) What is the furthest from that location, that you would ever consider parking and walk?
Please indicate on the map.
(For example.....by means of a circle.....etc)

(b) How long do you think that it would take you to walk this distance?

Up to 5 minutes	6 to 10 minutes	11 to 15 minutes	Greater than 15 minutes
☐	☐	☐	☐

Q7 (a) How much do you think it has cost to use your car and park it today?

_____

(b) Did you include the cost of petrol, oil etc. in this figure

yes ☐ no ☐

..If not, how much do you think that this would add?

_____

(c) How much of the cost in (a) has been met by someone else? If nothing ,write NIL.

_____

Q8 Should we wish to seek your views in a few months time, are you willing to give your name and address / telephone number?

yes ☐ no ☐

If yes....

NAME _____

ADDRESS _____

_____

POSTCODE _____

TELEPHONE NUMBER _____

*** THANK YOU FOR YOUR TIME ***

REMEMBER TO INCLUDE BOTH THE QUESTIONNAIRE AND MAP IN THE REPLY PAID ENVELOPE

☐☐☐ 23

☐☐☐ 26

☐ 29

☐☐☐☐ 30

☐ 34

☐☐☐☐ 35

☐☐☐☐ 39

☐ 43

ITS

ROTHERHAM SURVEYS

SURVEY NUMBER R 1

QUESTIONNAIRE NUMBER ☐☐☐☐

PARKING DESTINATION SURVEY.

The Institute for Transport Studies, the University of Leeds, is looking at how changes in parking policy may affect travel patterns and habits.
The self-completion questionnaire which follows relates to your present trip and parking location,and may be answered by ticking the appropriate boxes and/or specifying alternative answers.
A POST PAID ENVELOPE is provided for you to return the completed questionnaire at your earliest convenience.
The information will be treated completely confidentially.
Any queries should be directed to Mr.I.G.Turvey at the address below.

POSTAGE IS FREE. RETURNING THIS QUESTIONNAIRE WILL COST YOU NOTHING

(March 1985) Prof. A.D.May

★PRIZE DRAW £25 PRIZE DRAW £25 PRIZE DRAW £25 PRIZE DRAW★

IF THE QUESTIONNAIRE IS COMPLETED IN FULL THEN YOU WILL BE ENTERED IN A DRAW FOR A £25 CASH PRIZE. THE WINNING NUMBER WILL BE DRAWN IN THE LAST WEEK OF APRIL AND THE WINNING RESPONDENT WILL RECEIVE A CHEQUE FOR £25 BY POST AS SOON AS IS POSSIBLE AFTER THAT DATE.

★PRIZE DRAW £25 PRIZE DRAW £25 PRIZE DRAW £25 PRIZE DRAW★

INSTITUTE FOR TRANSPORT STUDIES
THE UNIVERSITY OF LEEDS
LEEDS LS2 9JT Tel: (0532) 431751 ext 7215

Director and Professor of Transport Economics: K. M. Gwilliam
Professor of Transport Engineering: A. D. May

■ Q1 If you had known in advance that it would cost twice as much to park at this location today, what would you have done today?

(1) Pay the increased price and attempt to park at the same location. ☐

(2) Search longer for a cheaper space ☐

(3) Park further from the centre and walk ☐

(4) Park further from the centre and catch a bus ☐

(5) Change your means of transport (bus, train etc) and still visit Rotherham centre. ☐

... specify means of transport _____

(6) Visit another centre by car ☐
... specify centre _____

(7) Visit another centre and change your means of transport ☐
... specify centre _____

... specify means of transport _____

(8) Other _____ ☐

□ Are there any of these options that you would never consider? ☐☐☐

_____

■ Q2 If you had known in advance that this particular location would not be available what would you have done today?

(1) Search longer for another convenient space ☐

(2) Park further from the centre and walk ☐

(3) Park further from the centre and catch a bus ☐

(4) Change your means of transport and still visit Rotherham centre ☐
... specify means of transport _____

(5) Visit another centre by car ☐
... specify centre _____

(6) Visit another centre and change your means of tranpsort ☐
... specify centre _____

...specify means of transport _____

(7) Other ☐
... please specify _____

□ Are there any of these options that you would never consider? ☐☐☐

_____

■ Q3 If charges throughout the centre of Rotherham were to be doubled , what would you do?

(1) Pay the increased price but still park at this location ☐

(2) Pay the increased price but search longer for a more convenient location ☐
...specify location _____

(3) Search for a non-central parking space which is cheaper and walk ☐

(4) Search for a non-central parking space which is cheaper and catch a bus ☐

(5) Change your means of transport and still visit Rotherham centre ☐
... specify means of transport _____

(6) Visit another centre by car ☐
... specify centre _____

(7) Visit another centre and change your means of transport ☐
...specify centre _____

...specify means of transport _____

(8) Other ☐

... Please specify _____

□ Are there any of these options that you would never consider? ☐☐☐

_____

■ Q4 If there were to be a major restriction in parking spaces throughout the centre of Rotherham what would you do?

(1) Search for a longer period in an attempt to find a central parking space ☐

(2) Park further from the centre and walk ☐

(3) Park further from the centre and catch a bus ☐

(4) Change your means of transport and still visit Rotherham centre ☐
... specify means of transport _____

(5) Visit another centre by car ☐
... specify centre _____

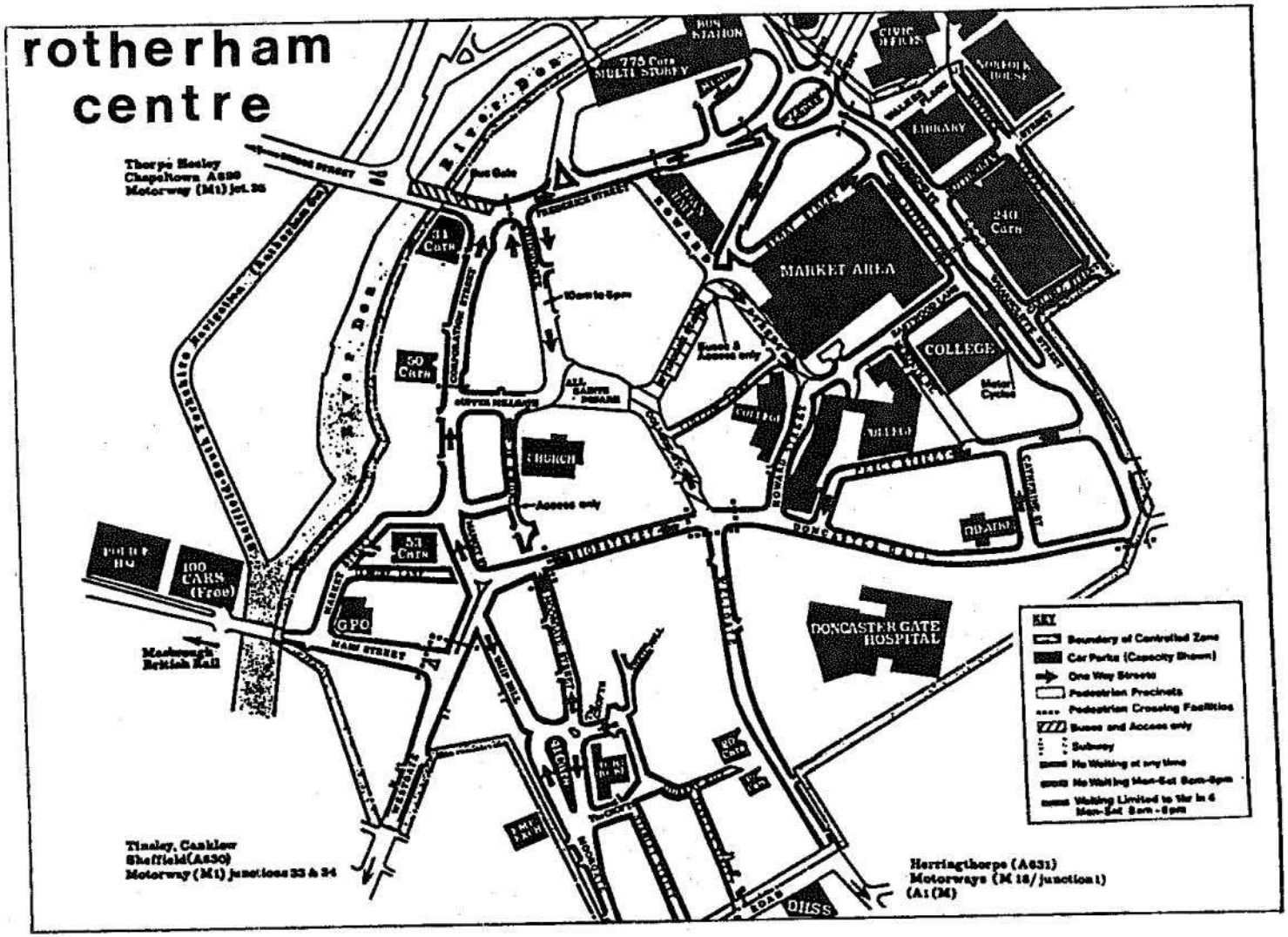
(6) Visit another centre and change your means of tranpsort ☐
... specify centre _____

...specify means of transport _____

(7) Other ☐
... please specify _____

□ Are there any of these options that you would never consider? ☐☐☐

_____


rotherham centre
Thorpe Hesley
Chapeltown A629
Motorway (M1) Jct. 35
BUS STATION
275 Cars MULTI STOREY
CIVIC OFFICES
NORFOLK HOUSE
LIBRARY
240 Cars
MARKET AREA
COLLEGE
53 Cars
50 Cars
CHURCH
Access only
100 CARS (Free)
POLICE HQ
GPO
MAIN STREET
Maltby
British Rail
DONCASTER GATE HOSPITAL
THEATRE
DILSS
Tinsley, Canklow
Sheffield(A630)
Motorway (M1) junctions 33 & 34
Herringthorpe (A631)
Motorways (M18/junction 1)
(A1(M)
KEY
Boundary of Controlled Zone
Car Parks (Capacity Shown)
One Way Streets
Pedestrian Precincts
Pedestrian Crossing Facilities
Buses and Access only
Subway
No Waiting at any time
No Waiting Mon-Sat 8am-6pm
Waiting Limited to 1hr in 4 Mon-Sat 8am - 6pm

ITS

INSTITUTE FOR TRANSPORT STUDIES
THE UNIVERSITY OF LEEDS
LEEDS LS2 9JT

NAME, _____ : WEATHER, _____ :

DAY, _____ day : DATE, [0] [6] [8] [5] : PAGE, _____ :

Contact Number	Envelope Number	Location	Time	Parking Type	Entry/ Exit	Sex of Driver	Number of Occupants	Other Comments
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

NOTES:

APPENDIX 5(B): THE ROTHERHAM 'AFTER' SURVEY

JULY 1985 (JULIAN RAINE) REPLY PAID POSTAL

ITS

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

Director and Professor of Transport Economics: K. M. Gwilliam
Professor of Transport Engineering: A. D. May

Dear Sir or Madam,

Thank you very much for your co-operation in completing and returning our first questionnaire about parking conditions in Rotherham town centre,which you were given in March. The information which you provided has been very useful to us in our studies. We are now conducting a follow-up survey to examine whether or not people have changed their parking habits or travel patterns since our first study in March. We would therefore be very grateful if you would complete the enclosed questionnaire and return it to us in the prepaid envelope provided.

The information will be treated completely confidentially. Any queries should be directed to Mr. I.G. Turvey at the address above.

POSTAGE IS FREE. RETURNING THIS QUESTIONNAIRE WILL COST YOU NOTHING.

Thank you,

Ian Turvey.

(July 1985)

Q1. Please indicate,in order of importance,the purposes for which you visit the centre of Rotherham (for example,if you visit Rotherham most frequently for the purpose of shopping,place a 1 in the corresponding box,followed by a 2 to indicate the second most frequent journey purpose,and so on).

EDUCATION	☐
WORK	☐
SHOPPING	☐
SOCIAL	☐
RECREATION	☐

OTHER ☐ Please Specify _____

Q2. Over the last two months how often have you visited the centre of Rotherham ?

ONCE PER WEEK	☐
MORE THAN ONCE PER WEEK	☐
MORE THAN TWICE PER WEEK	☐
MORE THAN TWICE PER MONTH	☐
OCCASIONALLY	☐

Q3. Over the last two months have you visited Rotherham more often or less often than you did in February and March ?

MORE OFTEN	☐
LESS OFTEN	☐
THE SAME	☐

If you have been visiting more often or less often,are there any specific reasons for this change ?

If so,Please Specify _____

_____

_____

_____

_____

Q4. Have you visited any other centres more often over the last two months than you did in February and March ?

If so,Please Specify Centre _____

Are there any specific reasons for this change ?

If so,Please Specify _____

_____

_____

Have you visited any other centres less often over the last two months than you did in February and March ?

If so,Please Specify Centre _____

Are there any specific reasons for this change ?

If so,Please Specify _____

_____

_____

Q5. Where do you normally park in the centre of Rotherham ?

AT A CAR PARK WHERE A CHARGE IS MADE	☐
AT A CAR PARK WHERE NO CHARGE IS MADE	☐
AT A PARKING METER	☐
ON A STREET WHERE NO CHARGE IS MADE	☐
OTHER	☐

Please Specify Location _____

If you have changed to this location recently,please give your reasons for doing so.

_____

_____

_____

_____

Q6. Where else have you parked in the centre of Rotherham over the last two months ?

Please Specify _____

_____

_____

Q7. Have you found parking in the centre of Rotherham over the past two months easier or more difficult than in February and March ?

EASIER	☐
MORE DIFFICULT	☐
THE SAME	☐

Q8. Have you noticed any other differences in parking conditions in the centre of Rotherham over the past two months ?

If so,Please Specify _____

_____

_____

_____

_____

_____

_____

_____

APPENDIX 6(A): THE KNARESBOROUGH SURVEY

JUNE 1985 REPLY PAID QUESTIONNAIRE

VERSION (1) (600)

ITS

KNARESBOROUGH SURVEYS

SURVEY NUMBER [K][1]

QUESTIONNAIRE NUMBER

PARKING DESTINATION SURVEY.

The Institute for Transport Studies, at the University of Leeds, is looking at how changes in parking policy may affect travel decisions by residents or visitors.

We would be very grateful if you could help us by filling in the following questionnaire. It has been designed to be easily answered and most questions only require you to tick the appropriate box.

A POST PAID ENVELOPE is provided for you to return the completed questionnaire at your earliest convenience.

The information will be treated completely confidentially.

Any queries should be directed to Mr.I.G.Turvey at the address below.

POSTAGE IS FREE. RETURNING THIS QUESTIONNAIRE WILL COST YOU NOTHING

Thankyou,

(June 1985)

Prof. A.D.May

INSTITUTE FOR TRANSPORT STUDIES

THE UNIVERSITY OF LEEDS
LEEDS LS2 9JT **Tel: (0532) 431751 ext** 7215

Director and Professor of Transport Economics: K. M. Gwilliam
Professor of Transport Engineering: A. D. May

Q1 What was the main purpose of your journey?

EDUCATION	WORK	SHOPPING	SOCIAL	RECREATION
☐	☐	☐	☐	☐

OTHER ☐ Please specify .....

■ If this is a shopping journey, why have you chosen to shop in the centre of Knaresborough?

.....

Q2 What was the address where you started your car journey? (The POSTCODE or street name will suffice).

.....

Q3 Why did you choose to park at this location today?

Cheapness/cost	☐	
Spaces always available	☐	Other..... Please Specify
Good surface	☐	.....
Easy to drive to	☐	.....
Nearness to destination(s)	☐	
No Vandalism	☐	

Q4 For approximately how long have you been parked at this location?

Less than 10 minutes	11 to 30 minutes	31 minutes to 1 hour	Over 1 hour & up to 2 hours	Over 2 hours & up to 4 hours	Greater than 4 hours
☐	☐	☐	☐	☐	☐

Q5 How frequently do you visit the centre of Knaresborough?

More than twice per week	More than once per week	About once per week	Once or twice per month	Occasion -ally	Never before
☐	☐	☐	☐	☐	☐

Q6 Have you been affected by day of the week variations in parking conditions in the centre of Knaresborough ?

.....

■ If so, how, if at all, have you adapted to them?

.....

Q7 Have you been affected by seasonal changes in parking conditions in the centre of Knaresborough ?

.....

■ If so, how, if at all, have you adapted to them?

.....

Q8 Have you been affected by changes in parking conditions in the centre of Knaresborough over the last 5 years ?

.....

■ If so, how, if at all, have you adapted to them?

.....

Q9 Is there any current parking space in the centre of Knaresborough where you would prefer to park?

yes ☐ no ☐

■ If yes, where is it and why do you not park there at the moment?

.....

Q10 Including the cost of petrol,oil etc , How much do you think it has cost you or your household to use and park the car *today* ?
If it has not cost you or your household anything, please write NIL.

.....

Q11 If you had known in advance that it would cost twice as much to park at this location today, what would you have done today?

(1) Pay the increased price and attempt to park at the same location. ☐

(2) Search longer for a cheaper space ☐

(3) Park further from the centre and walk ☐

(4) Park further from the centre and catch a bus ☐

(5) Change your means of transport (bus, train etc) and still visit Knaresborough centre. ☐
... specify means of transport .....

(6) Visit another centre by car ☐
... specify centre .....

(7) Visit another centre and change your means of transport ☐
... specify centre .....
... specify means of transport .....

(8) Other ..please specify..... ☐

■ Please list any options that you would never consider.

☐ ☐ ☐ ☐ ☐ ☐ ☐

Q12 If you had known in advance that this particular location would not be available what would you have done today?

(1) Search longer for another convenient space ☐

(2) Park further from the centre and walk ☐

(3) Park further from the centre and catch a bus ☐

(4) Change your means of transport and still visit Knaresborough centre ☐
... specify means of transport .....

(5) Visit another centre by car ☐
... specify centre .....

(6) Visit another centre and change your means of tranpsort ☐
... specify centre .....
... specify means of transport .....

(7) Other ☐
... please specify .....

■ Please list any options that you would never consider.

☐ ☐ ☐ ☐ ☐ ☐

Q13 If charges throughout the centre of Knaresborough were to be doubled , what would you do?

(1) Pay the increased price but still park at this location ☐

(2) Pay the increased price but search longer for a more convenient location ☐
... specify location .....

(3) Search for a noncentral parking space which is cheaper and walk ☐

(4) Search for a noncentral parking space which is cheaper and catch a bus ☐

(5) Change your means of transport and still visit Knaresborough centre ☐
... specify means of transport .....

(6) Visit another centre by car ☐
... specify centre .....

(7) Visit another centre and change your means of transport ☐
...specify centre .....
...specify means of transport .....

(8) Other ☐
...please specify .....

■ Please list any options that you would never consider.

☐☐☐☐☐☐☐

Q14 If there were to be a major restriction in parking spaces throughout the centre of Knaresborough what would you do?

(1) Search for a longer period in an attempt to find a central parking space ☐

(2) Park further from the centre and walk ☐

(3) Park further from the centre and catch a bus ☐

(4) Change your means of transport and still visit Knaresborough centre ☐
... specify means of transport .....

(5) Visit another centre by car ☐
... specify centre .....

(6) Visit another centre and change your means of tranpsort ☐
... specify centre .....
... specify means of transport .....

(7) Other ☐
... please specify .....

■ Please list any options that you would never consider.

☐☐☐☐☐☐

Q15 Please mark on the map with a ★ the place(s) that you have visited in Knaresborough today.(If more than one place then please put more than one ★).

Q16 (a) Please mark on the map with Ⓧ s the furthest from ★ that you would ever consider parking when visiting ★

■ (b) How long do you think that it would take you to walk the distance from Ⓧ to ★ ?

Up to 5 minutes	6 to 10 minutes	11 to 15 minutes	Greater than 15 minutes
☐	☐	☐	☐

Q17 Current Status

Work full time	Work part time	Housewife	Student	Retired	Unemployed
☐	☐	☐	☐	☐	☐

Other .....

Q18 How many cars are there in your household? .....

Q19 How many drivers are there in your household? .....

Q20 Should we wish to seek your views in a few months time, are you willing to give your name and address/telephone number?

If yes....

NAME .....

ADDRESS .....

.....

POSTCODE .....

TELEPHONE NUMBER .....

*** THANK YOU FOR YOUR TIME ***

Knaresborough

COMMENTS

APPENDIX 6(A): THE KNARESBOROUGH SURVEY

JUNE 1985 REPLY PAID QUESTIONNAIRE

VERSION (II) (300)

Q1 What was the main purpose of your journey?

EDUCATION	WORK	SHOPPING	SOCIAL	RECREATION
☐	☐	☐	☐	☐

OTHER ☐ Please specify .....

■ If this is a shopping journey, why have you chosen to shop in the centre of Knaresborough?

.....

Q2 What was the address where you started your car journey? (The POSTCODE or street name will suffice).

.....

Q3 Why did you choose to park at this location today?

Cheapness/cost	☐
Spaces always available	☐
Good surface	☐
Easy to drive to	☐
Nearness to destination(s)	☐
No Vandalism	☐

Other.....
Please Specify
.....
.....

Q4 For approximately how long have you been parked at this location?

Less than 10 minutes	11 to 30 minutes	31 minutes to 1 hour	Over 1 hour & up to 2 hours	Over 2 hours & up to 4 hours	Greater than 4 hours
☐	☐	☐	☐	☐	☐

Q5 How frequently do you visit the centre of Knaresborough?

More than twice per week	More than once per week	About once per week	Once or twice per month	Occasion -ally	Never before
☐	☐	☐	☐	☐	☐

ITS

KNARESBOROUGH SURVEYS

SURVEY NUMBER [K][1]

QUESTIONNAIRE NUMBER

PARKING DESTINATION SURVEY.

The Institute for Transport Studies, at the University of Leeds, is looking at how changes in parking policy may affect travel decisions by residents or visitors.

We would be very grateful if you could help us by filling in the following questionnaire. It has been designed to be easily answered and most questions only require you to tick the appropriate box.

A POST PAID ENVELOPE is provided for you to return the completed questionnaire at your earliest convenience.

The information will be treated completely confidentially.

Any queries should be directed to Mr.I.G.Turvey at the address below.

POSTAGE IS FREE. RETURNING THIS QUESTIONNAIRE WILL COST YOU NOTHING

Thankyou,

(June 1985)

Prof. A.D.May

INSTITUTE FOR TRANSPORT STUDIES

THE UNIVERSITY OF LEEDS
LEEDS LS2 9JT **Tel: (0532) 431751 ext** 7215

Director and Professor of Transport Economics: K. M. Gwilliam
Professor of Transport Engineering: A. D. May

Q6 Have you been affected by day of the week variations in parking conditions in the centre of Knaresborough ?

.....

■ If so, how, if at all, have you adapted to them?

.....

Q7 Have you been affected by seasonal changes in parking conditions in the centre of Knaresborough ?

.....

■ If so, how, if at all, have you adapted to them?

.....

Q8 Have you been affected by changes in parking conditions in the centre of Knaresborough over the last 5 years ?

.....

■ If so, how, if at all, have you adapted to them?

.....

Q9 Is there any current parking space in the centre of Knaresborough where you would prefer to park?

yes ☐ no ☐

■ If yes, where is it and why do you not park there at the moment?

.....

Q10 Including the cost of petrol,oil etc , How much do you think it has cost you or your household to use and park the car today ?
If it has not cost you or your household anything, please write NIL.

.....

Q11 If you had known in advance that it would cost twice as much to park at this location today, what would you have done today?

(1) Pay the increased price and attempt to park at the same location. ☐

(2) Search longer for a cheaper space ☐

(3) Park further from the centre and walk ☐

(4) Park further from the centre and catch a bus ☐

(5) Change your means of transport (bus, train etc) and still visit Knaresborough centre. ☐
... specify means of transport .....

(6) Visit another centre by car ☐
... specify centre .....

(7) Visit another centre and change your means of transport ☐
... specify centre .....
... specify means of transport .....

(8) Other ..please specify..... ☐

■ Please list any options that you would never consider.

☐ ☐ ☐ ☐ ☐ ☐ ☐

Q12 If you had known in advance that this particular location would not be available what would you have done today?

(1) Search longer for another convenient space ☐

(2) Park further from the centre and walk ☐

(3) Park further from the centre and catch a bus ☐

(4) Change your means of transport and still visit Knaresborough centre ☐
... specify means of transport .....

(5) Visit another centre by car ☐
... specify centre .....

(6) Visit another centre and change your means of tranpsort ☐
... specify centre .....
... specify means of transport .....

(7) Other ☐
... please specify .....

■ Please list any options that you would never consider.

☐ ☐ ☐ ☐ ☐ ☐

Q13 If charges throughout the centre of Knaresborough were to be doubled , what would you do?

(1) Pay the increased price but still park at this location ☐

(2) Pay the increased price but search longer for a more convenient location ☐
... specify location .....

(3) Search for a noncentral parking space which is cheaper and walk ☐

(4) Search for a noncentral parking space which is cheaper and catch a bus ☐

(5) Change your means of transport and still visit Knaresborough centre ☐
... specify means of transport .....

(6) Visit another centre by car ☐
... specify centre .....

(7) Visit another centre and change your means of transport ☐
...specify centre .....
...specify means of transport .....

(8) Other ☐
...please specify .....

■ Please list any options that you would never consider.

☐☐☐☐☐☐☐

Q14 If there were to be a major restriction in parking spaces throughout the centre of Knaresborough what would you do?

(1) Search for a longer period in an attempt to find a central parking space ☐

(2) Park further from the centre and walk ☐

(3) Park further from the centre and catch a bus ☐

(4) Change your means of transport and still visit Knaresborough centre ☐
... specify means of transport .....

(5) Visit another centre by car ☐
... specify centre .....

(6) Visit another centre and change your means of tranpsort ☐
... specify centre .....
... specify means of transport .....

(7) Other ☐
... please specify .....

■ Please list any options that you would never consider.

☐☐☐☐☐☐

Q15 Please mark on the map with a ★ the place(s) that you have visited in Knaresborough today.(If more than one place then please put more than one ★).

Q16 (a) Please mark on the map a boundary line which encloses all the furthest points from ★ that you would ever consider parking when visiting ★ .

(b) How long do you think that it would take you to walk the distance from the boundary to ★ .

Up to 5 minutes	6 to 10 minutes	11 to 15 minutes	Greater than 15 minutes
☐	☐	☐	☐

Q17 Current Status

Work full time	Work part time	Housewife	Student	Retired	Unemployed
☐	☐	☐	☐	☐	☐

Other .....

Q18 How many cars are there in your household? .....

Q19 How many drivers are there in your household? .....

Q20 Should we wish to seek your views in a few months time, are you willing to give your name and address/telephone number?

If yes....

NAME .....

ADDRESS .....

.....

POSTCODE .....

TELEPHONE NUMBER .....

*** THANK YOU FOR YOUR TIME ***

Knaresborough

COMMENTS

APPENDIX 6(A): THE KNARESBOROUGH SURVEY

JUNE 1985 REPLY PAID QUESTIONNAIRE

VERSION (III) (200)

ITS

KNARESBOROUGH SURVEYS

SURVEY NUMBER | K | 1 |

QUESTIONNAIRE NUMBER

PARKING DESTINATION SURVEY.

The Institute for Transport Studies, at the University of Leeds, is looking at how changes in parking policy may affect travel decisions by residents or visitors.
We would be very grateful if you could help us by filling in the following questionnaire. It has been designed to be easily answered and most questions only require you to tick the appropriate box.
A POST PAID ENVELOPE is provided for you to return the completed questionnaire at your earliest convenience.
The information will be treated completely confidentially.
Any queries should be directed to Mr.I.G.Turvey at the address below.

POSTAGE IS FREE. RETURNING THIS QUESTIONNAIRE WILL COST YOU NOTHING

Thankyou,

(June 1985)

Prof. A.D.May

INSTITUTE FOR TRANSPORT STUDIES
THE UNIVERSITY OF LEEDS
LEEDS LS2 9JT **Tel: (0532) 431751 ext** 7215

Director and Professor of Transport Economics: K. M. Gwilliam
Professor of Transport Engineering: A. D. May

Q1 What was the main purpose of your journey?

EDUCATION	WORK	SHOPPING	SOCIAL	RECREATION
☐	☐	☐	☐	☐

OTHER ☐ Please specify .....

■ If this is a shopping journey, why have you chosen to shop in the centre of Knaresborough?

.....

Q2 What was the address where you started your car journey? (The POSTCODE or street name will suffice).

.....

Q3 Why did you choose to park at this location today?

Cheapness/cost	☐
Spaces always available	☐
Good surface	☐
Easy to drive to	☐
Nearness to destination(s)	☐
No Vandalism	☐

Other.....
Please Specify
.....
.....

Q4 For approximately how long have you been parked at this location?

Less than 10 minutes	11 to 30 minutes	31 minutes to 1 hour	Over 1 hour & up to 2 hours	Over 2 hours & up to 4 hours	Greater than 4 hours
☐	☐	☐	☐	☐	☐

Q5 How frequently do you visit the centre of Knaresborough?

More than twice per week	More than once per week	About once per week	Once or twice per month	*Occasion -ally*	*Never before*
☐	☐	☐	☐	☐	☐

Q6 Have you been affected by day of the week variations in parking conditions in the centre of Knaresborough ?

.....

■ If so, how, if at all, have you adapted to them?

.....

Q7 Have you been affected by seasonal changes in parking conditions in the centre of Knaresborough ?

.....

■ If so, how, if at all, have you adapted to them?

.....

Q8 Have you been affected by changes in parking conditions in the centre of Knaresborough over the last 5 years ?

.....

■ If so, how, if at all, have you adapted to them?

.....

Q9 Is there any current parking space in the centre of Knaresborough where you would prefer to park?

yes ☐ no ☐

■ If yes, where is it and why do you not park there at the moment?

.....

Q10 Including the cost of petrol,oil etc , How much do you think it has cost you or your household to use and park the car today ?
If it has not cost you or your household anything, please write NIL.

.....

Q11 If you had known in advance that it would cost twice as much to park at this location today, what would you have done today?

(1) Visit another centre and change your means of transport ☐
... specify centre .....
... specify means of transport .....

(2) Visit another centre by car ☐
... specify centre .....

(3) Change your means of transport (bus, train etc) and still visit Knaresborough centre. ☐
... specify means of transport .....

(4) Park further from the centre and catch a bus ☐

(5) Park further from the centre and walk ☐

(6) Search longer for a cheaper space ☐

(7) Pay the increased price and attempt to park at the same location. ☐

(8) Other..please specify ..... ☐

■ Please list any options that you would never consider.

☐ ☐ ☐ ☐ ☐ ☐ ☐

Q12 If you had known in advance that this particular location would not be available what would you have done today?

(1) Visit another centre and change your means of tranpsort ☐
... specify centre .....
... specify means of transport .....

(2) Visit another centre by car ☐
... specify centre .....

(3) Change your means of transport and still visit Knaresborough centre ☐
... specify means of transport .....

(4) Park further from the centre and catch a bus ☐

(5) Park further from the centre and walk ☐

(6) Search longer for another convenient space ☐

(7) Other ☐
... please specify .....

■ Please list any options that you would never consider.

☐ ☐ ☐ ☐ ☐ ☐ ☐

Q13 If charges throughout the centre of Knaresborough were to be doubled , what would you do?

(1) Visit another centre and change your means of transport ☐
...specify centre .....
...specify means of transport .....

(2) Visit another centre by car ☐
... specify centre .....

(3) Change your means of transport and still visit Knaresborough centre ☐
... specify means of transport .....

(4) Search for a noncentral parking space which is cheaper and catch a bus ☐

(5) Search for a noncentral parking space which is cheaper and walk ☐

(6) Pay the increased price but search longer for a more convenient location ☐
... specify location .....

(7) Pay the increased price but still park at this location ☐

(8) Other ☐
...please specify .....

■ Please list any options that you would never consider.

☐☐☐☐☐☐☐

Q14 If there were to be a major restriction in parking spaces throughout the centre of Knaresborough what would you do?

(1) Visit another centre and change your means of tranpsort ☐
... specify centre .....
... specify means of transport .....

(2) Visit another centre by car ☐
... specify centre .....

(3) Change your means of transport and still visit Knaresborough centre ☐
... specify means of transport .....

(4) Park further from the centre and catch a bus ☐

(5) Park further from the centre and walk ☐

(6) Search for a longer period in an attempt to find a central parking space ☐

(7) Other ☐
... please specify .....

■ Please list any options that you would never consider.

☐☐☐☐☐☐

Q15 Please mark on the map with a ★ the place(s) that you have visited in Knaresborough today.(If more than one place then please put more than one ★).

Q16 (a) Please mark on the map a boundary line which encloses all the furthest points from ★ that you would ever consider parking when visiting ★ .

(b) How long do you think that it would take you to walk the distance from the boundary to ★ .

Up to 5 minutes	6 to 10 minutes	11 to 15 minutes	Greater than 15 minutes
☐	☐	☐	☐

Q17 Current Status

Work full time	Work part time	Housewife	Student	Retired	Unemployed
☐	☐	☐	☐	☐	☐

Other .....

Q18 How many cars are there in your household? .....

Q19 How many drivers are there in your household? .....

Q20 Should we wish to seek your views in a few months time, are you willing to give your name and address/telephone number?

If yes....

NAME .....

ADDRESS .....

.....

POSTCODE .....

TELEPHONE NUMBER .....

*** THANK YOU FOR YOUR TIME ***

Knaresborough

COMMENTS

APPENDIX 6(B): THE KNARESBOROUGH TOURIST SURVEY

AUGUST 1985 INTERVIEW

ITS

INSTITUTE FOR TRANSPORT STUDIES
THE UNIVERSITY OF LEEDS
LEEDS LS2 9JT Tel: (0532) 431751 ext 7215

KNARESBOROUGH TOURIST SURVEYS 1985

DAY.....	day.	
DATE.....	/0 /85.	
TIME.....	. hrs. (24 HOUR CLOCK)	
INTERVIEW NAME.....	Julian	Ian
PARKING LOCATION.....	York Place	Conyngham Hall
PARKING TYPE.....	Off Street Pay	Off Street Free
PARKING CHARGE.....	55p	100p
SEX OF DRIVER.....	Male	Female
NUMBER OF CAR OCCUPANTS.....	1 2 3 4 5 6 >6	

* GOOD MORNING/AFTERNOON.....

THE INSTITUTE FOR TRANSPORT STUDIES AT THE UNIVERSITY OF LEEDS IS CURRENTLY CONDUCTING RESEARCH INTO THE INFLUENCES THAT AFFECT THE DECISION TO PARK AT A PARTICULAR LOCATION WHEN VISITING A FACILITY. IN PARTICULAR WE WISH TO SEEK THE VIEWS OF TOURISTS TO THE AREA.

-ARE YOU A RESIDENT IN OR TOURIST TO KNARESBOROUGH? R T
(IF RESIDENT: "THANKYOU".....exit from questionnaire.
IF TOURIST : continue.....)

-WOULD YOU MIND ANSWERING A FEW SHORT QUESTIONS RELATING TO YOUR PRESENT JOURNEY? Y N
(IF NO : "THANKYOU".....exit from questionnaire.
IF YES: continue.....)

1. HAVE YOU EVER VISITED KNARESBOROUGH BEFORE TODAY?

NEVER 1 2 3 4 >4

2. WHY HAVE YOU CHOSEN TO SPECIFICALLY VISIT KNARESBOROUGH TODAY?

.....

.....

3. WHY HAVE YOU CHOSEN TO PARK AT THIS PARTICULAR LOCATION TODAY?

.....

.....

4. HAVE YOU PLANNED YOUR TRIP TO AND AROUND KNARESBOROUGH TODAY?
   - For example by reference to tourist information, street plans etc.. Please specify.....

.....

.....

5. HOW FAR IN TERMS OF WALK TIME ARE YOU WILLING TO PARK FROM THE FACILITIES THAT YOU WISH TO VISIT IN KNARESBOROUGH?

.....Minutes.

6. WHAT WOULD YOU HAVE DONE IF CHARGES AT THIS SITE HAD BEEN DOUBLED?

.....

.....

7. WHAT WOULD YOU HAVE DONE IF A SPACE WAS NOT AVAILABLE AT THIS SITE?

.....

.....

8. WHAT WOULD YOU HAVE DONE IF INCREASED CHARGES IN KNARESBOROUGH WERE INTRODUCED AT ALL CAR PARKS AT ALL TIMES?

.....

.....

9. WHAT WOULD YOU HAVE DONE IF THERE WAS A MAJOR RESTRICTION OF PARKING SPACES THROUGHOUT KNARESBOROUGH?

.....

.....

10. STATUS...(supply card)..... 1 2 3 4 5 6 7
    (If 7 then specify.....)

11. AGE.....(supply card)..... 1 2 3 4 5

THANKYOU FOR YOUR TIME