

THE IMPACT OF DEREGULATION ON
THE PERCEPTIONS OF
URBAN PUBLIC TRANSPORT USERS

by

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B. A. (Hons)

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A programme of advanced study was undertaken in partial fulfilment of the requirements, including literature reviews of previous relevant research (under the direction of Dr. R. Gray); attendance at relevant conferences and seminars at other research establishments. Briefly these consisted of:

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by ALISON JANE GREEN, B.A. (Hons)

ABSTRACT

The deregulation of stage carriage bus services represented a major change in the structure and operation of the bus industry in the U.K.. Therefore, there existed a need to monitor the effects of the changes brought about by deregulation on the travelling public. Although many research projects were set up to monitor deregulation, the paucity of attitudinal research meant that this project fills an important gap in the monitoring process. Plymouth was chosen because it had a fairly typical municipal bus operator, and one other major operator. In addition, no other research establishment was doing any detailed research in the South West. Four geographical areas within Plymouth were selected, in order to provide an in-depth analysis and comparative study between different types of users and different levels of bus service provision.

Two large scale postal surveys were conducted, one nine months before deregulation and one three months after. As a result of the findings from these surveys, a panel of respondents was set up who were interviewed three times, at four monthly intervals. An attempt was made to link the findings obtained in the factor analysis from the first postal surveys to the in-depth analysis in the panel surveys.

The panel surveys used the Fishbein Expectancy Value Model as a theoretical base because it is designed on the hypothesis that people integrate large numbers of pieces of information to arrive at an overall judgement. This ties in well with the findings of the postal surveys. In addition, the Fishbein model permits respondents to make a judgement about the bus service based on factors which are important to them, rather than on a prescribed list of attributes. The extension of the general postal surveys to the examination of individual perceptions is seen as an important aspect of the study.

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CHAPTER 1

Introduction

The deregulation of stage carriage bus services represented a major change in the objectives and operation of public transport provision. The releasing of bus services to the market opened up enormous potential for competition within the transport sector. Analysing the changes that take place due to deregulation is therefore seen as an area of crucial research importance. In addition to the evaluation of changes in supply of the transport mode, and the distribution of resources, an important element in the monitoring of the effects of the deregulation process is seen as the perception of these changes by the bus user, and their adaptation in travel behaviour.

Current research tends to focus upon the supply side of the industry, and easily measurable factors such as network coverage, passenger loadings, travel time and generalised cost. Attitudinal and behavioural research in the transport field has in recent years received growing attention (for example, Stopher, Meyburg & Brog, 1979; Michaels & Allaman, 1979; Cook, 1982), and now even more the importance of qualitative and perceived change should be recognised. Organisations such as BusWatch, Transport 2000, and The National Federation of Bus Users, who represent the interests of the

travelling public, have criticised much of the government sponsored research for its lack of consideration of the effects of deregulation on the passengers themselves.

Thus one of the main focuses of this research is the examination of the perception of changes in stage carriage bus services, and an attempt to measure changes in the attitudes and beliefs of bus users. Four geographical areas within Plymouth were selected for study. These were Estover/Glenholt, Southway, Plympton and Compton. Each of these areas possesses particular individual characteristics, and many features which make them typical of areas in any major city. Although Plymouth City Council and Plymouth Citybus have in the past undertaken research throughout the network on passenger loadings and demand for services, there has not been any attempt to relate the socio-economic characteristics of an area with the behavioural pattern of travel use, or any kind of qualitative assessment of services. The importance of the perception of the transport mode has been largely ignored, although some attempts to 'smarten up their image' have been made through advertising and the purchase of new vehicles by both major suppliers of bus services.

Two large postal surveys were conducted, one prior to deregulation, and one a year later following deregulation. In addition, three further, in depth surveys were conducted on a smaller, repeated, sample of respondents from the same four geographical areas.

The Fishbein Expectancy Value Model was used as a basis for the in-depth panel surveys. It was chosen because it is one of the most systematic and rigorous methods of attitudinal research. The Fishbein Expectancy Value Model has been shown to perform well in past transport research (Cook 1982, Thomas 1979), and to provide a reliable prediction of actual behaviour in the final model. This research is concerned mainly with a form of the model which examines the relationship between evaluative beliefs, normative beliefs and attitude. The objective was to examine these relationships and their stability over time as changes in bus services occurred. In addition, socio-economic, trip purpose and frequency data was collected in order that they might be included in the model and improve the understanding of the belief and attitude process.

Thus the main objectives of this research were;

- 1) to identify changes in passenger perception and attitude following the deregulation of stage carriage bus services
- 2) to monitor attitudes and the underlying belief structure as changes in bus services occurred.
- 3) to attempt to establish a model of attitudinal change appropriate for bus passenger surveys, relating objective changes to belief, attitude and other relevant factors.
- 4) to provide an overall assessment of the deregulation of bus services and its impact on specific groups of users.

CHAPTER 2

2.1 Plymouth and its Transport Network

Plymouth is situated on the South Devon Coast, approximately 40 miles west of Exeter. Much of the city and its suburbs were destroyed during the 2nd World War and have been rebuilt. The largest employer in the city is the recently privatised Devonport Dockyard. Several new business parks and industrial estates have been set up in recent years, mostly on the outskirts of the city. Agriculture and the construction industry continue to be major employers throughout the region, with tourism and its associated services playing quite a large part in the local economy.

Road communications focus upon the A38 which links up with the M5 to the east at Exeter, and provides access to Cornwall to the west. To the north of Plymouth the A386 connects with Okehampton and North Devon. Inter-city rail services are available to London, Birmingham and Bristol, with connections to all major towns. The Gunnislake rail branch line provides local commuter services via Devonport, Keyham, Saltash and Calstock. A regional airport is situated in the Roborough area of the city, with flights to Aberdeen, London and the Channel Islands. Plymouth is the main port in the county, with some container and roll-on/roll-off services including ferries to France and Spain. Appendix A shows a map of Plymouth main transport links.

Until October 1986 public transport in Plymouth was provided by Plymouth City Transport and Western National, co-ordinated under the Plymouth Joint Services Agreement, and operating under the name CityBus. Bus hours and revenues were split on a 80:20 basis, with Plymouth City Transport having the greater share.

In 1985 28 routes requiring 135 buses were in service in the peak period. Nearly 5 million bus miles were operated a year carrying about 22 million passengers. The route pattern was extensively revised in 1982/3 , following a large scale Market Analysis Project (MAP). From 1960 - 1980 bus use fell in Plymouth by more than half, although the mileage only fell by a quarter. This was partly the reason for a more than doubling of fares in real terms. The City Council took this as an indication of a need to examine the operation of bus services. Using MAP, which was originally designed by the National Bus Company and M Buchanan and Partners, it was possible to identify how many people travel from given zones in the city to destination zones for particular time periods. This project resulted in many proposals for reform of the bus routes then operating, which in many cases had been unchanged for years. Had the MAP changes not been implemented, either fare levels would have had to be significantly increased or an additional £1.35 million would have been required from the Rate Fund.

The resulting Plymouth CityBus network, introduced in October 1982 was the outcome of a conscious decision by the City Council about the trade-off between Rate Fund subsidy, fares and service levels.

The design of the network attempted to minimise cross subsidy between routes but made considerable use of cross subsidy between time periods in order to provide a minimum acceptable level of service at certain times of the day, particularly in the early mornings, evenings and Sundays. This cross subsidy inherent in the Plymouth network was precisely what the 1985 Transport Act sought to eliminate.

Fares were determined on a simple zonal basis, the city was divided into 3 concentric rings, with separate fares for travelling in one, two or three zones. Concessionary fare scales apply to children and old aged pensioners, with a valid pass. In return for providing the concession Plymouth City Council gives limited compensation to the operators for the reduced income they receive from concessionary fare payers. In addition Devon County Council purchases season tickets for use by schoolchildren who have to travel beyond statutory distances to school. Since deregulation operators have participated in the concessionary fare scheme, the funding for which comes partly from Devon County Council, for school children living more than 3 miles from school, and partly from Plymouth City Council.

Plymouth City Transport was a trading department of the City Council. In November 1984 the department employed 468 staff, of which 252 were bus drivers. About 160 buses were owned, the majority of which were double deckers. All the buses were, and still are, one man operated. Operations are based at Milehouse Depot, where all

vehicles are garaged and maintained and where offices are located. New workshops were built in early 1985 to replace the old tram sheds. Plymouth City Transport's remit was to break even financially, and until 1983 it was able to do so, relying solely on internally generated funds to cover expenditure. In 1983 Plymouth City Council decided to contribute to the capital support for the new depot, and following the abolition of the New Bus Grant, to the purchase of new buses. In 1983-84 Plymouth City Transport traded at a gross deficit level of about 5.8% of total expenditure, 3.7% met externally by Plymouth City Council.

In 1984 Western National operated a total of 500 vehicles, only 30 of which were based in Plymouth and participated in the Plymouth Joint Service Agreement. They are based at Laira Bridge Depot in Plymouth where their maintenance takes place.

2.2 The MVA Consultancy report, October 1984

Plymouth City Council, concerned about the potential impact of the proposed legislation on stage carriage bus services, commissioned a study by the MVA Consultancy in October 1984. The concern was that to maintain levels of services and fares, a significant increase in the Rate Fund subsidy would be required.

The MVA found a considerable amount of cross subsidy existing between times and days of the week. The viability of peak periods was questionable, with different costing assumptions leading to

differing conclusions. The total deficit incurred by the loss making periods was at least double the deficit funded by Plymouth City Council. The implication of this was that deregulation would result in the Council having to double its subsidy to maintain the existing level of service.

TABLE 2.1 ESTIMATED COSTS TO CITY COUNCIL OF MAINTAINING PUBLIC TRANSPORT SERVICES, PLYMOUTH JOINT SERVICES AREA.

	LOW EXPENDITURE £000's p.a.	CENTRAL ESTIMATE £000's p.a.	HIGH EXPENDITURE £000's p.a.
Services in non- profitable periods	45	360	910
Child fare concessions	277	277	277
Other City expenditure	105	105	105
	-----	-----	-----
TOTAL	427	742	1292
Current expenditure	350	350	350
	-----	-----	-----
Increase	77	392	942

Source: MVA Consultancy 1984

To avoid the need for subsidy for unprofitable periods on average either costs would have to be reduced by 44.8%, or revenues increased by 81.1%, or some combination of the two.

Fares elasticities were such that reducing fares would lose more revenue from existing passengers than would be gained from new passengers, and an increase in fares would increase revenue, despite some loss of patronage.

The estimated increased costs were based on;

- i) subsidy to support non-profitable services.
- ii) responsibility for bus stops and shelters.
- iii) monitoring of commercial services and administration of the tendering process.
- iv) Continuation of the Continuous On-Bus Survey to provide data on patronage.
- v) Provision of City wide timetables.

The estimated total cost to the City Council is shown in table 2.1

In the estimation of expenditure for the support of non profitable services no allowance for lower cost operation was made, in reality the competitive tendering process can result in very low cost or nil tenders. Estimations of increased costs and effects on rate poundage were, therefore, very pessimistic. In addition, the need to

subsidise capital expenditure was eliminated. The predictions of the MVA Consultancy report should, therefore be treated with caution. Indeed very little actual change in City Council support has occurred, the increased need for subsidised services being balanced by the elimination of support for capital expenditure. The fears of large increases in Rate Poundage were therefore largely unfounded. The MVA report, when published had considerable influence on the attitudes of both the City Council and Plymouth Citybus, with the result that they approached the deregulation issue with a very negative outlook.

2.3 The Research Project and Selection of Study Areas

Following discussions with Plymouth City Council and Plymouth City Transport, it was clear that there was a definite need for independent monitoring of the deregulation process. Although both the City Council and Plymouth City Transport conducted some research on passenger demand and concessionary fares, they did not possess the facilities for a more general study on passenger attitudes. In addition, although they agreed that the perceptions of users was an important element of deregulation, they were more concerned with the day to day management of services, and more tangible and immediate problems, such as the submission of tendering documents. Therefore, the research project was seen as filling an important gap in the monitoring process.

Four study areas were selected for the research, it was felt that complete coverage of the whole city centre network, while desirable in some ways, would be too time consuming, prohibitively expensive and would not permit such a detailed analysis. Four areas were therefore selected, chosen with the advice of the Corporate Planning Officer of the City Council, and with the aim of obtaining a cross section of different types of bus services and different socio-economic groups.

Two of the areas, Glenholt and Southway did not possess extensive local amenities, and therefore inhabitants relied on some form of transport for most work and shopping activities. Although these two areas were similar in this respect they differed in the type of population in terms of socio-economic factors (reflected in the composition of housing type and car ownership levels shown in appendices B and C), and the frequency of bus service provision. The population of area 4, Compton was of a fairly similar type to that of area 3, Plympton, however they differed in accessibility to bus services and distance to the City Centre. All four areas differed from each other in the type and frequency of bus service provision, and this was probably the most important factor in choosing these rather than any other parts of the city centre. Appendix D shows maps of the four study areas.

2.3.1 Area 1 Glenholt/Estover:

The first study area selected was that of Glenholt/Estover. This is situated approximately 6 miles north of the city centre, to the east

of the main Tavistock road. The population of this area, according to the 1981 census, is 15,204. The housing in the area consists of 51% owner occupied, 29% council owned. 75% of all households have one or more cars available. Within the area is a large out of town superstore, Asda, the nearest major amenities are in either Mutley Plain (5 miles) or the city centre.

Prior to deregulation the Glenholt region was served by the 43 bus service, this had an hourly frequency during the day, with one service at night and no service on Sundays. The service registered on 26th October 1986 was the X58 service, which operated hourly but included an hourly evening and Sunday service, called the 29 route. This was partially subsidised by the city council. The next major timetable restructuring came about on 14th June 1987, the service registered was of the same frequency as previously but was now called the 85a in the evenings and on Sundays. The 24th January 1988 saw a decrease in the evening and Sunday service, only four services being operated throughout a Sunday and none in the evenings. In summary therefore the Glenholt area saw an initial improvement in services following deregulation, then a worsening recently almost back to the pre-deregulation frequency. However, daytime services have remained unaltered in frequency, although the service numbers and bus stop siting in the city centre have been subject to change.

The Estover part of area 1 was served by the 46/47 circular route prior to deregulation, and the 45a. The 46/47 operated hourly throughout the daytime, evenings and on Sundays. The 45a operated

half hourly during the day, hourly at other times. Following deregulation the 46/47 route remained unaltered. The 45a service became the 26/27 service during the day, with an hourly frequency. A new limited stop service, the X50 was introduced, with a 10 minute frequency during the day, 15 minutes in the evenings, no services on Sundays. This service provided a fast link to the city centre, but did not stop en route at Mutley Plain, a very popular destination. June 14th 1987 saw no change to the 46/47 or 26/27 services, but the X50 suffered a reduced frequency to 15 minutes during the day, with no evening or Sunday service. The timetable brought into effect on 24th January 1988 saw no change in the above services.

In summary then, following deregulation the area saw an improvement in links with the city centre with the new X50 service, although since that time the frequencies have been reduced. Links to Mutley Plain worsened after deregulation, with a cut in the 45a from a half hourly to an hourly service, this situation has remained constant.

2.3.2 Area 2 Southway:

Southway is a large, sprawling, mainly council or ex-council owned estate, about the same distance from the city centre as area 1, but to the west of the Tavistock road. There exist a few local shops and amenities, and a large Tesco superstore approximately a mile away. According to the 1981 census the population is 14,057, 38% of property is owner occupied and 51% council owned. These figures are probably inaccurate at this time, a large proportion of council

owned property has now been privately bought. Of all households 69% have at least one car available.

Before 26th October 1986 the area was served by the 46/47 circular route (which also served Estover). It has already been discussed that this route has not altered in frequency from that time until the most recent timetable changes. The 40/41 route also operated to Southway, both services operating the same route until they reached the estate, then the 40 operating clockwise round, and the 41 anticlockwise, these had a half hourly frequency each, representing a combined 15 minute frequency if the passengers didn't mind taking the long way round to their destination. In the evenings they both operated hourly, representing a half hourly service in effect. Following deregulation the 40 and the 41 routes saw an increased frequency to every 8 minutes each, with a half hourly each service in the evenings and on Sundays. The route registered to come into effect on June 14th 1987, reduced the frequency to every 12 minutes each, with no service after 6pm (see table 2.2).

TABLE 2.2 Alterations to the 40/41 Bus Service

	daytime frequency	evening/Sunday frequency
before 26/10/86	½ hourly	hourly
26/10/86	8 minutes	½ hourly
14/6/87	12 minutes	no service

The 85 service was introduced to provide an hourly evening and Sunday service, but this did not have such an extensive coverage of the estate. On January 24th 1988 the daytime service remained unaltered but the evening and Sunday service was re-instated every 40 minutes, this service is a Plymouth City Council subsidised service.

Therefore, deregulation saw a vast improvement in services from Southway to the city centre, but a decrease in services during the evenings and on Sundays. One of the problems associated with the subsidised routes such as the Glenholt service in area 1 and the evening service to Southway, is that they are subject to continual route and frequency changes as tenders are renewed and reallocated between different bus companies.

2.3.3 Area 3 Plympton:

Plympton is a large self-contained population centre, about 5 miles from Plymouth city centre. It is virtually a town in itself and has its own shopping centre with several public houses, banks and other amenities, with a traditional weekly market. The population was 24,369 at the last census count. Car ownership is high, with 81% of households possessing one or more cars. Owner-occupancy rates are also high, 84% of housing being privately owned, only 7% council owned.

The main areas in Plympton are Woodford, Chaddlewood, St Maurice and Merafield. Woodford received a half hourly service prior to deregulation, the 20/21 route, which also served Chaddlewood (see table 2.3). The 20 operated from Plymouth to Woodford via St Maurice returning to Plymouth as the 21 from Chaddlewood to Plymouth. The 21 operated from Plymouth to Chaddlewood to St Maurice, returning as the 20 from St Maurice to Woodford to Plymouth. Thus St Maurice had a 15 minute service with links to Woodford and Chaddlewood. This was reduced to an hourly service each to Woodford and Chaddlewood in the evenings and on Sundays. Merafield received an hourly service, the 22 with no evening or Sunday service. Following deregulation the 20/21 service was renamed the 21/51 service, the Woodford link was lost but the frequency increased to every 12 minutes each for the 21 and 51, one operating clockwise from St Maurice to Chaddlewood the other anticlockwise through the estate. Woodford was now served by the 20 service to the city centre, which operated every 15 minutes, but it lost the links with Plympton centre. However, a new service the 20A/22A was introduced to compensate for this, linking the city centre with Woodford, Plympton centre and Merafield, this operated hourly, including off peak hours. In addition the 22 service during the daytime only operated hourly from Plymouth to Merafield. Changes introduced on June 14th 1987 reduced frequencies on the 20 Woodford route from 15 minutes to half hourly with no evening service, and reduced the 20A/22A service to Woodford and Merafield to a 2 hourly evening/Sunday service. The 21/51 route remained unaltered, as did the 22 Merafield route. Changes in timetabling on 24th January 1988 had no effect on Plympton, however on 14 March 1988 Western

National, who had not previously operated in the Plympton area (except some tendered evening services on 20A/22A), registered routes to run in competition with Plymouth CityBus. These were the 20A hourly to Woodford, the 22A hourly to Merafield, the 21A every 20 minutes to Chaddlewood and the 20C every 20 minutes to Woodford. In addition, a new Linkbus was introduced to link Hemerdon (25A hourly), Merafield (25B half hourly), and Colebrook (25C hourly) with Plympton centre. These additional services ceased to operate in July 1988 following negotiations between the two companies.

TABLE 2.3 Bus Services to Plympton

Woodford

before 26/10/86 daytime frequency evening/Sunday frequency

service no. 20/21 ½ hourly hourly

26/10/86

service no. 20 15 minutes hourly

service no. 20/22a hourly hourly

14/6/87

service no.20 ½ hourly no service

service no. 20/22a hourly 2 hourly

14/3/88

service no.20 ½ hourly no service

service no.20/22a hourly 2 hourly

service Vn. 20a hourly no service

St Maurice

before 26/10/86

service no. 20/21 15 minutes ½ hourly

26/10/86

service no. 21/51 6 minutes ½ hourly

14/3/88

service no. 21/51 6 minutes ½ hourly

service Vn. 20c 20 minutes no service

Chaddlewood

before 26/10/86

service no. 20/21 ½ hourly hourly

26/10/86

service no. 21/51 12 minutes hourly

14/3/88

service no. 21/51	12 minutes	hourly
service Wn. 21a	20 minutes	no service

Merafield

before 26/10/86

service no. 22	hourly	no service
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26/10/86

service no.22	hourly	hourly
---------------	--------	--------

14/6/87

service no.22	hourly	2 hourly
---------------	--------	----------

14/3/88

service no.22	hourly	2 hourly
service Wn.22a	hourly	no service

2.3.4 Area 4 Compton:

Compton is only about a mile north of the main shopping centre, it has its own local shopping and business centre, Mutley Plain, which offers a wide range of banking, insurance, and entertainment facilities. The population of the study area is approximately 10644. 73% of households in the Compton area were owner occupied at the time of the 1981 census, 1% council owned, a significant percentage of housing in the area (12%) being of the rented furnished type. 68% of households had one or more car available to them.

The Compton area is situated on one of the main corridor routes from Plymouth city centre to outlying areas, it is therefore served by a great many bus services. Although many services pass through the area, in practice they stop at different bus stops so a passenger standing at the wrong stop would not be able to take full advantage of all services. The simplest method of evaluating the frequency of service to this area is however to count how many services per hour pass through the area, regardless of this problem of bus stop siting. Before deregulation 16 services per hour served this area, this was increased to 51 after 26th October 1986, then decreased to 29 on June 14th 1987, and increased again to 44.5 after 24th January 1988. New services introduced in response to competitive pressure from Western National, after 14th March 1988 increased this to 50.5 buses per hour.

In summary, overall there has been a vast improvement in services to the area, although they have fluctuated they have never dropped to below the pre-deregulation levels. One route in particular within the Compton area deserves special attention, this is the C1 service. This was the first 'minibus' service to be introduced in Plymouth, and commenced operation before deregulation. The route operated round the residential streets of Compton, into the city centre, initially on a 12 minute frequency. This service proved very popular especially with the elderly and with women requiring assistance with pushchairs and other luggage, as the same drivers were used each day had built up a friendly rapport with the passengers. Following deregulation this service was cut to a 20 minute frequency and the drivers were no longer allocated especially to that particular route. Frequencies remained at this level until January 24th 1988, when they were further reduced to half hourly. Therefore although there was an overall improvement in services to the area as a whole users of this service experienced a worsening in their bus services.

In conclusion, bus services were, at the last timetable change, generally at higher frequencies than before deregulation (with the exception of the C1 service and some off peak journeys). The main impacts have been the introduction of minibus services on virtually all routes; the constant change of operator, service number and route on subsidised services, due to the tendering process; the breakdown of good will between the two main bus operators, and the outbreak of limited competition; and a lack of co-ordinated, city wide timetabling information.

CHAPTER 3

Privatisation, Deregulation and the Bus Industry

3.1 Privatisation

"The consumer is sovereign in the private sector. In the public sector he is dethroned by subsidy or monopoly."

(Howe, 1981)

One of the main policy issues of the present Conservative government has been that of privatisation and deregulation. It has sought to break down the barriers to free competition, in the belief that the market solution is the most efficient. This has been reflected in its treatment of public transport, with the introduction firstly of the 1980 Transport Act, and then the 1985 Transport Act.

The term privatisation is used as a general term to describe three interrelated aspects of economic policy;

- 1) denationalisation - the sale of public sector assets
- 11) deregulation - the opening of state activities to private sector competition

111) tendering - the contracting out of public services to the private sector (Kay, Mayer, and Thompson, 1986).

The volume of asset sales by central government increased from £377 million in 1979/80 to £1,142 million in 1983/84. Until 1983 most of these sales arose from sources other than the transferal of state ownership to the private sector, for example, the sale of British Petroleum shares and the leasing of motorway service areas. Many of the firms involved in the actual transfer of ownership were those that operated in markets already dominated by the private sector, for example, National Freight Corporation.

The central belief behind privatisation is the ability of competition to encourage efficient production. Improvements in the production process do not necessarily reflect changes in the management structure of the company concerned. Earlier economic writers, such as Hotelling (1938), saw the role of nationalised industry managers as that of protectors of the public interest, with laid down pricing and investment criteria. Little (1950), criticised this view because of its neglect of incentives to achieve productive efficiency. Little highlighted the problems of industries with ill-defined objectives, and the consequent difficulties involved in determining whether these objectives had in fact been achieved. These arguments were developed to form the basis of a theory of property rights. The White Papers of 1961, 1967 and 1978 (HM Treasury 1961, 1967, 1978) expressed dissatisfaction with the performance of nationalised industries and called for a greater

emphasis on commercial objectives and greater financial control. However, objections to privatisation are often raised on the grounds that it leads to unemployment. But even state owned firms cannot in practice finance overmanning over long periods. Large scale redundancies have already occurred in those firms which have failed to match international competitors' efficiency.

3.2 Competition and Deregulation

Recent Conservative thinking has expressed the view that the economic performance of all firms is improved by a competitive environment, and that under competition private firms are likely to do better. In addition, where there is no competition present, private firms do not perform significantly better. Moreover, the regulation of a private enterprise to prevent abuse of its monopoly power may induce serious distortions which result in its performance being worse than that of a corresponding public enterprise.

A number of markets have experienced an easing of regulatory restrictions, the most widely publicised perhaps was that of British Telecom, perhaps because of its size and the wide public interest in the share issue. There is evidence to suggest that prices have fallen in response to the threat of actual or potential competition. The liberalisation of the electricity supply industry in November 1983, however, seems to have led to few changes in either market structure or prices. Deregulation permitted the supply of power by private producers, making use of the publicly owned distribution

network. In addition, the liberalisation of gas supply (Oil and Gas Enterprise Act 1982) has also had little impact, deregulation enabled private suppliers to lease British Gas's transmission network to sell gas directly to large industrial customers. In practice no private suppliers have entered the market, and British Gas's pricing policy is presently under scrutiny by the Office of Fair Trading. A discussion of the deregulation of passenger transport will take place in the latter part of this chapter, in order to give the subject a more detailed treatment.

The underlying philosophy behind the deregulation issue is that of consumer sovereignty and the operation of the free market. If the consumer is free to choose what to buy, then given the demand, the market should set the appropriate price. Alfred Kahn Chairman of the Civil Aviation Board asserted in 1977, "wherever competition is feasible, it is for all its imperfections, superior to regulation as a means of servicing the public interest." (Kahn, 1977)

Arguments in favour of deregulation rest largely on the assumptions of perfect competition. The conventional theory of perfect competition assumes as necessary conditions;

- 1) no barriers to entry
- ii) numerous buyers and sellers
- iii) a homogeneous product
- iv) ready access to all relevant information by buyers and sellers

Given these conditions and no externalities, competition allocates scarce resources efficiently by directing capital to its most productive uses through appropriate pricing signals. Arguments in favour of deregulation are also based on theories of market structure, such as Baumol's theory of contestable markets (Baumol, 1965). These arguments were developed because of the unrealistic assumptions of traditional perfect competition theory. Contestable market theories stress ease of market entry and exit and have particular relevance to industries with mobile assets. Baumol (1965) asserts that the received theory of market structures tends to view efficiency as an increasing function of the number of firms in an industry. In an industry inclined towards pure monopoly (because of limited size of market and substantial fixed costs leading to economies of scale), regulation is considered essential.

More recently arguments revolve around the theory that the competitive pressures required for an efficient solution can come equally well from outside an industry. The essential feature is the *ability* to contest for a market rather than to compete within it. This ability to contest depends upon the ease with which a firm can enter and exit from a market without cost. The power of a firm to extract monopoly profit depends on the extent to which production stems from immobile capital, that is the extent to which the fixed costs of production are also 'sunk' costs. Consequently, an industry without sunk costs, even a natural monopoly industry, is said to be a perfectly contestable industry, the possibility of entry by rival firms is a constant threat. This has important consequences in terms

of welfare; a contestable market in long run equilibrium never offers more than a normal rate of profit; production inefficiencies also will be totally absent ; no product produced in a contestable market can be sold at a price less than its marginal cost.

Therefore, cross subsidies and predatory pricing practices are unlikely. The important factor is the threat of competition rather than actual competition. In addition, if a market contains two or more firms in the long run prices cannot exceed marginal costs. The competitive system has wide public support as an ideal, but actual market conditions vary widely from the model. (Foster, 1983)

3.2.1 Natural Monopolies

Several of the nationalised industries have been regarded as natural monopolies. This is most obviously the case in industries which involve distribution networks (eg. gas or electricity). In each of these the costs of providing two competing networks would probably be almost twice that of providing one. These are not only natural, but sustainable, monopolies (Sharkey 1982), therefore an entrant to the market would find it impossible to compete with the incumbent because of the amount of investment required. Not only is it inefficient for competition to emerge, it is also unlikely. However, it may be feasible to introduce competition into a part of the firm's activity. In the case of railways, Starkie (1984), suggests that the track and signalling and the scheduling of services can be regarded as a natural monopoly. The operation of train services, however, does not show the characteristics of a natural monopoly.

In the case of natural monopoly the new theory of contestability (Baumol, Panza and Willig, 1982) draws attention to a solution to this problem. If it is not possible to have competition in the market for the product, then it could be possible to have competition for the monopoly through franchising. Analysis by Domberger (1985) and Chadwick (1985), and Demsetz (1968) shows that where sunk costs are not significant, franchising appears a particularly appropriate policy. In recent years franchising (or competitive tendering) has been introduced for a range of publicly provided services eg. bus services, refuse collection and school cleaning (more recently research has focussed on the possibility of franchising for Legal Aid services). This process involves the offering of a tender to perform a particular service, bidders submit a price to the tendering authority, and generally the bidder submitting the lowest tender price is awarded the contract. According to contestable market theory therefore, the removal of protection should give the incentive to find the most effective and appropriate means of meeting differing types of demand for services.

3.2.2 Efficiency

Efficiency involves both productive efficiency and allocative efficiency. Productive efficiency is the production of a good or service at minimum cost. Allocative efficiency implies that the good or service meets consumers' needs at prices which reflect the cost of provision. Competition can operate in a number of ways in a market. Firstly, there competition in the product market may

encourage firms to supply the goods demanded by consumers at a price which reflects the cost of production. Thus a firm in a competitive market may have incentives to achieve allocative efficiency, provided that the market price reflects the value of the output. Secondly, competition in the market exists for firms via takeovers. This may promote profit or value maximisation as the objective of managers and shareholders. Thirdly, there is always a threat of bankruptcy.

However, the assumption that markets operate efficiently has been questioned by many writers. It was the belief in market failure that provided the rationale for nationalisation, it was felt that private ownership would not achieve allocative efficiency. Either the industry was in a monopoly position or else non-commercial objectives existed which implied that some outputs should be produced even at a loss (Hotelling, 1938)

The problem with comparing the productive efficiency of private industry with that of the public sector, is that of making meaningful comparisons. In the United Kingdom many public sector activities are not carried out in the private sector to any great extent. Pryke (1985) analysed the activities of the airline, ferry and hovercraft industries, and the sale of electricity and gas appliances. The conclusions drawn were that private enterprise was more profitable and was increasing its market share at the expense of the public sector. In cases where comparisons of cost levels and efficiency were possible it was found that the private sector was

significantly more efficient, and had lower costs. However, a number of studies of the costs and efficiency of electricity generation and distribution in the United States by Millward (1982) have concluded that the public sector had lower unit costs of supply than the privately owned enterprises (Yunker, 1975; Meyer, 1975; Pescatrice and Trapani, 1980). In contrast, a comparative study of water utilities in the U.S. (Crain, and Zardkoohi, 1978) showed substantially higher costs in the public sector. The results of these and many other studies (eg. Caves and Christensen, 1978; Forsyth and Hocking, 1980) do not suggest that there is anything inherently more efficient about private ownership. There are both efficient and inefficient public enterprises, likewise in the private sector.

3.2.3 Subsidies

If privatisation results in lower subsidies being paid then other consumers will benefit via lower taxation. Subsidies represent real resources which could be consumed elsewhere. Privatisation may generate benefits for consumers because privately owned enterprises have a greater incentive to produce goods and services in the quantity and variety demanded by the consumer. One of the aims of privatisation is to change motivations of management towards profit-making. A privately owned company may have greater incentive to exploit monopoly power commercially. If this is unregulated then consumer benefits from privatisation will be less than they might be, and may be negative. In addition, a privatised company will be

less willing to provide uneconomic services. One view is that the resources so released will be used more productively, although particular sets of consumers will lose by the change. This raises the question of how such losses, often thought of as social obligations, should be treated. Furthermore, eliminating inefficient production and restrictive labour practices means the release of resources. This will benefit taxpayers and consumers outside the industry, but some employees and suppliers will suffer. Competition, it is held, is the most important mechanism for maximising consumer benefits and for limiting monopoly power.

One of the aims of nationalisation was to enable cross-subsidisation from more profitable services. However, cross-subsidisation tends to disguise the size of the subsidy and, it is argued, opens the door to political pressures. Additionally, it entails restrictions on competition in order to protect the source of funds: cross-subsidisation and unrestricted competition are mutually incompatible. For those reasons some economists have recommended that explicit public subsidies should be provided in preference to cross-subsidies.

3.3 Deregulation and The Airline Industry

Experience of deregulation in the airline industry is useful as a comparison with the public transport industry. The United States Airline Deregulation Act was passed in 1978 and the US domestic air transport industry has operated in an environment of almost free

competition since 1979. The US domestic air transport industry was deregulated in the belief that an efficient innovative and price responsive system would be produced by placing the maximum reliance on actual or potential competition (Foster, 1983).

US air transport was subject to rigid controls over route entry, fare structure and price. The extensive changes in the industry which have occurred since deregulation have been seen as reflecting the regulatory swing from a regulated to a deregulated operating environment . Under deregulation airlines have not only been given increased flexibility in setting fares, they have been able to reorient their route structures, and new carriers are able to commence interstate service.

Regardless of the introduction of deregulation, the economic climate of the late 1970s and early 1980s would have caused problems for the airline industry . Airline demand is sensitive to the state of the economy, and sluggish growth inhibits increases in demand for air travel. However, despite these difficulties, several carriers did thrive. Between 1978 and 1982, the former locals grew by nearly 40% and increased their share of the domestic market from 9% of the Registered Passenger Miles to 12% in 1982. In the year ending June 30, 1982, five of the six local service carriers had positive operating results. In addition, several of the new entrants, especially Southwest, People Express and Midway made considerable profits. On the other hand, the former trunks meanwhile recorded operating losses of nearly a billion dollars. Two of the trunks,

Braniff (now bankrupt) and Pan Am, were responsible for 40% of the domestic trunk losses at that time. Though some carriers have gained and others have lost, the travelling public benefitted initially from the effects of deregulation. Despite the poor performance of the economy generally, airlines did achieve high load factors in the early days of deregulation. These high load factors were largely due to the introduction of a variety of peak/off peak and restricted discount fares. The uses of such fares allows airlines to provide convenient service to those time sensitive passengers who demand it. (McKinnon, 1983). However, the improvement in services was short lived, many smaller airlines were taken over by larger concerns, others were simply forced out of the market. The situation that now exists is that services from major destinations are fairly frequent, but more rural destinations have suffered. Some of the 'through routes' have also been segmented, so that passengers have to break their journey to change planes. In addition, new entrants now find it almost impossible to obtain investment finance to purchase equipment because of the competition and uncertainty existing in the market. Thus the only companies now able to invest and operate a reasonable network of services are those already established.

Experiences of deregulated air services in South Australia have been similar to those in America. Since 1979 there was a significant increase in services offered, new routes were developed, providing a number of locations with services for the first time. Other areas with services prior to 1979, experienced an increase in frequencies. On multi-firm routes, emphasis was on product differentiation.

Again, though the initial surge in competition and increased services was short lived, although the severe cutbacks that occurred in America have not occurred in Australia, there now exists a fairly stable situation, with services at a level above that prior to deregulation and a few firms dominating the market.

Following this initial period of competition there now appears to be a move toward greater concentration, with larger airlines taking over the smaller concerns. The increasing concentration in the airline industry has been the topic of debate and economic research (for example, Welles, 1986). However, other investigators have shown that the degree of rivalry in the airline industry has in fact increased and remained high, since deregulation (Sandler, 1988). Recent concerns have centered around safety levels and the amount of 'near misses', this has led to some calls for some tighter restrictions on the market. A Civil Aeronautics Board Report (1975) expressed that concern that, 'in the absence of countervailing measures, removal of entry and price controls would be likely to degrade safety. Any serious financial difficulties encountered would be conducive to degrade safety.' It has also been argued that there is a positive relationship between profitability and safety in the transportation industries. However, research on the U.S. airline industry has shown that it does not appear the case that profit-reducing changes in regulation have led to less safe airlines (Golbe, 1986). There has also been a call from some political quarters for a re-regulation of the market.

3.4 Experiences of Deregulated Bus Operations Overseas

Experiences of deregulated bus services in other countries suggest that while some types of operation not found in Britain before are likely to develop, for example minibuses and shared taxis, a competitive environment does not necessarily lead to great innovations in types of services or technology. In general, the independent operators in overseas cities have concentrated on relatively conventional services along the main routes, often 'creaming off' from the established bus operator. It is extremely rare that they have sought new sources of demand. In Santiago, Chile (one of the few cities in which total deregulation has been implemented) all bus operators charge a flat fare, with none of the divergence that economic theory would predict. Indeed, in Hong Kong, many completely new minibus ('maxicabs') routes were initiated only as a result of Government officers identifying the need, designing a route and then franchising that route as part of a package including routes with more proven potential. (Hibbs, 1985)

Problems associated with congestion and safety have occurred in many cities, even those that have only experienced partial deregulation, for example, Hong Kong and Bangkok. In Hong Kong the problems of congestion and random stopping of minibuses have led to increasing controls on stopping places and attempts to turn minibuses into franchised timetabled services. (Clymo, 1986)

It is difficult to draw any direct comparisons between overseas experiences and those in the U.K. In most cases labour costs are much lower than in the U.K.. Demand for public transport in these countries is increasing in many cases and car ownership and incomes are very low in comparison. However it is useful to observe how a more flexible operating structure leads to greater innovation and lowering of costs. The flexibility referred to could involve either route and timetabling flexibility, or a more flexible working and organisational structure. This could prove especially relevant in the context of the break up of the National Bus Company and the move toward smaller operating systems.

Evidence on the effects of deregulation on both Express Coach Services (which will be dealt with in the next section) and the domestic Airline Industry, seems to suggest that following an initial period of intense competition by many small firms, large companies emerge as dominant and either drive competitors out of the market, as in the case of National Express, or take over the smaller firms, as has happened in the U.S. airline industry. In the longer term larger firms use their existing financial advantage and superior knowledge of the market to drive out competitors via price cutting and increased frequencies. The larger companies are more able to bear losses in the short term than the smaller competitors. Evidence from overseas examples of deregulated stage carriage services varies in this respect, some countries have large numbers of small companies operating, others one main operator. However, many of the smaller operators have found it necessary to form

workers cooperatives in order to protect their interests. Therefore the evidence seems to suggest that already existing firms in the market will, in the long term, survive and there will be a move back to larger scale operations.

3.5 Deregulation and The Bus Industry

Moves toward deregulation in the bus industry commenced with the introduction of the 1980 Transport Act; with the deregulation of express coach services and liberalising the rest of the market; culminating in the 1985 Transport Act, which completely deregulated stage carriage bus services. A discussion follows of the issues surrounding deregulation in the bus industry, and the effects of the 1980 Transport Act.

3.5.1 Cross-Subsidisation

Cross subsidy occurs when the revenue from a profitable route/time subsidises a loss making route/time. Cross subsidy allows monopoly profits to be made on profitable parts of a bus operation which can be used to sustain the non profitable parts. Fare increases and loss of patronage on competitive routes have been directly attributed to the existence of cross subsidisation.

"The fact that so little is known about the patterns of cross subsidy that exist is symptomatic of the fact that it is not in practice serving any recognizable end of economic or social policy" (Beesley and Glaister 1985).

The view of Lord Shepherd is that,

'in many areas cross subsidy is being taken to the point where the benefits obtained in meeting certain social objectives have been outweighed by the long term damage being inflicted on the future performance of routes now suffering from overpricing and going into premature decline.'

(Lord Shepherd 1984)

Cross subsidisation had its origins in the 1930 Road Traffic Act, the remit was 'to maintain standard charging of a uniform per mile fare for profitable and non profitable services alike, and to protect operators who provided unremunerative services, in order to provide a comprehensive network' (Road Traffic Act 1930).

Cross subsidy occurs when services are provided at less revenue than is required to meet escapable costs, and make a contribution, however small, to the fixed costs of the firm. Abandoning any operation that makes a contribution will reduce the revenue available to meet fixed costs, and increase the unit costs of the whole operation. In practice commercial operators are mostly concerned that escapable costs are covered by revenue on a more or less service-by-service basis, and an overall profit is made at the end of the day. (Hibbs 1986).

The licensing system prevented competition on the profitable sections of the network. Without licensing, monopoly profits are eliminated by competition, leaving no source of internal subsidy. In a network based on the existence of cross subsidy most passengers travelling on profitable routes pay higher fares and there is greater incentive to find other forms of transport. The elimination of cross subsidy should therefore, result in fares being related to demand and costs, and there should be a gain in allocative efficiency. However, the unprofitable services, run previously as a result of cross subsidy, have to be adapted, disappear or be subsidised by the local authority. The White Paper 'Buses' (HMSO 1985), predicted that many services would continue to be provided even without subsidy, by small operators whose costs are less, or by other lower cost forms of transport, such as minibuses or shared taxis.

In some cases cross subsidy has reduced the need for local authority subsidy, and, it has been argued, that even though cross subsidy is not at an optimum it is preferable to the costs that occur in its absence. Gwilliam et al (1985) argue that, only if the loss per passenger on the unprofitable routes is well over twice the mean fare per passenger on the profitable routes, will the removal of cross subsidy boost patronage. In many cases cross subsidy will raise patronage rather than reducing it. If the government budget is constrained cross subsidy may not be consistent with allocative efficiency, and regulatory policy may be necessary. Competition is not sure to throw up a pattern of fares and frequencies which

accords with consumers preferences. This issue will be discussed in detail when we examine some of the experiences of deregulation.

3.5.2 Costs

During the past twenty years the rise in public sector operating costs of between 15-30% over the rate of inflation, has been attributed to the rapid growth of real wages. This, it is argued was caused by 'leakage' from increasing subsidies. Public sector operators costs are 30-40% higher than private sector costs, and both foreign experience and UK studies indicate that competition would give the incentive to keep costs down (Monopolies and Mergers Commission 1982). However, there is very little hard evidence available with which to compare public sector and private sector operating costs, it is almost impossible to make a like with like comparison because of the very different operating structures. External conditions such as average road speeds, the extent of peak demand and the nature of the local labour market are likely to dominate cost levels. These are very different for the majority of private operators compared to most public operators.

The MVA consultancy attempted a comparison and has generated evidence about the relative costs of NBC and private sector operators. The study was commissioned by Surrey County Council, it compared the costs and capabilities of the three private operators and the two National Bus Company (NBC) operators, all of which provided some local bus service in the area. The main conclusion was

that, the private operators had significantly lower operating costs than their NBC counterparts. The main reasons given were that the private operators benefitted from lower overheads and greater staff flexibility, leading to lower manpower ratios. Crew wages were not found to be significantly different between operators, once weekend and late evening working had been allowed for, although NBC employees did enjoy better pension facilities. Apart from one company with an ageing fleet, there was little difference in bus capital costs between operators. The maintenance and engineering standards of the independent operators were generally found to be as good as the NBC companies. All companies involved had low rates of lost mileage through engineering faults and high inspection pass rates. One of the main reasons for the observed cost differentials was staffing levels. The two NBC companies employed over four staff for every peak vehicle operated, whereas the three private operators employed 1.3, 2.2 and 1.3. The operator with 2.2 employees per peak vehicle was the most comparable with the NBC companies, in terms of providing town services with late evening and Sunday working. Other Research . (Monopolies and Mergers Commission, 1982) showed two NBC companies having costs per vehicle mile at a level 60-70% of the local authority owned company.

As stated it is important that valid comparisons are made since there are wide variations between local authority operators, among NBC subsidiaries and within the private sector. Issues that need to be considered in any comparison include:

- i) are similar types of operation being considered
 - ii) are the routes served comparable
 - iii) are the times of day and days of the week on which the service operates the same
 - iv) are similar vehicles used
 - v) is the quality of service offered to passengers the same
 - vi) are private and public operators equally safe
 - vii) are there economies of scale associated with various fleet sizes
- (White, 1985)

Cost comparisons can also be highly misleading, it is unrealistic to compare them on a cost per mile basis since this is highly dependent on the nature of the route. Measuring the costs per hour in service gives much more useful results.

Even if small independent companies do have lower costs, it does not necessarily follow that there will be a massive expansion in their services. When threatened with potential competition, existing operators can cut their costs, as examples such as London Buses and Midland Red have shown. Where expansion does occur it could be through agreed substitution for existing operators or by tendering for routes. It could also take the form of direct competition on the road, but it might well be the richest rather than the lowest cost operator who survives. Experiences of deregulated express coach services demonstrates this. (see section 3.6.4)

Costs may be reduced via the decline of unprofitable services, decreased labour costs and changed working practices. The adoption of new, labour intensive methods will preserve employment. It is thought that economies of scale, if they exist at all in the bus industry, are slight, and even that diseconomies of scale may exist (Gwilliam et al., 1985). The break up of NBC could reduce costs even further. Some researchers hold the view that economies of scale do exist and existing operators have been able to undercut smaller operators since 1980. Department of Transport estimates are that for big buses, competition will cause drivers wages to fall by 29%, and utilisation to increase by 11%. Hence any reduction in the money costs of running bus services represents a redistribution of welfare rather than a real efficiency gain. (MVA Consultancy 1985)

3.5.3 Innovation and flexibility

Removal of protection and the need to reduce costs, it was predicted, will result in operators experimenting with different types of services and lead to greater flexibility. It is asserted that the use of smaller vehicles will improve service quality. Several small buses have higher total labour and capital costs than the equivalent large vehicle, but either passengers are assumed to be willing to pay the higher fares, or costs will be reduced via greater labour productivity and more flexible working practices. Glaister modelled a route based on a corridor from Fleet St to Bishops Bridge Rd. Three time periods were considered, with high, medium and low flows. During the high flow service levels improved a

great deal, but small buses charged a fare 3 times that of the big buses. Big bus prices fell as a result of competition. During low flows service levels did diminish and high fares resulted. Therefore the passenger with a low time value would lose out. (Glaister 1985)

Time savings are an important feature of minibus operation, as this permits greater frequencies. Operators must be capable of measuring how much passengers are willing to pay for time savings. The value of time depends not only on their wage rate, but also whether the journey is taken in leisure or work time. Waiting time has a higher value than on bus time (Pope 1979). Small buses provide a higher quality of service, largely on account of their higher frequency. Operators must therefore, be aware of the type of passenger market that they are operating in. Passengers may be willing to pay the extra fares to cover the higher costs. Walters (1982) therefore argues that the socially optimum size of vehicle is substantially smaller than the traditional bus. The actual calculation of demand for bus services and fare levels will be much easier for existing operators who have experience of the market.

Three main arguments are used in favour of minibuses. Firstly, the small bus has to pick up and set down less frequently, therefore achieving a higher speed, which increases its productivity and reduces passenger journey times. Secondly, the smaller size of vehicle allows a wider choice of destinations to be served and facilitates off-route diversions to suit individual passengers. Thirdly, these improvements and the enhanced frequencies are likely

to generate additional demand and revenue, permitting a further expansion of the service.

The main disadvantages associated with the use of small buses are threefold. Firstly, in some areas the traffic and environmental consequences of large numbers of minibuses are likely to be detrimental, particularly hail-stop operations in busy streets. Secondly, minibus fares seem likely to be more expensive than existing bus fares and competition may lead to a reduction in normal bus services with adverse effects on a sizeable section of the population that is unable to pay the higher fares. Thirdly, the smaller vehicle has less flexibility in its capacity than a normal bus. To cope with peak periods, therefore, significantly more small vehicles are required relative to the off-peak periods. There is no doubt that mini and micro bus services are more appropriate in certain circumstances. Whether they are suitable for peak travel, or complete replacement of big buses is doubtful (Walters 1982). Even opponents of the White Paper can see the major benefit of deregulation as innovation, though this must be weighed up against congestion and other externality effects.

Minibuses and shared taxis are widely used in Third World countries and have been very successful in cities such as Hong Kong and Bangkok. Labour costs in the UK are very much higher than in these countries and surplus capacity exists in the UK, so the effects are likely to be less widespread. Independent operators in UK trial areas showed little interest in minibuses. They may however be

viable if firstly, demand levels are such that a bus service that is infrequent is replaced by a more frequent one, secondly the service is strongly promoted , and thirdly if the minibus service is more convenient to use. (Walters 1982)

Bly & Oldfield (1986), argue that there is no case for completely replacing conventional buses by minibuses, but by operating at high load and creaming off traffic, a limited number of minibuses may give their passengers waiting time savings which exceed the disadvantages to other passengers, of fewer big buses and increased congestion. Regulation would still be required to restrict their numbers, otherwise commercial incentives would lead to their expansion to a level at which the net disbenefits are very large.

The successful operation of minibus services probably also requires a break away from the rigid operating, labour and engineering practices characteristic of large scale conventional bus operations. The successful minibus operation by Devon General in Exeter recognised this and has generated considerably increased volumes of demand.

Over the last 3-4 years NBC owned operators have concentrated on minibus experimentation and many areas now have substantial numbers of minibus services. High frequency minibuses on profitable routes is a good method of route protection, replacing one big bus by 3 minibuses. The large financial outlay required has meant that until recently only NBC operators were not able or willing to implement

minibus services to any great degree. Financial constraints and traditionally conservative management techniques delayed the introduction of minibuses by many municipal operators and Passenger Transport Executives. (Bus Business 1987)

3.5.4 Safety and Environmental Effects

While the 1985 Transport Act sought to eliminate quantity control of stage carriage services, it was not the intention to eliminate quality control. One of the main reasons for the introduction of the 1930 Road Traffic Act was concern over safety standards, both from unsafe driving practices and from unsafe vehicles. Indeed, evidence from the Hereford and Worcester Trial area showed instances of both of these, with drivers racing, bunching at bus stops, leap-frogging and generally driving irresponsibly. (Evans, 1985)

West Midlands Passenger Transport Executive (1982) examined differences in quality and maintenance standards between different types of operators and concluded that all operators have similar maintenance standards, although independents use fewer staff to achieve them. However, Savage, in a paper presented to the Transport Economists Group in 1985 (Savage 1985), put forward the view that there was a strong inverse relationship between operator size and the number of defects, (see table 3.1). The general conclusion he reached was that, if deregulation leads to a decline in the average

size of bus companies, then there will be a need to monitor supply more closely.

Many of the detrimental effects of competition, such as congestion, environmental aspects and safety levels, can be observed in cities such as Hong Kong and Bangkok. In these cases there is not, and never has been the complete deregulation of regular bus services to the extent introduced in the UK by the 1985 Transport Act. Over time the changing level of provision of bus and taxi services may have a significant effect on the distribution and level of economic activity in cities and rural communities. Some of these effects may be beneficial, in particular competition may lead to more generous levels of service and lower fares in the day time off-peak period, and this may encourage more people to travel into the City Centre for shopping and entertainment. In Plymouth the effect of this may be enhanced by the pedestrianisation scheme recently introduced in February 1987. Pedestrianisation of the City Centre may also cause some modal change from car use to bus use, partly from problems associated with car parking and partly from increased frequencies and awareness.

TABLE 3.1 COMPARISON OF FLEET SIZE AND NUMBER OF DEFECTS

fleet size	number of operators	total number of vehicles	faults per 100 vehicles	Faults per million vehicle km	
				MEAN	STD DEV
1	131	131	18.3	6.5	15.59
2	63	126	15.9	5.6	10.80
3	61	183	18.0	6.4	13.88
4	54	216	9.7	3.4	6.66
5	29	145	5.5	1.4	4.32
6-9	71	498	7.8	2.1	4.68
10-14	35	392	9.7	2.5	4.60
15-19	16	260	6.9	1.7	2.17
20-49	7	165	13.3	3.1	2.99
50+	11	4114	3.5	0.7	0.78

Source: Savage 1985, from a Sample of Data from the Yorkshire Traffic Area

3.6 The 1980 Transport Act

The 1980 Transport Act represented a new philosophy of government policy towards the bus and coach industry. There was a departure from a status quo of 50 years standing. The 1930 Road Traffic Act introduced quantity controls through a system of road service licensing regulated by Traffic Commissioners, the burden of proof resting on the operator that the service they wished to operate served was in the public interest. This applied to all types of service other than contract and private hire operations. A significant range of quality controls existed, covering the design, safety and fitness of vehicles. Prior to the 1930 Road Traffic Act a completely unregulated environment existed, with operators free to operate whatever services they wished. Concern over road safety and wasteful overcapacity led to the introduction of regulation. It is not really appropriate to compare the pre-1930 situation with what may come about following deregulation. Demand for bus services is now considerably less and has been diminishing rapidly since the mid-1950's, generally as a result of increased car ownership. Loss of patronage has resulted in a greater need for subsidisation, and operating costs have been rising steeply.

The primary aim of the 1980 Transport Act was to minimize government involvement by reducing the level of regulation. The effects of The Act were fourfold, express coach services were deregulated, trial

areas for deregulated stage carriage services were set up, the ability of Traffic Commissioners to control stage carriage bus fares was largely removed and the burden of proof for operators applying for public service vehicle licences was shifted from the applicant to the objector.

3.6.1. The Effects of the 1980 Transport Act

The 1980 Transport Act contained four main parts, the deregulation of express coach services, the removal of price controls on stage carriage bus services, the relaxation of conditions for the granting of operators licences and the setting up of 'trial areas' in which stage carriage services were deregulated. The Act can be seen as a forerunner to the 1985 Transport Act, which deregulated stage carriage bus services in all areas (except London and Scotland). These effects are examined in turn below, the effects of the removal of price controls and relaxation of licencing conditions are virtually impossible to separate, the combined effects on stage carriage services will therefore be considered.

3.6.2 Stage Carriage Services, fares and relaxation of licencing conditions:

The Monopolies and Mergers Commission (1982) in their study of Bristol Omnibus Co. (BOC), Cardiff City Transport (CCT), Trent Motor Traction (TMT) and West Midlands Passenger Transport Executive (WMPTE), examined, among other aspects of the bus industry, the

effects of the 1980 Transport Act on competition in stage carriage bus services. In WMPTE no competitors emerged. In Cardiff an operator, CK coaches, commenced services in competition with CCT, a price war emerged resulting in higher frequencies at lower fares. However, on February 15th 1982 CK ceased to operate stage carriage services and went into liquidation. Both BOC and TMT experienced competition and responded according to NBC policy. This involved fare cutting and route matching. Bunching and timetable matching occurred, with TMT running buses at 5 minutes ahead of their main competitor Brewash Travel. Generally the Commission agreed that social considerations demand a network and a level of services which could not be operated profitably. In view of the reluctance of Local Authorities to increase their subsidy for public transport, fares on other routes would have to increase or some loss-making routes be abandoned. Where competition results in lower fares on the profitable routes and higher fares elsewhere, there would be a closer matching of price and cost and this would result in a gain in terms of allocative efficiency.

Changes in stage carriage bus fares, following the implementation of the 1980 Act, were studied by Coe & Jackson (1983). They concluded that there was little overall change in fare levels directly attributable to the Act. Initially there were some moves away from uniform pricing but by 1983 an overall fare scale was generally in operation. Some promotional pricing occurred, mostly in competition with British Rail. Most fare agreements existing before the Act remained. Up until January 1983 there were only three examples of

the Traffic Commissioners using reserve powers to control the terms of competition in the six areas sampled. No instances of intervention to prevent overcharging were recorded.

3.6.3 The Trial Areas.

Three 'trial areas' were set up under the 1985 Transport Act, the purpose of these was to examine the possible results of the deregulation of stage carriage bus services. Evidence from the three trial areas, Norfolk, Devon and Hereford & Worcester has been documented by Fairhead and Balcombe (1984). In Norfolk little change was attributed to deregulation, some services were discontinued but financial restriction rather than deregulation was the main cause. In Hereford some savings were gained on competitive tendering for education transport, however, this was not achieved without some withdrawal of bus services. In the town of Hereford itself a significant amount of competition emerged, even free buses being operated for a short period of time. Midland Red used its financial advantage to drive other operators out of the market (Evans 1985). Evans found that initially a period of instability and fare changes existed, with Midland Red running 30% more services than previously. Significant savings were made with only 2% of services requiring subsidy, and the council maintaining that no service was discontinued that would not have disappeared anyway. Problems did occur with bunching and traffic congestion, and some drivers were warned about reckless driving. In the Devon Trial Area, one new operator entered the market, Red Bus Services, other

operators were loath to risk jeopardising their relationship with Devon General, who subcontract many services and own Exeter bus station. Some services have been withdrawn or reduced by Devon General, overall there was a net increase in services.

The applicability of experiences in the Trial Areas to the rest of the country is limited. The three areas were largely rural in nature and conclusions were drawn from studies performed over a very limited time scale. In addition, it has been virtually impossible to isolate other factors leading to the decline or withdrawal of bus services.

3.6.4 Express Coaches

Prior to the 1980 Transport Act the licensing of long distance coach services was regulated. By comparison with other European countries a very comprehensive express coach system operated, mostly provided by National Express and the Scottish Bus Group. Only a very small number of independents operated any long distance inter-city services. Their main role was limited to the provision of seasonal holiday services.

Competition with respect to express coach services produced very significant results, fares decreased and services increased. It is, however, difficult to draw any conclusions in comparison with stage carriage services as much of the competition evolved as a result of removal of protection of British Rail services.

Kilvington and Cross (1986), comparing the effects of deregulation of intercity coach services with possible outcomes for stage carriage services, concluded that competition can produce perverse and unexpected results. Public sector operators are not necessarily disadvantaged by deregulation, they are as responsive and innovative as the private sector, indeed they have more experience of demand for services. The removal of regulation does not guarantee a response, especially in rural areas. The Act offered opportunities for expansion in the regular frequency long distance area, where traditionally the National Bus Company dominated and licensing restrictions were most severe. Generally the majority of small independent operators took no action, they preferred to concentrate on their existing markets. Generally small firms are less willing to take risks, their small size restricted innovation, and operators are cautious in their attitude towards the competitive environment. Some small operators attempted to introduce or expand express services, but failed because of intense price competition from National Express and because of a lack of marketing experience. Other operators succeeded by specialisation and the identification of new markets, or via joint agreements with National Express. National Express increased frequencies and kept fares at a lower real level than those prior to the Act, despite the collapse of competition. Their success is partly due to the network and existing structure, for example coach stations, and also due to their existing knowledge of the market and passenger demand. British Rail suffered the greatest abstraction on Inter-City routes. Price has

not been the only determining factor, good motorways and trunk roads has eroded British Rail's main advantage.

The effects of deregulation for the independent operator have been disappointing. A small number of firms successfully developed commuter coach operations. However, where the greatest innovation took place there too followed the greatest disasters. British Rail were perhaps the most disadvantaged by deregulation of express coach services. The greatest benefits have been for public transport users. On this basis the outcome of the legislation confirms free market philosophy that the consumer will always be the main beneficiary under such a regime. There has been an increase in supply and a lowering of fares. Rail users have also benefited, they have gained through lower fares, without significant reductions in services. (Kilvington and Cross, 1986)

In conclusion, the experiences of deregulation in the transport industry so far have resulted generally in an initial period of intense competition and fare decreases, followed by a gradual concentration of the market and a move toward larger firm operation. This has been shown to be the case in both the airline industry in the U.S. and the express coach market in the U.K.. The impacts of the 1980 Transport Act, which concerned stage carriage services as well as long distance coach services, have been difficult to interpret. It is uncertain whether changes taking place in stage carriage bus fares and service levels were directly attributable to the liberalisation of the market, or as a response to passenger

demand or innovation in the closely related coach industry. In addition, it is difficult to draw comparisons with experiences of deregulated bus services overseas because of the differences existing in labour market conditions, levels of demand and car ownership rates.

The next chapter will examine the contents, and subsequent effects of the 1985 Transport Act, in which stage carriage bus services were completely deregulated (except in London). Both the national and local situation will be considered in the light of the economic arguments put forward in this chapter.

CHAPTER 4

4.1 The 1985 Transport Act and its Impact

This chapter details the changes introduced by the 1985 Transport Act, and some of the available evidence on the effects throughout the country so far. The evidence was taken from issues of 'Bus Business' from 1986 to August 1988, a weekly publication specifically produced for persons working in the bus industry. The discussion then proceeds with a general discussion of the impacts on Plymouth. This evidence provides a basis for the empirical work, which attempts to evaluate these changes and assess whether there has been an improvement or deterioration in services.

In 1983 the Adam Smith Institute published its 'Omega Report' on transport policy, and although this was not an official government publication it articulated current Conservative government philosophy in its range of proposals. Among these recommendations was the extension of deregulation beyond long distance coach services, as covered by the 1980 Transport Act, to include stage carriage bus services. This was followed in 1984 by the government White Paper 'Buses' (HMSO, 1984), proposing deregulation of all stage carriage bus services, except in London; the dividing up of the National Bus Company into smaller concerns; and the privatisation of local authority companies. A system of competitive

tendering was to operate in London, full deregulation to follow at some time in the future. Operators registered their proposed commercially viable services by February 1986, then the process of tendering for remaining services, which the local authority chose to operate, took place. A transitional period existed when operators could withdraw their registered routes, and deregulation came into effect on 26th October 1986. After this time operators must give 42 days notice to the Traffic Commissioners before withdrawing a service.

The main points of the 1985 Transport Act were as follows:

- i) the abolition of road service licencing
- ii) stricter quality and safety control
- iii) The introduction of a system of competitive tendering, or franchising, for non-profitable routes which the local authority concerned may wish to operate.
- iv) concessionary fare schemes to continue, under the direction of the local authority.
- v) additional grants for rural services. A £20m rural bus grant was paid, this is to be phased out over the first five years of deregulation. A further £1m per annum was available for 'innovative' rural services.

vi) the reorganisation of the National Bus Company and the breaking up of the Passenger Transport Executives.

Speaking at a conference shortly after the enactment of the Act, the then Secretary of State for Transport, the Rt. Hon. Norman Fowler, explained that the legislation had three main aims. These were;

i) the removal of bureaucratic restriction

ii) the need to ensure that almost everyone gained good access to public transport

iii) the provision of maximum choice to the user, by facilitating competition

(Fowler, 1985).

Alternatively the legislation stated that;

"passengers will experience lower fares and better services, at least on the more profitable routes or times of day. Where subsidy is necessary, it will be less than previously, and local authority costs will be reduced. Greater flexibility and innovation is expected and, therefore the aim is to give a better service to the passenger at less cost to the ratepayer and the tax payer."

(1985 Transport Act)

Local authorities have developed their own criteria for deciding which services to subsidise; some have opted to maintain networks at roughly the same levels of service as before deregulation; others have introduced 'distance' criteria, so that everyone within a town or city be within for example half a mile of a service: and some, especially on rural routes, have refused to subsidise services with passenger loadings below a certain level. Operators have been invited to participate in concessionary fare schemes, but this does not always apply to child concessions which may be at the discretion of the operator. Therefore local authorities have had a certain degree of freedom in the awarding of subsidies, and a range of different policies have emerged.

4.2 The Bus Industry October 1986-August 1988

This section documents some of the experiences of deregulation throughout the country as a whole, and compares these with the aims of the government in implementing such a policy.

On the first day of deregulation, 26th October 1986, few operators escaped any problems. Most of the problems concerned, for example, the failure to get newly acquired vehicles operational in time, drivers getting lost, delays due to passenger enquiries to drivers, and an inadequacy of publicity. These were well documented in media reports. Few services failed to operate. Since then experiences of deregulation have been varied but some of the more significant

events are documented below. The examples given have been categorised into savings to Local Authorities, examples of innovative services, instances of the emergence of competition, intervention by the Traffic Commissioners and Office of Fair Trading, and effects on employees.

4.2.1 Savings in Subsidy Payments

On the 26th October the smallest commercially registered Passenger Transport Executive network was Greater Manchester at 68% of previously existing services. West Midlands Passenger Transport Executive (WMPTE), estimated that approximately 98.2% of 1985/6 bus mileage was covered by combined commercial and tendered bus networks. Of this West Midlands Travel operated over 91%. The costs of tendered services were lower than anticipated, with more than fifty nil tenders being submitted. (A nil tender is one which a bidder submits to operate without any subsidy support). In addition, net savings of £134,000 were recorded under tenders put out by Highland Regional Council. There was a substantial switch of routes from Scottish Bus Group's subsidiary Highland Scottish Omnibus Co. to independent firms. Similarly in Lancashire a £6 million cut in the £8.3 million revenue support spending of Lancashire County Council was achieved following highly competitive bidding for tenders on top of generous registrations for commercial services by the County's operators. This led Transport Secretary, John Moore to claim that the new pattern of commercial and tendered operations

saw 'service levels pretty much maintained' and that there were local authority subsidy savings of up to 70% in some areas. Nationally the initial savings were equivalent to approximately £40m per annum.

However, when the Transport and Road Research Laboratory reported its preliminary findings on the opening stages of deregulation the Association of County Councils accused them of including financial conclusions which 'fell far short of an accurate and balanced assessment' in the report. The report concluded that there was reduction in subsidy payments of £31m per annum throughout Britain, but made no reference to the £20m being paid through transitional rural bus grant, the £1m of rural innovation or to extra major items of expenditure on administration, staffing and publicity. John Moore in his speech to the Chartered Institute of Transport in May 1987, claimed that local authorities had reported savings of some £40m in the cost of subsidies on deregulation day, for supporting a similar level of service. Approximately 83% of services were being run without subsidy. The number of operators of bus and minibus services had increased by 4% to almost 2,000. Over one quarter of those who registered services were new to the operation of local services and a further 8% new to the bus business altogether.

As deregulation has progressed the registration of, and tendering for, routes has been subject to flux and change. For example, in June 1987 Yorkshire Rider gave notice of its withdrawal from 67 groups of routes around West Yorkshire. The majority of these

involved evenings and Sundays, equal to 2 million operational miles. Tendering for them could add £2m to the local authority subsidy bill. At the same time Greater Manchester Buses announced a cut to half of its Sunday service.

Calculations in August 1987 showed that there was an average increase in the price of tenders of 20% from the same time last year. In December 1987 further examples of increases in tender prices were found, for instance, Lancashire County Council found that new tenders brought increases of over 23% in costs, although some of the individual contracts almost doubled in price. (Bus Business, September 1987)

In response to pressure from the Passenger Transport Authorities Transport Secretary Paul Channon agreed to increase set expenditure levels for Merseyside, West Midlands and West Yorkshire. This may also have been a recognition on the part of the government that initially high registration levels would not be maintained, and increases in tendering prices during the first couple of years was inevitable until some stability returns to the market. (Bus Business, July 1988)

One of the predictions of the proponents of the 1985 Transport Act was that some lower cost operators would be able to undercut larger operators, and some nil tenders would result. In June 1987 Busways Travel registered commercially two thirds of peak hour schools and works services, previously tendered. This however may have been in

response to competition, rather than as a result of low costs. (Bus Business, August 1987)

4.2.2 Innovation

Initially the Transport and Road Research Laboratory recorded 50 registrations for vehicles no larger than taxis (A significant number of these were subsequently withdrawn), 250 for vehicles no larger than minibuses. These figures however, are deceptive because operators were asked to state the *largest* bus they would use on the service, therefore, some routes registered as single or double deckers are in fact being run by minibuses. Some two hundred new firms entered the market for stage carriage bus services and commenced operations. Examples of the introduction of high frequency minibus services have been numerous, and only a few instances are listed here. A significant development has been the plans for a £20 million investment in the operation of intensive urban minibus services in cities including Leeds, Manchester and Sheffield drawn up by United Transport International, the BET subsidiary with UK and overseas transport operating interests. Thirty of their 225 minibuses were introduced to Manchester, under the name of 'Bee Line'. Minibuses were introduced in Harrogate in July 1986, by West Yorkshire Road Car Company. South Midland Bus Co. have introduced 16 seater hail and ride services in Didcot and Carterton. There has been an extension of minibuses in West Glamorgan and Dyfed, and more routes in Swansea, Neath and Llanelli by South Wales Transport. South Yorkshire PTE has set up a commercial network of minibus

routes in Sheffield, Rotherham and Doncaster. West Midlands PTE purchased 36 Sherpa-based minibuses. (Bus Business, February 1987)

The taxi trade has been very slow to respond to liberalisation of restrictions, but Lincoln City Transport did introduce twenty hackney type taxi cabs on regular bus operations, called 'Lincoln Limos', with a fare ten pence higher than the regular bus fare. There is hardly any major town or city that has not experienced the introduction of minibus operation of some form. The appearance of the minibus has perhaps been the most influential and visible impact of the 1985 Transport Act. If the number of new deliveries of minibuses are examined (Table 4.1) it can be seen that not only are minibuses penetrating every sector of the industry, but that every area is expanding.

Table 4.1 New Minibus Purchases by Sector

	1985	1986	1987
Local authority companies	11	115	232
Metropolitan PTC's	12	258	695
London Buses	3	48	65
NBC	485	1909	662
Privatised NBC	-	25	555
SEB	-	92	138
<u>private sector</u>	-	526	931
	511	2969	3278

Source: Bus Business, January 1988

4.2.3 Emergence of Competition

Cardiff Bus indulged initially in aggressive marketing campaigns, spending £250,000 on its 'Pick an Orange' advertising campaign. Fierce competition in South Wales emerged, with independent operator Clayton Jones introducing a series of minibus services from Rhydyfelin, Gyncoch, Perthcelyn and Mountain Ash. This caused considerable local rivalry and National Welsh responded by increasing the frequency of their services. Perhaps the most visible outbreak of competition came about in Glasgow, Strathclyde Buses, accused its competitors of 'suicidal aggression' and the Scottish Bus Group of flooding Glasgow's streets with too many buses. During the first weeks of deregulation hundreds of buses swarmed down the main streets in Glasgow causing considerable congestion. Other towns and cities have experienced varying degrees of competition, many companies using high frequency minibuses.

In Greater Manchester the largest entrant to the market was UTB (United Transport Buses) who introduced about 200 minibuses into South and East Manchester. The response of Greater Manchester Buses Ltd (GMB) was to operate a similar service with about 250 minibuses. Other competition using conventional buses between GMB and smaller bus operators also occurred.

In South Yorkshire few cases of competition arose. In Sheffield one private operator operated a half-hourly service in competition with South Yorkshire Transport. Similarly, on Merseyside very little

interest was shown in competition, with the three main operators sticking fairly closely to their traditional territory. In Tyne and Wear initially there was little competition between the major operators. At the time of writing there are signs that operators are expanding into new areas. Examples of operators running services side-by-side exist and some fare reductions have occurred. A few small operators are also competing with the major companies, for example, in South Shields, where there is competition between Busways and Hylton Castle Motors.

There has been competition between Midland Red and West Midlands Travel (WMT) in two areas of the West Midlands. The Birmingham Coach Company began competing with WMT. Starliner a small private company commenced a minibus service with 40 minute frequencies, competing with a high frequency, but less direct WMT service.

An attempt has been made to assess the scale of competition in the metropolitan areas by Tyson (1987), by analysing the total number of operators requesting tender documents, the number of bidders per tender and the type of operator awarded tenders. He concluded that the monopoly existing in many areas prior to deregulation has not been broken. There were a high number of requests for tender documents, the number of operators varied competing for contracts, from an average of 2.36 and 2.53 in Strathclyde and Greater Manchester to 1.3 and 1.4 in Tyne and Wear and W.Yorks. However, on average one in five tenders were uncontested. Only 10% of contracts

were awarded to non-municipal/metropolitan/NBC companies (referred to as 'independents' in the industry).

4.2.4 Intervention by Traffic Commissioners or The Office of Fair Trading.

Sir Gordon Borrie of the Office of Fair Trading (O.F.T.) issued the following statement soon after deregulation came into effect,

"whilst a desirable consequence of additional competition should be more vigorous competition on fares, new entrants can be vulnerable to predatory behaviour by the established bus companies, who may be able to tolerate short term losses because of the scale or scope of their operations."

He further warned that,

"such a response by established operators on services previously regulated would be incompatible with the continuation and promotion of effective competition."

(Bus Business, December 1986)

The O.F.T. received more than fifty complaints from February to November 1986. These concerned both predatory pricing and the scheduling of buses to arrive at stops just ahead of rivals' buses. A report by Greater Manchester Passenger Transport Authority (1987) states that,

"deregulation has produced an unprecedented level of public complaint from passengers,"

most of which was directed at Greater Manchester Buses Ltd.

Clayton Jones, a South Wales independent received warning letters from Mid Glamorgan County Council, concerning the operation of 16 of his 29 contracts. Inspectors reported vehicles with incorrect destination blinds, vehicles of the wrong seating capacity, failure to display operators licences, and the non operation of some journeys. In April 1987 Clayton Jones was again under scrutiny by the Traffic Commissioners, he was ordered to repay 20% of fixed rebate grant and had some licence restrictions imposed, which were later quashed. North Western Traffic Commissioners prevented the operation of three local services from Rochdale Bus Station by Sport's Tours of Littleborough. Easyway Buses had all its registrations cancelled by the North Western Traffic Commissioners following 'incidents' at Blackpool Bus Station, during which an assault took place. Allegations of unsafe and illegal driving practices have also been under investigation.

The OFT reported in 1987 that 50% of all complaints concerned predatory pricing, these were extremely difficult to give a ruling on because they required an assessment of what 'uneconomic' behaviour was. The distinction between a commercial price cut to stimulate demand and predatory pricing to drive a competitor out of the market is not always easy to identify.

The OFT, at the time of writing, is investigating South Yorkshire Transport and West Yorkshire Road Car for anti-competitive behaviour. The complaint brought against SYT is that it reintroduced a previously withdrawn route and charged an uneconomic fare. The complaint against WYRC is similar, brought by independent operator who alleges that the fare on a route is uneconomically low, and deliberately a loss maker to drive them out of business. The investigation and judgement process could take several months. Although the complaint procedure via the OFT does take some considerable time it is sometimes possible to get a High Court injunction in the meantime. Several of these have been issued, mostly in very clear cases of uncompetitive behaviour, such as the operation of free buses. For example, in July 1988 the High court issued a writ to halt the running of free buses in Torbay by Hampshire Bus and City of Oxford Motor Services in favour of Devon General. (Bus Business, August 1988)

4.2.5 Effects on the Industry and Employees

Most operators have introduced a differential pay scale for minibus and regular bus drivers, with minibus wages being up to forty pence an hour less. Resistance to minibus schemes by workforces has resulted in a number of stoppages, for example, in Gosport, Portsmouth, Gloucester and Hull. In June 1987 the Scottish Bus Group was hit by a series of strikes and industrial action when management tried to introduce more flexible working practices. These disputes were finally settled in August 1987 with an agreement to introduce

flexible rostering a shorter working day and a higher basic rate. The 10 day strike lost the company £3m. However, the new working practices eliminated the traditional high overtime bonuses which were commonplace throughout the industry. August 1987 also saw London busmen strike against the effects of tendering on pay and conditions.

One of the initial effects of deregulation in Scotland was the loss of fourteen routes to independents in the first round of Highland Region route tenders, costing Highland Scottish Omnibuses 30 drivers' jobs.

In a conference held in October 1987 on the results of deregulation 'one year on' the manager of Burnley and Pendle buses, a municipal operation, stated that they had achieved 30% cost savings in the first year of deregulated operation. This had been achieved by the reduction in staff by 36%, by voluntary redundancy and early retirement. Workers were now required to work a system of flexible rostering and no payments were given for mealbreaks. Further savings were made by closing enquiry offices. Previous pay rates had been reduced by 35% for non viable operation and 51% for coaching. Now 5 different rosters and 5 different groups of drivers existed in the same company.

The privatisation of bus companies has attracted attention from many directions. Some companies have been subject to worker or management buy-outs, as was expected. Some mergers have taken place, and some

buy-outs by larger concerns. There has also been interest from companies not previously associated with the bus industry, and some multinationals and holding companies have entered the market. The largest of these is perhaps United Transport Buses, the UK subsidiary of BET, who also, among other things, operate buses in Africa. United Transport commenced operation in Manchester, Leeds and Bradford, and also showed an interest in some areas of Gloucestershire. However, United Transport have now sold off their interests in the bus business, in a worldwide policy of the parent company to divorce itself from passenger transport operation.

An Australian company Westbus (UK) have also entered the stage carriage business, ADP Travel and Swinnairds of Ashford form the basis of this venture. July 1987 saw another Australian owned company, TNT, bidding for National Express.

A company which had no previous interest in transport, Allied Bus has become the new owner of Lancashire Road Car, East Midland Motor Services and Midland Red North, Allied are a holding company from outside the industry, intending to adopt a profile similar to the old NBC. Another large holding company, Endless Holdings, with its operating subsidiary Drawline, acquired Red Bus North Devon and Southern National of Taunton in October 1987.

The industry generally has felt the need since deregulation to cut costs and improve efficiency, sometimes in the face of fierce competition from rivals. Therefore there have been some job losses

and reorganisation of routes since October 1986. For example, over a quarter of Crosville contracts were surrendered in a bid to improve financial performance after only a few months, some redundancies also followed. In March 1988 GM Buses reported a loss of £1.7m, however this was less than expected.

In August 1987 Midland Red North, due to financial problems, cut their fleet of 300 buses by 100. A new timetable introduced on 26th April 1987 saw 2 services improved and 20 cut. Greater Manchester Buses reduced their double decker network in January 1988, this involved 100 routes, and gave a saving of 67 peak requirement buses. (Bus Business, March 1988)

Statistics released by the Department of Transport showed that in the year following deregulation bus use in Britain fell by 5.6%. This reversed the upward trend that began at the beginning of the 1980's, following two decades of ever falling passenger journey figures (see table 4.2).

TABLE 4.2. Numbers of Passenger Journeys 1982-87

number of passenger journeys (millions)	year
5518	1982
5642	1985/6
5328	1986/7

Source: Bus Business, June 1988

There were greater falls in patronage in PTE areas, some as great as 13.1%. In addition, vehicle km on local bus services rose by 2.5%, but coupled with the drop in passenger trips this implies a 9% fall in passengers boarding per bus km. Staff productivity has risen, staffing has fallen by 4.4%, cost per bus mile fell 7%. (Department of Transport Statistics Bulletin 1988) As far as the bus and coach building industry is concerned 1987 saw sales of imported buses and coaches in Britain exceed those of home produced vehicles for the first time.

On the positive side, some companies had a very good return on their investments in the year following deregulation, for example, in December 1987 the Cheltenham and Gloucester staff of Midland Red South were given a 10% pay increase by their profit sharing scheme. Lothian Region Transport staff were paid a 1% bonus following successful trading performance, and Northern General staff were given a 3% bonus.

4.2.6 Changes in fare levels and structure

As stated before, concessionary fare schemes continued under the 1985 Act, however, the position over child concessionary fares varied. The awarding of such concessions has been at the discretion of the local authority concerned, often operators took responsibility in providing cut price fares for children. In some areas, such as Lancashire and Surrey, and most PTEs the authorities took their own initiative to offer operators support for keeping

child fare rates as provided for in the 1985 Act. But in most areas child concessions, where offered, are considered to be the operators' responsibility. This has resulted, for instance in parts of Merseyside, in children experiencing huge increases in fares. Not only do they have to pay the full adult fare on some operators' services in Merseyside, but those fares have increased by 55%.

In West Yorkshire the first fare increase since 1981 was introduced soon after deregulation. By March 1988 South Yorkshire Transport fares had increased by 250%, passenger journeys in the area have fallen by 35% since deregulation. On June 26th 1988 fares were increased by a further 15%.

In Greater Manchester there was no change in fares initially but in July 1988 GM Buses fares increased on average 6.7%. In the Greater Manchester area fares charged by the smaller operators are 5-10% lower than those charged by GMB or the ex-NBC companies. Where small operators compete GMB has responded by lowering fares.

Despite heavy competition on some routes in the Strathclyde region, in general there has been no change in single or return fares until March 1987 (except one case of a company reducing fares by 5% on one route). However, in March the Scottish Bus Group (SBG) companies increased fares by 5p on routes outside the city centre. A variety of multi-journey tickets have been introduced by SBG and Strathclyde Buses. In some areas where they face competition Strathclyde Buses

have introduced an off-peak 'Shoppers Return' priced at a little more than the single fare.

An interesting comment was made by the High Court, ruling in favour of Merseyside Passenger Transport Authority when they rejected an attempt by Crosville Motor Services and North Western Road Car to have Merseyside PTE's low fares policy on tendered routes ruled illegal. The court ruled that the PTE could;

"not have regard to fares charged in a free market for there was no such market."

It was ruled that;

"public transport requirements are the requirements of a public to travel and which is prepared to pay a fare it can reasonably afford."

(Bus Business, March 1988)

The High Court seem to be stating that the market does not operate efficiently to provide a perfect solution, and that the interests of the travelling public need to be protected in some way by some overseeing authority. In the latter statement the judge also appears to be making a value judgement about the function of public transport.

To conclude, the industry as a whole seems to have had mixed experiences during the first two years of deregulation, there have

been job losses, and wages in this sector have definitely fallen. However, some employment opportunities have been created, mostly for minibus drivers and the 'knock on' effect on the bus and coach manufacturing sector. In addition, some companies have achieved exceptional trading performances, and awarded bonuses to their workers. A great deal of interest has been expressed by firms both well established in the bus industry, and those from outside the industry. Therefore capital investment has not been any problem for newly privatised firms. The first year's passenger journey figures were disappointing, but this may be expected following such a major disruption.

4.2.7 Safety and Environmental Effects

The purchase of large amounts of new minibuses and selling off of old stock may have contributed to an improvement in maintenance and the numbers of vehicles with defects especially for larger bus companies. The average age of a company's fleet of buses is falling dramatically, many of the old double deckers used before deregulation were up to 20 years old. However, a period of adaption of skills for the maintenance staff may take place, although in the long run there should be a net improvement in quality of vehicles generally.

Maintenance problems have been experienced at Yellowway Motor Services where Department of Transport inspectors issued 38 prohibitions when 42 vehicles were inspected. 90% of vehicles were

found to be defective. 145 immediate dangerous defects were discovered, and 163 that were likely to become dangerous. Another example of these problems was experienced at Scottish Bus Group firms, this led to 'O' licences being renewed only for a short period of time. Vehicle examiners found 50% of buses to be faulty, of these the company only detected 12%. The concern in these two stated examples is that these companies represent a relatively large market share, traditionally larger companies had better maintenance records than smaller concerns. Therefore, either the trend for better maintenance by larger companies is being reversed, or smaller companies are performing even worse than they were before deregulation.

4.3 Plymouth since Deregulation

4.3.1 Commercial Services

The network registered commercially by Plymouth CityBus represented well over 70% of the previous network. Western National, who only operated 20% of services in the city, had a similar record. Fares were not subsidised before deregulation by the city council, except concessionary fares, and there was no rise in fares by either operator or any change in the fare structure initially.

Both Plymouth CityBus and Western National registered some high frequency minibus routes. Citybus operated 4 minute services to Whitleigh and Southway, 6 minutes to Plympton, and 7 minutes to

Ernesettle. Western National operated 8 minute frequencies to Turnchapel, Saltash and Keyham. All these services were in the respective company's traditional operating territory. The only area where services overlapped significantly was on the Keyham route through Devonport, this route was also subject to competition from a subsidised service, the 'Hospital Link', which charged approximately 20 pence lower fares.

The first major timetable changes came in June 1987, CityBus's high frequency 4 minute services to Whitleigh and Southway were reduced to 6 minutes, in addition there were changes in evening and Sunday services and some general restructuring of routes. Perhaps the most significant change to take place at this time was an increase in fares of 5 pence by CityBus, which was not matched by Western National.

The next significant event was the buy-out of Western National by local coach operator, Plympton Coachlines, with the financial backing of midland operator Badgerline. There has not been any perceivable change in operation as a result of this change, the company still trades as Western National, however there have been management changes.

January 24th 1988 saw the next major timetable alterations, again there were amendments to some evening and Sunday services, some areas receiving improved services, and some experiencing cuts.

Reorganisation and restructuring of routes also took place, mostly due to changes in subsidised contracts.

Following this period of relative stability the two major operators began to introduce competitive services. This followed a strike by the workforce of CityBus lasting 16 days. During that period of time Western National expanded its operation to provide services to those areas hit by the strike. Upon the return of the CityBus workforce Western National announced that it was to continue services in these areas in competition with CityBus, which this affected most of the high frequency routes, CityBus responded by introducing competitive services on traditional Western National routes, notably those with high frequency minibus services. The Plymouth to Tavistock route also became an area of high competition. In addition CityBus reorganised its fare structure and introduced a 'fare stage' system for cash fares, which resulted in a lowering of fares for most passengers especially on short journeys.

In August 1988 Plymouth CityBus announced that they expect to declare a loss of over £300,000, because of the strike, for that financial year. They expected to lose a further £200,000 as a result of the bus war with Western National.

The competition between the two rival firms continued for some two months, after which time there was some withdrawal of services, but the situation still remains that of hostility and suspicion between CityBus and Western National.

4.3.2 Subsidies and Tendered Services

In 1984/85 Plymouth City Council made a non-route specific contribution of £350,000 towards the purchase of vehicles by Plymouth City Transport. In 1988/89, the City Council has at the time of writing allocated a budget of £130,000 for route subsidy payments. Of this £120,800 has already been allocated. Devon County Council also contributes to route subsidies (50% in most cases), a total budget of £84,300 to date for 1988/89. However, it will be necessary to subsidise further bus routes from the 88/89 budget if operators withdraw services as a result of the end of their 'bus war' (which was still taking place when this report was prepared). CityBus and Western National notified the City Council of their planned withdrawals in September 1988, although tenders had been sought at the time of writing it was not known what the price of them would be. Speculations by the City Council were that the cost of replacement routes would substantially exceed the budget. The average number of bids per tender is just over two, this is not surprising as Western National and Citybus almost always tender, with one of the smaller operators occasionally submitting a tender. On only one occasion has there been an increase in the price of a tender, two additional evening peak journeys on a particular service. The Monday to Saturday service cost £27 a week when tendered initially for a 3 month period, when the journeys were re-tendered this increased to £38. In early 1987 tenders were invited for a number of services. One operator submitted a number of nil

tenders, however, since that time no more nil tenders have been submitted.

Before deregulation the use of OAP concessions was not monitored, £550,000 per annum was paid on an assumed use of four per week per pass issued, times average fare discount. This was shown to have inflated in the 1981 MAP survey. Since the 1985 Act, ticket issue returns and surveys show a reduction in cost to £350,000 per annum (1988). This reduction reflects true cost rather than reduced use. Before deregulation child fares were all commercially subsidised, since October 1986 peak child fares have been compensated by the City Council at £200,000 per annum. Hence total costs are the same for subsidising OAP and child fares as they were previously for subsidising OAPs. The extension to subsidising the handicapped was estimated to be £25,000 for 1988/89. (Bentley 1988)

Thus, experiences of deregulation throughout the country have been very different, perhaps the most visible impact has been the introduction of minibus services on a large scale. Plymouth itself has also seen large numbers of minibuses. Very little competition has taken place in Plymouth, and what rivalry exists is between the two companies operating before deregulation. Although the beginning of 1988 saw an increase in competition between these two companies in Plymouth they still operate largely the same networks as they did prior to deregulation. Therefore the main changes occurring in Plymouth have been the introduction of minibuses and alterations in service frequencies.

CHAPTER 5

Introduction

With the advent of deregulation of stage carriage bus services the marketing of buses became more important, and consequently the need to know consumer preferences. This chapter starts by looking briefly at the role of marketing, and specifically the role of consumer needs and preferences and justifies the social psychological approach used in this work.

The function of marketing is to enable producers and providers of services to keep in touch with the needs and wants of consumers. Therefore, marketing research fills a gap between the producer and the consumer.

Marketing research focuses on the nature and structure of the market and enables the investigator to locate market opportunities. Markets can then be segmented according to various criteria, geographical, socio-economic, or consumer behaviour. Thus, marketing provides a link between the economic functions of the producer and the psychological needs of the consumer.

In a competitive market with many buyers and sellers and a relatively homogeneous product, the importance of advertising and marketing is increased in order to differentiate the product in the eyes of the consumer and to target advertising effectively at different types of consumer. In addition, the decline in bus patronage in the 1960s and 70s presented a challenge to the newly deregulated bus companies to reverse this downward trend, one of the means of achieving this might be through effective marketing of their services.

Marketing provides a link between psychological research into consumer needs and preferences and the economic act of exchange. One of the

important aspects of this research is that it seeks to provide a link between the attitudes of bus users and the process of deregulation and increased competition. Thus, in the same way that marketing does, it attempts to link two separate disciplines, economics and social psychology, in order to provide a greater understanding of the market process and the interaction between the producer and the consumer.

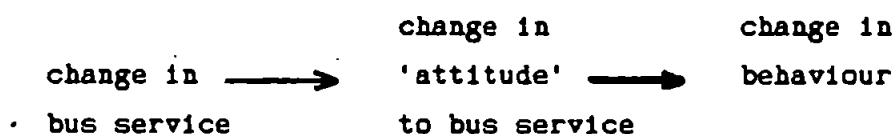
The starting point for the discipline of marketing lies in needs, wants and intentions. The roots are therefore in social psychology, in this chapter the importance of the psychological approach to transport is examined and some of the techniques that have been successfully used.

5.1 The Importance of a Psychological Approach

A large part of this research project focuses on the measurement of passengers' attitudes to bus services. The reasons for approaching the deregulation issue in this way were twofold. Firstly, there seemed to be a lack of this type of monitoring, although as deregulation has progressed more projects with 'attitudinal components' have been set up. Secondly, it was felt that to ignore the feelings of the consumer would constitute an important omission in the measurement of the success or otherwise of deregulation. This chapter therefore proceeds with a discussion of some of the attitudinal research into bus travel. Because the concept 'attitude' is often used in different ways there will then be an examination of the psychological theory of what is actually meant by 'attitude' and the relationship of attitude to behaviour.

If deregulation is successful in its aims, then increases in travel use should occur, this process may not however, reveal itself for some years. If a relationship between attitude and behaviour exists, and a reliable measure of attitude can be found, then it should be possible to identify reasonable lasting perceptions towards bus travel and therefore provide an insight into the longer term impacts of deregulation.

An essential part of transport research is the understanding of travel behaviour, it is important for both planners and operators who need to be able to efficiently allocate resources. The disruption of bus services due to deregulation may have long term effects on behaviour and modal choice, through the effects on attitudes and beliefs. It is therefore, important to understand how consumer behaviour is influenced by these changes in perception. Thus changes in bus services would affect consumer behaviour in the following way:



The time lag involved in the above process is not certain and it is possible that researchers monitoring the effects of changes in bus services may conclude that little or no effect on behaviour had occurred. However, a change in attitude may have taken place, which had not fed through to alter behaviour. It is hypothesised that the change in the 'attitude' component (consisting of beliefs, perceptions and cognitions) would occur in a relatively short time scale following bus service changes, and therefore would be observable soon after such changes took place. The problem with

merely observing behaviour and drawing inferences from it, is that firstly, the time lag is uncertain and may be variable in length for different users, and secondly, behavioural change may be restricted by external factors such as financial constraints.

The behaviour under examination, that is use of bus services for shopping and work journeys, could be seen as not under the complete control of the individual, at least in the short term, because of the need to travel to work or buy certain consumer goods in the absence of other travel mode alternatives. In order to make changes in travel behaviour the individual would either have to make considerable financial investment, in purchasing a car, moving house or changing jobs; or he/she would need to expend extra effort, in walking or cycling to his/her destination; or a major change in lifestyle would be required, in changing shopping behaviour, or rearranging personal habits to facilitate liftsharing etc.

It should be possible through this research to examine the time lag between belief and attitude change, and change in behaviour, for a specific transport mode, and specific trip purposes. The time period involved in the study (approximately 12 months) may indeed show no significant change in either behavioural intention or actual behaviour, but this period would expect to show changes in attitudes and beliefs. It is hypothesized that the time lag between changing belief and attitude and change in behavioural intention and behaviour, will vary according to different categories of user, by journey purpose, frequency of use and income group (indicated by

occupation). A model can therefore be developed based on perception of the travel mode, and how attitudes and beliefs change as a result of a changes in supply of bus services for different socio-economic/demographic groups.

5.2 Attitudinal Research in Bus Travel Behaviour

Most studies into travel behaviour have concentrated on easily measurable factors such as time, cost and distance factors. However, these variables are not sufficient to explain the decision making process behind the choice of travel mode (Goodwin and Hensher 1978). Attributes such as comfort and convenience, which are more difficult to quantify are also important,

"It is recognised that a concentration on the measurable carries with it the danger of excluding important but not easily quantifiable factors."

(Goodwin & Hensher 1978)

The problem of incorporating these factors into established models has led to several areas of research. For example, attempts to identify the components of multifaceted attributes have taken place by Hensher et al (1975), Nicolaidis (1977) and Prashker (1979). Time-cost models have been developed to include attitudinal data (Recker & Golob, 1976; Recker & Stevens, 1976, 1977; Golob & Recker, 1977). More general research has also taken place into attitudes to

travel modes (Carrick, 1978; Thomas, 1976). Many studies have concentrated on present modal choice (Paine et al, 1969; Westin & Watson, 1975; Recker & Golob, 1976; Recker & Stevens, 1976, 1977; Golob & Recker, 1977; Johnson, 1978; Meyer & Louviere, 1978; Levin, 1979; Levin & Herring, 1981). Other studies have attempted to determine which characteristics travellers demand of a new mode (Golob et al, 1972). Some studies have investigated the impact of service changes on attitude and behaviour (Horton & Louviere, 1974; Hensher & Louviere, 1979). In addition, the effect of trip purpose on modal choice has been investigated by writers such as Golob & Recker (1977), Norman (1977), Recker & Golob (1976), Recker & Stevens (1976, 1977), Westin & Watson (1975). The importance of social factors on travel behaviour has also received attention, (Paine et al, 1969; Golob et al, 1974). Attitudinal variables and their influence have been investigated, for example by Hartgen (1974).

Louviere and Norman (1977) asked respondents to rate the probability that they would use different bus systems. In the first and second studies that they conducted, they found that fare level was the most important factor, with frequency of service being the least important factor. The third study revealed the price of petrol for cars to be the most important element, followed by fare levels, with reliability the least important. Carrick (1978), on the other hand examined the composite image of bus travel in Sheffield. The technique used was the application of principal components analysis to attitudinal scales, which identified five main factors,

'comfort/convenience/reliability', 'non rush hour trip', 'quality', 'staff unhelpful', 'travel time rush hour'. Cost in this instance was found to be of secondary importance, possibly because of the low fares policy operating in Sheffield at that time.

Norman (1977) measured the effect that different journey purposes had on the way that respondents rated different bus systems. He found that for work trips, total walking distance and number of stops were more important than for leisure trips, but that in both cases they were statistically insignificant when it came to decision making. Another study of the effects of journey purpose was made by Recker and Golob (1976), who divided respondents into 'immobile' and 'composite mobile' groups, in order to examine the influence of journey purpose on modal choice. For the mobile group for the trip to work (Recker and Golob 1976), four factors described bus use 'service', 'vehicle ride quality', 'crowding' and 'sociability'. Other important explanatory factors included 'bus availability'. For the immobile group three factors were found to be important, 'service', 'vehicle ride quality' and 'personal environment and autonomy'. Golob and Recker (1977), examined the shopping trip purpose and found four factors important in the perception of bus services; 'service', 'vehicular environment', 'convenience' and 'personal environment'. However only the bus security attribute was found to be significant in the explanation of modal choice. Recker and Stevens (1976), found, for non work trips, four factors associated with bus travel; 'convenience', 'personal safety', 'service' and 'status'. For grocery shopping the attribute 'ease of

carrying packages' recorded the highest response, whereas shopping for personal goods 'level of service' was important.

Recker and Stevens (1977), also examined the shopping trip. They found that for 'car-less' respondents bus travel was described by three factors, 'service', 'comfort' and 'social status'. For the 'mobile' group of respondents, the factor 'service' also included the attributes of cost and vehicle transfer, 'comfort' was expanded by the inclusion of personal safety while waiting for a bus into the factor 'personal security', and an additional factor 'practicality' was important. The choice of mode for the car-less group was based on three attributes, the effort involved in walking, destination flexibility, and the social status of the car and bus. For the mobile group of respondents, they were less concerned about the social status aspects, and more concerned with service and practicality aspects of bus use.

In a study of 874 travellers in Los Angeles, Dobson & Tischer (1976) illustrated an effective perceptual market segmentation procedure for transport policy analysis. Three different aspects were examined, frequency of mode use, perceived system attributes and socio-demographic data. The network time, distance and cost were derived for the sample at the geographic zone level. Three modes were considered, single occupation cars, bus and car pool. Beliefs about 19 attributes for each mode were collected with a semantic differential format. Marital status, number of people in the household, type of housing, income, age, race, sex, and car

ownership were obtained from the respondents. The attributes included were; comfort, convenience, cost, luggage space, ease of use, reliability, punctuality, travel time, vehicular safety, personal safety, destination accessibility, crowding, wait for vehicle, relaxing, weather, waiting in traffic, flexible schedule, extra time and parking cost. The segmentation approach produced a structure that isolated travellers with common viewpoints about alternative transport modes. Then a factor analysis step can be used to identify and define salient generalized attribute variables, such as those discussed in Spear (1976), or Nicolaidis (1975).

Louviere and Norman (1977), and Norman (1977), examined the importance of fares over bus service characteristics. By contrast Recker and Golob (1976), Golob and Recker (1977), and Recker and Stevens (1976, 1977), revealed that there is a much more complex pattern of bus service characteristics which are important. Factors such as level of service, convenience and quality of service were found to be important. The different findings could be a function of the methodology used and the sampling procedures of the researchers. Equally terms such as 'level of service', 'convenience' and 'quality of service' are either vague or subject to different interpretations.

As a large part of the research investigates attitudes of passengers to the bus service, it is useful at this point to examine the 'attitude' concept in more detail.

5.3 Attitudinal Theory

5.3.1 Uses of Attitudinal Techniques in Transport Research

Research into and use of, attitude measurement techniques flourished in the 1970's and early 1980's but developments have now stagnated on the conceptual side. The focus recently has been on the measurement technique, therefore, models of attitude formation and change remain much as they were in the early 1970's (Bagozzi, 1988).

Attitudinal theories attempt to explain behaviour in terms of attitudinal variables. In transport there appear to be several important areas for the application of attitude measurement techniques. The main applications are listed by Michaels & Allamans (1979), and are given below;

- 1) as a market segmentation tool
- ii) for the monitoring of subjective responses to transport systems, environments and operations
- iii) to evaluate programmes, service changes or other policy changes affecting transport supply. In addition, attitude measurement in before and after, and time series designs. (it is this application which concerns us)
- iv) in the development of demand models

5.3.2 Some Definitions of 'Attitude'

Much of social psychology has been devoted to the study of attitudes. Indeed early writers such as Thomas & Zaniecki (1918), considered social psychology to be the scientific study of attitudes. Some of the definitions that have been given to 'attitude' are listed below:

"An attitude is a complex of feelings, desires, fears, convictions, prejudices or other tendencies that have a given set or readiness to act to a person because of varied experience."

(Chave, 1934)

"a more or less permanently enduring state of readiness of mental organisation which predisposes an individual to react in a characteristic way to any object or situation with which it is related."

(Cantril 1934)

Thus an attitude is essentially a preparation or readiness for response. A full definition of attitude does not seem to have been an essential requirement for the development of measurement procedures in much psychological research. Most investigators intuitively select a particular measurement procedure that seems to be inferred from observed consistency in behaviour.

Most researchers view attitude as a multidimensional concept, including affective, cognitive and conative components (Cantril

1934). The characteristic that distinguishes attitude from other concepts is its evaluative or affective nature. Affect is the most essential part of the attitude concept. Research on the three component view has emphasised both the independence and interdependence of the different components.

A distinction has also been made between behavioural intention and actual behaviour (Fishbein 1967), so that attitudes are seen as being made up of the following components;

- i) affect (feelings, evaluations)
- ii) cognition (opinions, beliefs)
- iii) conation (behavioural intentions)
- iv) behaviour (observed overt acts)

The affective component is the element referring to emotions, measuring the amount of positive or negative feeling held toward the attitude object. The cognitive part represents beliefs held about the attitude object. The conative aspect corresponds to the tendency to behave in a particular way. (Allport 1935) One criticism of most attitudinal research is that it seeks only to measure the affective component. (Michaels and Allaman 1979)

It is impossible to measure attitude directly, it is usually measured using an attitude scale consisting of a set of statements or beliefs related to the attitude object. These measure valience, or the degree of positive or negative feeling toward the attitude object. Many different attitudinal measurement techniques have been

used. Fishbein & Ajzen (1972), in a review of research between 1968 and 1970 found more than 500 different methods of attitudinal measurement. Some of the most widely used are Thurstone's method of Equal Appearing Intervals (1928), Likert's method of Summated Ratings (1932), semantic differential techniques (Osgood et al, 1957), repertory grids (Kelly, 1955), paired comparisons (Golob et al, 1972).

5.3.3 The Attitude-Behaviour Relationship

The empirical research makes use of the Fishbein Expectancy Value Model, this is based on particular assumptions about the relationship between attitudes, behavioural intentions and behaviour. The purpose of using such a model was that, if it proved appropriate in this context, it may reveal the way in which a person's attitude to public transport feeds through to affect the use of public transport (how attitude affects behaviour). Expectancy value models have a long history in both social psychology and in marketing research. The appeal of the expectancy value model lies in its simplicity and, more importantly, the advantage it possesses in accommodating both cognitive and motivational elements of consumer behaviour. A positive attitude follows only when beliefs and evaluations are both high. In this sense the expectancy value model is attractive because it overcomes a fundamental limitation of other models (Bagozzi, 1988). Areas of consumer research which have successfully used the expectancy value model include the purchase of toothpaste (Wilson, Mathews and Harvey, 1975), cars (Raju, Baghat

and Sheth, 1975), detergents (Lutz, 1975), medical therapies (Oliver and Berger, 1979), coupons (Shimp and Kavas, 1984), fruit drinks (Bonfield, 1974), weight control drugs (Oliver and Bearden, 1985), clothing (Miniard and Cohen, 1979) and financial loans (Ryan and Bonfield, 1980).

The reasons for using the Fishbein model in this research can therefore be given as:

1) the particular conceptual framework and the attitude-behaviour relationship

ii) the imposition of a systematic, tested methodology on the study

iii) it includes aspects of attitudes which are omitted in other models, in particular by including salient (relevant) beliefs, it allows the inclusion of components that are relevant to the individual respondent

iv) previous research into consumer behaviour and transport mode choice have found the expectancy value model to be a useful tool

We will proceed with a discussion of the attitude-behaviour relationship, the particular form of which provides the basis of the model.

Much of attitudinal research is concerned with the interrelationship of the attitudes that a person holds, and how these attitudes relate to behaviour. One fundamental problem in social psychology is in determining the direction of the causal relationship. Does attitude

affect behaviour, or does behaviour affect attitude, or is there a feedback mechanism present? Kahle and Berman (1979), observed four different viewpoints concerning causal attitude-behaviour relationships; firstly, that attitudes cause behaviours (McGuire 1976); secondly, behaviours cause attitudes (Bem 1972); thirdly, attitudes and behaviours have mutual causal impact (Kelman 1974); and attitudes and behaviours are slightly, if at all related (Wicker 1969). The frequent reports of low or nonsignificant correlations between attitude measures and behavioural criteria (eg. Wicker, 1969), challenge the proposition that attitudes cause behaviour. This has led some writers to shift the emphasis of research to examining the conditions when attitudes and behaviour do correlate (Rogosa, 1980).

It is generally accepted that the effect of attitude is moderated or dominated by other such variables as motives, values, habits, experience, norms and expectations. Much research has focussed on identifying some of the important factors that moderate the attitude-behaviour relationship (eg. Fazio & Zanna, 1978; Liska, 1974; Norman, 1975; Snyder & Swan, 1976; Warland & Sample, 1973).

Low correlations between attitude and behaviour may occur when attitudes are unstable (Schwartz 1979); when the person is not under full control of the behaviour (Davidson and Jaccard 1979); when there is a lack of direct experience on which to base attitudes (Fazio and Zanna 1978); when measures of attitudes and behaviour are not concerned with exactly the same actions (Ajzen and Fishbein

1977); when the measurement of attitudes is subject to measurement error (Alwin 1973, 1976); or when the behavioural criterion is too narrow (Fishbein and Ajzen, 1974; Weigel and Newman, 1976) and contains appreciable error variance as well (Epstein 1979). One cause of the attitude not being apparently related to behaviour is that the behaviour in question is perhaps related to a number of attitudes, only one of which is under investigation. In addition, social norms may provide ideas about 'proper' behaviour under certain conditions, and it may be that the situation under investigation is one in which what society considers correct behaviour overrides the personal attitude of the individual.

Bentler and Speckart (1981) hypothesized that attitudes would have a positive, direct effect on behaviour, which was in accord with findings by McGuire (1976) and Kahle and Berman (1979). Bentler and Speckart's results (1981), support the view that attitudes have a more powerful effect on behaviour than any other factor. Attitude exerts a significant, direct effect on behaviour. In contrast behaviour has a significant direct effect on attitude in only one context, studying. This context provides support for views of writers as Bem (1972) and Kelman (1974).

Apparently there is, therefore, no single way of interpreting the relationship between attitude and behaviour since the context of the investigation will affect the relationship and direction of causality. It also appears that the precise nature of the attitude-behaviour effects may depend on the behaviour under consideration.

The main empirical results confirm the conclusions of Kahle and Berman (1979) that attitudes cause behaviour. Yet it is apparent that this is too broad a generalisation of the complex influences which may exist in some circumstances.

A similar way of describing the attitude-behaviour discrepancy has been put forward by Fishbein (1967), who questions the assumption of consistency between behaviour and attitudes. Fishbein's model proposes that behaviour is best predicted, not by attitudes, but by behavioural intentions (the intention to perform actions or behaviours) which, in turn, are a joint function of the person's attitude towards performing the behaviour in question, his beliefs about what other people expect him to do and his motivation to comply with these expectations or norms. Studies by Fishbein and Ajzen (1974), show that people do behave in accordance with their attitudes. Provided that appropriate measures of behaviour are used, the overall behavioural trend is consistent with the person's attitude. Ajzen & Fishbein (1977), argued that it is useful to define a behavioural measure in terms of four facets or elements: the action involved, the target at which the action is directed, the context in which it occurs, and the time of its occurrence. A multiple act measure involves many different actions performed in different contexts and at different points in time. Measurements should deal with events that are under the purposive control of subjects, and the time lag between measurement waves should not be excessive (Davidson and Jaccard 1979).

Other investigators have also provided evidence for a strong relation between attitude toward a behaviour and actual performance of that behaviour (Janis & Hoffman, 1970; Kothpandapani, 1971; Veevers, 1971). These and other studies suggest that attitudes can be used to predict not only general behavioural tendencies, but single actions as well, provided we assess attitudes toward the particular behaviour under consideration.

5.4 The Fishbein Expectancy Value Model

5.4.1 Background to the Model

We will now turn to an examination of the background to the model; the actual mathematical model itself, some of the refinements suggested; some of its applications in the transport context; and some of the criticisms which have been levelled at it.

The hypothesised links between attitude and behaviour by Fishbein and Ajzen (1974) form the basis for their 'theory of reasoned action' (Ajzen and Fishbein 1980). According to the theory, behaviour is determined by intention, whereas intention is determined by 'attitude toward the behaviour' and 'subjective norm'. 'Attitude towards the behaviour' is defined as the sum of 'evaluative (behavioural) beliefs' about the consequences of performing the behaviour in question. Such beliefs are specific to the respondent about performing the behaviour in question. In this instance the beliefs would concern 'using a particular bus service

for work/shopping'. Any evaluative belief contains both an expectancy element (will this consequence be made more or less likely by my performance of this behaviour?) and a value element (how good or bad would such a consequence be?). Thus if a respondent stated the belief 'the bus is often late', the expectancy element would consist of 'how likely it is to be late', and the value element 'how good or bad it is that the bus is late this often'. Originally Fishbein (1967) included in his model a term representing personal normative beliefs, representing what subjects thought they should do in the situation, as distinct from social norms (others' perceived opinions). This term was dropped from the model, on the grounds that it was merely an alternative measure of behavioural intention, (Fishbein and Ajzen 1969, 1970).

Expectancy value models are designed on the hypothesis that people integrate large numbers of pieces of information to arrive at an overall judgement. Fishbein's theory comprises two distinct models. In the first the attitude toward an object is the dependent variable, the main determinants are the salient (relevant to the individual concerned) beliefs about this object and the evaluative aspect (whether they are considered favourable or unfavourable) of those beliefs which are combined in the form of a linear, additive expectancy value model. The second model deals with the prediction of a specific behavioural intention and the corresponding overt behaviour in a well defined situation. Two major variables are assumed to determine these variables, the attitude toward the act and the social norm. The second model depends crucially on the

assumptions underlying the first. Much of the research conducted using Fishbein's techniques has taken the first model largely for granted, and concentrated on the predictive aspect.

Fishbein's theory of attitude is detailed below;

i) an individual holds many beliefs about a given object.

ii) associated with each of the attributes is an implicit evaluative response ie an attitude.

iii) through conditioning the evaluative responses are associated with the attitude object.

iv) the conditioned evaluative responses summate.

v) on future occasions the attitude object will elicit this summated evaluated response to the overall attitude (Fishbein 1967). These relationships can be depicted as;

$$A_o = \sum_{i=1}^n b_i e_i$$

Where A_o = attitude toward an object

b = beliefs about o

e = evaluation of attribute i

n = number of beliefs

The second model is designed to predict behavioural intention and not overt behaviour. The relationship between behaviour as measured and actual behaviour will be dependent on other external variables including the time period between stated intention and actual behaviour, and the specificity of the behaviour stated:

$$B = I = A_{act} W_1 + \left(\sum_{i=1}^n NB_i \cdot MC_i \right) W_2$$

B = actual behaviour

I = behavioural intention

A_{act} = attitude toward the act in question, related to the object, o.

NB_i = normative belief

• MC_i = motivation to comply with normative beliefs

w₁ & w₂ = empirically derived weights

Three main factors may result in an inadequate relationship between behavioural intention and behaviour. First, the level of specificity, second the time interval, and third the behaviour is not always under the person's own control. (Thomas 1971)

In contrast to earlier attitude theories Fishbein clearly identifies the attitude toward a specific behavioural intention in a well defined situation that is directed or related to an object. For example, this differentiates the attitude toward public transport

generally and the use of it for a specific trip purpose. For this reason it could be very important to ask respondents in the questionnaire to evaluate the bus service they used for their particular trip purpose. Fishbein's theory recognises the influence of other external variables such as abilities and external events on overt behaviour. However these influence behaviour only indirectly by affecting either the attitudes or the social norm component, or the relative weights of these predictors.

The attitude construct in the theory of reasoned action, as Fishbein and Ajzen (1972) have termed their conceptual model, is behaviour oriented; unlike more general attitudes towards objects, persons, institutions or policies, attitudes toward behaviours are found to be good predictors of the corresponding intentions and behaviours (Ajzen and Fishbein 1973, 1977).

5.4.2 Developments and Criticisms of the Expectancy Value Model

The essential component of the first model is that belief and attitude components be highly correlated, otherwise the second model may not be correct. Many researchers have indeed shown that the belief and attitude components are highly correlated (Ajzen and Fishbein 1972; Davidson and Jaccard 1975), that subjective norms, normative beliefs and motivation to comply are highly correlated (Glassman and Birchmore 1974; Glassman and Fitzhenry 1976) and that behavioural intentions can be predicted from a linear combination of attitudinal and normative variables (Davidson and Jaccard 1975;

Warshaw 1980; Wilson, Matthews and Harvey 1975). On the other hand, Glassman and Fitzhenry (1976) reported that the normative component was a significant predictor of intentions in only a quarter of the situations in which it was expected to be significant. Ryan and Bonfield (1980) have shown that measures of attitudinal and normative components are uncorrelated. Schlegel, Crawford and Sanborn (1977) found that inclusion of the 'motivation to comply' variable, however measured, worsened the prediction of behavioural intention. The effects of the inclusion of the normative component, and its contribution to the model can be investigated in this research. It may be the case that the normative and motivation to comply elements are appropriate in some circumstances, and not in others, their relevance to transport behaviour can therefore be investigated.

It is accepted that behaviour can produce feedback which will influence later attitudes and subjective norms (Fishbein and Ajzen 1975) but in other respects the model is unidirectional in its causal assumptions. Recent research involving the theory of reasoned action has focused on other variables not previously included in the theory, particularly prior behaviour. Ajzen and Madden (1986), examined the effect of adding a 'perceived behavioural control' variable to the theory. Perceived behavioural control accounts for the degree to which subjects feel they are in control of, or have the ability to perform, the behaviour if they want to. It is assumed in the theory of reasoned action that both expectancy value attitude and normative belief-motivation to comply (NBMC) are unidimensional

constructs. This assumption is implicit whenever the product of salient beliefs and evaluative aspects are added together to produce a single attitude score and the product of the normative beliefs and motivation to comply elements are added to yield a single (NBHC) score. Findings by Burnkrant and Page (1988) support those of Bagozzi (1981), that expectancy-value attitude exists as a multidimensional rather than unidimensional construct. The performance of the model in this study may indeed reveal that this is the case, and provide scope for further investigation.

According to Ajzen, Timko and White (1982), attitudes are no longer expected to predict behaviour unconditionally, their relation to behaviour is moderated by other variables. The strength of attitude-behaviour relations is assumed to be dependent on a variety of factors including the judged influence of external events (Wicker 1971), direct experience with the attitude object or with the behaviour (Fazio and Zanna 1978a); Regan and Fazio, 1977), confidence with which the attitude is held (Fazio and Zanna 1978b), internal consistency of the attitude (Norman 1975), heightened self-awareness, (Wicklund 1982), and such individual difference variables as self-monitoring (Snyder 1974, 1982), and self-consciousness (Scheier, 1980; Scheier, Buss and Buss 1978). The structure of the original expectancy value model may therefore have to be adapted to permit the inclusion of these factors. The model is conceptually simple and flexible so adaptation to suit different circumstances should not be too difficult.

Although a number of studies have given support to Fishbein's model (eg. Ajzen & Fishbein, 1972; Fishbein & Ajzen, 1975), whereas more recently Songer-Hocks (1976) has suggested that it may be too simple to account for all situational variables by the weighting system. It may be therefore that the model should be revised. Songer-Hocks (1975) used a variation of the Fishbein model to investigate the potential limitations of the model. She found that certain situational factors could alter the nature of the model significantly. Her findings raised the question of the generality of the Fishbein model, since different prediction models were required by different situational conditions. However, in reply to Songer-Hocks, Fishbein and Ajzen (1976), argue that her finding that intention-behaviour correspondence varies from one condition to another is not a reflection of the model's inadequacy. Such findings support the point made that the empirical relation between intention and behaviour cannot be taken for granted but must be submitted to systematic empirical investigation (Ajzen and Fishbein 1973; Fishbein 1973; Fishbein and Ajzen 1975). The ability of the model to be adapted in this way to different circumstances should be seen as an advantage of it not a disadvantage. Songer-Hocks also makes the misconception that behaviour, like intention is determined directly by the attitudinal and normative elements, whereas Fishbein and Ajzen argue that the two components serve only as determinants of intention, their relationship to behaviour is dependent on the correspondence between intention and behaviour.

Schwartz and Tessler (1972), point out that the model's capacity to predict should decrease as the time interval between measurement of predictors and behaviour increases. (Ajzen & Fishbein, 1973, also recognised this problem). Although various explanations of this limitation have been proposed, the problem is seen by Songer-Hocks (1975) as one of feedback regarding the effects of the behaviour. Attitudes, beliefs and intentions are modified as a consequence of feedback in the behavioural sequence. It therefore seems reasonable that the changes in behaviour follow the changes in attitudes, beliefs and intentions in the time sequence. A second issue suggested by Schwartz and Tessler (1972), concerns the novelty of the behaviour. If a person has had prior experience of the act, his attitudes toward that act are more stable over time and more consistent with behavioural intentions and subsequent behaviour. Engaging in the behaviour over a period of time and experiencing its effects may cause changes in previously held attitudes, beliefs and intentions related to the act. Thus, measures of these predictors with respect to a familiar act may result in more reliable indicators of behaviour. One might expect then that the Fishbein model would provide better prediction of behaviour when the act in question is one with which the actor has had prior experience. Therefore, only bus users who had been using the service for at least one year were used in this research. Changes in attitude to bus services would therefore be directly attributable to changes in the services themselves, rather than to any sort of learning process due to the novelty of the action and feedback process.

In addition, Schwartz and Tessler (1972), point out that since a wide array of other variables could affect the attitude-behaviour relationship (eg. competing attitudes and motives and demographic characteristics), the model's selective focus is not sufficient. Because the number of potentially important 'other' variables is almost infinite, this approach confronts researchers with the task of attempting to anticipate and independently assess the full range of variables that might disrupt attitude-behaviour correspondence. This has been recognised in this research and demographic data were collected, although one of the limitations of the model may prove to be the omission of other important variables.

Fishbein's model has been used in a variety of areas, from family planning decisions (Davidson and Jaccard 1975) to toothpaste preferences (Wilson, Matthews and Harvey 1975). Although the model has been found to perform well in the prediction of behaviour, evidence to support its construct validity has been very limited (Miniard and Cohen, 1979, 1981; Warshaw 1980). The model has been used primarily to provide explanations about why people do or do not perform particular behaviours and to suggest ways of changing that behaviour (Ajzen and Fishbein 1980; Lutz 1975). Other researchers who have examined the model's validity, with very few exceptions (Bagozzi 1981b; Bentler and Speckart 1979, 1981), used single measures of the proposed antecedents of intentions (Ajzen and Fishbein 1970; Miniard and Cohen 1979; Warshaw 1980). Single measures do not permit an adequate assessment of the validity of the model because they lack generality and correspondence to the

theoretical constructs used (Bentler and Speckart 1979, 1981; Cook and Campbell 1976).

The preceding arguments concerning the validity and operation of the Fishbein Model illustrate how complex even the seemingly most simple attitudinal model can become in different contexts. Each method of attitude measurement stresses different requirements, and all are hence open to criticism. Several of the other ratings procedures force respondents to make a response even if the attribute is irrelevant to them. The model developed by Fishbein eliminates this problem. The Fishbein Expectancy Value Model only uses beliefs that are salient, or important, to the individual. Many of the so called attitudinal studies cannot be said to be truly attitudinal by nature, in that they are simply concerned with the ranking and scaling of the importance of attributes. It is because of the drawbacks associated with other methods and the advantages of the Fishbein Expectancy Value Model that it has been the chosen tool for this research. To summarise these are given as;

- i) other approaches merely rank or scale the importance of attributes
- ii) other methods force the individual to make responses to irrelevant attitudes and beliefs
- iii) the model has been shown to perform well in a variety of situations
- iv) the model is sufficiently flexible to permit the inclusion of demographic/socio-economic factors

5.4.3 Applicability to Transportation Research

Fishbein's theory was developed to overcome the failure of other methods of attitudinal research to establish a strong relationship between attitude and behaviour. This was achieved by limiting the modelling to specific single acts. The main emphasis of the theory is directed to attitudes, beliefs and the determinants of their formation and change. Therefore, the theory is concerned mainly with one attitude object and with a special course of action. It is assumed that the individual has volitional control and is not restricted by external effects, for example lack of ability, in exhibiting the behaviour under consideration. In reality the use of transport modes is restricted by things such as car availability. The theory was originally formulated to explain individual behaviour, therefore it implicitly assumes individual independence. Within the model the use of a travel mode is explained exclusively with subjective variables. The corresponding objective conditions are not analysed but the potential for their inclusion does exist.

Although a great deal of this research focuses on attitudes, attitudinal theory as a theoretical base is not sufficient for explaining modal choice. It provides no assumptions on the perception of the attributes of the transport mode, and no assumptions for the actual decision process. There is the assumption of adding individual attributes of a transport mode into an overall 'attitude'. This assumption contradicts psychological theory which puts forward that perception and memory combine to specific

configurations rather than being separated in single elements. So there are many more features which determine behaviour. However, attitudinal theory may provide an essential aid to understanding modal choice and the determinants of travel behaviour. If travel behaviour is influenced by factors such as income and car availability then simply observing behaviour is not an adequate measure of the level of satisfaction with a particular mode. Over time attitude will feed through to behaviour, but how this process works, and the time lag involved is uncertain. Whatever the drawbacks of psychological research it is perhaps the only real means of investigating whether a passenger is satisfied with a particular travel mode.

In the context of transport research, Thomas (1977) criticized attribute-importance approaches because of the way in which attributes of an object are specified by the researcher and passively evaluated by the respondents. Fishbein's conceptual framework is concerned instead with individual beliefs about the consequences of using each alternative. The emphasis switches from mode image to value in use, so respondents are not just assessing the vague concept of 'bus services' they are actually expressing how they perceive using their particular service for their particular purpose. Loosely structured in-depth interview sessions establish the consequences that would be anticipated in the actual use of a particular mode.

The Fishbein model was used by Thomas (1975), in a study of attitudes to bus services by women shoppers in Brentwood. A sample of 203 women was used, selected on the basis of mode use and the alternatives available for shopping trips to the local town: women who used the bus and whose alternative was to walk or to rely on the few local shops, women who had these options but were regularly (at least once a fortnight) driven as a passenger in a car to a shop, and women who drove themselves by car to shop. The first two groups represented approximately normal distributions of socio-economic group and age, but the third group was skewed in favour of higher socio-economic group and younger women. The aim was to examine the content and stability of the belief system and to test the performance of the model when applied to the transport context. Interviews with 30 women were conducted to establish relevant attribute beliefs. The survey consisted of interviews during which,

- 1) trip and shopping patterns were established and demographic data collected

- ii) the procedure for the elicitation of salient (relevant) beliefs were repeated but the responses were coded using the modal salient set (this means that the beliefs were coded according to a prescribed framework, based on a small sample of responses, rather than individually coded) and the order of elicitation noted

- iii) self completion booklets were used to measure overall attitudes toward the two travel acts.

The actual beliefs stated about using or not using the bus reflected the options each woman perceived as relevant to her. The belief

systems were found to be rational in that women perceived accurately the likely consequences of using the bus service both in the light of the expectancies they held about the service and in the context of the alternative modes available to them. Significant correlations (R^2 above 0.500) were observed between overall attitude toward use of a travel mode and an estimate of attitude based on the products of evaluation and belief strength. It is suggested that in routine travel behaviour attitude may be more influenced by behavioural commitment (a feedback loop from behaviour to attitude) than in some other areas, this obviously deserves a fuller investigation. The monitoring of salient beliefs, their content, strength and associated evaluations, following minor changes in service levels of buses showed predictable changes in belief structure, and demonstrated the sensitivity of the methodology.

However, one major criticism has been levelled at Thomas's methodology, namely that a sample of salient beliefs were used, from only 30 of the total population of 203 respondents. One of the main advantages of Fishbein's theory is that it uses individual salient beliefs, specific to the individual, the method used by Thomas eliminates this and introduces the problem of irrelevant beliefs being used. (Towriss, 1984)

Cook (1982), used the Fishbein model successfully in an investigation of modal choice of rail and non rail users between Exmouth and Exeter. Unlike Thomas, Cook used individually elicited salient beliefs. In depth attitude surveys were conducted of

frequent rail and non rail travellers from Exmouth to Exeter, in order to ascertain what factors determined the respondents' modal choice decision. The model performed well in the prediction of specific travel behaviour, positive correlations were found between the belief component and the independent attitude measure (0.587, 0.532 and 0.511 for bus, rail and car modes respectively for work journeys), and a strong link was found between beliefs, attitude, behavioural intention and actual behaviour (correlations between behaviour and behavioural intention of 0.815, 0.612 and 0.782 were found for bus, rail and car respectively, for work journeys).

The biggest drawback of the use of expectancy value models is that the use of modal salient beliefs (beliefs relevant to a particular transport mode for a specific purpose) does not permit the grouping of individuals on the basis of similar beliefs, or an examination of how beliefs vary with socio-economic or demographic characteristics. This however could be possible using a technique such as cluster analysis, and could provide a useful extension of the applicability of the model. Many users of expectancy value models (eg. Thomas 1975), have also adopted a common set of individuals, or groups in the normative component of the model. This practice suffers from the same weakness as the use of modal salient beliefs, in that individuals may be asked to respond to normative beliefs which to them are not important. An alternative form of expectancy value model is one which uses individual beliefs instead of a common belief set, such as the method used by Cook (1982). For each of the behaviours that are to be investigated, the individual's beliefs

about that performance of that behaviour are elicited in a free response format. The individual's responses are recorded item by item. These belief items are then read back to the individual, whereupon they are scaled for their evaluative aspects and belief strength, using simple bipolar scales. Attitudes to the behaviours are measured together with subjective normative beliefs, and intentions to perform specific behaviours. The most attractive aspect of using individual salient beliefs is that their use facilitates an examination of how, for example, beliefs about buying a particular product, or using a particular service vary across the population. The researcher is freed from the constraints on disaggregation arising from the use of modal salient beliefs, and is allowed much greater flexibility in the use of the model (Cook 1982).

Although Thomas (1975), monitored beliefs and attitudes following a change in bus service frequency, this was only performed in a simple 'one off' before and after study. The stability of these beliefs and attitudes over time was not considered, the approach cannot therefore be considered truly dynamic (Towriss 1984). An important aspect of attitudinal change is how beliefs alter initially, as a result of service changes, and how stable they are in the long term, this has implications for the adaptation of travel behaviour and is an important element in predicting the longer term effects of changes in service frequencies.

Previous transport research into attitudes and beliefs by Cook (1982) and Thomas (1975) has successfully utilised the Fishbein Expectancy Value Model and shown the proven reliability of this model. For this reason and the advantages it possesses over other attitudinal models, it was selected in this case. Previous use of the model has concentrated on an analysis of attitudes and beliefs to modal choice in a relatively stable environment, it is the intention to extend the applicability of the model, and to examine changing beliefs following a period of instability and uncertainty. The beliefs and attitudes of bus users, and the relationship of these beliefs and attitudes to objective conditions, should assist in the evaluation of whether deregulation of stage carriage bus services has been successful in terms of passenger satisfaction. Previous research in transport using the Fishbein model has already established that a strong link between behavioural intention and behaviour exists and that behavioural intention is a direct function of attitude, if the model is found to perform well in this instance then it should be possible to predict behavioural changes arising from changes in attitude.

5.4.4 The Choice of the Fishbein Model

It was decided that a system of questioning be used which would allow the respondent to only state beliefs and attitudes which were important to him/her. One of the advantages of the Fishbein Model is that this is precisely what it does. In addition, the Fishbein Model also permits the respondent to state both positive and negative

beliefs, and provides a measure of the importance of each belief. For these reasons it was selected as a basis for the panel surveys. The two postal surveys, conducted before deregulation and about 3 months after deregulation, used a system of questioning which tended to impose the views of what the investigator considered relevant. Respondents were asked to rank a list of stated attributes in order of importance and to rate them on a scale from 'very good' to 'very bad'. Closed attribute sets make no allowances for the inclusion of other attributes which the respondent may consider equally important. Often, as in this instance, the scales are derived from previously published work. Although the advantage is that there is an empirical basis for using the attributes, it is often the case that they originate from different modes, samples of the population, and geographic areas. Using this type of format has advantages of simplicity when conducting a large scale survey, and was consistent over the two surveys in that the same questions were included on both occasions, so providing a useful indication of changing attitudes to the attributes stated. However, the disadvantage is that important omissions can be made, and respondents may be required to make judgements on attributes which may in fact have little importance. Although the latter point can be detected from the ranking procedure, it then involves the investigator in decisions as to whether to weight responses according to the importance of them to the individual. Therefore, it was felt that the three panel surveys were needed to investigate these points more closely.

CHAPTER 6

Methodology

It has been hypothesised that deregulation will result in changes in the supply of bus services, which will in turn cause a change in perceptions and attitudes, and, in the longer term, a change in behaviour. The Fishbein model has been successfully used in a wide range of situations to identify beliefs, attitudes and to predict consumer behaviour. The aim of the empirical work is to monitor attitudes to the bus service as changes take place in their supply. The initial postal surveys, one before and one after deregulation was introduced, were fairly simplistic in the measures employed. The type of survey, a large scale self completion form, necessitated that the format was easily understood and reasonably short. Therefore the aim of these two surveys was to investigate whether any changes had taken place in the overall perceptions of bus users. It was clear from the results obtained that changes had occurred, so the empirical work continued with in-depth panel surveys using the Fishbein model as a basis for the methodology. This enabled a more complex investigation of the changes in perceptions. The aim was to focus in at a detailed level on the attitudes and beliefs about the use of public transport. This was used to then examine the way that attitudes concerning public transport use generally interacted with beliefs about the specific service used. The sample was of a smaller

size because much more detail was required and respondents were interviewed on three different occasions.

The techniques employed by Fishbein allow the interviewer to obtain a wide range of responses, and permitted a comparison between the best possible situation and the situation which exists. There follows a discussion of the way in which the empirical work was operationalised, and a description of the questionnaires, copies of which are contained in appendices F, G, H and I.

6.1 Postal Surveys: Pre and Post- Deregulation (January 1986, February 1987)

As discussed in chapter 5, the measurement of attitudes is not easy because the concept of 'attitude' is an abstract one. 'Attitude' is a construct, hence it is a tool that serves the need in humans to see order and consistency in what people say, think and do, so that given certain behaviours, predictions can be made about future behaviours (Henerson, Morris and Fitz-Gibbon, 1987). Therefore, an attitude is not something that can be measured in the same way as physical attributes such as heart beat. Attitudes can only be inferred from a person's words and actions.

The initial two surveys were in the form of postal, self-completion questionnaires. Postal surveys are frequently criticised on the grounds that those people who respond to them are not representative of the general population, this is often reflected in poor response

rates and skewness in favour of particular age or social class groups among the respondents. However, despite the drawbacks there are a number of very valid arguments in favour of postal surveys. Firstly, financial resources were very limited and postal surveys are considerably cheaper to administer than personal interview surveys. Secondly, postal surveys can be sent to all respondents virtually simultaneously, and most replies received within a week or two, while interviews are generally performed sequentially and take much longer. Thirdly, the questionnaire can be completed at the respondent's convenience, and hence receive more careful attention. Fourthly, postal surveys have the advantage of greater anonymity. This is especially important when sensitive or personal questions are asked. Fifthly, each respondent is exposed to exactly the same wording which may not be the case in an interview session. This advantage is countered by the problem that some respondents will have a different understanding of the same wording. Sixthly, the respondent cannot be biased by the interviewer. Interviewer bias can occur via voice inflection or by them telling the respondent their own personal opinion. Finally, the postal technique makes respondents in widely scattered geographical areas more accessible. (Bailey, 1978).

Postal surveys, therefore, possess many advantages over other social survey methods especially for the type of research which was being conducted. The aim of these surveys was to obtain a large coverage of householders cheaply and effectively, therefore the postal method seemed ideal for the initial part of the study.

It was felt that although coverage of the whole of the Plymouth area would be desirable, it was necessary to limit the research because of time and financial constraints, therefore four geographical areas were selected. These areas were chosen because of the different distance, socio-economic characteristics, and bus service provision that each received. An added advantage of concentrating on only four areas was that it was easier to monitor service changes for each area. (These areas have been discussed in detail in chapter 2)

Sampling methods can be classified into those that yield probability samples and those that yield non-probability samples. In the former the probability of selection of each respondent is known. In the latter the probability of selection is not known. In a random sample each person in a given population has an equal probability of selection. All that is required to conduct a random sample is to select persons without showing bias for any personal characteristics. Random sampling has the advantage of cancelling out biases and providing a statistical means for estimating sampling errors. However, for large samples and large sampling frames, random sampling becomes very time consuming unless computerised. Therefore, rather than choose randomly from a list, it is possible to assume that the units are randomly listed in the sampling frame and then choose $1/k$ th of them (with k being any constant). A $1/k$ th systematic sample is a sample constructed by selecting every k th element in the sampling frame (Bailey, 1978). For example, from a list of names and addresses every 10th name could be selected. Systematic sampling can be viewed as a practical approximation to random sampling but is

much easier to administer. Therefore in the first two postal surveys this method of sampling was utilised. Householders were selected from the most recent electoral register available by systematic sampling.

Survey work commenced in January 1986 with a pilot survey in order that some idea of the response rates and types of response could be obtained. The pilot survey consisted of 100 surveys being sent out to the four selected geographical areas (25 to each). Seven forms were returned from area 1, three from area 2, thirteen from area 3 and twelve from area four. Based on these response rates 1600 surveys were sent out in February 1986, 360 to Glenholt, 830 to Southway, 200 to Plympton, and 210 to Compton, with the aim of receiving at least one hundred replies from each area. This method was abandoned in the second survey because of the difficulty of predicting response rates, and four hundred surveys were sent to each area.

The aim of the surveys was to compare changes in attitudes to bus services for identifiable population groups, segmented by frequency and purpose of use, age occupation, sex, geographical location and car ownership. The second survey was of a similar format to the first one in order that the results be strictly comparable. However, a different sample was used due to a general unwillingness expressed in the first survey to participate further. This unwillingness had unfortunately not been picked up on in the pilot survey.

The surveys included questions on details such as ticket type and time of travel, this information was useful in that it provided a comparison with data collected annually from 1983 to 1986 from student on bus surveys, and ensured that a representative sample was selected, but was not useful in itself for the purpose of this research. These questions were eliminated in the second survey as it was felt that the questionnaire was rather lengthy and this might be affecting response rates. Respondents were also asked for information on their age group, sex, occupation, journey purpose, frequency of bus use, ticket type, time periods of bus travel, normal destination, bus route. They were asked to rank the most important characteristics of a good bus service from a list consisting of:

- value for money
- no smoking
- frequent service
- door to door service
- limited stop service
- plenty of room
- circular routes around the city centre
- good timetables
- punctuality
- friendliness of staff

This list was compiled on the basis of previous transport research, for example by Dobson & Tischer, 1981; Louviere & Norman, 1977 and Recker and Golob, 1976. Respondents were asked to rank these on a

scale ranging from 1 to 10, one indicating extremely important, ten being very unimportant or irrelevant.

In the previous list respondents were asked to rank the most important aspects of a good bus service. They were next asked how they rated the service they used. It was felt that asking respondents to rank the importance of attributes of a good bus service and asking them to rate exactly the same list of attributes about their own service may prove confusing and may cause some overlap of perception. The aim was for the respondent to perceive two completely separate types of service. The list of 'attributes of a good service' and the list of attributes to rank about the service they used therefore differed slightly in wording and content. However, the wording was consistent over the two postal surveys to ensure strict comparison over time. Respondents were thus asked to rate the following aspects about the bus service they received on a bipolar scale from +3 very good to -3 very bad:

- current frequencies
- current fare levels
- punctuality
- luggage space
- bus stop siting
- access to timetabling information
- ease of understanding timetabling information
- journey time
- convenience of route
- timing of services

Frequency of service was included because it was predicted that deregulation would result in an increase in services on profitable routes and times of day, and a decrease in unprofitable services. Similarly, the relaxation over fare setting could result in overall fare changes or differential fare structures. If significant competition arose, then a price war may result. Punctuality has been consistently shown to be an important aspect of bus service perception (for example, Louviere and Norman, 1977), and may reflect changes in operating efficiency. The luggage space provided by the increasingly popular minibuses was much less than that on the traditional double deckers. This may be particularly important for groups of users such as mothers with pushchairs and shoppers with heavy loads and the very popular 'shopping trolley'. Bus-stop siting was included in anticipation of the introduction of 'hail-and-ride' services. Questions on timetabling information were included because prior to deregulation all bus services in Plymouth were published in a single timetable. The responsibility for providing timetabling information was then passed to individual operators, and this could result in some confusion especially if an area is served by services by two different operators. One of the advantages put forward by proponents of minibus services is that they can achieve shorter journey times, although the increase in numbers of buses may increase journey times through increased congestion. 'Convenience of route' was included because the need for low cost, profitable operation could result in some of the more circuitous routes serving

some remote estates being cut. The highly used 'corridor routes' into the city centre may receive increased bus frequencies at the expense of these routes. If significant competition arose following deregulation then operators may indulge in the practice of timing their services to run a couple of minutes before their competitors'. In addition, increased frequency can result in 'bunching' at bus stops, the source of the popular belief that 'you wait ages for a bus and then three arrive at once'. Therefore, the timing of services was considered potentially important. One important omission from the above list was 'cleanliness'. Both postal surveys took place during the winter months and it was assumed that cleanliness would take on greater importance during poor weather, therefore it was deliberately omitted in order that a 'seasonal bias' would not be introduced. Perhaps a more important omission was 'comfort'. The significance of 'comfort' of minibus services in respondents' perceptions, as revealed in the following three panel surveys was not anticipated.

The first postal survey took place before deregulation came into effect, all the following surveys took place afterwards, to summarise the timing of the research;

January 1986 - survey 1, postal

October 26th 1986 - deregulation introduced

February 1987 - survey 2, postal

July 1987 - fares increase Plymouth Citybus

July 1987 - panel survey 1

November 1987 - panel survey 2

January 1988 - bus fare structure altered

March 1988 - service changes, bus war in Plympton

April 1988 - panel survey 3

6.2 Panel Surveys

The postal surveys yielded a fairly crude measure of attitude change and it was felt that a more detailed approach was then required to provide a more accurate picture of changing attitudes and beliefs.

A panel survey is one in which similar measurements are made on the same sample at different points in time. Most current attitudes can be measured reliably only at the time of the survey (Whitley, 1985). It is therefore not a reliable technique to ask respondents to consider retrospectively what attitudes they held in the past. Models of attitude change therefore require repeated measures of the

attitudes, obtainable only via panel surveys. In this case a sample of two hundred respondents were selected, who were interviewed three times during the course of about ten months. Repeated interviewing reduces the effects of memory loss, but they have the disadvantage of incurring a high accumulative rate of non-response.

Each of the four areas used in previous surveys was sub-divided, so, for example, Plympton was divided into ten smaller zones. A quota of five respondents per zone was then set and the two interviewers were instructed to spread these five respondents as evenly as possible through the zone. This ensured that the respondents were not all located in the same street. The surveys were conducted after six o'clock in the evening and at week-ends to increase the likelihood of respondents being in, and to include people who work.

A series of three door to door interviews were conducted on an initial panel sample of 200 people, 50 from each of the four study areas used in previous survey work. These interviews took place in July 1987, November 1987 and April 1988. The final sample consisted of 87 respondents, who had been questioned on all three occasions. The method used was a 'door to door' questionnaire, which has the advantage of being able to gain highly detailed information, although the method is both expensive and time consuming. For this reason the sample was limited to 200 people. In the second and third surveys if a response had not been gained after three visits, then a postal survey was left.

Respondents were asked what the main purpose of their bus journeys were and the frequency of use. After the initial round of surveying it was decided to eliminate those respondents under 16, and those who used the bus for anything other than work or shopping, this was because the small numbers of responses obtained for these categories would not yield any statistically reliable results.

Respondents were then asked to consider what qualities were most important about a good bus service. They were permitted to state as many attributes as they wished, the only prompting being 'anything else you can think of' when they appeared to have finished, therefore arguably the first two or three attributes in most cases should receive the most attention.

The interviewer then asked the respondents to consider the bus service they used, and to state how they would rate it on a scale from +3 very good to -3 very bad; whether using the bus for their particular purpose was from +3 wise to -3 foolish; and whether they found it from +3 pleasant to -3 unpleasant. This section refers to the independent attitude component A_o , this should correlate closely with the findings from the next section concerning beliefs about the bus service. Thus the result from this section was three scores ranging from -3 to +3, these were summed to obtain an overall evaluation. This methodology is based on that used by Fishbein (1973) and Cook (1981), as described in detail in chapter 5.

Still asking the respondent to think about the service they used, they were then asked what they 'thought about it' or what 'beliefs they held about it'. After each response the interviewer would ask 'is that a good thing or a bad thing', and ask the respondent to judge how good or bad on a bipolar scale from -3 to +3, then the respondent was asked 'how likely is this to happen' and to again rank the likelihood on a bipolar -3 to +3 scale. So, for example if the response to the question 'now think about the bus service you use, what do you think about it, what beliefs do you hold about it?' was 'its sometimes crowded', then the rest of the interview might proceed as follows;

interviewer; would you say that being crowded was a good thing or a bad thing?

respondent; obviously bad.

interviewer; could you rank how bad on this scale, -3 indicates very bad, -2 moderately bad, -1 a bit bad, 0 neither good nor bad.

respondent; it is rather annoying -2.

interviewer; how likely do you think it is that the bus is going to be crowded? Would you try to judge on this scale, +3 indicates that its likely to always be crowded, 0 would be about 50% of the time and -3 never crowded. So if it was for example, crowded once a week

and you caught the bus five days a week then you'd give it -2. On the other hand, if its always crowded, +3.

respondent; I always catch it at peak times, so its always crowded, +3.

This belief is then quantified by multiplying the belief strength component by the belief importance component, to obtain -6 ($-2 \times +3$). If on the other hand the respondent had not used the bus only at peak times, and thus it was only crowded occasionally, s/he may have given a score of -2 rather than +3, this would result in an overall positive belief score of +4 (-2×-2). The respondents could also state as many beliefs as they wished. As stated above the result obtained in this section should correlate closely with the independent attitude evaluation, so persons with a strongly positive evaluation would also tend to hold positive beliefs.

In order to ascertain whether the respondents' behaviour was affected by anyone else's opinions, they were then asked "does anyone else's opinion influence your choice of transport, and if so how likely is it that this person (or persons) would think that you should use the bus in the next month". The likelihood of the respondent travelling by bus in the next month was then established, again using a bipolar scale from -3 very unlikely, to +3, very likely. This refers to the normative belief/motivation to comply component referred to by Fishbein. This component, it is suggested, moderates the attitude component in the prediction of behaviour.

Therefore, for example, even if a person holds a strongly positive attitude to an object or action s/he may not perform a particular behaviour because of the views of other people.

The next set of questions established the bus route used, car ownership, age, sex, occupation and in the last two surveys, whether the respondents used the bus more or less than before deregulation, and whether they considered the service better or worse. ('if you think back to about a year or so ago, before all these minibuses arrived, would you say that the service is now better, about the same or worse? Do you think that you use it more, about the same or less? Why?') This phrase was used because some bus users may be unaware of what the word 'deregulation' means, but they would be aware of changes in bus services.

Having discussed the Fishbein model and the methodology used, we move on in the next chapter to discuss the results of the empirical work and the implications of the findings in the light of what is already known about the results of deregulation in Plymouth.

CHAPTER 7

7.1.1 Postal Surveys: Analysis of Results

The postal surveys were conducted in early 1986 and 1987, deregulation of bus services came into effect on 26th October 1986.

TABLE 7.1 Response rates for two surveys

	pilot	1986	1987
Area 1	28%	51%	31%
Area 2	12%	24%	31%
Area 3	52%	38%	37%
Area 4	48%	39%	37%
Total	35%	38%	34%

It can be seen from the range of the above response rates how difficult it is to predict response rates for different areas. It was found in both surveys that the largest group of respondents was made up of housewives and retired persons, (classed as economically inactive for census purposes) the distribution of other occupations varied slightly over the two surveys and between geographical areas.

(see appendix O)

The largest single age group in both surveys was 26-45, there was a skew towards the younger age group in the second survey.

TABLE 7.2 Distribution of age groups:

	survey 1		survey 2	
16-25	16	4.3%	138	17.2%
26-45	173	46.8%	287	35.7%
46-65	132	35.7%	231	28.8%
over 65	49	13.2%	99	12.3%
	370		803	

7.1.2 The Attitude Component

The attitude component referred to the section on the questionnaire when respondents were asked to rate a list of attributes about the bus service they used (for example, rating current fare levels on the scale from -3 to +3). The respondents used the bipolar scale to quantify their attitudes, however, the coding of responses was from 1 to 7. This coding was adopted in order to simplify the task of entering the data into the computer and does not affect the significance of the final result. The number '4' corresponds to a rating of '0' on the bipolar scale, anything above this shows a favourable attitude, below an unfavourable one. The mean was used in the analysis to indicate overall attitude, although it is recognised that in certain circumstances the median may be a more appropriate tool. The median has the advantage of not being affected by extreme skewness, however, this did not seem to be a problem in this case.

Table 7.3 shows the differences between the two surveys in how highly each attribute of the bus service was rated.

TABLE 7.3 T-Test Comparing Distribution of Attitude Scores for the Two Surveys

attribute	mean		T value	significance
	Survey 1	Survey 2		
'attitude'	50.55	53.08	-3.25	0.001 ^a
fares	3.12	3.60	-4.95	0.000 ^a
frequency	3.94	4.62	-6.38	0.000 ^a
timing	4.03	4.47	-4.26	0.000 ^a
convenience	4.69	4.95	-2.34	0.020 ^b
journey time	4.40	5.16	-7.35	0.000 ^a
punctuality	4.61	4.29	3.46	0.001 ^a
bus stop siting	4.90	5.08	-1.83	0.067 ^c
comfort	4.54	4.67	-1.39	0.164
access to				
timetables	4.36	4.40	-0.30	0.761
understanding				
of timetables	4.45	4.09	3.42	0.001 ^a
friendliness	4.22	4.41	-1.95	0.052 ^c
luggage space	3.44	3.55	-1.22	0.222

^a indicates that the result is significant at the 1% level (two tailed test), ^b indicates significance at the 5% level and ^c the 10% level. This notation will continue throughout the following tables.

So, for example, 'frequency of service' was ranked better overall in the second survey, with a mean score of 4.62 (compared with 3.94 in the first survey). This difference was significant at the 1% level, with a T value of -6.38. On the other hand, 'good timetables' was not rated significantly differently in the second survey as the significance value (0.761) indicates. An explanation of T-tests and significance values is contained in appendix J , Statistical Methods Used.

Table 7.4 shows the differences between the two surveys in the rankings of the important components of a good bus service.

A comparison of how highly respondents rated the bus service they used and how important various attributes of a good service were should reveal how far the service received matches up to the perceived 'ideal' service.

From Table 7.3, the results of the T-Tests to compare the difference in the distribution of scores between survey one and survey two showed that there was a significant increase in overall attitude rating (that is the scores given to current fares, frequencies, timing etc. summed). Therefore it could be assumed that that there was a general overall perceived improvement in service provision. In the second survey fare levels were rated, overall significantly lower than in the first survey, this may be consistent with the results obtained for the importance component for value for money, which was ranked as significantly more important in the second

survey than in the first (see table 7.4). The greatest differences occurred in frequency and journey time, and indeed, the most significant change in bus services between the two time periods was the introduction of high frequency minibuses, with the reduced journey times associated with them. Thus the survey findings do seem to be a fairly accurate reflection of changing bus services and attitudes. In addition, frequency levels were rated significantly lower in the second survey (table 7.3). However, high frequency was not ranked as a significantly more important attribute of a good bus service. (table 7.4).

TABLE 7.4 Comparison of Importance of Attributes of a 'Good Bus Service' over the Two Surveys

Attribute	Mean survey 1	Mean survey 2	T value	significance
value for money	2.97	3.30	-2.54	0.011 ^b
high frequency	3.74	3.70	0.29	0.774
no smoking	4.91	4.59	2.14	0.033 ^b
door to door service	5.18	2.83	15.67	0.000 ^a
limited stop service	5.71	4.78	5.97	0.000 ^a
plenty of room	5.76	5.97	-1.50	0.133
punctuality	2.80	5.06	-18.18	0.000 ^a
friendly staff	5.27	2.75	19.06	0.000 ^a
good time- tables	4.95	4.42	3.53	0.000 ^a
circular routes	6.03	4.21	10.55	0.000 ^a

Attributes are ranked from 1 to 10, 1 denoted very important, 10 unimportant

Bus stop siting was also rated significantly lower in the second survey. Punctuality was rated as significantly better in the second survey, and also given less importance, this is interesting as punctuality, along with fares and frequency, is consistently one of the most important aspects of bus services.

7.1.3 Importance of Attributes of a 'Good' Bus Service

Although we have already briefly discussed the important attributes of a good service in comparison to attitudes to the bus service used this section examines in more detail.

As stated respondents were asked to rank the importance of a list of attributes of a 'good' bus service. The rating '1' would indicate that the attribute was a very important component of a good bus service, '10' would indicate very low importance or irrelevance.

In order to simplify the quantification of the results we took the percentage of respondents giving the ranking 1,2 or 3 to the attributes as an indication of importance. The results are shown in table 7.5.

TABLE 7.5 Percentage of Respondents giving the Ranking 1,2 or 3 to Attributes of a Good Bus Service.

	SURVEY 1		SURVEY 2	
	no.	% response	no.	% response
no smoking	120	31.2%	437	51.2%
high frequency	267	54.9%	414	62.6%
value for money	337	67.9%	531	69.9%
door to door	146	32.3%	252	35.1%
limited stops	100	22.8%	119	16.6%
plenty room	92	19.2%	199	29.9%
punctuality	364	72.5%	560	73.9%
friendly staff	119	24.7%	308	39.2%
good timetables	158	32.6%	352	45.4%
circular routes	62	18.1%	27	3.5%

It can be seen from table 7.5 that 72.5% of respondents in the first postal survey ranked punctuality as very important (giving it the score either 1,2 or 3). This is somewhat conflicting with the result shown in table 7.4, that the mean ranking was 5.06 in the second survey. This indicates that there were a lot of respondents who ranked punctuality as very important and a lot who ranked it as very unimportant. The 26% who did not give it the ranking 1,2 or 3 ranked it as very unimportant, these were people who lived in areas which received the improved high frequency minibus services, mainly in

Compton and Plympton. The high frequency presumably meant that specific times of arrival were not so important. Value for money was judged to be very important by 67.9% of respondents, and high frequency by 54.9%. The three least important factors appear to be circular routes, ranked as very important by 18.1%, plenty of room, 19.2%, and limited stops, 22.8%. In the second survey punctuality, value for money and were still rated as important on more occasions than any of the other named attributes. One interesting factor is that no smoking was named as important by over 50% of respondents, indicating increasing health awareness. This also shows that the method used is a good indicator of changing attitudes. There has been a generally increased awareness about the dangers of smoking and if we examine the response rate for 'no smoking' (table 7.6), it received the highest response rate.

One of the problems with this section was that it was not certain whether non-response indicated unimportance. If it did then this could change the picture somewhat. From table 7.6, the lower response rates in the second survey may be an indication that respondents were generally satisfied with their bus services and this affected their perceptions of what factors should constitute a good bus service. If this is so then it seems that bus users are not very objective in their assessment of an ideal service, it is affected by their experiences of bus services personally. Thus if a person receives a high frequency service, then high frequency will be given less importance in his/her assessment of what constitutes a good service.

TABLE 7.6 Response Rates for each Attribute of a 'Good Bus Service'

Attribute	SURVEY 1		SURVEY 2	
	response rate	response rate	response rate	response rate
no smoking	385 (73%)		853 (72%)	
high frequency	486 (92%)		662 (55%)	
value for money	496 (94%)		759 (63%)	
door to door service	452 (86%)		786 (66%)	
limited stop service	439 (83%)		718 (60%)	
plenty of room	478 (91%)		664 (55%)	
punctuality	502 (95%)		758 (63%)	
friendly staff	482 (91%)		785 (66%)	
good timetables	485 (92%)		776 (65%)	
circular routes	343 (65%)		767 (64%)	

Since each of the four geographical areas received different bus services, and possessed different socio-economic characteristics, it is useful to examine each area individually. These differences have already been discussed in detail in chapter 2, section 2.3. Briefly to recap, Glenholt is about six miles from the city centre, with few local facilities, a poor bus service and high levels of owner occupied housing. Southway is also about six miles from the city centre, with some local amenities, a high frequency bus service and high levels of council house occupation. Plympton is five miles from the city centre, almost a separate town in itself with good local

amenities and a fairly frequent bus service, moderate levels of owner occupied housing, and high car ownership levels. Compton is only one mile from the city centre, with fairly good facilities, a frequent bus service, high levels of retired persons and low levels of car ownership.

7.1.4 Differences between areas

When the scores obtained for the perception of the various aspects of the current bus service were analysed, it was found that in the first survey there was no overall significant difference between areas in the *summed* ratings given. However, convenience of route and luggage space were both rated significantly higher in Glenholt than in Southway, journey time was rated significantly higher in Compton than in Glenholt (better in Compton or worse in Glenholt).

TABLE 7.7 'Attitude' to bus services before and after deregulation for four study areas

area	mean 'attitude'	
	SURVEY 1	SURVEY 2
Glenholt/Estover	49.13	51.26
Southway	50.99	57.44
Plympton	51.43	52.59
Compton/Mannamead	52.41	51.64

In the survey conducted after deregulation greater differences were found between areas. Over all 'attitude' (the scores given to fares, frequencies, timing, convenience of route etc. summed), was significantly higher in Southway than the other 3 areas. None of the attitude components was rated higher in Glenholt than in any other area, therefore it could be deduced that attitudes to bus services following deregulation were lower in Glenholt than in the other 3 three areas. Taking each area separately:

Area 1:Glenholt/ Estover

The Glenholt area includes not only Glenholt itself, but also part of a larger area called Estover. Glenholt itself continued to receive an hourly service, however part of the area received an increased frequency, limited stop service with a more direct route.

In the second survey, when T-tests were performed, frequency of service was rated significantly lower in this area than in Southway, this reflects the difference that actually occurred in service frequencies, Southway having a vastly improved frequency, rather than Glenholt having had any cut in service frequency (see table 7.8). Timing, convenience of route and friendliness of staff were also rated significantly lower in Glenholt than in Southway (or higher in Southway). However, differences occurring between areas could also be due to differences in socio-economic factors existing between the areas. Glenholt and Southway were quite different in their composition of housing type and car ownership rates (see

appendix B and C), which indicated that Glenholt is a generally more affluent area.

TABLE 7.8 Comparison of Attitudes in Glenholt and Southway in the Survey Following Deregulation

Attitude	mean Glenholt	mean Southway	T value	sign.
fares	3.61	3.67	-0.29	0.774
frequency	4.14	5.54	-7.54	0.000 ^a
timing	4.14	5.11	-5.42	0.000 ^a
convenience	4.04	5.52	-7.48	0.000 ^a
journey time	4.56	5.57	-5.24	0.000 ^a
punctuality	4.31	4.71	-2.22	0.027 ^b
bus stop				
siting	4.94	5.40	-2.66	0.008 ^a
comfort	4.74	4.85	-0.64	0.524
access to				
timetables	4.71	4.68	0.15	0.882
understanding				
of timetables	4.17	4.50	-1.66	0.099 ^c
friendliness	4.13	4.68	-3.27	0.001 ^a
luggage space	3.71	3.37	1.94	0.053 ^c

When further T-tests were computed for the results obtained in Glenholt, it was found that the attributes shown in table 7.9 were rated significantly differently over the two surveys. This table shows only the results for which there was a significant difference in attitude score.

TABLE 7.9 T-test results comparing attitude rating in survey 1 and survey 2 for Glenholt

	sign. level	higher/lower in 2nd survey	mean 1st survey	mean 2nd survey
fares	0.007 ^a	higher ('better')	3.112	3.613
journey time	0.043 ^b	"	4.123	4.564
access to timetables	0.007 ^a	"	4.164	4.711

With reference to the importance of attributes of a good service, table 7.10 shows that no smoking, plenty of room and friendly staff were ranked as more important in the second survey. However, these attributes all appear in the middle range of importance (the scale runs from 1 to 10) and the most important attributes such as value for money, punctuality and frequency were not ranked significantly differently over the two surveys. This may indicate that respondents were satisfied with the frequency and fares of their services, so they took on less importance. They may however, not have been satisfied with other aspects, so these took on greater importance.

TABLE 7.10 T-test results comparing attribute rankings in survey 1 and survey 2 for Glenholt

attribute	sign. level	mean 1st survey	mean 2nd survey
no smoking	0.000 ^a	4.881	3.739
plenty room	0.002 ^a	5.831	5.013
friendly staff	0.002 ^a	5.246	4.390

Area 2: Southway

Southway received an increased frequency of service following deregulation, from 20 minutes to 12 minutes, and the introduction of mini-buses (23 seater). Respondents from Southway gave significantly higher ratings over all than in any other area, and no single attitude component was rated significantly lower than in any other area.

TABLE 7.11 T-test results comparing attitude ratings in survey 1 and survey 2 for Southway

	sign. level	higher/lower in 2nd survey	mean 1st survey	mean 2nd survey
fares	0.001 ^a	higher	3.077	3.667
frequencies	0.000 ^a	"	3.980	5.544
timing	0.000 ^a	"	4.081	5.105
convenience	0.004 ^a	"	5.010	5.518
journey time	0.000 ^a	"	4.574	5.573
friendliness	0.002 ^a	"	4.128	4.681
comfort	0.026 ^b	"	4.464	4.853

Therefore the increased frequency of service and change in type and size of vehicle seem to have directly resulted in an improvement in perception of all aspects of the bus service, although only the above list was significant at the 0.05% level. This is an interesting result, as no change took place in fare levels, and yet they were rated higher in the second survey. This may indicate that users perceived the service as offering increased value for money, and that users' attitudes to bus services are composed of a complex mix of different aspects of the service which can not be separated into different components in this way.

The important attributes of a good bus service are shown in table 7.12. The table shows only those attributes which were ranked significantly differently in the second survey than in the first.

TABLE 7.12 T-test results comparing attribute ranking in survey 1 and survey 2 for Southway

<u>attribute</u>	<u>sign. level</u>	<u>mean 1st survey</u>	<u>mean 2nd survey</u>
no smoking	0.000*	4.776	3.597
high frequency	0.006*	3.926	3.210

Table 7.12 indicates that 'no smoking' and 'high frequency' are both ranked significantly more important after deregulation. The 'no smoking' result is consistent with greater health awareness. 'Frequency of service' with respect to the services used by respondents (see table 7.11) was rated significantly better

following deregulation. In addition, as the result in table 7.12 shows, 'high frequency' was also considered more important after deregulation. Thus, if respondents considered their service to be more frequent and for frequency to be more important, then this implies a high level of satisfaction with their service.

Area 3: Plympton

Plympton experienced changes not only in service frequency but also in route, the link between Woodford and Ridgeway being severed (see maps in appendix D). Approximately 50% of daytime services to Plympton were operated using 23 seater minibuses, All evening services utilised minibuses. Confusion over timetables could have resulted from changes in service numbering. The 20/21 route being replaced by the 21/51 service.

Table 7.13 shows the aspects about the bus service used which were rated significantly differently over the two surveys.

TABLE 7.13 T-test results comparing attitude ratings in survey 1 and survey 2 for Plympton

	sign. level	higher/lower in 2nd survey	mean 1st survey	mean 2nd survey
fares	0.013 ^b	higher (better)	3.013	3.585
frequency	0.010 ^a	higher (better)	3.987	4.607
journey time	0.000 ^a	higher (better)	4.237	5.141
punctuality	0.000 ^a	lower (worse)	4.987	4.223
understanding of timetables	0.002 ^a	lower (worse)	4.653	4.443

Further tests showed the following attributes to be ranked as significantly more important in the second survey than in the first, as shown in table 7.14. Interestingly, the only common attribute in the two lists is 'understanding of timetables' (table 7.13) and 'good timetables' (table 7.14). 'Understanding of timetables' was rated lower after deregulation and 'good timetables' were considered more important. Thus, we could conclude that following deregulation respondents in Plympton suffered a perceived worsening of their service with respect to timetabling information. However, four other attributes were rated higher following deregulation. These were fares, frequency, journey time and punctuality, all commonly considered as very important aspects of a good bus service. None of these were ranked as significantly more or less important after deregulation, this may indicate satisfaction with these aspects of the service. Thus, we might conclude that perception of fares, frequency of service, journey time and punctuality improved following deregulation, but timetabling information worsened.

TABLE 7.14 T-test results comparing attribute rankings in survey 1 and survey 2 for Plympton

<u>attribute</u>	<u>sign. level</u>	<u>mean 1st survey</u>	<u>mean 2nd survey</u>
no smoking	0.000*	5.357	3.479
plenty room	0.001*	6.087	5.014
friendly staff	0.000*	5.787	4.333
good timetables	0.001*	5.313	4.119

Area 4: Compton

Compton is situated on one of the main corridor routes into Plymouth, it has therefore experienced improvements in service frequencies, mostly using minibuses. However, some of the links from Alexandra Rd to outlying areas have been cut. Congestion at peak times has also been a problem. The C1 route, which operates on a route around the residential part of Compton, was introduced initially as an experiment in 1985 and it proved to be very popular. Despite the fact that it was unprofitable public pressure demanded that it continue. One aspect of the C1 service that the, mostly elderly, passengers particularly liked was that the same three drivers operated the service. This created a friendly and personal service. The C1 service has experienced a decrease in frequency and no longer uses the same drivers throughout the day. Frequencies on the C1 route reduced from 12 minutes to 20 minutes, and then to a half hourly service.

TABLE 7.15 T-test comparing attitude ratings in survey 1 and survey 2 for Compton

	sign. level	higher/lower in 2nd survey	mean 1st survey	mean 2nd survey
punctuality	0.002*	lower (worse)	4.595	3.953
understanding of timetables	0.001*	lower (worse)	4.641	3.838

When T-tests were computed it was found that there was no significant difference in ratings given to frequency of service or convenience over the two surveys, which is surprising since most services passing through this area have been subject to significant service improvements. From table 7.15 it can be seen that two attributes were rated lower (worse) in the survey after deregulation. There were no significantly higher ratings given in the second survey, therefore we can conclude that respondents in this area perceived their services as having deteriorated since deregulation.

An examination of Table 7.16 shows that the only attributes rated as more important in the second survey were friendly staff and good timetables. If the respondents were dissatisfied to any great extent then there would be common attributes in both lists. As with Plympton, the only common attribute is that referring to timetabling information. Thus, we can only say with any degree of certainty that bus services in Compton were perceived as worsening with respect to

timetabling information. It is not possible to speculate about 'more important' factors such as frequency. This highlights the need for a more in-depth approach.

TABLE 7.16 T-test results comparing attribute rankings in survey 1 and survey 2

<u>attribute</u>	<u>sign. level</u>	<u>mean 1st survey</u>	<u>mean 2nd survey</u>
friendly staff	0.003	5.587	4.619
good timetables	0.005	5.236	4.199

As already stated, one of the aspects of the C1 service that passengers particularly liked was that there was a friendly atmosphere. The change in operating arrangements which meant that this service now had a variety of drivers may have been reflected in the perceived increase in importance of friendliness of staff.

7.1.5 Summary of Results Obtained for all Areas

In summary, it could be concluded that after deregulation there was a definite improvement in perception of the bus service in Southway. Glenholt had a more negative perception, not significantly worse than the first survey overall, but significantly lower than the other areas.

However, when the figures are aggregated for all areas, a different pattern emerges. The results of T-tests for the whole set of results were shown in table 7.7 at the beginning of the chapter.

It was found that overall most aspects of the bus service were rated higher in the survey following deregulation, than in the survey before. However, although this may indicate that there was a more favourable perception of the bus service for most respondents, it is interesting to note that punctuality was one of the factors rated lower following deregulation. This is especially important because punctuality was consistently ranked as the most important aspect of a good bus service in both surveys.

In addition, T-tests showed that the following attributes were ranked as significantly more important in the second survey than in the first; door to door service, punctuality, limited stop service, no smoking, friendly staff, good timetables and circular routes. Only one attribute, value for money was ranked less importantly in the second survey.

7.1.6 Differences between Sexes

In society men generally tend to have the highest levels of car ownership and are more likely to make work rather than shopping journeys. Male bus users would, therefore, be expected to have different expectations and attitudes to bus services. To test this

the data was examined to see whether there were any differences between sexes in the evaluation of services.

In neither survey was sex a significant factor in the difference in attitude rating. However, in the second survey differences did occur between sexes in the importance given to the attributes of a good bus service, Males ranked almost all attributes as more important than females. These attributes were, high frequency, value for money, door to door service, limited stop, plenty of room, friendliness of staff, good timetables and circular routes. It is important however, to note that males tend to use the bus service for work journeys rather than for shopping, the sex factor may therefore combine with the 'purpose' factor, although no significant difference was found when journey purpose alone was considered. Possibly those males who are now retired, and hence only use the bus for shopping, historically always used the bus for work journeys and have retained perceptions from those experiences.

7.1.7 Differences between age groups

Just as experiences shape the attitudes of different sexes, so too will they affect people of different age groups. Older people may have a wider experience of bus services. In addition, different age groups may have different needs. So, for example, retired persons

with more time to spend may place less importance on high frequency services, and more on comfort and mobility.

It was found, in both the pre-deregulation survey and the post deregulation survey, that different age groups had differing patterns of attitude rating, generally the older age groups tended to give significantly higher ratings to all aspects, differences were also obtained between the importance of different factors in a good bus service

TABLE 7.17 Over All Attitude for Different Age Groups

age	mean over all attitude (Σ fares, frequency etc.)	
	<u>survey 1</u>	<u>survey 2</u>
16-25	45	49.79
25-45	48.06	51.92
46-65	51.63	54.32
over 65	55	59.24

When a comparison was made between the oldest and the youngest age groups (over 65 and 16-25) it was found that almost all of the 'attitude' components were rated significantly higher. This is shown in table 7.18.

Interestingly, comfort was rated almost identically in the first survey by the two groups of respondents, with a mean of approximately 4.75 for both. However, in the second survey it was rated significantly higher (better) by the older age group. This may reflect a real change in the comfort of services, or a positive change in the perceptions of services overall for the older age group. If the results shown here are correct than it can be concluded that improvements in bus services following deregulation had a greater impact on older respondents than younger ones.

TABLE 7.18 T-Test Comparing Attitudes of Oldest and Youngest Respondents (over 65 and 16-25 year olds)

Attribute	SURVEY 1				SURVEY 2			
	mean	mean	T	sign.	mean	mean	T	sign.
	youngest	oldest	value		youngest	oldest	value	
fares	2.94	3.71	-1.65	0.108	2.45	3.30	-5.80	0.000 ^a
frequency	4.00	4.22	-0.46	0.651	3.00	4.62	-7.47	0.000 ^a
timing	4.55	4.28	0.64	0.526	4.30	4.87	-2.25	0.025 ^b
convenience	3.90	5.24	-2.53	0.017 ^b	4.12	5.08	-3.99	0.000 ^a
journey								
time	3.40	4.93	-3.11	0.004 ^a	4.75	5.53	-3.24	0.001 ^a
punctuality	4.20	5.10	-2.33	0.026 ^b	4.73	5.95	-5.89	0.000 ^a
bus-stop								
siting	4.63	5.44	-2.00	0.055 ^c	4.04	5.11	-4.74	0.000 ^a
comfort	4.75	4.75	-0.02	0.986	4.81	5.51	-3.16	0.002 ^a
access to								
timetables	3.55	4.55	-2.19	0.035 ^b	4.59	4.83	-1.04	0.300
understanding								
timetables	3.80	4.77	-1.98	0.057 ^c	4.26	4.52	-1.01	0.313
friendly	3.75	4.73	-2.25	0.031 ^b	3.96	4.09	-0.53	0.599
luggage								
space	2.40	3.93	-4.04	0.000 ^a	4.23	4.95	-3.35	0.001 ^a

It was not just the very old and the very young that gave different attitude ratings. When the sample was divided into over 45 year olds and under 45 year olds it was shown that the older group consistently gave higher scores for each attribute in both surveys. This is shown in table 7.19.

TABLE 7.19 T-Tests comparing attitudes of over 45 and under 45 year olds

attribute	SURVEY 1				SURVEY 2			
	mean {45	mean >45	T value	sign.	mean {45	mean >45	T value	sign.
fares	2.93	2.28	-2.30	0.022 ^b	2.69	2.87	-1.97	0.050 ^b
frequency	3.90	3.98	-0.52	0.600	3.33	3.98	-4.99	0.000 ^a
timing	4.01	4.07	-0.35	0.729	4.58	4.68	-0.74	0.459
convenience	4.47	4.86	-2.23	0.026 ^b	4.33	4.68	-2.76	0.006 ^a
journey								
time	4.12	4.64	-3.05	0.002 ^a	4.83	5.11	-1.97	0.049 ^b
punctuality	4.42	4.78	-2.48	0.013 ^b	4.96	5.43	-3.81	0.000 ^a
bus stop								
siting	4.67	5.11	-2.82	0.005 ^a	4.13	4.53	-3.22	0.001 ^a
comfort	4.40	4.65	-1.74	0.082 ^c	4.98	5.24	-2.13	0.033 ^b
access to								
timetables	4.18	4.47	-1.73	0.083 ^c	4.60	4.75	-1.23	0.219
understanding								
timetables	4.30	4.58	-1.71	0.087 ^c	4.19	4.69	-3.73	0.000 ^a
friendly	3.91	4.50	-3.84	0.000 ^a	3.99	4.22	-1.71	0.087 ^c
luggage								
space	3.20	3.66	-3.13	0.002 ^a	4.25	4.65	-3.37	0.001 ^a

The differences in scores may be due to differences in the way in which different age groups or sexes allocate scores, rather than any difference in perception. Care should, therefore, be taken in choosing samples of respondents, and drawing inferences from different population samples. The problem does not exist in the panel surveys because they are comparing the scores of the same respondents over a period of time, although discussions of differences between respondents and geographical areas may encounter this.

7.1.8 Factor Analysis

The results from the postal surveys seemed to indicate that users' attitudes to bus services are composed of a complex mixture of different aspects of the service, which cannot be separated into different components such as 'frequency' or 'value for money'. Factor analysis was, therefore, used in order to investigate way in which 'attitude to the overall service' was made up.

For a full explanation of the technique of factor analysis the reader is here directed to appendix J. Contained below is a brief summary of the method employed and its purpose.

The aim of factor analysis is to organise and simplify data. It is a technique which is widely used in social psychology, especially when describing different personality types. So, for example, 'extrovert' may be used to describe an individual who scored highly on tests for

a variety of personality measures. Therefore, the primary aim of factor analysis is the discovery of common factors. For example, an area might be described as 'industrialised' if the common factor consisting of high levels of industrial activity, high numbers of manufacturing industry, good transport services, lack of rural or agricultural land and certain types of housing was extracted. The techniques for extracting the factors generally seek to take out as much common variance as possible in the first factor. The first factor extracted is usually a very general one composed of many variables. General factors, giving the maximum amount of the variance in the first factor, include significant loadings from most if not all the items in the analysis. Group factors arise when a few tests with significant loadings appear in the same factor. A factor containing only one significant loading for a particular item would be a unique factor.

Factor analysis was performed on the attitude component for both the pre and post deregulation postal surveys.

Survey 1

In the first survey three factors were extracted, using principle components analysis.

TABLE 7.20 Survey 1 Factor Extraction using Principal Components Analysis

	eigenvalue	pct. variance
Factor 1	4.87047	40.6%
Factor 2	1.17908	9.8%
Factor 3	1.06267	8.9%

The first block of results shows the percentage of common variance accounted for by the unrotated factors. The eigenvalue is a measure which is computed in the process to show the relative importance of the factor. Following convention, in this analysis those factors with eigenvalues greater than or equal to one were considered significant.

The factors were rotated obliquely using the oblimin technique (appendix J contains a discussion of this technique), and were found to consist of:

TABLE 7.21 Composition of Rotated Factors

	factor 1	factor 2	factor 3
fares	.49118	.38111	-.11686
frequency	<u>.75184</u>	.12387	-.03901
timing	<u>.70252</u>	.17436	-.01816
convenience	<u>.84327</u>	-.26877	.10743
journey time	<u>.80219</u>	-.19529	.07957
punctuality	<u>.57437</u>	.29269	-.01217
bus stop siting	.46803	.14422	.18312
comfort	.21129	.47320	.25176
access to			
timetables	.00430	.02474	<u>.85834</u>
understanding of			
timetables	.00313	.05828	<u>.85068</u>
friendliness	.09855	<u>.68305</u>	.10751
luggage space	-.08637	<u>.77684</u>	.05384

It is generally assumed that only those variables with values of greater than 0.5 were considered to be significant factors (see appendix J). From table 7.21, therefore, factor 1 can be seen as consisting of frequency of service, timing, convenience of route, journey time and punctuality. This is a general factor and can be seen to be concerned with general time and distance considerations. Factor 2 can be seen as consisting of friendliness of staff and luggage space, both relating to the 'environment' of the actual journey, comfort is just below the .5 threshold but almost significant. Factor 3 appears to relate to information, and consists of accessibility of timetables and ease of understanding of them.

TABLE 7.21 Composition of Rotated Factors

	factor 1	factor 2	factor 3
fares	.49118	.38111	-.11686
frequency	<u>.75184</u>	.12387	-.03901
timing	<u>.70252</u>	.17436	-.01816
convenience	<u>.84327</u>	-.26877	.10743
journey time	<u>.80219</u>	-.19529	.07957
punctuality	<u>.57437</u>	.29269	-.01217
bus stop siting	.46803	.14422	.18312
comfort	.21129	.47320	.25176
access to			
timetables	.00430	.02474	<u>.85834</u>
understanding of			
timetables	.00313	.05828	<u>.85068</u>
friendliness	.09855	<u>.68305</u>	.10751
luggage space	-.08637	<u>.77684</u>	.05384

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If the results shown in table 7.21 are compared to the results obtained in the second survey, only two factors were eventually extracted.

TABLE 7.22 Survey 2. Factor Extraction Using Principal Components Analysis

	eigenvalue	pct. variance
Factor 1	4.48657	37.4%
Factor 2	1.33629	11.1%

TABLE 7.23 Composition of Rotated Factors

	factor 1	factor 2
fares	.48621	.09418
frequency	<u>.90004</u>	-.18274
timing	<u>.90527</u>	-.07753
convenience	<u>.73200</u>	-.01694
journey	<u>.69337</u>	.04827
punctuality	<u>.63057</u>	.20015
bus stop siting	.48555	.18506
comfort	.15584	<u>.50509</u>
access to		
timetables	.00123	<u>.68770</u>
understanding of		
timetables	.10818	<u>.67964</u>
friendliness	.01761	<u>.62792</u>
luggage space	-.10067	<u>.64586</u>

The first factor can be seen to consist of frequency of service, timing, convenience of route, journey time and punctuality, this is

comparable to the factor extracted in the first survey, also a general time/distance factor. The second factor consists of comfort, access to timetables, ease of understanding timetables, friendliness and luggage space, this is similar to the second two factors extracted in survey one.

What the analysis shows is that when respondents judge aspects of a bus service they tend to relate certain variables together. They have a general time/distance perception consisting of frequency, journey time etc. This analysis was useful as a foundation for the three door to door panel surveys which were conducted next. As described earlier, in Chapter 6, in these surveys respondents were asked to state beliefs about their bus service and to state what attributes were important about a good bus service, rather than ranking or scaling a pre-selected list. This basic analysis enables us to group responses such as 'frequent', 'regular', 'punctual' in to general categories. In addition, and perhaps more importantly the results indicate that when users assess a bus service they do not tend to concentrate on just one factor, for example, punctuality. Therefore, any assessment of bus services is based on group of factors, although some factors within the group may receive more importance than others. Thus, just as a decrease in punctuality may not be sufficient to provoke an overall less favourable attitude, so too an improvement in a certain aspect of the bus service may not result in an overall more favourable attitude. Therefore, an increase in the frequency of services alone may not result in any

change in attitude to the overall service. This is a subject which requires further attention in the analysis of the panel surveys.

7.2 Analysis of Panel Surveys

7.2.1 Analysis of the Three Surveys, all areas

The first panel survey consisted of replies obtained from 200 households, 50 from each of the same four areas used in the postal surveys. Of these those respondents under the age of 16 using the bus for educational purposes were excluded. This decision was taken because it was felt that there were insufficient numbers to perform any meaningful statistical analysis, and this group differed from other groups (shoppers and work journeys) in such a way that they would probably warrant being treated separately. Therefore the sample was reduced to 190 replies. The second survey reduced the sample to 119 respondents, either through non-response or the respondent having moved. The final sample consisted of 87 respondents, 71 women and 16 men. These respondents had participated in all three surveys. Therefore it was possible to monitor changes in individual behaviour and perception over the time period from July 1987 to April 1988. Slight changes took place in the frequency of bus use, and of journey purpose, generally these changes were due to changes in employment.

TABLE 7.24 Response rates for three panel surveys

	survey 1	survey 2	survey 3
<u>total</u>	<u>190</u>	<u>119</u>	<u>87</u>
area 1	40 (21.0%)	27 (22.7%)	18 (20.7%)
area 2	50 (26.3%)	34 (28.6%)	26 (29.9%)
area 3	49 (25.8%)	29 (24.4%)	24 (27.6%)
area 4	51 (26.8%)	29 (24.4%)	19 (21.8%)

The results given in this section refer only those responses given by the 87 people who were interviewed in all three surveys.

TABLE 7.25 Frequency of Bus Use July 1987, December 1987 and April 1988

<u>frequency/survey</u>	<u>July</u>	<u>December</u>	<u>April</u>
at least 4 days a week	28 (32.3%)	26 (29.9%)	27 (31%)
at least once a week	37 (42.5%)	41 (47.1%)	36 (41.3%)
at least once a month	20 (22.8%)	16 (18.2%)	18 (20.6%)
less than once a month	2 (2.2%)	4 (4.5%)	6 (7.8%)

n= 87

TABLE 7.26 Journey Purpose, July 1987, December 1987, and April 1988

<u>purpose/survey</u>	<u>July</u>	<u>December</u>	<u>April</u>
shopping	64 (73.4%)	65 (74.7%)	60 (68.9%)
work	23 (26.6%)	22 (25.3%)	27 (31.1%)

The changes in journey purpose and frequency of use shown in tables 7.25 and 7.26 are reflected in changes in the employment of

respondents. Differences that occurred in the housewife and retired categories were often due to inconsistency by women over the age of 60 in the way in which they categorised themselves. Sometimes they would categorise themselves as retired and on other occasions as housewives. It was possible with such a small sample to be fairly specific in the employment categorisation and to include narrow groups such as nurse or teacher/lecturer.

TABLE 7.27 Employment of Respondents over the Three Surveys

<u>job/survey</u>	<u>July</u>	<u>December</u>	<u>April</u>
blue collar workers			
skilled	0	0	1
semi-skilled	3	5	8
unskilled	3	5	3
<u>total</u>	<u>6</u>	<u>10</u>	<u>12</u>
economically inactive workers			
retired	22	27	24
housewife	24	21	25
student	2	1	1
disabled/sick	2	1	1
unemployed	3	3	1
<u>total</u>	<u>53</u>	<u>53</u>	<u>52</u>
white collar workers			
management	2	1	0
nurse/lecturer	7	5	5
clerical	13	11	12
retail	4	3	6
<u>total</u>	<u>26</u>	<u>20</u>	<u>23</u>
other			
voluntary work	2	0	0

It can be seen from the total number of economically inactive respondents that shifts took place over the time period between employment categories rather than increases in unemployment or persons retiring. The number of economically inactive respondents in the sample 59% compares with an average over the four areas of 37.5% (from 1981 census data). The sample was not therefore representative of the population as a whole, and results from student 'on-bus' surveys in Plymouth conducted in 1983 and 1986 revealed that 18% of bus users were retired compared with 26% of this sample.

Students from the Combined Honours first year degree course at Polytechnic South West are required each year to conduct and analyse some form of social survey. In the years 1983 and 1986 this took the form of an 'on-bus' survey. Questions were asked about journey purpose, ticket type, age, sex and route destination. Unfortunately it is not possible to compare numbers of housewives, as the 'on-bus' surveys merely asked for age and journey purpose rather than occupation. However, as these surveys took place during the week it could be assumed that most of those respondents using the bus service for shopping were either part time workers or housewives. In the 'on-bus' surveys 23% of respondents were using the service for shopping, this compares with 27% of the panel survey sample who stated their occupation as 'housewife'. If the number of respondents in the two 'on-bus' surveys (43%) is compared with the number of the panel survey 'economically active' (40%), the proportion is roughly equal. Therefore the panel survey sample is fairly representative of the bus using population.

Since the same respondents were used in each survey there was no change in the ratio of sexes, and no changes in the numbers in each age group.

If we examine the change in car ownership for that time period, we can see that there was a gradual decrease in the availability of cars for the members of the panel.

TABLE 7.28 Availability of Car over the Three Surveys

<u>availability/survey</u>	<u>July</u>	<u>December</u>	<u>April</u>
yes	27	26	25
occasional	14	10	8
<u>no</u>	<u>42</u>	<u>50</u>	<u>54</u>
total	83	86	87

However, if we look at table 7.25 we can see that this decrease in car ownership was not matched by an increase in the frequency of use of bus services. Therefore the decrease in car ownership and the decrease in frequency of bus use may reflect a decrease in the need to travel so frequently, which could either be a function of changing employment patterns, and/or a function of economic circumstances. Since information on economic circumstances, for example, wages, was not collected it is impossible to speculate with any degree of certainty what the reasons for this decrease in travel behaviour were. It is possible that this could even be due to random factors.

7.2.2 The Attitude Component

The 'attitude' component refers to that section on the questionnaire which asked whether the service was good/bad, and using it foolish/wise and pleasant/unpleasant. Respondents were asked to evaluate the bus service they used on a bipolar scale from +3 to -3. They were first asked to indicate the degree to which the service was 'good' or 'bad'. They were then asked whether they considered using the service for their particular purpose was 'foolish' or 'wise'. This terminology was that used by Fishbein, and although initially it appears somewhat unusual and contrived it was successfully used by Cook (1981) and Thomas (1977). Finally respondents were asked to state whether they generally found their experience of using the service 'pleasant' or 'unpleasant'. This section was the independent attitude component to which Fishbein referred. This component should correlate closely with the belief component (Ajzen & Fishbein 1970).

The results in table 7.29 relate to the same 87 respondents who participated in all three surveys, therefore any change in evaluative score is assumed to reflect a change in personal perception.

TABLE 7.29 Independent Attitude Evaluation

	Good	+3	+2	+1	0	-1	-2	-3	Bad	total	MEAN
										score	
July	39	26	8	6	1	2	5			150	1.72
December	40	32	7	6	2	0	0			189	2.17
April	29	30	16	6	3	2	1			153	1.76

	Wise	+3	+2	+1	0	-1	-2	-3	Foolish	total	MEAN
										score	
July	35	15	9	17	2	5	4			120	1.38
December	44	28	7	7	0	1	0			193	2.22
April	45	18	12	8	4	0	0			179	2.06

	Pleasant	+3	+2	+1	0	-1	-2	-3	Unpleasant	total	MEAN
										score	
July	5	35	16	22	3	1	4			84	0.96
December	6	34	19	29	7	3	3			83	0.95
April	9	26	31	14	4	1	2			98	1.13

Table 7.29 shows the numbers of respondents giving each response. The total score is obtained by multiplying the number of respondents by the score and summing the result (for example, $(+3 \times 39) + (+2 \times 26) + (+1 \times 8) + (-1 \times 1) + (-2 \times 2) + (-3 \times 5) = 150$). The results obtained indicate that most users are in fact quite satisfied with the service which they receive, and this satisfaction increased between July and December 1987, with a lessening in April 1988. The result obtained in April is interesting because although fewer respondents rated the service as '+3 very good' than in the

other two surveys, more of them gave a positive rating than in the first survey (75 compared with 73). It seems clear from the above findings that there was an improvement in the perceptions of most users during the period July 1987 to December 1987, followed by a slight decrease from December to April 1988. This decrease however, still maintained a level of favourable perception above that in July 1988.

In the last two surveys, in December 1987 and April 1988, respondents were asked to consider whether the bus service they used was better, worse or about the same as it was before deregulation. The results from this section should correlate fairly closely with those found for the attitude component.

TABLE 7.30 Evaluation of Whether Bus Services had Improved Since Deregulation

<u>Evaluation/survey</u>	<u>December</u>	<u>April</u>
a lot better	29 (33%)	15 (17%)
a bit better	24 (28%)	19 (22%)
the same	18 (21%)	29 (33%)
a bit worse	7 (7%)	14 (16%)
a lot worse	9 (10%)	10 (11%)

Table 7.30 shows that in the December survey a total of 53 respondents (61%) replied that the service they used was better,

and 16 that it was worse (18%). This compares with 34 respondents in April replying that it was better (39%), and 24 worse (28%). If these changing perceptions are a true indicator of changing levels of bus service provision we could conclude that for 34 (39%) users bus services had improved after deregulation and remained at a higher level. For 19 (22%) users the service improved and then suffered a decline. However, the correlation between the scores given for the attitudinal component and those for this section were not significant.

TABLE 7.31 Correlation between Attitude Evaluation and Whether respondent rated service as better or worse

survey	correlation	R ²	significance
December	0.39698	0.15760	0.0001
April	-0.05496	-0.00302	0.6131

A positive linear relationship was expected between the attitude component and whether the service was rated as better or worse than it was before deregulation. However, from table 7.31 it can be seen that in the December survey only a fairly low correlation was found between the two. The correlation in the April survey was not significant and wrongly signed. The value for R² obtained in the December survey indicates that about 15.8% of the variance in attitude can be explained by whether the service was perceived as

better or worse. It is possible that the complex nature of attitude to bus services means that, despite the fact that bus services were not at such a high level as in December, they were still considered as adequate. The perceptions of bus users in Plymouth will be influenced by the historical experiences they have of bus services. For example, fares in Plymouth have never been subject to wholesale subsidy, so have always been at a fairly high level compared to some other cities, service frequencies have traditionally been fairly low partly because of lack of subsidy, but also because traditionally high car ownership levels in the South West limit demand for bus services.

The Fishbein model is based on the assumption that the independent attitude component correlates closely with the belief component. The belief component consists of the product of belief strength; measured on a bipolar scale from +3 likely to -3 unlikely; and belief importance, measured on a bipolar scale from +3 good to -3 bad. Therefore a respondent who named 'the bus is uncomfortable' as a belief would be asked how likely it was that the bus would be uncomfortable, and whether this was a good or bad aspect of the service. Respondents could name as many beliefs as they wished, and the importance/strength products were summed to produce a single figure which should correlate closely with the attitude component (the good/bad, foolish/wise, pleasant/unpleasant component). For example, if the belief 'the bus is uncomfortable' was allocated the score +3 always uncomfortable, and -1 fairly bad aspect, this would result in a score of -3. If the next belief stated was 'it's a

friendly service', given +1 fairly likely and +3 very good aspect of the service, resulting in the score +3 then the sum of the two belief scores would be zero, the mildly negative belief cancelling out the mildly positive one. However, respondents naming a large number of negative or positive beliefs would result in quite high belief scores. This is the procedure recommended by Ajzen and Fishbein (1970), although other researchers have experimented with taking the mean belief score as an alternative (Bentler and Speckart, 1979). Table 7.32 shows the correlations obtained between the attitude and belief components.

TABLE 7.32 Correlation between the Independent Attitude Component and Belief Component

<u>survey</u>	<u>correlation</u>	<u>R²</u>	<u>significance</u>
July	0.251	0.112	0.238
December	0.164	0.042	0.462
April	0.121	0.082	0.270

The correlations found were not significant and indicate the need to examine the belief component in considerable depth. This finding throws doubt on the Fishbein model and the reliability of it in this context. A discussion of the belief component is contained in the next section, 7.2.3.

Four geographical areas were under consideration and different changes took place in the supply of bus services, therefore one would expect some difference between areas in the perceptions of users. Section 7.2.4 contains an analysis of the results for each of the four areas.

7.2.3 The Attribute and Belief Components

Respondents were asked to state what attributes were important to them about a good bus service and were permitted to state as many attributes as they wished. Similarly, they were asked to state what beliefs they held about the service they used, and could state as many beliefs as they wished. The individual list of attributes and beliefs elicited by respondents was lengthy because they were permitted to use their own words to describe them. Therefore, they were categorised in order to make the list more manageable and more meaningful. This meant that beliefs of different individuals could be compared even though they used different terminology. The attributes and beliefs could be roughly divided into four separate groups, those concerning comfort/environmental factors, financial factors, convenience factors, and a miscellaneous category. The comfort category containing aspects referring to, the physical design of the vehicle, for example, the size of seats; the manners, driving ability and amount of assistance offered by the drivers; the internal environment of the vehicle, for example, whether passengers were smoking, crowdedness, temperature, noisiness; and the external environment, exposure to the weather and traffic conditions. The

second category, which concerned fares, included responses such as 'return tickets available before 9.00a.m.', which make the total daily journey cheaper, but also make it more convenient for passengers who do not have to ensure that they have the correct money twice in one day. Convenience was another category which posed problems, it was divided into separate sub-categories consisting of, distance, which included aspects such as long walk, frequent stops and convenient routes; timing aspects, such as, short wait, fast journey and punctuality. The timing sub-category included factors which also relate to comfort, so 'long wait' or 'long journey' increases the amount of discomfort felt by some passengers. A third sub-category related to aspects such as having to tender the exact fare, '(in)convenient', '(un)reliable', '(in)efficient'. The miscellaneous category includes anything that did not fit in with any of the other three categories. The factor analysis conducted on the results of the two postal surveys was used as a justification and guide to this categorisation. It was found that respondents tend to categorise attributes in a similar way themselves. The scheme used for grouping the responses is shown in table 7.33 The results of the factor analysis were used as a guide for this, timetabling information was not given a separate category because it was not mentioned by many respondents. Financial factors were given a separate category because of the differences between areas in the mention of related beliefs and attitudes. In the first survey over half the respondents in Southway mentioned cheap fares as an important attribute of a good bus service, very few respondents in

the other surveys or in the other areas mentioned it (see appendix K for analysis of each individual area).

TABLE 7.33 Categorisation of Attributes and Beliefs

1. Comfort

1G general comfort

1.1 physical design of vehicle

1.2 drivers and staff of bus company

1.3 internal environment of vehicle

1.4 external environment and traffic conditions

2. Financial

2.1 amount of fare tendered

3. Convenience

3G general convenience

3.1 distance

3.2 timing

3.3 other

4. Miscellaneous

4.1 other

It should be noted that the belief list included both positive and negative beliefs, so the above list was further sub-divided into, for example, positive financial aspects (for example, cheap) and negative financial aspects (for example, expensive). A full list of

all the beliefs and attributes elicited, and their relevant categories, is contained in appendix L and M.

The first three attributes and beliefs were considered to be the most important, indeed few respondents named more than three.

TABLE 7.34 Attributes Among the First Three Named as Important Aspects of a Good Bus Service

<u>attribute/survey</u>	<u>July</u>	<u>December</u>	<u>April</u>
comfort	71 (39.2%)	65 (41.9%)	58 (35.4%)
finance	18 (9.9%)	8 (5.2%)	12 (7.3%)
convenience	89 (49.2%)	82 (52.9%)	91 (55.5%)
misc.	3 (1.6%)	0	3 (1.8%)
<u>N of attributes</u>			
stated	181	155	164

From table 7.34 it is shown that there were 71 instances of comfort factors being named among the first three stated attributes of a good bus service in the first survey. In addition there was an increase in the percentage of responses which fell into the 'convenience' category over the three surveys. The most popular individual response was 'punctual' in all three surveys, followed by 'frequent/regular service', and then 'comfortable'. This is shown in table 7.36. In both the July and April surveys, over 50% of respondents named 'punctual' among the first three stated attributes

of a good bus service. Comfort was named by 34% in the first survey, falling to 12% in the final survey. It is important to remember that these, being panel surveys, used the same set of respondents on all three occasions. Therefore there is a high likelihood that any change in stated belief or attribute is due to an actual change in attitude rather than the product of sampling differences or chance

TABLE 7.35 Number of Respondents Stating Punctual, Frequent and Comfortable Service Among the First Three Stated Attributes of a Good Bus Service

<u>attribute/survey</u>	<u>July</u>	<u>December</u>	<u>April</u>
punctual	44	40	48
frequent	42	35	40
comfort	30	20	12

N= 87

Of the 44 people, in the first survey, who named punctual service to be an important attribute of a good bus service, 7 also stated that they believed the service to be punctual, and 4 that they believed it to be unpunctual. If punctuality is of primary importance one would expect the group of people who stated punctuality to be important, but considered their service to be unpunctual to hold a less favourable view than the sample over all. However, the numbers

involved are so small that it is impossible to conducted any statistically reliable or significant test.

Although punctuality was named by most respondents, it was not the sole factor that these people used in their assessment of the service. The factor analysis showed that timing, frequency, punctuality, bus stop siting, convenience etc. tend to be grouped together into a general factor. The fact that punctuality was the most popular response merely indicates that it appeared in most people's 'general factor' list. Therefore the overall attitude held would depend not only on whether the person believed the service to be punctual but also whether they believed it to also be frequent, well timed etc..

How respondents alter their perceptions of the bus service when one of their 'general factors' is altered is uncertain, but the increase in attitude evaluation occurring between July and December corresponded with an increase in bus service frequencies, and the decrease in attitude evaluation corresponds with a fall in frequency.

'Comfortable' was a very popular response to the question concerning the important attributes of a good bus service, and this may suggest that it is a very important factor in the perception of a bus service. However, factor analysis identified the secondary factor as concerned with comfort and information. During the period July to December the widescale use of minibuses caused many passengers to

complain about dis-comfort, but their overall attitude still increased because service frequency had increased, this is clearly more important in the overall assessment of the bus service. Therefore, comfort is an important element in respondents' judgment of the bus service, but other factors take precedence over it. Thus a worsening in comfort is more than compensated for by increased frequency. A worsening in comfort would perhaps not provoke such a negative perception to the overall service as a worsening in other factors. This has important implications for bus operators, if the travelling public are prepared to tolerate worsened comfort and safety standards for the sake of frequency and convenience of service then we could see the type of low standard operation existing in some third world countries.

7.2.4 The Normative Belief/Motivation to Comply Component

Fishbein (1967) suggests that the opinions of other people or 'societal norms' affect behaviour by interacting with the attitude component. Therefore, for example, if someone holds a very favourable attitude to performing an action s/he may not perform that action if s/he feels that some other person or persons do not think they should. Thus, the theory of reasoned action has an element of conformity or motivation to comply introduced. However, in this study only 5 out of the final total of 87 respondents stated that they were in any way influenced by any other person's opinion about whether they should use the bus service. The choice of travel mode is not however, a typical application of the Fishbein model, it

is usually applied to the purchase of consumer goods, or to actions that have strong moral links, such as giving blood and giving up smoking. The attitudes of others' may enhance the importance of respondents attitudes but in the absence of any other evidence this cannot be investigated. The normative belief/motivation to comply component was therefore disregarded in this study.

7.3 Summary

The results of the postal survey, conducted before and after deregulation, indicate that on the whole respondents in all four areas perceived either the same or an improvement in bus services following deregulation. A comparison of the results obtained before and after deregulation showed that in Glenholt and Southway at least there was no worsening of the rating of the bus service, and a significant increase in the perceptions of some factors. The results obtained for Plympton and Compton were more uncertain. Respondents in Plympton rated some aspects higher in the second survey, and some lower. If we examine the type of aspects then the factor analysis shows that frequency, timing, convenience, journey time and punctuality are the most important aspects. However, although frequency was rated higher punctuality was rated lower. It is therefore difficult to say whether there was an overall improvement in perception or not. This highlighted the need for more in-depth analysis to find out how important each different aspect was. The results obtained for Compton in the before and after postal surveys indicated that there was a worsening in the perception of punctuality and timetabling information, but no change in the other aspects. Again, a more in-depth analysis was needed to find out whether, despite the worsening in these two aspects, there was a worsening of overall attitude to the bus service generally.

The three panel surveys, conducting during the first eighteen months of deregulation showed that the initial improvements in services were not in most cases maintained.

Table 7.36 Comparison of Good/Bad part of Attitude Component

area	July	December	April	increase/decline
Glenholt	1.83	1.72	1.67	decline
Southway	2.15	2.08	1.62	decline
Plympton	1.79	2.29	2.00	overall increase, increase then decline
Compton	1.74	2.42	2.05	overall increase increase then decline

Table 7.36 shows how the good/bad part of the attitude component changed over the time period for each area. In Glenholt and Southway any perceived improvements in services immediately following deregulation were not maintained. Respondents in Plympton and Compton perceived an improvement in services between July and December, but this declined between December and April. The level of score was however at a higher level than in July, thus services could be seen as improving, suffering some decline, but remaining at levels higher than in July. The analysis of the results from the postal surveys indicated that respondents in the higher age groups tend to give higher scores, therefore it is difficult to draw comparisons between areas on the individual scores. We can only comment on the *pattern* of scores with any degree of confidence.

The good/bad part of the attitude component seems to be closely related to the most important factor in the perception of bus services and the pattern of scores seems to follow the pattern of type and quantity of beliefs stated. For example, the pattern exhibited in Plympton of an increase in score, followed by some decline, is matched by the pattern of numbers of respondents naming 'infrequent' as a belief, and the decline in numbers naming 'convenient' as a belief. The factor analysis indicated that bus users have a complex system of attitudes and beliefs, consisting of one, most important, general factor concerned with time and distance attributes, and one or two subsidiary factors, of less importance, concerned with comfort and information attributes. The good/bad component of the panel surveys seems to be related to the first of these factors and the pleasant/unpleasant to the second. It was also found that bus users would state the same number or more negative beliefs following an improvement in the first factor attributes. However, these negative beliefs were of a different type, and referred to attributes listed in the secondary factors. Thus, an improvement in punctuality or frequency would result in increased score in the good/bad component, but in more negative beliefs concerning comfort factors. This is a well known phenomenon in psychology, when basic needs have been satisfied, for example, hunger or thirst, there is a hierarchy of other needs that then needs satisfying, for example, love or friendship.

Table 7.37 Comparison of Pleasant/Unpleasant part of Attitude Component

area	July	December	April	increase/decline
Glenholt	0.83	1.22	1.56	increase
Southway	0.88	0.38	1.07	overall increase, decline then increase
Plympton	1.12	1.04	0.75	decline
Compton	1.11	1.47	1.11	overall same, increase then decline

The results in table 7.37 show that the pattern of scores for the pleasant/unpleasant part of the attitude component followed the opposite pattern to that of the good/bad part. In terms of the findings of the factor analysis this may indicate that respondents in Glenholt and Southway were not satisfied with the most crucial aspects of the bus service (the good/bad score decline), and therefore the satisfaction of comfort and subsidiary factors was not important, they were thus perceived as fairly good. On the other hand, respondents in Plympton and Compton had their most important needs satisfied, and so turned their attention towards less important aspects. This does not mean that bus services in Plympton and Compton were less comfortable than in the other two areas. It means that the users in Plympton and Compton were satisfied with the most important aspects of their service, and then wanted other aspects to also improve. If comfort was improved in these two areas it may be that just as many negative beliefs may be stated, but they

may refer to, for example, information. Therefore however much bus services are improved passengers will always hold some negative beliefs about the service. In addition, the satisfaction of the most important needs of consumers serves to create or highlight other needs.

The Fishbein model did not behave as expected despite the fact that great care was taken in the design of the survey. The belief component did not generally correspond with the attitude component, and the normative belief/motivation to comply component was of insignificant influence. This technique may therefore be inappropriate for this type of research, but it did reveal some very interesting results. It was found that although services improved and the attitude component increased, more negative beliefs were stated. A closer examination of these beliefs revealed that they were not the type of beliefs classified in the factor analysis as the most important type. This led us to speculate whether respondents were thinking more consciously about the bus service because of the survey itself, or whether there was a process by which if a certain set of factors improve, this allows the individual to then express beliefs of secondary importance. Alternatively, a lack of relationship between the belief and attitude components may have occurred because the respondent thought that by complaining the interviewer may have some power to improve the service (although it was clearly pointed out that the survey was in no way connected with any bus company or the city council).

Despite the fact that the Fishbein model did not behave in the way expected, the methodology used by Fishbein proved very useful in trying to explain the complex nature of attitudes to bus services. The combination of the results of the factor analysis from the large scale postal surveys, and the in depth information on beliefs from the panel surveys, gave an insight into the way that bus users form judgements about bus services.

There is no doubt that the fears expressed by Plymouth City Council prior to deregulation have not been borne out. Bus users, in these four geographical areas at least, have experienced an improvement over the pre-deregulation levels of service, for most times of day. In addition, most bus users showed an improvement in the perception of their bus service. However, there was some discrepancy in the attitude and belief components which clearly deserve further investigation if the Fishbein model is to be successfully utilised in this type of research. One important finding was that attitude score depends greatly on the age of respondents, this has implications for any kind of future attitudinal research, not only in the transport context.

CHAPTER 8

Summary and Conclusions

Deregulation resulted in an overall increase in the frequency of bus services in Plymouth. However, most of these increases were at peak times (week-day and daytime). Off-peak services have generally either maintained the same levels of service or suffered a decline. In addition, the tendering process has resulted in a great deal of uncertainty, with changes in routes, times and operators every couple of months. One of the most visible impacts of deregulation has been the widescale use of minibuses at high frequencies. Two main operators existed before deregulation, this situation has not altered. After a period of competition on some routes early in 1988 the bus companies have again retreated to their traditional operating territory, confirming many writers' theories that deregulation would result in an oligopoly in most areas.

8.1 Plymouth City Council Support

The evidence from Plymouth City Council indicates that there has been a reduction in subsidy payments for concessionary fares. The amount payable for children and OAP concessions in 1988 being the roughly the same as that payable for only OAPs in 1984/85.

The City Council is no longer required to subsidise capital expenditure by the bus companies, and this clearly represents a

saving. However, subsidy payments before privatisation were made on a non-specific basis, so it is difficult to calculate how much of the subsidy was allocated to capital expenditure and how much to actual route subsidy. Undoubtedly much of the route subsidy was internally generated via cross-subsidisation. Conversations with the Corporate Planning Officer of Plymouth City Council, R. Bentley, reveal that the overall payments made by Plymouth City Council are, at the time of writing, roughly the same as prior to deregulation, the savings on concessionary fares being balanced by increased costs of route subsidy via the tendering process.

8.2 Innovation and Flexibility

The most visible impact of deregulation has been the increased usage of minibuses. This has resulted, in some areas, in increased frequency of service. This was reflected in the results of the empirical work, with improved perceptions of users subject to increased frequency of service. However, minibuses have also fulfilled the role of providing a lower cost service on off-peak, low demand services. The use of smaller buses has contributed to lower cost operation and kept the cost of tendered services at a low level. The two main bus companies, Citybus and Western National, are the only operators in the area to own substantial fleets of minibuses and this may be a contributory factor in accounting for the fact that in most cases these two companies are the only tenderers for services, and submit the lowest tenders when there is competition.

The introduction of minibuses has resulted in increased frequency of service on some routes, and some experimentation with more flexible operation. The main barrier to flexible operation has not been the operator or consumer but public protest at the use of residential streets for services and fears over the safety of pedestrians. There is a limited hail-and-ride facility on most minibus services, with the proviso being that the driver will stop only when and where it is safe to do so.

Minibuses also brought with them some of the disadvantages put forward by writers such as Walters (1982). Overcrowding can be a problem at peak times and traffic congestion severe on main corridor routes and at Royal Parade, the main terminus. In the December panel survey 'crowded' was cited as a belief by 8 out of 26 respondents in Southway (31%) and 7 out of 24 respondents in Plympton (29%). December is a busy time with the increased use due to Christmas shoppers and some crowding would be expected even with double-decker operation. Indeed, 'crowded' was not cited frequently in the other two panel surveys. We can therefore conclude that overcrowding is not generally a significant factor in the perception of the bus service and if there is any increase in overcrowding it is not seen by passengers as an important factor. The exception to this is when demand is particularly high, for example at Christmas, and it may be that 'crowdedness' has a threshold point at which it becomes important.

Environmentally minibus operation represents a saving in pollution costs when one minibus replaces one double decker. A minibus emits fewer toxic fumes than a double decker, however, where minibuses have been used to increase frequency then this must mean an overall increase in pollution levels.

The use of shared taxis and taxi-buses has not emerged in Plymouth and there has been little interest shown by the taxi drivers in bus operation or by bus operators in taxi services.

8.3 Emergence of Competition

Competition has been limited to that between the two main bus companies. The take-over of Plympton Coachlines (the only prospective local rival) by Western National effectively eliminated any source of competition. Therefore, the prediction by Gwilliam et al. (1985) that in many areas an oligopolistic situation would emerge has been fulfilled. This assertion was made because prior to deregulation most areas had two main sources of bus service provision, either the municipal or metropolitan operator and the local National Bus Company operator. These large operators have a commercial advantage at the outset, and evidence from the express coach industry indicates that the established market leader finds it easier to maintain that advantage and protect itself from competition from smaller rivals.

8.4 Safety

There is no evidence available at the time of writing on levels of maintenance of bus companies in the Plymouth area, or on driving practices. There has been no intervention by the Traffic Commissioners and no publicised criticism of safety levels. However, some respondents did cite 'too fast' as a belief in the three panel surveys. The suspension and different handling properties of the minibuses may have contributed to this. Passengers were probably not used to travelling at higher speeds on buses and it may take time for them to get used to this. The increase in journey time of minibuses was put forward as an advantage of them, it is interesting that some passengers, initially anyway, saw this feature as a negative aspect of the service.

8.5 Effects on the Industry and Employees

Industrial dispute has been a feature of employer-employee relations in both main bus companies since deregulation, concerning both pay and working practices. A prolonged strike by Citybus employees resulted in Western National gaining some commercial advantage, public goodwill and some Citybus drivers. The situation was eventually resolved with the introduction of differential wage rates for double decker and minibus drivers and the introduction of more flexible working practices.

The structure of the industry has not changed substantially since the initial privatisation of the municipal operator. The industry is still characterised by a two firm market leadership with small local coach operators still fulfilling their traditional excursion and private hire role.

8.6 Fare Levels and Structure

There has been little change in fare levels over all. However, the zonal fare system has been broken down to a great extent, and been replaced with a type of 'fare stage' system. This system is more equitable with distance travelled being more closely related to fare paid.

8.7 The Attitudinal Research

The results obtained from the three panel surveys conducted after deregulation confirmed postal survey results, that on the whole services improved following deregulation and people's perceptions became more favourable. The scores given on the attitude component indicated that, although in some cases levels of service were not maintained at the levels immediately following deregulation, in all cases respondents gave a positive score on the -3 to +3 bipolar scale. There were differences in perceptions by different groups of users, which is reflected in the scores given on attitude scales, and different importance given to attributes by different users. One

important finding was that there is a positive correlation between age of respondents and attitudinal score.

The Fishbein model did not behave as expected, the belief component did not generally correspond with the attitude component, and the normative belief/motivation to comply component was of insignificant influence. However, the methodology recommended by Fishbein was very useful and did not suffer from the limitations of other methods of scaling lists of predetermined attributes.

The first study area, Glenholt/Estover received an improved bus service to most of the area, with increased frequencies and a limited stop service to the city centre. This was generally reflected in the attitude component. Services increased after deregulation but then declined, but remained at levels above those before deregulation.

The second area, Southway, experienced a vast increase in service frequencies and the use of minibuses on almost all services. This was matched initially by a very favourable attitude to the service, but as services declined, and off-peak services were cut, this was matched by a decline in attitude. Again, peak levels have remained above those prior to deregulation.

Plympton perhaps suffered the greatest upheaval to bus services, with some re-routing and the emergence of competition between the two rival bus companies. The results from this area were difficult

to interpret, maybe this reflects the degree of confusion in the minds of the users to some extent.

8.8 The Implications for Marketing

This research has shown that generally frequency of service and punctuality are the most important attributes of a bus service, however, the factor analysis showed that there is not one single individual attribute that is more important than any other. The most important factors are firstly, time and distance and secondly, comfort and information. A single improvement in, for example, frequency, will not result in an improved perception if, for example, there is a worsening in reliability or punctuality. In addition, bus users will continue to cite negative beliefs even when services improve. It is the nature of these beliefs that is important not the number. The bus operator must therefore bear in mind when conducting market research that there are different levels of importance of attitudes and beliefs. The way in which market research questions are asked will also lead to different results. So, for example, if the passenger is asked whether s/he is satisfied with the bus service they may give a different response than if s/he were asked to rank it on a good/bad bipolar scale, or if s/he were asked what beliefs s/he held about the service. The market researcher needs to be aware of the importance of various attributes to the consumer in order to analyse any attitudinal questionnaire reliably. The different perceptions and needs of specific groups of users or age groups, should assist in the development of market

segmentation tools to ensure the effective targetting of marketing and advertising. In addition, the identification of the important elements of bus services will assist in the marketing process. However, research of this nature examining attitudes and beliefs at an in depth, micro level is seen as an essential foundation for the development of marketing techniques, and enables the producer to gain a fuller understanding of the needs of the consumer.

In the case of Plymouth's bus services, in the four areas studied at least, marketing and advertising needs to stress the advantages of the increased frequencies of bus services, and in some way overcome any negative perceptions concerning comfort factors. With reference to timetabling information, the operator may be able to convince the users that timetables are unnecessary in an environment of very frequent bus services, and thus change any negative perceptions regarding lack of information. Once the operator has identified an aspect about the bus service which is seen as unsatisfactory then s/he can use marketing to alter perceptions. In addition, when major changes are brought about marketing is essential to gain acceptance of those changes. Some of the hostile reactions throughout the country to the competitive operating environment could have been avoided if the parties concerned had marketed more effectively.

8.9 Conclusions

Deregulation did not seem to alter the priorities of users, frequency and punctuality were still rated as the most important

aspects. More frequent services in most areas of Plymouth for most journeys must, therefore, mean that deregulation has resulted in an overall improvement in bus services. The exception to this is users in the Compton area who relied on the C1 service, which suffered decreased frequencies throughout the day. In addition, the type of user who rely on this service were the most 'immobile' of the population, namely old aged pensioners and mothers with young children. The question therefore is not whether most users have experienced an improvement in service, but whether the function of public transport is to provide less mobile sections of the population with transport, and whether this function is still being fulfilled following deregulation. If the sole purpose of public transport is to provide bus services at a price and level of service at which companies can make profits or break even, and consumers are willing to pay for, then I would suggest that deregulation has been an outstanding success. However, if it is considered the function of public transport to provide services for less mobile sections of the population, or to subsidise services for low income users who otherwise would not have any means of transport, then the results of deregulation have been less clear. Certainly Plymouth City Council and Devon County Council have provided 'socially necessary' services on the criterion that everyone within the city should be within ½ a mile of a bus service, and have maintained services at a frequency of at least every 2 hours. However, those areas and times of day which now only receive this minimum service on the whole received a much better service prior to deregulation. This is especially true for evening services. The criteria one would use for judging a

service which has a vast increase in services during the day but a very poor evening service must depend to some degree on some kind of moral judgement about the purpose of public transport.

One of the problems of this research was that it did not take into account those potential or very occasional users have been put off using the bus service due to confusion and uncertainty. If there was an effect on these groups of people there is also no way of detecting whether this effect will last or whether these people will use the bus service again at some future time if stability is restored.

As far as the predictions by writers such as Beesley and Glaister (1985) and Gwilliam et al. (1985), are concerned it seems that the stage carriage bus industry has closely followed the same course as the express coach market. Fares have fallen and services have increased on popular routes, although they have declined since their initial high levels they still remain above the levels existing before. In addition, as with express coaches the dominant firms existing before deregulation still remain dominant, and a certain amount of oligopolistic collusion exists.

In conclusion, if the criterion used to judge whether deregulation has been successful is to examine the frequency of services to most users and most areas, then it has indeed been so. This has been matched by a general increase in the perceptions and attitudes of users to their services. However, what the in-depth panel surveys

show is that service changes have affected individual groups of users differently. It would be interesting to investigate this panel in more detail and to attempt to establish how much of their attitude is determined by their social and economic background, how much is due to experience of the bus service and how much to personality differences. The only respondents who stated 'there is no conductor' for example, were those in the over 60 age group. They are obviously drawing on a greater wealth of experience of using bus services than the younger respondents, many of whom probably never used a two-man operated bus. This may explain some of the differences in the scores given by different age groups. Older people may simply have a lower expectation of bus services because they have experienced more expensive, infrequent services.

8.10 Further Research

a) A comparison of the results obtained for the factor analysis of the postal surveys and the attitude components of the panel surveys seemed to indicate that there was a link between the first 'general factor' and the good/bad part of the attitude component. In addition, there appeared to be a link between the second 'comfort factor' and the un/pleasant part of the attitude component. This relationship deserves further investigation, and the role of the foolish/wise part of the attitude component needs more attention.

b) The analysis conducted is specific to four fairly small geographical areas in Plymouth. Further research could compare the

importance of different attributes in other cities, or for different types of area.

c) The analysis has been restricted over a fairly short time period. A further analysis is required to investigate any long term trends in changing travel behaviour and attitude. The method of using a panel of respondents is a very accurate way of measuring change, as the same individuals are used on each occasion. However, it is recognised that the problem of non-response increasingly erodes the sample size over time.

d) Although previous transport researchers (Cook, 1981; Thomas, 1977) have successfully used the Fishbein model to predict travel behaviour and modal choice, the model did not perform as predicted in this instance. The reasons for this deserve closer analysis, and further research into the use of the model for the measuring of attitudes to bus travel is recommended.

e) A very important effect of changes in bus service provision is seen as the effect on occasional users who normally use some other mode. The analysis fails to include this group of people, as it concentrates on the changing attitudes of users only. Therefore, one of the gaps in the overall analysis of the effects of deregulation is seen as the effect it has had on potential users.

REFERENCES

Abelson R.P. and Rosenberg M.J. (1958). Symbolic psychologic; a model of attitudinal cognition. Behavioural Science, 3, 1-13, 1958.

Adam Smith Institute (1983). Omega Report.

Ajzen I. (1982). On behaving in accordance with one's attitudes, in: M.P. Zanna, E. Tory Higgins, C. Peter Herman (eds), Consistency in social behaviour: The Ontario symposium, vol. 2. Lawrence Erlbaum Assoc. New Jersey. 1982.

Ajzen I. and Fishbein M. (1970). The prediction of behaviour from attitudinal and normative variables. Journal of Experimental and Social Psychology, 6, 446-487, 1970.

Ajzen I and Fishbein M. (1972). Attitudes and normative beliefs as factors influencing behavioural intentions. Journal of Personality and Social Psychology, 21, 1-19

Ajzen I. and Fishbein M. (1973). Attitudinal and normative variables as predictors of specific behaviours. Journal of Personality and Social Psychology, 27, 41-57, 1973.

Ajzen I. and Fishbein M. (1977). Attitude behaviour relations: A theoretical analysis and review of empirical research. Psychological Bulletin, 84, 888-918.

Ajzen I. and Fishbein M. (1980) Understanding attitudes and predicting social behaviour. Prentice-Hall. New Jersey.

Ajzen I. and Madden T. (1986). Prediction of goal-directed behaviour: Attitudes, intentions and perceived behavioural control. Journal of Experimental Social Psychology 22. 453-474

Ajzen I., Timko C. and White J.B. (1982). Self-monitoring and the attitude-behaviour relation. Journal of Personality and Social Psychology. 42. 3. 426-435. 1982.

Allport G.W. (1935). Attitudes. In: Huchinson, C. (ed.) A handbook of social psychology. Clark University Press. Worcester. Mass: 798-844.

Alwin D. (1973). Making inferences from attitude-behaviour correlations. Sociometry. 36. 253-278. 1973.

Bagozzi R.P. (1980) Causal Models in Marketing New York. John Wiley & Sons.

Bagozzi R.P. (1981a) An examination of the validity of two models of attitude. Multivariate Behavioural Research. 16. 323-359

Bagozzi R.P. (1981b) Attitudes intentions and behaviour: a test of some key hypotheses. Journal of Personality and Social Psychology 41. 607-27

Bagozzi R.P. (1982) A field investigation of causal relations among cognitions, affect, intentions and behaviour. Journal of Marketing Research Vol XIX, Nov. 1982. 562-84

Bagozzi R.P. (1988). The Rebirth of Attitude Research in Marketing. Journal of the Market Research Society, Vol 30 no.2

Bagozzi R.P. and Burnkrant, R.E. (1979). Attitude organisation and the attitude-behaviour relationship. Journal of Personality and Social Psychology, 37, 6, 913-929, 1979.

Baumol W.J. (1965). Economic Theory and Operations Analysis Prentice Hall, 1965.

Baumol W.J. Pazar J.C. Willig R.D. (1982). Contestable Markets and the theory of industry structure. New York: Harcourt Brace Javanovich.

Beesley M.E. and Glaister S. (1985). Deregulating the bus industry in Britain (C): A response. Transport Reviews, Vol 5, 2, 133-142.

Bem D.J. (1967). An experimental analysis of self persuasion. Journal of Experimental Social Psychology, 1, 199-218, 1967.

Bem D.J. (1972). Self perception theory. In: L. Berkowitz (ed), Advances in experimental social psychology (Vol 6) New York, Academic Press. 1972.

Bentler P.M. and Speckart G. (1979). Models of attitude-behaviour relations. Psychological Review, 86, 452-464, 1979.

Bentler P.M. and Speckart G. (1981). Attitudes 'cause' behaviours: A structural equation analysis. Journal of Personality and Social Psychology, 40, 2, 226-238, 1981.

Bentley R. (1988). Personal interview. Plymouth City Council Corporate Planning Officer.

Bly P.H. and Oldfield R.H. (1986). Competition between minibuses and regular bus services. Jnl of Transport Econs and Policy Vol XX, 1, 47-68.

Bonfield E.H. (1974). Attitude, Social Influence, Personal Norm and Intention Interactions as Related to Brand Purchase Behaviour. Journal of Marketing Research, 11, 379-389

Budd R.J. and Spencer C. (1985). Exploring the role of personal normative beliefs in the theory of reasoned action: The problem of discriminating between alternative path models. European Journal of Social Psychology, 15, 299-313, 1985.

Burnkrant R.E. and Page T.J. Jnr. (1982). An examination of the convergent, discriminant and predictive validity of Fishbein's behavioural intention model. Journal of Marketing Research, 19, 550-561

Burnkrant R.E. and Page T.J. Jnr. (1988). The structure and antecedents of the normative and attitudinal components of Fishbein's theory of reasoned action. Journal of Experimental Social Psychology, 24, 66-87, 1988.

Cantril H. (1934). Attitudes in the making. Understanding the child, 4, 13-15.

Carrick R.J. (1978). 'Getting inside people's heads' An Alternative Approach to Public Transport Evaluation. Occasional Paper 7, Department of Geography and Geology, Huddersfield Polytechnic.

Caves D.W. and Christensen L.R. (1978). The relative efficiency of public and private firms in a competitive environment: the case of Canadian railroads. Social Systems Research Institute Workshop Series, October.

Chadwick E. (1859). Research into different principles of legislation and administration in Europe of competition for the field as compared with competition within the field of service. Jnl of Royal Statistical Society, Series A, 22, 381-420.

Chapanis N.J. and Chapanis A.C. (1964). Cognitive dissonance: five years later. Psychological Bulletin, 61, 1-22, 1964.

Chave E.J. (1928). A new type scale for measuring attitudes. Relig. Educ. 23, 364-369.

Clymo J. (1986). Setting a course for deregulating bus operations. Transport, Vol 7, 3.

Coe G.A. and Jackson R.L. (1983). Developments in stage carriage bus fares before and after the Transport Act 1980. Transport and Road Research Laboratory Report LR 1098. Dept. of the Environment, Dept of Transport.

Cook H. (1982) Unpublished MPhil thesis. The determinants of modal choice on the Exmouth-Exeter corridor. Department of Shipping and Transport. Plymouth Polytechnic.

Cook T.D. and Campbell D.T. (1976). The design and construct of quasi-experiments and true experiments in field settings. In: Dunnette, M.D. (ed) Handbook of Industrial and Organisational Psychology Chicago: Rand McNally.

Crain W.M. and Zardkoohi A. (1978). A test of the property rights theory of the firm: water utilities in the United States. Jnl of Law and Economics, XXI, 2

Crockett W.H. (1974). Balance, agreement and subjective evaluations of the P-O-X triads. Journal of Personality and Social Psychology, 29, 102-110, 1974

Davidson A.R. and Jaccard J.J. (1975). Population psychology: a new look at an old problem. Journal of Personality and Social Psychology, 31, 1073-82

Davidson A.R. and Jaccard J.J. (1979). Variables that moderate the attitude-behaviour relation: Results of a longitudinal survey. Journal of Personality and Social Psychology 37, 1364-1376, 1979.

Demsetz M. (1968). Why regulate utilities? Int of Law and Econ. 11, April, 55-66.

Deutsch M. (1949). The directions of behaviour: a field-theoretical approach to understanding inconsistencies. Journal of Social Issues, 5, 43-9, 1949.

Dobson R. and Tischer M.L. (1976). Beliefs about buses, carpools and single occupation autos: a market segmentation approach. Transportation Research Forum Proceedings 17, 200-209

Domberger S. (1985). Economic regulation through franchise contracts. Paper presented to IFS Conference on competition and regulation, May 1985.

Eiser J.R (1986). Social Psychology: Attitudes, cognition and social behaviour. Cambridge University Press. Cambridge 1986

Eiser J.R. and Stroebe W. (1972). Categorisation and social judgement. Academic Press. London. 1972.

Epstein S. (1979). The stability of behaviour: On predicting most of the people much of the time. Journal of Personality and Social Psychology. 37. 1097-1126. 1979.

Evans A. (1985). Estimating the economics of competitive bus services in Hereford. Paper presented to PTRC summer annual meeting July 1985.

Fairhead R.D. and Balcombe R.J. (1984). Deregulation of bus services in the Trial Areas- 1981-1984. Transport and Road Research Laboratory Report LR 1131. Dept of the Environment, Dept of Transport.

Farnell C. (1987). A Second Generation of Multivariate Analysis Classification of Methods and Implications for Marketing Research. In: Review of Marketing 1987. M.J. Houston (ed). Chicago, American Marketing Association.

Fazio R.H. and Zanna M. (1978a). Attitudinal qualities relating to the strength of the attitude-behaviour relationship. Journal of Experimental Psychology, 14, 398-408, 1978.

Fazio R.H. and Zanna M. (1978b). On the predictive validity of attitudes: The roles of direct experience and confidence. Journal of Personality, 46, 228-243, 1978.

Festinger L. (1957). A theory of cognitive dissonance. Row, Peterson. Evanston.

Fishbein M. (1967). Attitude and the prediction of behaviour. In: Fishbein M. (ed.) Readings in attitude theory and measurement. John Wiley & Sons, Inc. New York.

Fishbein M. (1973). The prediction of behaviour from attitudinal variables. In: Mortensen, D.C. and Sereno, K.K. (eds) Advances in Communications Research. New York: Harper Row, 3-31.

Fishbein M. (1976). Extending the extended model: some comments. In: Anderson B.B. (ed) Advances in Consumer Research Vol III Cincinnati: The Association for Consumer Research 491-497.

Fishbein M (1977). Consumer beliefs and behaviour with respect to cigarette smoking: An initial analysis of the public literature. In: Federal Commission Report to Congress, Pursuant to the Public Health Cigarette Smoking Act for the year 1976, App A.

Fishbein M and Ajzen I. (1972). Attitudes and opinions. A Rev. Psychol. 23, 487-544.

Fishbein M and Ajzen I. (1974). Attitudes toward objects as predictors of single and multiple behavioural criteria. Psychological Review, 81, 59-74. 1974.

Fishbein M. and Ajzen I. (1975). Belief, attitude, intention and behaviour: an introduction to theory and research. Addison-Wesley. Philippines.

Fishbein M. and Ajzen I. (1976a). Misconceptions about the Fishbein model: Reflections on a study by Songer-Nocks. Journal of Experimental Social Psychology, 12, 579-584

Fishbein M. and Ajzen I. (1976b). Misconceptions revisited: A final comment. Journal of Experimental Social Psychology, 12, 591-93

Foster J. Rhoads. (1983). Commentary on the boundaries between competition and regulation. In: Foster J. Rhoads., Hall G.R., Holmberg S.R. Phillips C.F. (eds) Airline Deregulation, lessons for public policy formation. Wallace publication for study of regulation 1983.

Fowler N. Rt Hon. (1985). The 1980 Transport Act Bus and Coach Council Conference. May Fair Hotel, London, January 1985.

Fredricks A.J. and Dossett D.L. (1983). Attitude-behaviour relations: A comparison of the Fishbein-Ajzen and the Bentler-Speckart models. Journal of Personality and Social Psychology, 45, 3, 501-512, 1983.

Glaister S. (1985). Competition on an Urban Bus Route. Jnl of Transport Econ and Policy, Vol XIX, 1, 65-81.

Glassman M. and Birchmore M. (1974). The relationship between subjective norms and normative beliefs. Unpublished manuscript, University of Illinois.

Glassman M. and Fitzhenry N. (1976). Fishbein's subjective norm: theoretical considerations and empirical evidence. In: Anderson B.B. (ed), Advances in Consumer Research, Vol III, Ann Arbor, MI: Association for Consumer Research.

Golbe D.L. (1986). Safety and Profits in the Airline Industry. Journal of Industrial Economics, Vol XXXIV, 305-18

Golob T.F. and Recker W.R. (1977). Mode Choice Prediction using Attitudinal Data: a Procedure and Some Results. Transportation, 6, 321-332

Golob T.F., Canty E.T., Gustafson R.C., Vitt J.E. (1972). An analysis of consumer preference for a public transportation system. Transp. Res. 6, 81-102

Goodwin P.B. and Hensher D.A. (1978). The transport determinants of travel choice: An overview. In: Hensher D.A. and Dalvi Q. (eds) The Determinants of Travel Choice Saxon House: Farnborough.

Gwilliam K.M., Nash C.A. and Mackie P.J. (1985). Deregulating the Bus Industry in Britain (B): The case against. Transport Reviews. Vol 5, 2, 105-132.

Heider F. (1946). Attitudes and cognitive organization. Journal of Psychology. 21, 107-12. 1946.

Heider F. (1958). The psychology of interpersonal relations. Wiley. New York.

Held M. (1979). Some thoughts about the individual's choice among alternative travel modes and its determinants. In: Stopher P.R., Meyburg A.H. and Brog W. (eds) New Dimensions in Travel-Behaviour Research. Mass.: Lexington Books. 1981.

Hensher D.A. and Louviere J.T. (1979). Behavioural Intentions as Predictors of very Specific Behaviour. Transportation. 8, 167-182

Hensher D.A., McLeod P.E. and Stanley J.K. (1975) Usefulness of Attitudinal Measures in Investigating the Choice of Travel Mode. International Journal of Transport Economics, 2, 51-75

Hibbs J. (1986). Cross-subsidy revisited. Transport Economist Winter 1986 Vol 14, 2.

Higginson M. (1984). Buses after 'Buses' - possible implications of the 1984 White Paper. University of London, Dept of Extra-mural Studies, November 1983.

H.M. Treasury (1961). Financial and Economic Obligations of the Nationalised Industries. Cmd 1337, HMSO.

(1967). Nationalised Industries. Cmd 3437, HMSO.

(1978). The Nationalised Industries Cmd 7131, HMSO.

Horton F. and Louviere J.T. (1974). Behavioural Analysis and Transportation Planning Inputs to Transit Planning. Transportation, 3, 165-182

Hotelling H. (1938). The general welfare in relation to the problems of taxation and of railway and utility rates. Econometrica 1938.

Howe Sir Geoffrey. (1981). Speech given to the Selsden Group on 1st July. Conservative Central Office Press Release 533/81.

Jaccard J., Knox R., and Brinberg D. (1979). Prediction of behaviour from beliefs: An extension of a subjective probability model.

Journal of Personality and Social Psychology, 37, 1239-48

Johnson M.A. (1974). Travel Attitudes and Choice Between Automobiles and Public Transportation. Travel Demand Forecasting Project, University of California, Berkeley.

Kahle L.R. and Berman J.J. (1979). Attitudes cause behaviours: A cross-lagged panel analysis. Journal of Personality and Social Psychology, 37, 315-321, 1979.

Kay J., Meyer C., Thompson D. (1986). Privatisation and regulation: the U.K. experience. Oxford: Clarendon Press.

Kelman H.C. (1974). Attitudes are alive and well and gainfully employed in the sphere of action. American Psychologist, 29, 310-324, 1974.

Kilvington R. and Cross A. (1986). Deregulation of Express Coach Services in Britain. Oxford Studies in Transport: Gower.

Levin I.P. (1979). The Development of Attitudinal Modelling Approaches in Transport Research. In: Hensher D.A. & Stopher P. (eds.) Behavioural Travel Modelling. Croom-Helm, London, 758-782.

Levin I.P. and Herring R.D. (1981). Functional Measurement of Qualitative Variables in Mode Choice: Ratings of Economy, Safety and Desirability of Flying versus Driving. Transportation, 15(A), 207-214

Likert R. (1932). A technique for the measurement of attitudes. Arch. Psychol. 140.

Liska A.E. (1974). The impact of attitude on behaviour: attitude-social support interaction. Pacific Sociological Review, 17, 83-97, 1974.

Lord Shepherd (1984). Dept. of Transport White Paper Buses Cmnd 9300 HMSO.

Louviere J. and Norman K.L. (1977). Applications of Information Processing Theory to the Analysis of Urban Travel Demand. Environment and Behaviour, 9(1), 91-107

Lutz R.J. (1975). Changing brand attitude's through modification of cognitive structure. Journal of Consumer Research 1 (March) 49-59

Lutz R.J. (1977). An experimental investigation of causal relations among cognitions, affect and behavioural intention. Journal of Consumer Research, 3 (March) 197-208

Manstead A.S.R., Proffitt C., and Smart J.L. (1983). Predicting and understanding mothers' infant-feeding intentions and behaviour: Testing the theory of reasoned action. Journal of Personality and Social Psychology 44.657-671

Mckinnon C. Dan. (1983). A personal appraisal of airline deregulation. In: Foster J Rhoads. Hall G.R., Holmberg S.R., Phillips C.F. (eds) Airline Deregualtion. Lessons for Public Policy Formation. Wallace publication for the study of regulation 1983.

McGuire W.J. (1976). The concept of attitudes and their relations to behaviours. In: H.W. Sinaiko and L.A. Broedling (eds), Perspectives on attitude assessment: surveys and their alternatives. Champaign, III.: Pendleton, 1976.

Meyer R.A. (1975). Publicly owned versus privately owned utilities: a policy choice. Review of Economics and Statistics. November.

Meyer R.A., Levin I.P. and Louviere J. (1978). Fundamental Analysis of Mode Choice. Transportation Research Record. 673. 1-7

Michaels R.M. and Allaman P.M. (1979). Research in psychometrics: potential for applications and new directions for travel modelling. In: Stopher P.R., Meyburg A.H., Brog W. New Horizons in Travel-Behaviour Research Lexington Books: Massachusetts.

Millward R. (1982). The comparative performance of public and private enterprise. In: Lord Roll (ed) The Mixed Economy London: Macmillan.

Minniard P.W. and Cohen J.B. (1979). Isolating attitudinal and normative influences in behavioural intentions models. Journal of Marketing Research 16. (Feb) 102-110

Minniard P.W. and Cohen J.B. (1981). An examination of the Fishbein-Ajzen behavioural intentions model's concepts and measures. Journal of Experimental Social Psychology, 17, 309-39

Monopolies and Mergers Commission (1982). Bristol Omnibus Co. Ltd. Cheltenham District Traction Co. City of Cardiff District Council. Trent Motor Traction Co., West Midlands Passenger Transport Executive. A report on stage carriage services supplied by the undertakings. HMSO.

Mower White C.J. (1982). Consistency in cognitive social behaviour. An introduction to social psychology. Routledge and Kegan Paul. London. 1982.

MVA Consultancy (1985). The impact of the Buses White Paper on Plymouth. final report. Plymouth City Council.

Newcomb T.M. (1953). An approach to the study of communicative acts. Psychological Review, 60, 393-404. 1953.

Newcomb T.M. (1956). The prediction of interpersonal attraction. American Psychologist, 11, 575-86, 1956.

Newcomb T.M. (1968). Interpersonal balance, in; R.P. Abelson, E. Aronson, W.J. McGuire, T.M. Newcomb, M.J. Rosenberg and P.H. Tannenbaum (eds), Theories of cognitive consistency: a source book. Rand McNally. Chicago. 1968.

Nicolaidis G.C. (1977). Psychometric Techniques in Transportation Planning; Two Examples. Environment and Behaviour, 9(4), 459-486.

Norman R, (1975). Affective-cognitive consistency: attitudes, conformity and behaviour. Journal of Personality and Social Psychology, 32, 83-91, 1975.

Norman K.L. (1977). Attributes in Bus Transportation: Importance depends on Trip Purpose. Journal of Applied Psychology, 62(2), 164-170.

Nuttin J.M. (1975). The illusion of attitude change: towards a response contagion theory of persuasion. Academic Press. London. 1975.

Oliver R.L. & Bearden W.O. (1985). Crossover Effects in the Theory of Reasoned Action. Journal of Consumer Research, 12, 324-340

Oliver R.L. & Berger P.K. (1979). A Path Analysis of Preventive Health Care Decision Models. Journal of Consumer Research, 6, 113-122

Osgood C.E. Suci G.J. and Tannenbaum R.H. (1957). The measurement of meaning. University of Illinois Press. Urbana. Illinois.

Osgood C.E. and Tannenbaum P.H. (1955). The principle of congruity in the prediction of attitude change. Psychological Review, 62, 42-55. 1955.

Pagel M.D. and Davidson A.R. (1984). A comparison of three social-psychological models of attitude and behavioural plan: Prediction of contraceptive behaviour. Journal of Personality and Social Psychology, 47, 517-33. 1984.

Paine F., Nash A.N., Hille S.J. and Brunner G.A. (1969). Consumer Attitudes Towards Autos Versus Public Transport Alternatives. Journal of Applied Psychology, 53, 472-480

Pescatrice D.R. and Trapani J.M. III. (1980). The performance and objectives of public and private utilities operating in the United States. Intl of Public Econs, 13, 2.

Pomazal R.J. and Jaccard J.J. (1976). An informational approach to altruistic behaviour. Journal of Personality and Social Psychology, 33, 317-326

Prashker J. (1979). Direct Analysis of the Research Importance of the Attributes of Reliability of Travel Time in Urban Travel. Transportation, 8, 329-346.

Pryke R. (1985). The comparative performance of public and private enterprise. In; Kay J., Meyer C., Thompson D. (1986). Privatisation and regulation: the U.K. experience. Oxford: Clarendon Press.

Raju P., Bhaghat R. and Sheth J.N. (1975). Predictive Validation and Crossvalidation of the Fishbein, Rosenberg and Sheth Models of Attitude. Advances in Consumer Research 2, 405-425

Recker W. and Golob T.F. (1976). An Attitudinal Modal Choice Model. Transportation Research, 10(5), 229-310.

Recker W. and Stevens R. (1976). Attitudinal Models of Modal Choice: The Multinomial Case for Selected Nonwork Trips. Transportation, 5, 353-375.

Regan D.T. and Fazio R. (1977). On the consistency between attitudes and behaviour: Look to the method of attitude formation. Journal of Experimental Social Psychology, 13, 83-91, 1977.

Road Traffic Act 1930. HMSO.

Rogosa D.A. (1980). A critique of cross lagged correlation. Psychological Bulletin, 88, 245-258, 1980.

Rosenberg M.J. and Hovland C.I. (1960). Cognitive, affective and behavioural components of attitudes. In: C.I. Hovland and M.J. Rosenberg (eds), Attitude organisation and change: An analysis of consistency among attitude components. New Haven, Conn.: Yale University Press 1960.

Ryan M.J. (1978). An examination of an alternative form of the behavioural intention model's normative component. In: Hunt, H.K. (ed) Advances in Consumer Research Vol V Provo, Utah: The Association for Consumer Research 283-289

Ryan M.J. (1978b). An experimental test of the expanded behavioural intention model. Working Paper no. 171. New York: Graduate School of Business, Columbia University.

Ryan M.J. and Bonfield E.H. (1975). The extended Fishbein model and consumer behaviour. The Journal of Consumer Research 2, 118-136

Ryan M.J. and Bonfield E.H. (1980). Fishbein's intentions model, a test of external and pragmatic validity. Journal of Marketing 44, (Spring) 82-95

Ryan M.J. and Etzel M.J. (1976). The nature of salient outcomes and referents in the extended model. In: Anderson, B.B. (ed) Advances in Consumer Research, Vol III Cincinnati: The Association for Consumer Research, 485-490

Sandler R.D. (1988). Market Share Instability in Commercial Airline Markets and the Impact of Deregulation. Journal of Industrial Economics. Vol XXXVI, 3, p327-335

Savage I. (1985). Change in the bus industry, how cheaper are the independents? Paper presented to the Transport Economists Group. January. White P.R., Farrel P. Savage I. Transport Economist Summer 1985.

Scheier M.F. (1980). Effects of public and private self-consciousness on the public expression of personal beliefs. Journal of Personality and Social Psychology, 39, 514-521. 1980

Scheier M.F., Buss A.H. and Buss D.M. (1978). Self-consciousness, self-report of aggressiveness and aggression. Journal of Research in Personality, 12, 133-40. 1978.

Schlegel R.P., Crawford C.A. and Sanborn M.D. (1977). Correspondence and mediational properties of the Fishbein model: An application to adolescent alcohol use. Journal of Experimental Social Psychology, 13, 421-30. 1977.

Schwartz S. (1979). Temporal instability as a moderator of the attitude-behaviour relationship. Journal of Personality and Social Psychology, 36, 715-724. 1979.

Schwartz S.H. and Tessler R.C. (1972) A test of a model for reducing measured attitude-behaviour discrepancies. Journal of Personality and Social Psychology, 24, 225-236, 1972.

Secord P.F. and Backman C.W. (1965). An interpersonal approach to personality. In: B. Maher (ed), Progress in experimental personality research, vol 2. New York: Academic Press

Sharkey W.W. (1982). The theory of natural monopoly. Cambridge: Cambridge University Press.

Sherif M. and Hovland C.I. (1961). Social judgement: assimilation and contrast effects in communication and attitude change. Yale University Press. New Haven, Conn. 1961.

Shimp T.A. & Kavas A. (1984). The Theory of Reasoned of Action Applied to Coupon Usage. Journal of Consumer Research, 11, 795-809

Snyder M. (1974). Self-monitoring of expressive behaviour. Journal of Personality and Social Psychology, 30, 526-537, 1974.

Snyder M. (1982). When believing means doing: creating links between attitudes and behaviour. In: M.P. Zanna, C.P. Herman, and E.T. Higgins (eds) Variability and consistency in social behaviour: The Ontario Symposium. Hillsdale, N.J.: Erlbaum. 1982.

Snyder M. and Swann W.B. Jnr. (1976). When actions reflect attitudes: the politics of impression management. Journal of Personality and Social Psychology, 34, 1034-1042. 1976.

Songer-Nocks E. (1975). Situational factors affecting the weighting of predictor components in the Fishbein model. Journal of Experimental Social Psychology 12, 56-69. 1976.

Songer-Nocks E. (1976). Reply to Fishbein and Ajzen. Journal of Experimental Social Psychology, 12, 585-590

Starkie D.N.M. (1984). B.R.: privatisation without tears. Economic Affairs, October-December, 16-19.

Stopher P.R., Meyburg A.H. and Brog W. (1979). Travel-behaviour research: A perspective. In: Stopher P.R., Meyburg A.H. and Brog W. (eds) New Dimensions in Travel-Behaviour Research. Mass.: Lexington Books. 1981.

Thomas K. (ed) (1971). Attitudes and behaviour. Penguin. London.

Thomas K. (1975). The use of a modified expectancy value model in the forecasting of off-peak travel behaviour. Cranfield Memo 141. Cranfield Institute of Technology.

Thomas K. (1977). A re-interpretation of the 'attitude' approach to transport mode choice, and an exploratory empirical test. Cranfield Memo 140. Cranfield Institute of Technology.

Thomas W.I. and Zaniecki F. (1918). The polish peasant in Europe and America. Badger. Boston.

Thurstone L.L. (1928). Attitudes can be measured. Am. Jnl. Sociol. 33, 529-554.

Towriss J.G. (1984) A new approach to the use of expectancy value models. Journal of the market research society. 26, 1 1984, 63-75.

Transport Act 1985. HMSO.

Upshaw H.S. (1962). Own attitude as an anchor in equal appearing intervals. Journal of Abnormal and Social Psychology. 64, 85-96. 1962.

Upshaw H.S. (1965). The effect of variable perspectives on judgements of opinion statement for Thurstone scales: equal appearing intervals. Journal of Personality and Social Psychology. 2, 60-9, 1965.

Walters A.A. (1982). Externalities in urban buses. Jnl of Urban Econs. Vol 11.

Warland R.H. and Sample J. (1973) Response certainty as a moderator variable in attitude measurement. Rural Sociology, 38, 174-186, 1973.

Warshaw P.R. (1980). A new model for predicting behavioural intentions: An alternative to Fishbein. Journal of Marketing Research, 17, (May), 153-172

Watson D. and Tellegen A. (1985). Toward a consensual structure of mood. Psychological Bulletin, 98, 219-235

Weigel R.H. and Newman L.S. (1976). Increasing attitude-behaviour correspondence by broadening the scope of the behavioural measure. Journal of Personality and Social Psychology, 33, 6, 793-802, 1976.

Welles C. (1986) Is Deregulation Working? Business Week, December 22nd p50-55

Westin R.B. and Watson P.L. (1975). Reported and Revealed Preferences as Determinants of Mode Choice Behaviour. Journal of Market Research, 12, 282-9.

White P.R. How cheaper are the independents? Paper presented to the Transport Economists Group. January. White P.R., Farrel P. Savage I. Transport Economist Summer 1985.

Whitley E.W. (1985). The Case for Postal Research. Journal of the Market Research Society, Vol 27, no.1

Wicker A.W. (1969). Attitude versus action: The relationship of verbal and overt behavioural responses to attitude objects. Journal Social Issues, 25, 41-78, 1969.

Wicker A.W. (1971) An examination of the 'other variables' explanation of attitude-behaviour inconsistency. Journal of Personality and Social Psychology, 19, 18-30, 1971.

Wicklund R.A. (1982). Consistency with what? In: M.P. Zanna, C.P. Herman, and E.T. Higgins. Variability and consistency in social behaviour: The Ontario Symposium. Hillsdale, N.J.: Erlbaum, 1982.

Wilkie W.L. & Pessemier E.A. (1973). Issues in Marketing's use of Multi-Attribute Attitude Models. Journal of Marketing Research, 10, 428-441

Wilson D.T., Matthews H.L., and Harvey J.W. (1975). An empirical test of the Fishbein behavioural intention model. Journal of Consumer Research 1, (March) 39-48

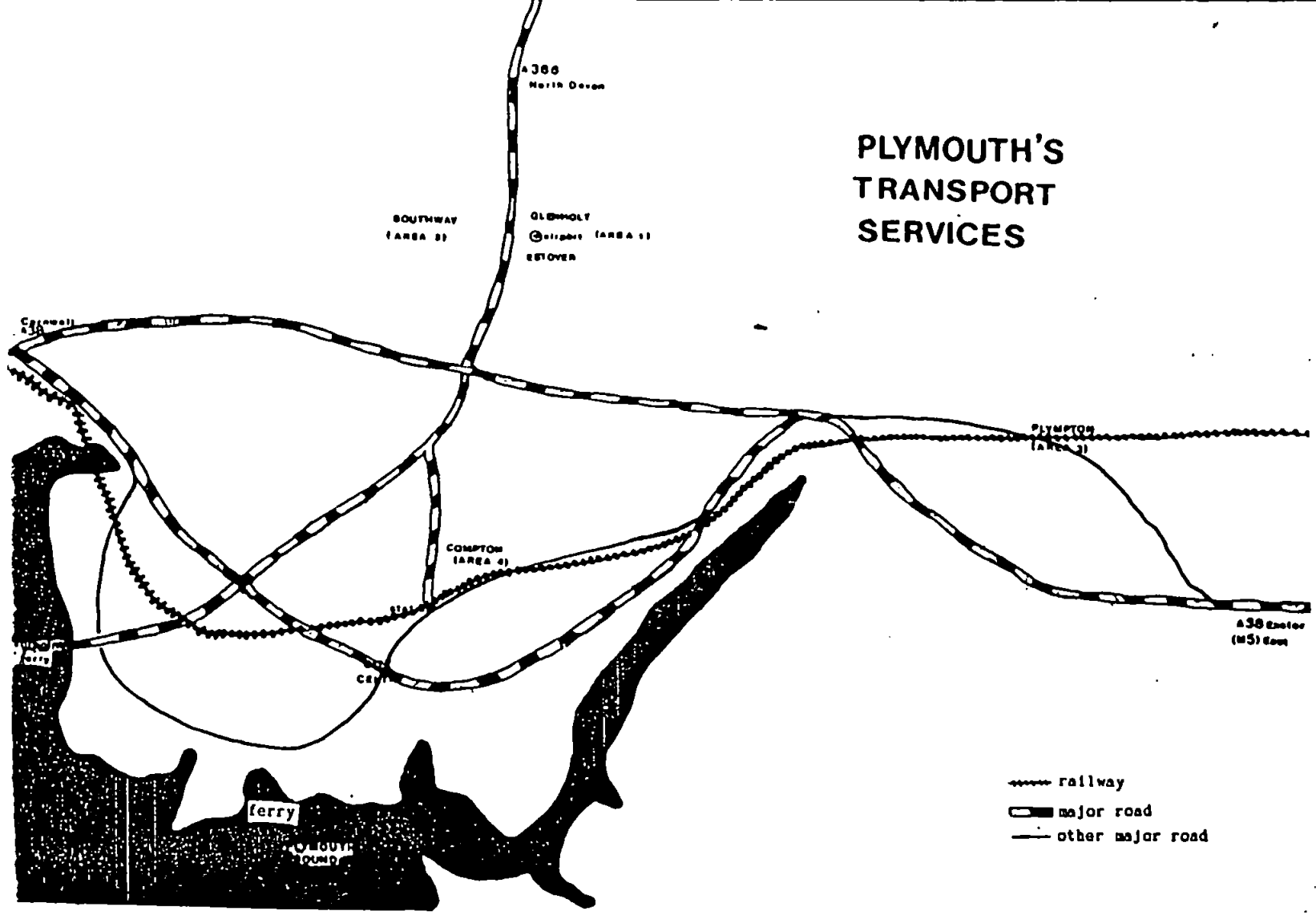
Yunker J.A. (1975). The economic performance of public and private enterprise: the case of US electric utilities. Jnl of Econ and Business, 28, 1.

Zuckerman M. and Reis H.T. (1978). Comparison of three models for predicting altruistic behaviour. Journal of Personality and Social Psychology, 36, 498-510

APPENDIX A

MAP OF PLYMOUTH'S TRANSPORT
NETWORK

PLYMOUTH'S TRANSPORT SERVICES

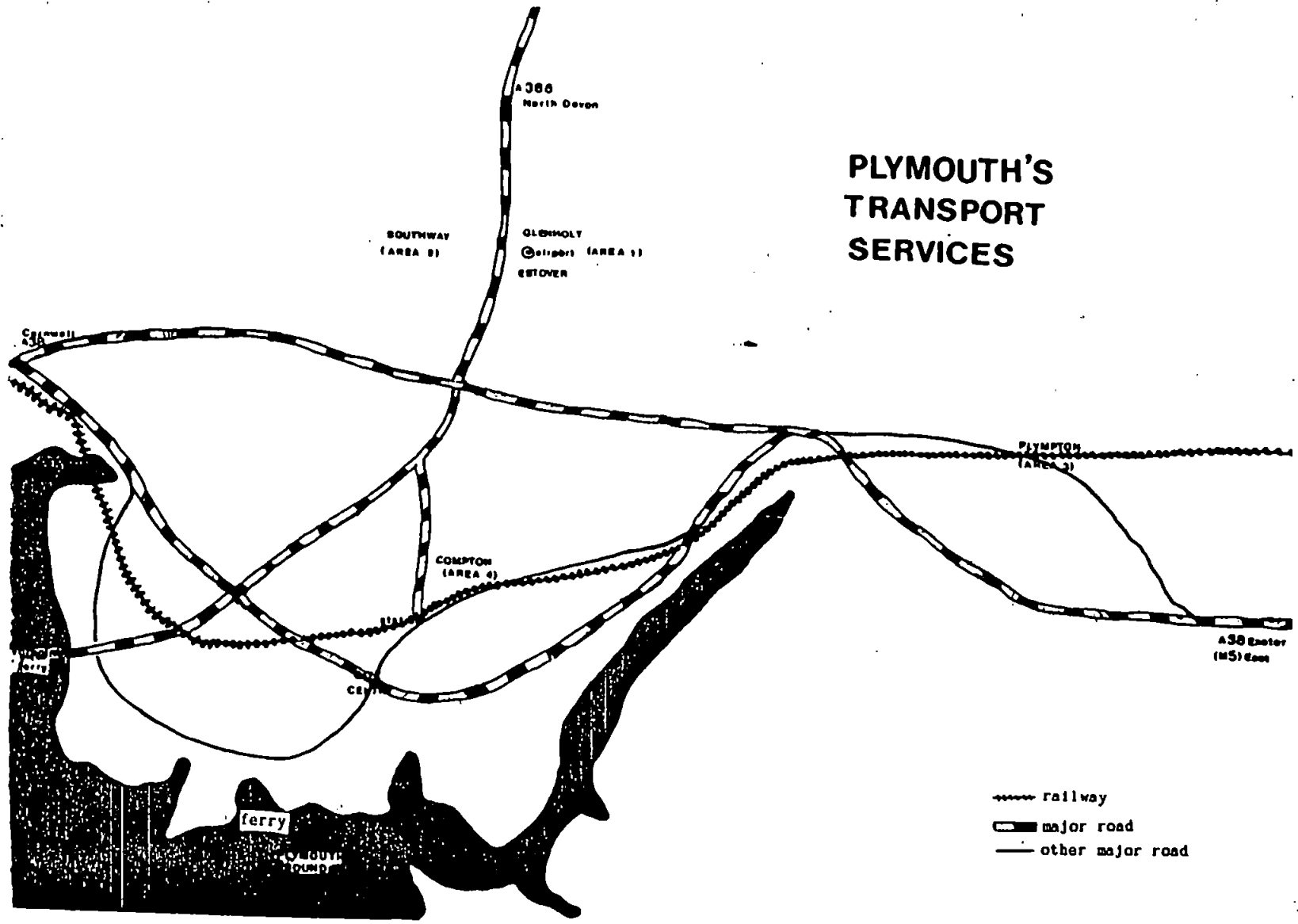


--- railway
- - - major road
— other major road

A1

PLYMOUTH'S TRANSPORT SERVICES

A1



--- railway
— major road
— other major road

APPENDIX B

TYPE OF HOUSING IN EACH

AREA

APPENDIX B

Type of Housing in each area

HOUSING/AREA	1	2	3	4
owner occupier	51%	38%	84%	73%
council	29%	51%	7%	1%
housing association	2%	0%	2%	2%
rented unfurnished	2%	1%	2%	9%
rented furnished	6%	4%	2%	12%
other rented	5%	6%	3%	3%
non-permanent*	5%	0%	0%	0%

Figures obtained from 1981 Census Data.

* there is a mobile home site in Glenholt, hence the high level of non-permanent accommodation

APPENDIX C

CAR OWNERSHIP IN EACH

AREA

APPENDIX C

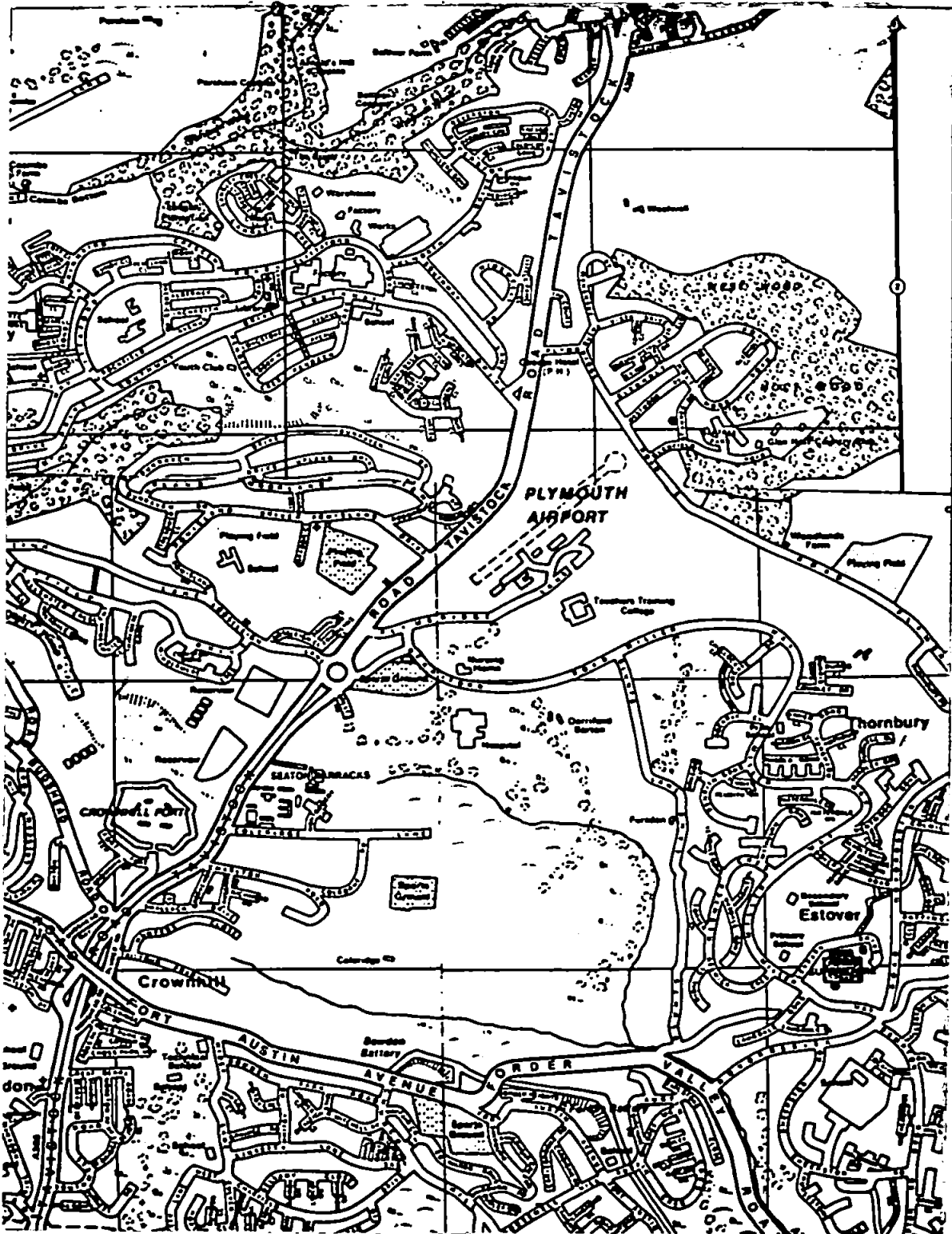
Car ownership in four study areas

area/no. of cars	0	1	2	3+	tot. with >1
area 1	25%	59%	14%	2%	75%
area 2	31%	56%	11%	2%	69%
area 3	19%	62%	16%	3%	81%
area 4	32%	51%	14%	3%	68%

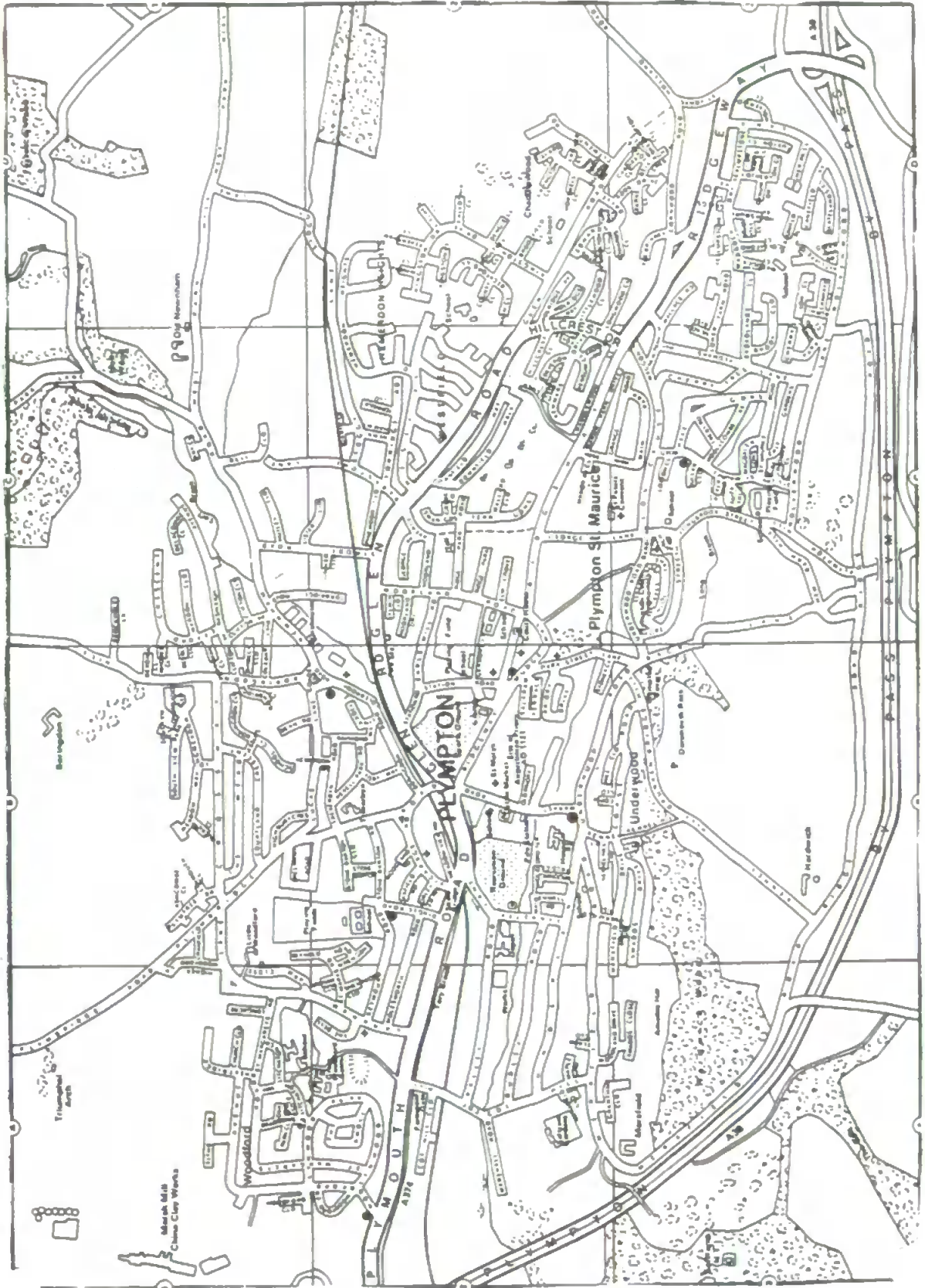
Source: 1981 Census Data

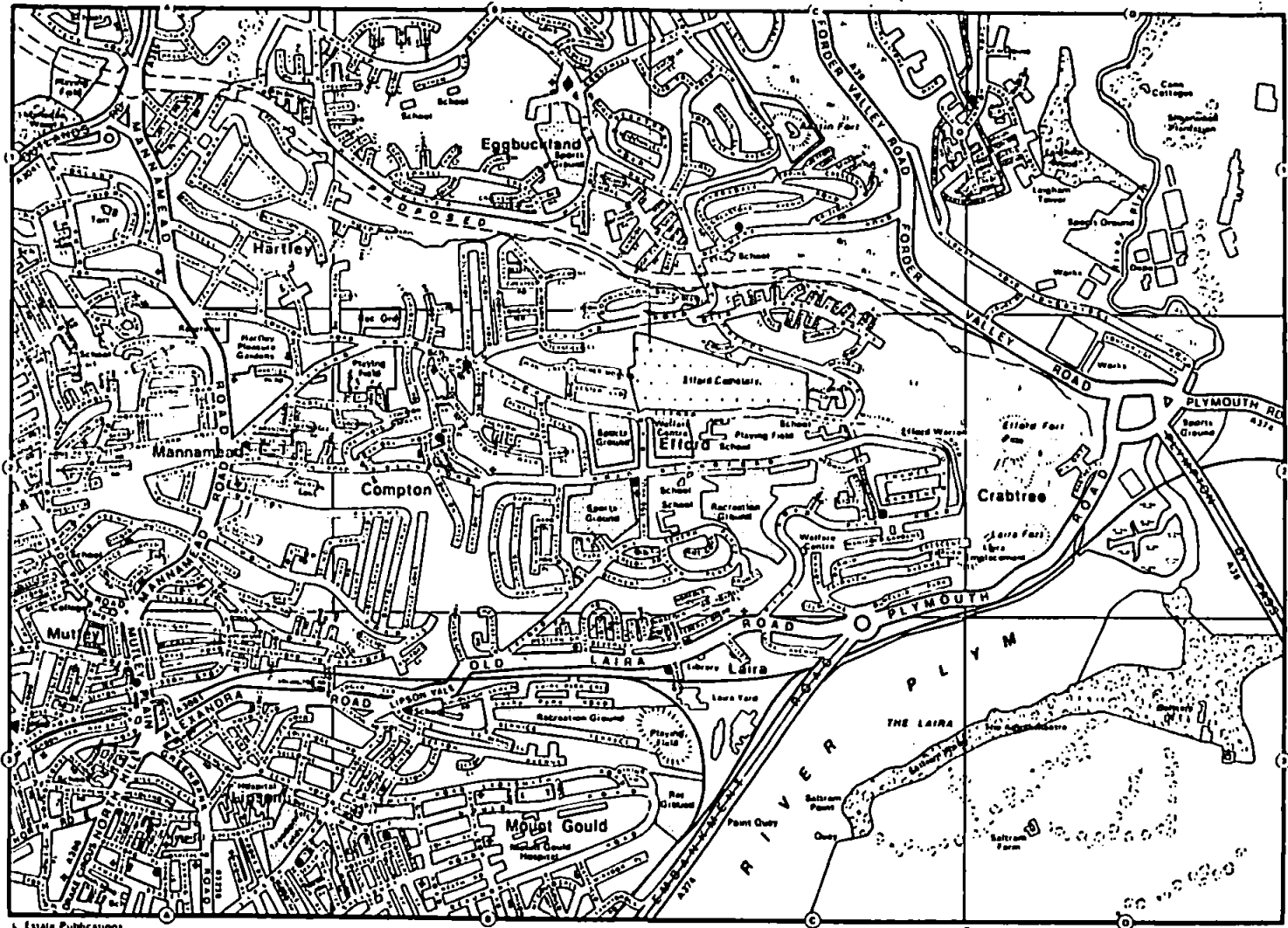
APPENDIX D
MAPS OF THE FOUR
STUDY AREAS

GLENHOLT



PLYMPTON





COMPTON

D7

APPENDIX E
EMPLOYMENT IN THE FOUR
STUDY AREAS

APPENDIX E

Employment of persons in four study areas

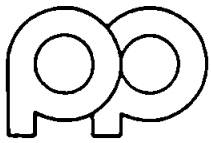
	AREA 1	AREA 2	AREA 3	AREA 4
All persons 16+	10710	9933	18062	8637
working	6254 (62.9%)	6083 (61.2%)	11087 (61.3%)	4334 (50.1%)
seeking work	426 (3.9%)	572 (5.7%)	552 (3%)	364 (4.2%)
retired	758 (7%)	547 (5.5%)	1720 (9.5%)	1077 (24.5%)
student	381 (3.5%)	399 (4%)	686 (3.8%)	578 (6.7)
other inactive (housewives?)	2709 (25.3%)	2124 (21.4%)	3884 (21.5%)	2119 (24.5%)

Source: 1981 Census Data

APPENDIX F

FIRST POSTAL SURVEY

JANUARY 1986



Faculty of Maritime Studies
Department of Shipping and Transport
Heath C.A. Rich, Extra Master, MSc, DMS, FNI, FCIT, MBIM.
Phone ext: 5497

Reply to: A. Green (Ext. 5476)

Our ref: AG/GD

Your ref:

Date:

Dear Sir/Madam,

As a resident of Plymouth may I ask for your help in a survey I am undertaking? I am trying to establish peoples' travel behaviour and attitudes to public transport.

This survey forms part of a two year research project funded by the Science and Engineering Research Council. In order to up-date my information fully, and to put it to the best possible use, I am anxious to obtain a reply from each person I write to. I hope that you will be able to spare a few minutes to complete the enclosed questionnaire, even if some parts of it may not apply to you.

Due to the amount of interest in this subject at the moment, you may already have received surveys from students to fill in, however as this is a SERC funded project, I would be grateful if you could spare a few more minutes of your time to fill in the enclosed. An envelope is provided in which to return the completed form, no stamp is required. All results will be treated in the strictest confidence.

Yours faithfully

Alison Green
Research Assistant

PLYMOUTH PUBLIC TRANSPORT SURVEY

Please tick box to answer.

There are two categories, one for the householder, and one for 'other occupant' this can be anyone in the same house who travels independently.

Who is answering as other occupant?

- | | |
|----------------------|--------------------------|
| spouse | <input type="checkbox"/> |
| flatmate | <input type="checkbox"/> |
| child | <input type="checkbox"/> |
| other (please state) | |

SECTION A

1. Which form of transport do you normally use? Tick one only.

	householder	other occupant
car (sole use)	<input type="checkbox"/>	<input type="checkbox"/>
car (occasional use)	<input type="checkbox"/>	<input type="checkbox"/>
car (passenger)	<input type="checkbox"/>	<input type="checkbox"/>
bus	<input type="checkbox"/>	<input type="checkbox"/>
cycle	<input type="checkbox"/>	<input type="checkbox"/>
motorcycle	<input type="checkbox"/>	<input type="checkbox"/>
walking	<input type="checkbox"/>	<input type="checkbox"/>
other (please state)	<input type="checkbox"/>	<input type="checkbox"/>

2. To which age group do you belong?

	householder	other occupant
under 16	<input type="checkbox"/>	<input type="checkbox"/>
16-25	<input type="checkbox"/>	<input type="checkbox"/>
26-45	<input type="checkbox"/>	<input type="checkbox"/>
46-65	<input type="checkbox"/>	<input type="checkbox"/>
over 65	<input type="checkbox"/>	<input type="checkbox"/>

3. How often do you use the local bus service?

	householder	other occupant
at least 5 days a week	<input type="checkbox"/>	<input type="checkbox"/>
several days a week	<input type="checkbox"/>	<input type="checkbox"/>
about once a week	<input type="checkbox"/>	<input type="checkbox"/>
about once a fortnight	<input type="checkbox"/>	<input type="checkbox"/>
about once a month	<input type="checkbox"/>	<input type="checkbox"/>
less than once a month	<input type="checkbox"/>	<input type="checkbox"/>

Please turn over

4. If you use the bus at all, what is the main purpose of your journey?

	householder	other occupant
work	<input type="checkbox"/>	<input type="checkbox"/>
in the course of work (eg. postman)	<input type="checkbox"/>	<input type="checkbox"/>
education	<input type="checkbox"/>	<input type="checkbox"/>
shopping	<input type="checkbox"/>	<input type="checkbox"/>
entertainment	<input type="checkbox"/>	<input type="checkbox"/>
visiting friends	<input type="checkbox"/>	<input type="checkbox"/>
other (please state)	<input type="checkbox"/>	<input type="checkbox"/>

5. What bus do you normally catch?

Give number/route

householder
 other occ.

6. What is your normal destination?

householder
 other occ.

7. What type of ticket do you normally buy?

	householder	other occupant
single	<input type="checkbox"/>	<input type="checkbox"/>
return	<input type="checkbox"/>	<input type="checkbox"/>
pass (state what type)	<input type="checkbox"/>	<input type="checkbox"/>

SECTION B

Even if you do not use the bus service very often please try to answer the next set of questions.

This section is designed to try to measure your views on the local bus service. The best way to show you how to answer the questions is to give you an example:

For example, to the question 'what is your view of the colour scheme of buses in Plymouth?' you may feel a strong dislike and answer thus;

very bad **(-3)** -2 -1 0 1 2 3 very good
 or you may hold no particularly strong views at all;

very bad -3 -2 -1 **(0)** 1 2 3 very good

What is your view of;

8. current fares

h/holder very bad -3 -2 -1 0 1 2 3 very good
 other occ. very bad -3 -2 -1 0 1 2 3 very good

9. current frequencies

h/holder very bad -3 -2 -1 0 1 2 3 very good
 other occ. very bad -3 -2 -1 0 1 2 3 very good

Please turn over

10. timing of services

h/holder very bad -3 -2 -1 0 1 2 3 very good
other occ. very bad -3 -2 -1 0 1 2 3 very good

11. convenience of route

h/holder very bad -3 -2 -1 0 1 2 3 very good
other occ. very bad -3 -2 -1 0 1 2 3 very good

12. time taken to complete journey

h/holder very bad -3 -2 -1 0 1 2 3 very good
other occ. very bad -3 -2 -1 0 1 2 3 very good

13. punctuality

h/holder very bad -3 -2 -1 0 1 2 3 very good
other occ. very bad -3 -2 -1 0 1 2 3 very good

14. bus stop siting

h/holder very bad -3 -2 -1 0 1 2 3 very good
other occ. very bad -3 -2 -1 0 1 2 3 very good

15. comfort

h/holder very bad -3 -2 -1 0 1 2 3 very good
other occ. very bad -3 -2 -1 0 1 2 3 very good

16. access to information about timetables etc.

h/holder very bad -3 -2 -1 0 1 2 3 very good
other occ. very bad -3 -2 -1 0 1 2 3 very good

17. ease of understanding that information

h/holder very bad -3 -2 -1 0 1 2 3 very good
other occ. very bad -3 -2 -1 0 1 2 3 very good

18. friendliness of staff

h/holder very bad -3 -2 -1 0 1 2 3 very good
other occ. very bad -3 -2 -1 0 1 2 3 very good

19. amount of luggage space available

h/holder very bad -3 -2 -1 0 1 2 3 very good
other occ. very bad -3 -2 -1 0 1 2 3 very good

Please turn over

20. I would now like you to consider which aspects are important about a good bus service. Please rank the following on a scale from 1 to 10. One indicates that it is very important, 10 that it is either unimportant or irrelevant.

Thus 'colour of buses' might be given 8, not very important at all.

	householder	other occupant
no smoking	<input type="text"/>	<input type="text"/>
high frequency	<input type="text"/>	<input type="text"/>
value for money	<input type="text"/>	<input type="text"/>
door to door service	<input type="text"/>	<input type="text"/>
non-stop service	<input type="text"/>	<input type="text"/>
plenty of room	<input type="text"/>	<input type="text"/>
punctuality	<input type="text"/>	<input type="text"/>
friendly staff	<input type="text"/>	<input type="text"/>
good timetables	<input type="text"/>	<input type="text"/>
circular routes around the city centre	<input type="text"/>	<input type="text"/>
other (please state)	<input type="text"/>	<input type="text"/>

21. Sex	householder	other occupant
male	<input type="text"/>	<input type="text"/>
female	<input type="text"/>	<input type="text"/>

22. Occupation:	householder	other occupant
employer/manager/professional	<input type="text"/>	<input type="text"/>
clerical/retail/shop	<input type="text"/>	<input type="text"/>
foreman/skilled worker	<input type="text"/>	<input type="text"/>
semi-skilled worker	<input type="text"/>	<input type="text"/>
unskilled/manual worker	<input type="text"/>	<input type="text"/>
armed forces	<input type="text"/>	<input type="text"/>
unemployed	<input type="text"/>	<input type="text"/>
retired	<input type="text"/>	<input type="text"/>
other eg. student, housewife	<input type="text"/>	<input type="text"/>

23. Would you be prepared to co-operate with further surveys of this type?

Thank you for completing this survey, the results will be treated in the strictest confidence, your co-operation has been greatly appreciated.

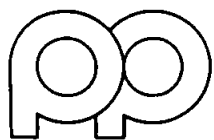
A.J. Green
Research Assistant

Any comments you wish to make:

APPENDIX G

SECOND POSTAL SURVEY

JANUARY 1987



Faculty of Maritime Studies

Department of Shipping and Transport

Temporary Head: S.T. Harley, RD, Extra Master, ACI Arb.
Barrister-at-Law.

Phone: (0752) 264667

Reply to: Ext 5476

Our ref: AG/GD

Your ref:

Date:

Dear Sir/Madam,

As a resident of Plymouth may I ask for your help in a survey I am undertaking? I am trying to establish peoples' travel behaviour and attitudes to public transport.

You may be aware that certain changes have taken place over the last few months regarding bus services in your area. This survey forms a three year research project, into the effects of the privatisation of bus services. In order to up date my information fully, and to put it to the best possible use, I am anxious to obtain a reply from each person I write to. I hope that you will be able to spare a few minutes to complete the enclosed questionnaire, even if some parts of it may not apply to you.

An envelope is provided in which to return the completed form, no stamp is required. All results will be treated in the strictest confidence.

Yours faithfully

Alison J Green
Research Assistant

PLYMOUTH PUBLIC TRANSPORT SURVEY

please tick box to answer.

Three categories are included for up to three people in the household to answer, this can be anyone who travels independently. Please leave them blank if they do not apply.

SECTION A

1. Which form of transport do you normally use? Tick one only.

- car (sole use)
- car (occasional use)
- car (passenger)
- bus
- cycle
- motorcycle
- walking
- other (please state)

2. How often do you use the local bus service?

- at least 5 days a week
- several days a week
- about once a week
- about once a fortnight
- about once a month
- less than once a month

3. If you use the bus at all, what is the main purpose of your journey?

- work
- in the course of work (eg. postman)
- education
- shopping
- entertainment
- visiting friends
- other (please state)

4. What bus do you normally catch?

Give number/route

.....

Please turn over

SECTION B

Even if you do not use the bus service very often please try to answer the next set of questions.

This section is designed to try to measure your views on the local bus service. The best way to show you how to answer the questions is to give you an example:

For example, to the question 'what is your view of the colour scheme of buses in Plymouth?' you may feel a strong dislike and answer thus;

very bad -3 -2 -1 0 1 2 3 very good
or you may hold no particularly strong views at all;

very bad -3 -2 -1 0 1 2 3 very good

What is your view of;

5. current fares

very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good

6. current frequencies

very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good

7. timing of services

very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good

8. convenience of route

very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good

9. time taken to complete journey

very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good

10. punctuality

very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good

11. bus stop siting

very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good

12. comfort

very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good
very bad -3 -2 -1 0 1 2 3 very good

Please turn over

13. access to information about timetables etc.
 very bad -3 -2 -1 0 1 2 3 very good
 very bad -3 -2 -1 0 1 2 3 very good
 very bad -3 -2 -1 0 1 2 3 very good

14. ease of understanding that information
 very bad -3 -2 -1 0 1 2 3 very good
 very bad -3 -2 -1 0 1 2 3 very good
 very bad -3 -2 -1 0 1 2 3 very good

15. friendliness of staff
 very bad -3 -2 -1 0 1 2 3 very good
 very bad -3 -2 -1 0 1 2 3 very good
 very bad -3 -2 -1 0 1 2 3 very good

16. amount of luggage space available
 very bad -3 -2 -1 0 1 2 3 very good
 very bad -3 -2 -1 0 1 2 3 very good
 very bad -3 -2 -1 0 1 2 3 very good

17. I would now like you to consider which aspects are important about a good bus service. Please rank the following on a scale from 1 to 10. One indicates that it is very important, 10 that it is either unimportant or irrelevant. Thus 'colour of buses' might be given 8, not very important at all.

- no smoking
- high frequency
- value for money
- door to door service
- non-stop service
- plenty of room
- punctuality
- friendly staff
- good timetables
- circular routes around the city centre
- other (please state)

18. To which age group do you belong?

- under 16
- 16-25
- 26-45
- 46-65
- over 65

19. Sex

- male
- female

Please turn over

20. Occupation:
 employer/manager/professional
 clerical/retail/shop
 foreman/skilled worker
 semi-skilled worker
 unskilled/manual worker
 armed forces
 unemployed
 retired
 housewife
 student
 other (please state)

21. Would you be prepared to co-operate with further surveys of this type?

Thank you for completing this survey, the results will be treated in the strictest confidence, your co-operation has been greatly appreciated.

A.J. Green
 Research Assistant

Any comments you wish to make:

APPENDIX H
DOOR TO DOOR
SURVEY

ATTITUDINAL PUBLIC TRANSPORT SURVEY

Name
Address
.....

1..How often do you use the local bus service?

- (i) At least four days a week
- (ii) At least once a week
- (iii) At least once a month
- (iv) Less than that

2. For what main purpose?

Shopping

Work

3. Can you now name some of the things that are important to you about a good bus service.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

4. I would now like you to tell me some of the beliefs or opinions you hold about the bus service. When you think about using the bus for work/shopping what things spring to mind? How likely is this to happen? (-3+3) How bad/good is this? (-3+3). (write down up to 8 on grid)

5. I would now like you to indicate your opinion about using the bus service for work/shopping on a scale ranging from -3 to +3.

GOOD +3 +2 +1 0 -1 -2 -3 BAD

FOOLISH -3 -2 -1 0 +1 +2 +3 WISE

PLEASANT +3 +2 +1 0 -1 -2 -3 UNPLEASANT

7. When a person travels, other people's views may

affect their choice of transport. Who is likely to influence your choice of travel for (shopping/work/school) in the next month?

- 1. husband
- 2. wife
- 3. son/daughter
- 4. parent
- 5. other relative
- 6. other

8. Your thinks you ought to travel by bus in the next month, is this:)

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

9. You intend to travel by bus for (shopping/work/) in the next month, is this

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

10. Could you tell me which bus(es) you would usually catch

11. age

12. occupation

13. Do you usually have a car available for your own personal use? YES NO SOMETIMES
OFTEN

14. Would you say that the bus service you use, for the purpose you use it, is better, the same or worse than before these minibuses arrived, about a year ago?

- a) much better
- b) a bit better
- c) about the same
- d) a bit worse
- e) a lot worse

15. Do you use the bus service now more, the same or less than then?

- a) a lot more
- b) a bit more
- c) the same
- d) a bit less
- e) a lot less

16. Why?

APPENDIX I

POSTAL SURVEY FOR NON-RESPONDENTS

OF THE DOOR TO DOOR SURVEY

Department of Shipping &
Transport
Plymouth Polytechnic
Drake Circus
Plymouth
tel. 221312
Ms A.J. Green ext 5476

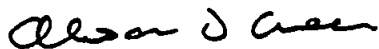
Dear

A few months ago one of our survey team called and you agreed to participate in a short interview. Recently, you were called upon again to conduct a follow-up interview. However, you were either out or unavailable. In order to avoid invading your privacy any further, and to save us both time and money, we would be most grateful if you would fill in the enclosed questionnaire and return it as soon as possible. A freepost envelope is enclosed, so no stamp is required.

Should you require any assistance or information please do not hesitate to contact me at the above address.

Thank you for your assistance in this important piece of local research into public transport services.

Yours faithfully



Alison J. Green
Research Assistant

1. How often do you use the local bus service? (tick answer)

- a) at least 4 days a week
- b) at least once a week
- c) at least once a month
- d) less than that

2. Mostly for shopping? Tick one only
or work?

3. Please now write down what things are important to you about a good bus service.

.....

any comments you'd like to make

4. Do you think it is a good idea or a bad idea to use the bus for work/shopping. (+3 indicates very good, -3 very bad)

Good +3 +2 +1 0 -1 -2 -3 Bad (circle your choice)

5. Do you think it is foolish or wise to use the bus for work/shopping. (very foolish = -3, very wise =+3)

Foolish -3 -2 -1 0 +1 +2 +3 Wise

6. Is your bus journey generally a pleasant or unpleasant experience? (very pleasant = +3, very unpleasant = -3)

Pleasant +3 +2 +1 0 -1 -2 -3 Unpleasant

7. How likely is it that you will use the bus in the next month?

- certain
- very likely
- fairly likely
- 50/50 chance
- fairly unlikely.....
- very unlikely
- certain not

8. Which bus do you catch? (number or route)

9. If you now think about the bus service that you use, what things spring mind about using it for work/shopping?

For example: You may comment that there are 'no conductors', this you may consider as a bad aspect, and it is very likely as there are only one man operated buses in Plymouth.

You would answer thus:

1. 'no conductors'
Good +3 +2 +1 0 -1 **(-2)** -3 Bad Likely **(+3)** +2 +1 0 -1 -2 -3 Unlikely

Another example:

2. 'have to wait in the rain'
Good +3 +2 +1 0 -1 -2 **(-3)** Bad Likely +3 +2 **(+1)** 0 -1 -2 -3 Unlikely

Waiting in the rain you may think is very bad (-3), but it doesn't rain all the time in Plymouth so only slightly likely (+1).

Now write down the things you think about the bus service you use, just name as many as come readily to mind:

1.
is this Good +3 +2 +1 0 -1 -2 -3 Bad/Likely +3 +2 +1 0 -1 -2 -3 Unlikely

2.
is this Good +3 +2 +1 0 -1 -2 -3 Bad/Likely +3 +2 +1 0 -1 -2 -3 Unlikely

3.
is this Good +3 +2 +1 0 -1 -2 -3 Bad/Likely +3 +2 +1 0 -1 -2 -3 Unlikely

4.
is this Good +3 +2 +1 0 -1 -2 -3 Bad/Likely +3 +2 +1 0 -1 -2 -3 Unlikely

5.
is this Good +3 +2 +1 0 -1 -2 -3 Bad/Likely +3 +2 +1 0 -1 -2 -3 Unlikely

6.
is this Good +3 +2 +1 0 -1 -2 -3 Bad/Likely +3 +2 +1 0 -1 -2 -3 Unlikely

7.
is this Good +3 +2 +1 0 -1 -2 -3 Bad/Likely +3 +2 +1 0 -1 -2 -3 Unlikely

8.
is this Good +3 +2 +1 0 -1 -2 -3 Bad/Likely +3 +2 +1 0 -1 -2 -3 Unlikely

Would you use the word 'regular', in place of and to mean the same as 'frequent' when describing the bus service?

Yes/No

Over the past year or so bus services have been subject to some changes, would you say that on the whole the bus service you use is;

- a) a lot better now
- b) a bit better now
- c) about the same
- d) a bit worse now
- e) a lot worse now

Would you say that you use the bus service;

- a lot more
- a bit more
- the same
- a bit less
- a lot less than before these changes took place.

Reasons why you use more or less:

Do you have a car available for your own use?

- YES
- NO
- SOMETIMES

Thank you very much for filling in this survey, the results will be strictly confidential. Please put the completed form in the Freepost envelope provided.

Please do not forget to post this form

APPENDIX J
STATISTICAL METHODS
USED

APPENDIX J1

T-Tests

A t-test compares two sample means, and shows whether there is any significant difference between the two means. Testing for a significant difference between the means of samples is a special case of fitting a confidence interval on the unknown mean of a population.

If μ_1 is the mean of the population from which the first sample of size, N_1 , and mean, \bar{X}_1 , is drawn. If μ_2 is the mean of the population from which the second sample, of size, N_2 , and mean, \bar{X}_2 , is drawn. The mean of the random variable, Δ , which represents observations on the difference $\bar{X}_1 - \bar{X}_2$ obtained in simultaneous draws of N_1 and N_2 items from the respective populations.

Since $E(\bar{X}_1 - \bar{X}_2) = E(\bar{X}_1) - E(\bar{X}_2)$, $\mu_\Delta = \mu_1 - \mu_2$

The variance of samples 1 and 2 are treated as unknown but equal, and since the common variance $\sigma^2 = \sigma_1^2 = \sigma_2^2$ is unknown, we have to estimate $\sigma_{\bar{X}_1 - \bar{X}_2} = \sigma_\Delta$ from the sample. The relevant formula for this estimate s_Δ , is a function of the weighted-average variance, with weights,

$$\frac{N_1 - 1}{N_1 + N_2 - 2} \qquad \frac{N_2 - 1}{N_1 + N_2 - 2}$$

respectively;

$$s_\Delta = \sqrt{\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2}} \sqrt{\frac{N_1 + N_2}{N_1 N_2}}$$

The test statistic is;

$$t = \frac{(\bar{X}_1 - \bar{X}_2) - \mu}{s_\Delta}$$

which need only be compared with $t_{\alpha, N_1 + N_2 - 2}$. On the null hypothesis that there is no difference between the two means ($\mu = 0$), the test statistic simplifies to $(\bar{X}_1 - \bar{X}_2) / s_\Delta$.

APPENDIX J2

Factor Analysis

The main aim of factor analysis is the 'orderly simplification' (Burt, 1940) of a number of interrelated measures. When a group of variables has a great deal in common 'a factor' may be said to exist. Factor analysis makes it possible to describe a group. Starting with a mass of tests which show correlations it is possible to end up with a few factors or dimensions. The factors are often taken as descriptive of the group. Such terms as 'cosmopolitan' 'introvert' etc. are descriptive labels given to a collection of items or tests which are highly correlated and are presumed to reflect common characteristics.

The primary aim of factor analysis is the discovery of common factors. The techniques used for extracting the factors generally seek to take out as much common variance as possible in the first factor. Subsequent factors are in turn intended to account for the maximum amount of remaining common variance until no common variance remains.

General factors, usually the first in a factor solution giving the maximum amount of the variance in the first factor, include significant loadings from most if not all the items in the analysis. Group factors arise when a few tests with significant loadings appear in the same factor. A factor containing only one significant loading for a particular item would be a unique factor.

The Correlation Matrix

Since one of the goals of factor analysis is to obtain 'factors' that help explain these correlations, the variables must be related to each other for the factor model to be appropriate. If the correlations between variables are small, it is unlikely that they share common factors.

Factor Extraction

In principal components analysis, linear combinations of the observed variables are formed. The first principal component accounts for the largest amount of variance in the sample. The second principle component accounts for the next largest amount of variance and is uncorrelated with the first. Successive components

explain progressively smaller portions of the total sample variance and all are uncorrelated with each other. When all factors are included in the solution all of the variance of each variable is accounted for, and there is no need for a unique factor in the model. The proportion of variance accounted for by the common factors, or the communality of a variable, is 1 for all the variables. In the factor extraction phase the number of common factors needed to adequately describe the data is determined. The decision is based on eigenvalues and percentage of the total variance accounted for by different numbers of factors. A plot of the eigenvalues (screeplot) is also useful in determining the number of factors.

The Rotation Phase

Although the factor matrix obtained in the extraction phase indicates the relationship between the factors and the individual variables, it is usually difficult to identify meaningful factors based on this matrix. Often the variables and factors do not appear correlated in any interpretable pattern. Most factors are correlated with many variables. The rotation phase attempts to transform the initial matrix into one that is easier to interpret. The purpose of rotation is to achieve a simple structure. Rotation does not affect the goodness of fit of a factor solution. Although the factor matrix changes, the communalities and the percentage of total variance explained do not change. The percentage of variance accounted for by each of the factors does, however, change. Rotation redistributes the explained variance for the individual factors. The unrotated factor matrix is difficult to interpret. Many variables have moderate sized correlations with several factors. After rotation the number of large and small factor loadings increases. Variables are more highly correlated with single factors. Orthogonal rotation results in factors that are uncorrelated. However, sometimes allowing for correlations among factors simplifies the factor pattern matrix. Oblique rotation is sometimes more useful because it is unlikely that influences in nature are uncorrelated. Even if they are uncorrelated in the population, they need not be in the sample. Oblique rotation preserves the communalities of the variables, when it is used however, the factor loadings and factor variable correlation are no longer identical.

APPENDIX K
ADDITIONAL DATA FROM THE
DOOR TO DOOR SURVEYS

APPENDIX K

Responses for the Four Study Areas

K.1 Area 1 Glenholt/Estover

The final sample consisted of 18 people from this area, 1 man and 17 women. Contained in the tables K1-4 is a summary of their main characteristics.

TABLE K1 Ages of Respondents from Glenholt/Estover Area

age group	number of respondents
20-39	3 (17%)
30-39	6 (33%)
40-49	1 (6%)
50-59	6 (33%)
over 60	2 (11%)

TABLE K2 Car Ownership over the Three Surveys Glenholt/Estover

survey	July	December	April
own use	6 (33%)	6 (33%)	5 (27%)
none	8 (44%)	7 (38%)	8 (44%)
occasional	4 (22%)	5 (27%)	5 (27%)

TABLE K3 Journey Purpose over the Three Surveys Glenholt/Estover

survey	July	December	April
shopping	12 (66%)	13 (71%)	11 (61%)
work	6 (33%)	5 (27%)	7 (38%)

TABLE K4 Frequency of Use over the Three Surveys
Glenholt/Estover

survey	July	December	April
at least 4 times a week	5 (27%)	5 (27%)	8 (44%)
at least once a week	10 (55%)	8 (44%)	6 (33%)
at least once a month	3 (16%)	5 (27%)	4 (22%)

It can be seen from tables K1 - K4 that very little difference took place in the behaviour of respondents, with respect to their travel behaviour. There was a slight increase in frequency of use in the last survey, but some of these changes may be due to changes in weather conditions and employment patterns. Table K5 shows the independent attitude components.

TABLE K5 Independent Attitude Component Glenholt/Estover

survey	July	December	April
mean score			
good/bad	1.83	1.72	1.67
foolish/wise	2.00	1.72	2.33
un/pleasant	0.83	1.22	1.56

It can be seen from table K5 that there was a slight decrease in the scores given to the good/bad component, but a fairly large improvement in the pleasant/unpleasant component. Services during this period had been subject to increased frequencies and a faster journey time with the introduction of the X50 service. This service

was used by 12 out of the 18 respondents. This improvement in perception should (according to Fishbein) be matched by a corresponding increase in the belief component.

TABLE K6 Mean Belief Component and Number of Beliefs Stated

<u>survey</u>	<u>July</u>	<u>December</u>	<u>April</u>
mean no. of negative beliefs stated	1.39	1.61	1.67
mean no. of positive beliefs stated	1.05	0.78	0.94
mean negative belief score	-9.39	-7.78	-9.06
mean positive belief score	8.94	3.61	4.22
mean total belief score	-0.44	-4.17	-4.83

It can be seen from the numbers of beliefs stated and the mean scores that there was an increase in the number of negative beliefs and a decrease in the number of positive beliefs stated. This should indicate a less favourable perception of the bus service. However, the independent attitude component does not reflect these findings.

The most frequently named attribute of a good bus service was punctuality, followed by frequent/regular service, this is shown in table K7.

TABLE K7 Most Frequently Named Attributes of a Good Bus Service
Glenholt/Estover

attribute/survey	July	December	April
frequent/regular	9	5	9
punctual	10	10	13
comfort	3	3	2
polite/friendly drivers	5	6	5
reasonable fares	1	3	1
convenient route	4	3	0
clean	2	2	3
reliable	2	4	1
fast journey	1	3	1

TABLE K8 Most Frequently Named Beliefs Glenholt/Estover

belief/survey	July	December	April
unpunctual	4	4	4
punctual	3	2	3
infrequent	1	2	0
frequent/regular	3	3	2
uncomfortable	1	4	1
comfortable	4	0	1
no bus shelter	0	4	3
dirty	1	4	2
good	2	1	1
pleasant drivers	2	2	2
fast	1	3	4

The rest of the responses were scattered, the list above only contains those attributes and beliefs which were named in at least two of the surveys, or were stated by more than two respondents. It can be seen from the list of beliefs that as many positive beliefs as negative beliefs were consistently named over the three surveys. Interestingly the third most popular attribute was friendly/polite drivers, whereas for the total sample comfort was the third most popular response. This may reflect the nature of the sample, although one would expect an area with larger numbers of old aged pensioners to reveal this characteristic. Perhaps Glenholt/Estover has a tightly knit community which places a high value on these types of attributes in the local community generally. However, there are insufficient numbers in this sample to investigate this possibility. The independent attitude component revealed that bus users were fairly well satisfied with their bus service, and found it to be more pleasant in April 1988 than in July 1987. Therefore it could be concluded that deregulation resulted in an increase in the supply of bus services and a more favourable perception of these services. The results obtained from the belief component are more problematic. It may be the case that respondents tended to elicit more negative beliefs, not because the service was any worse, but because they were forced to think about the service, which they had not consciously done before. Alternatively, they may have been stating more of the less important beliefs, the methodology was such that they were required to make some response and were prompted to state as many beliefs as possible. If respondents had been merely asked 'do you have any comments to make about your bus service' then

only those respondents with very strong feelings would probably respond.

K2 Area 2 Southway

This area consisted of 26 respondents, 5 men and 21 women, their characteristics are summarised in tables K9 to K12

TABLE K9 Age of Respondents Southway

age	n
16-19	3 (12%)
20-29	3 (12%)
30-39	8 (31%)
40-49	4 (15%)
50-59	4 (15%)
over 60	4 (15%)

TABLE K10 Journey Purpose Southway

purpose/survey	July	December	April
shopping	19 (73%)	20 (77%)	19 (73%)
work	7 (27%)	6 (23%)	7 (27%)

TABLE K11 Frequency of Use Southway

frequency/survey	July	December	April
at least 4 times a week	12 (46%)	6 (23%)	8 (31%)
at least once a week	8 (31%)	17 (65%)	15 (58%)
at least once a month	6 (23%)	3 (12%)	3 (12%)

TABLE K12 Car Ownership Southway

survey	July	December	April
own use	5 (19%)	4 (15%)	4 (15%)
none	16 (62%)	17 (65%)	17 (65%)
occasional	5 (19%)	5 (19%)	5 (19%)

It can be seen that quite a large shift took place between July and December in the frequency of bus use, this is not matched by any change in car ownership figures, therefore it is clear that, for whatever reason, people were making less journeys. This could be due to seasonal factors, financial changes or changes in perceptions of bus services. If this is matched by worsening attitudes to bus services then it could be concluded that changes in travel behaviour were at least partly due to changes in services, and perceptions of those changes.

If the mean scores for the attitudinal component are examined it is shown that there was a definite decrease in one component, the good/bad section, but an increase over all increase in the other two components. This is shown in table K13.

TABLE K13 Attitudinal Component Southway

survey	July	December	April
mean score			
good/bad	2.15	2.08	1.62
foolish/wise	1.27	2.46	2.08
un/pleasant	0.88	0.38	1.07

Nevertheless, the scores for all three parts of the attitudinal component are all positive which indicates a favourable attitude to the bus service (the scale ran from -3 to +3). The difference in scores may be due to the widescale use of high frequency minibuses, the service improved in frequency initially, then frequencies were reduced, this would explain the decrease in the good/bad component. As for the other two components it may be the case that any initial hostility to the new minibuses and their smaller size subsided over time. The type and number of beliefs stated by respondents should provide some explanation of this. (see tables K14 and K16).

TABLE K14 Mean number of Beliefs and Belief Score

survey	July	December	April
mean no. of negative beliefs	1.35	2.62	2.12
mean no. of positive beliefs	1.42	0.77	0.46
mean score negative beliefs	-6.62	-15.54	-13.58
mean score positive beliefs	7.50	4.42	2.81
total mean belief score	0.88	-11.11	-10.77

The mean number of positive beliefs stated by each respondent in the first survey outweighed the number of negative beliefs. This is not surprising as bus services increased from a 20 minute service to an 8 minute service, the decrease in bus services between July and April was matched by a corresponding decrease in the number of positive beliefs and an increase in the number of negative beliefs. The relationship between this component and the attitude component is less clear. There appears to be a relationship between the good/bad component but not the foolish/wise and un/pleasant components. This type of finding can again be explained in terms of the factor analysis. Bus users tend to hold a complex system of attitudes consisting of an important general factor and one or two subsidiary factors concerned with less important aspects of bus service provision. Therefore the decrease in the good/bad component refers to the first, most important, factor, and the decrease in the foolish/wise and un/pleasant component to the less important factors. Thus, if the most important factor is worsening, then we would expect more negative beliefs to be stated. The good/bad part of the attitudinal component, if this is true, is therefore a clearer indication of changing overall perceptions.

TABLE K15 Most Frequently Named attributes of a Good Bus

Service Southway

attribute/survey	July	December	April
frequent/regular	14	14	14
punctual	9	11	12
reasonable fares	14	2	4
comfort	15	13	8
politeness/friendliness	10	5	8
luggage space	5	3	0
clean	1	1	3
double deckers	1	5	0
uncrowded	2	2	4

From table K15 it can be seen that there were a large number of respondents stating 'reasonable/cheap fares' as an important attribute in the first survey. This number declined sharply in the subsequent surveys. The results of the factor analysis showed that this type of attribute appeared to be of secondary importance, it appeared in the second factor. Fares were not subject to any change at this time and, if the factor analysis is correct, are not of primary importance, therefore frequency and punctuality took precedence over them.

The most frequently named beliefs are contained in table K16. One interesting change to to happen concerned comfort. In the first survey 11 out of the 26 respondents stated that they believed their bus service to be comfortable.

TABLE K16 Most Frequent Named Beliefs Southway

belief/survey	July	December	April
frequent	8	6	4
infrequent	2	2	2
punctual	7	3	2
unpunctual	2	2	1
comfortable	11	1	0
uncomfortable	7	13	7
pleasant drivers	5	4	1
unpleasant drivers	6	2	5
good	0	2	5
crowded	0	8	4
expensive	5	1	2
too fast	2	5	2
too small	0	0	5

However, in December 13 out of 26 stated that it was uncomfortable. 'Uncomfortable' was the single most frequently cited belief in the December survey. This finding is consistent with the findings of the pleasant/unpleasant element of the attitude component. It was found that the pleasant/unpleasant score (see table K13) declined from July to December (indicating that it was less pleasant), and then increased from December to April. This follows the same pattern as the number of respondents naming 'uncomfortable' as a belief. Despite the fact that the hypothesised relationship between overall attitude and belief component did not occur, it can be seen that the findings from each section are not entirely inconsistent. However,

the relationship between attitude and beliefs seems to be more complex than Fishbein's specification.

K3 Area 3 Plympton

Area 3 consisted of 24 respondents, 6 men and 18 women. It can be seen from table K17 that a high proportion of the respondents were in the over 60 age group.

TABLE K17 Age of Respondents Plympton

age group	no.	%
20-29	1	4%
30-39	5	21%
40-49	3	13%
50-59	2	8%
over 60	13	54%

TABLE K18 Journey Purpose Plympton

survey	July	December	April
shopping	17 (71%)	18 (75%)	18 (75%)
work	7 (29%)	6 (25%)	6 (25%)

TABLE K19 Frequency of Use Plympton

survey	July	December	April
at least four times a week	6 (25%)	7 (29%)	7 (29%)
at least once a week	12 (50%)	10 (42%)	11 (46%)
at least once a month	5 (21%)	6 (25%)	5 (21%)
less than once a month	1 (4%)	1 (4%)	1 (4%)

TABLE K20 Car Ownership Plympton

survey	July	December	April
own use	11 (46%)	12 (50%)	12 (50%)
none	11 (46%)	11 (46%)	10 (42%)
occasional	2 (8%)	1 (4%)	2 (8%)

From tables K18 to K20, as far as travel behaviour generally is concerned there is very little change, either in frequency of bus use or car ownership over the three surveys.

TABLE K21 Attitude Component Plympton

survey	July	December	April
good/bad	1.79	2.29	2.00
foolish/wise	1.33	2.33	2.00
un/pleasant	1.12	1.04	0.75

There was an overall increase in the good/bad and foolish/wise components from July to April, but there was also a decrease in the pleasant/unpleasant element (table K21). The relationship of this to the belief component is, again, unclear. If we examine table K22 it can be seen that in the second survey there is an increase in the number of negative beliefs and a decrease in the number of positive beliefs stated. If we refer back to the attitude component (table K21) we saw that the opposite to what we would expect happened, there was a more favourable rating given in the second survey.

TABLE K22 Mean Number of Beliefs Stated and Mean Scores Plympton

survey	July	December	April
mean no. of positive beliefs	0.83	0.37	1
mean no. of negative beliefs	1.92	2.17	2.04
mean score positive beliefs	7.42	1.62	6.04
mean score negative beliefs	-11.42	-14.54	-11.25
mean score total beliefs	-4	-12.92	-5.21

The lack of relationship between the attitude and belief component makes it very difficult to assess whether peoples' perceptions had improved or not. However, an examination of the types of attributes and beliefs stated in the second survey (tables K23 and 24), may shed some light on the situation.

TABLE K23 Most Frequently Named Attributes of a Good Bus Service Plympton

attribute/survey	July	December	April
punctual	15	11	14
frequent	8	8	7
comfort	6	7	4
polite/friendly drivers	7	10	8
convenient route	7	4	2
reliable	1	4	2
good timetables	0	1	4
double deckers	2	5	1

The attributes named in the three surveys did not differ very much from those stated in other areas, with frequency and punctuality being of great importance.

TABLE K24 Most Frequently Named Beliefs Plympton

belief/survey	July	December	April
comfortable	6	0	3
uncomfortable	7	4	9
punctual	2	1	2
unpunctual	2	1	3
frequent	4	1	4
infrequent	0	3	0
good	2	5	5
convenient	0	0	5
unpleasant/rude drivers	3	4	3
crowded	2	7	0
inconvenient route	9	4	1
cramped	1	4	2
too fast	1	6	4

The most frequently cited beliefs in the second survey refer to the nature of the vehicle, with uncomfortable, crowded and cramped being the most popular. 'Too fast' was another frequently stated belief, interestingly the beliefs which have been taken to be the most important (from the factor analysis), are not very frequently stated. Only one person in the second survey believed the survey to be unpunctual, and three to be infrequent. Thus, we can conclude that these findings combined with the improvement in perception shown by the attitude component reflects that bus services improved overall during this time period. The belief component shows either that there was a worsening of less important factors, or that these factors were bad before but were not stated because respondents concentrated on the more important factors. Therefore, if the bus service is infrequent, unpunctual and uncomfortable people will tend to mention only the first two beliefs because these are more important. Improve frequency and punctuality and they will then state the belief that it is uncomfortable. If this hypothesis is true then it seems that no matter how good the bus service is there will always be something for passengers to complain about, although this will not affect their overall assessment of how good or bad the service is. Another way of assessing how well a service is perceived is therefore to examine the type of beliefs people hold. If the negative beliefs refer mainly to comfort, size of vehicle and information then we can assume that the more important aspects of the bus service are quite satisfactory. Of course this is a gross

generalisation, and any one factor may be more or less important to a single individual.

K4 Area 4 Compton

The sample in area 4 consisted of 19 people, 4 men and 15 women. This area is situated fairly close to the city centre, therefore walking is a reasonable option to using the bus service for most people. However, many of the population are elderly and unable to walk far. The demand for bus services in this area is affected by the weather because of its proximity to the city centre, and because there are very good local amenities. In good weather conditions many people will walk to the city centre, and in bad weather many will use local shops instead.

TABLE K25 Age Of Respondents Compton

age	no.	%
20-29	2	(11%)
30-39	2	(11%)
40-49	4	(21%)
50-59	2	(11%)
over 60	9	(47%)

TABLE K26 Car Ownership Compton

survey	July	December	April
own use	7 (37%)	8 (42%)	8 (42%)
none	9 (47%)	8 (42%)	7 (37%)
occasional	3 (16%)	3 (16%)	4 (21%)

TABLE K27 Journey Purpose Compton

survey	July	December	April
shopping	16 (84%)	14 (74%)	13 (68%)
work	3 (16%)	5 (26%)	6 (32%)

TABLE K28 Frequency of Bus Use Compton

survey	July	December	April
at least four times a week	5 (26%)	8 (42%)	4 (21%)
at least once a week	7 (37%)	7 (37%)	5 (26%)
at least once a month	6 (32%)	2 (11%)	5 (26%)
less than once a month	1 (5%)	2 (11%)	5 (26%)

It can be seen from tables K25 to K28 that there was a decrease in the frequency of bus use in this area between December and April. Most of the users in this area used the C1 service (12 out of 19) which had been subject to cuts in service frequency throughout the period July to April. However, if we examine the attitude component, there was not an overall worsening in perceptions from July to April. In fact there was an increase in attitude score between July and December, which corresponds with an increased frequency of use. It is important to remember that this was winter time, and therefore increased use may have been partly due to weather conditions and changes in shopping patterns with Christmas approaching.

TABLE K29 Attitude Component, mean scores Compton

survey	July	December	April
good/bad	1.74	2.42	2.05
foolish/wise	1.58	2.11	1.89
un/pleasant	1.11	1.47	1.11

From table K30, there was an increase in the number of negative beliefs stated in the December survey, which does not seem consistent with the findings from the attitude component. Following the discussion in section K3 on similar findings in Plympton, we will therefore look closely at the type of attributes and beliefs stated over the three surveys (see tables K31 and K32).

TABLE K30 Mean number of Beliefs Stated and Belief Scores

Compton

survey	July	December	April
mean no. of positive beliefs	1.47	0.68	0.68
mean no. of negative beliefs	1.11	1.74	1.84
mean positive belief score	9.53	4.68	5.26
mean negative belief score	-4.89	-9.26	-12.37
mean total belief score	4.63	-4.58	-7.11

TABLE K31 Most Frequently Stated Attributes Compton

survey	July	December	April
frequency	13	13	15
punctuality	10	11	8
reasonable fares	7	5	6
friendly/polite drivers	7	4	3
comfort	10	3	1
convenience	4	1	4

TABLE K32 Most Frequently Stated Beliefs Compton

survey	July	December	April
frequent	2	2	1
infrequent	4	3	11
punctual	1	1	1
unpunctual	1	1	3
comfortable	7	1	0
uncomfortable	3	4	2
convenient	6	0	0
short walk	5	1	1
good	0	4	4

It can be seen from the above tables that frequent service was named as important by 15 of the 19 respondents in the third survey, and 11 of them also believed that their service was infrequent. In view of the findings from the factor analysis conducted on the two postal surveys, this is a very important result. (The factor analysis showed that frequency was one of the most important attributes of a good bus service) However, these findings are inconsistent with the attitude component, which did not show any significant worsening of perception. This supports the idea that attitudes to bus services are composed of a mixture of different attributes, and although

frequency is of primary importance, so also is punctuality for example which was not cited as a negative belief by many respondents. This lends support to the argument that bus users are able to make an overall judgement about bus services in general in the light of changes in different aspects of it, so just because frequency declined other aspects either improved or remained at acceptable levels so that the overall service is judged as better. In addition, this may also have been due to the fact that 9 out of the 19 respondents were in the over 60 age group. Findings from the postal surveys show that there is a positive correlation between age and attitudinal score, and it may be that frequency of service is not a very important factor for this particular group of respondents. It is not possible with such a small group of respondents to conduct any meaningful statistical tests but the mean attitude score for the over 60 age group, shown in table K33, may give some indication of an underlying relationship.

TABLE K33 Mean Attitude Score for Different Age Groups Compton

age group	20-29	30-39	40-49	50-59	over 60
JULY					
good/bad	-2.00	2.50	0.75	2.00	2.78
foolish/wise	-2.00	-0.50	1.00	2.50	2.89
un/pleasant	-1.00	0.00	1.00	1.50	1.78
total	-5.00	2.00	2.75	6.00	7.45
DECEMBER					
good/bad	1.00	2.50	2.50	3.00	2.56
foolish/wise	1.50	2.50	2.50	1.50	2.11
un/pleasant	1.00	1.00	1.25	1.50	1.78
total	3.50	6.00	6.25	6.00	6.45
APRIL					
good/bad	1.00	1.50	2.00	2.00	2.33
foolish/wise	1.00	2.50	1.75	0.50	2.44
un/pleasant	-0.50	0.00	1.00	0.50	1.89
total	1.50	4.00	4.75	3.00	6.66

There does seem to be a relationship between age group and attitudinal score. However, there was a decrease in the mean scores given by the over 60 age group over the three surveys, which is consistent with the belief component. In addition, all of the respondents in the over 60 age group used the C1 service. The 8 respondents between 20 and 49 years of age tended to use any service from Mutley Plain/Maanamead Road and these services were subject to very high frequencies following deregulation (Mutley Plain/Mannamead Rd is a major corridor route into the city centre). Since the C1

service represents only a small volume of bus passengers in the Compton area it would be unfair to conclude from these findings that services had declined, or that passengers' perceptions of bus services had worsened in Compton. What we can conclude is that the C1 service was subject to cuts in service frequency, and this was reflected in a corresponding increase in the number of negative beliefs stated and the attitude component. The importance of this finding to the bus company and local authority depends on whether it is judged that a decrease in the services to an elderly and often housebound group of users is outweighed by an increase in services in other areas.

APPENDIX I

LIST OF ALL NAMED BELIEFS FROM THE
DOOR TO DOOR SURVEYS

APPENDIX L

List of All Named Beliefs about the Bus Service

1. punctual
2. unpunctual
3. short walk
4. long walk
5. convenient
6. inconvenient
7. comfortable
8. uncomfortable
9. expensive
10. cheap
11. smoking
12. unpleasant drivers
13. lack of luggage space
14. bus moves before seated
15. pleasant drivers
16. regular
17. infrequent
18. frequent stops
19. lack of information
20. meet people
21. unreliable
22. pleasant journey
23. don't run late
24. spacious
25. too many small buses
26. fast
27. door to door
28. crowded
29. poor driving
30. few bells
31. no replacement for breakdowns

32. dirty
33. clean
34. bus passes are good
35. stuffy
36. too fast
37. infrequent stops
38. no smoking
39. narrow seats
40. reliable
41. not enough hand rails
42. don't pull in to kerb
43. good timetables
44. too slow
45. doors open when moving
46. hard to get on/off
47. inconvenient route
48. no bus shelter
49. uncrowded
50. boring
51. efficient
52. cramped
53. no change given
54. noisy
55. don't stick to route
56. cause traffic problems
57. good
58. no stop near railway station
59. direct
60. transfer tickets are good
61. poor weekend service
62. driver plays radio
63. have to wave the bus down
64. long journey
65. good for the elderly
66. nice view
67. smoking

68. keep breaking down
69. exposed to the weather
70. long wait
71. no seats for kids
72. bus passes are badly organised
73. no conductors
74. can't get a return
75. can never find an inspector
76. fares keep changing
77. all arrive at once
78. long queues at peak times
79. zonal system is unfair
80. have to stand
81. drivers move off when you are running
82. bad timetables
83. cars parked at the bus stop
84. badly behaved passengers
85. good drivers
86. get thrown about
87. unpleasant journey
88. condensation gets on your clothes
89. go on strike
90. double deckers are good
91. concerned over the bus war
92. have to have correct fare
93. ring a ride is good
94. buses not clearly marked

APPENDIX M

LIST OF ALL NAMED ATTRIBUTES FROM THE
DOOR TO DOOR SURVEYS

APPENDIX M

List of all Named Attributes

1. timing
2. friendliness
3. comfort
4. punctuality
5. regular
6. frequent
7. cheap
8. plenty of stops
9. plenty room
10. smoking
11. good timetables
12. good driving
13. clean
14. convenient
15. reliable
16. short walk
17. good communication with the public
18. quick
19. conductors
20. no smoking
21. easy to get on
22. late evening services
23. efficient
24. convenient routes
25. time to sit before bus moves
26. luggage space
27. pleasant journey
28. better design of buses
29. good ventilation
30. free shopping buses
31. big buses
32. concessionary fares
33. large seats
34. short wait
35. good Sunday service
36. help getting on
37. bus shelters
38. park and ride
39. direct route
40. returns before 9.00am
41. safety
42. stick to route
43. warm
44. available
45. begin early in the morning
46. uncrowded
47. weekly passes
48. small buses
49. good destination boards
50. consistency

APPENDIX N
RESPONSE RATES FOR THE
DOOR TO DOOR SURVEYS

APPENDIX N

TABLE N1 Response rates for three panel surveys

	survey 1	survey 2	survey 3
<u>total</u>	190	119	87
area 1	40 (21.0%)	27 (22.7%)	18 (20.7%)
area 2	50 (26.3%)	34 (28.6%)	26 (29.9%)
area 3	49 (25.8%)	29 (24.4%)	24 (27.6%)
area 4	51 (26.8%)	29 (24.4%)	19 (21.8%)
<u>journey purpose</u>			
shopping	135 (71.1%)	88 (73.9%)	60 (69.0%)
work	46 (24.2%)	31 (26%)	27 (31.0%)
education	9 (4.7%)	0	0
<u>sex</u>			
male	31 (16.3%)	18 (15.1%)	16 (18.4%)
female	159 (83.7%)	101 (84.9%)	71 (81.6%)
<u>age</u>			
16-19	16 (8.4%)	2 (1.7%)	0
20-29	33 (17.4%)	18 (15.1%)	12 (13.8%)
30-39	34 (17.9%)	25 (21.0%)	19 (21.8%)
40-49	30 (15.8%)	21 (17.6%)	14 (16.1%)
50-59	29 (15.3%)	18 (15.1%)	13 (14.9%)
over 60	48 (25.2%)	35 (29.4%)	29 (33.3%)
<u>occupation</u>			
housewife	47 (24.7%)	34 (28.6%)	25 (28.7%)
retired	38 (20.0%)	32 (26.9%)	24 (27.6%)
skilled	23 (12.1%)	10 (8.4%)	6 (6.9%)
semi-skilled	40 (21.0%)	29 (24.4%)	26 (29.9%)
unemployed	4 (2.1%)	3 (2.5%)	1 (1.1%)
self-employed	1 (0.5%)	0	0
student	17 (8.9%)	1 (0.8%)	1 (1.1%)
disabled	2 (1.1%)	1 (0.8%)	1 (1.1%)
unskilled	15 (7.9%)	9 (7.6%)	3 (3.4%)
misc./part-time	3 (1.6%)	0	0

TWO POSTAL SURVEYS

OCCUPATION OF RESPONDENTS IN THE

APPENDIX O

APPENDIX Q

Occupation of Respondents in the Two Postal Surveys

	SURVEY ONE	SURVEY TWO	%
Employer/manager/professional	17.5	19.9	
clerical/retail/shop	11.3	12.2	
foreman/skilled worker	12.0	2.7	
semi-skilled worker	8.6	17.8	
unskilled/manual worker	4.8	10.5	
armed forces	2.4	10.5	
unemployed	2.8	14.5	
retired	15.3	2.5	
housewife	14.9*	2.5	
student		4.0	
N	957	1218	

* The first survey grouped housewife and student together

APPENDIX P

PAPER PRESENTED TO THE ANNUAL PTRC CONFERENCE

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USER ATTITUDES TO BUS COMPETITION IN PLYMOUTH

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1. INTRODUCTION

The main objective of the research conducted has been the investigation of the effects of the deregulation of urban bus services in Plymouth. This project commenced in October 1985 and forms the basis of a Science and Engineering Research Council funded MPhil/PhD thesis. An important element of the research has been the evaluation of changing attitudes and perceptions of the local public transport system. Four geographical areas within Plymouth were selected for in-depth study. Each of these areas receives different bus service frequencies, possesses different socio-economic characteristics and different behaviour patterns. This paper contains the results of a before and after study into deregulation of urban bus services in Plymouth. The main emphasis has been on the investigation of changing passenger perception of the mode, via a series of household surveys, a cordon count and data obtained from Plymouth City Council.

2. BACKGROUND

Until October 26th 1986 public transport provision was supplied by Plymouth City Transport and Western National, co-ordinated under the Plymouth Joint Services agreement, and operating under the name 'CityBus'. Bus hours and revenues were split on a 80:20 basis, with Plymouth City Transport having the greater share.

The route network was extensively revised in 1982/83 following a large scale Market Analysis Project. The design of the new network attempted to minimise cross subsidy between routes, but made considerable use of cross subsidy between time periods. Fares were, and still are determined on a simple zonal basis, consisting of three concentric rings with separate fares being charged for travelling in one, two or three zones.

Plymouth City Transport was a trading department of the City Council. All buses were, and still are, one man operated. In 1983 Plymouth City Council contributed to the capital support for the construction of a new depot and the purchase of new buses. In 1983-84 Plymouth City Transport traded at a gross deficit of approximately 5.8% of total expenditure, 3.7% met externally by Plymouth City Council. Except for certain concessionary fares, fares were not subsidised by the City Council.

Commercially Registered Services

The bus network in Plymouth is complex, it consists of about 20 routes classified as radial, cross city or circular. The changes to routes have been wide ranging, virtually every route undergoing some change. Some circular routes have been broken at their outer ends, while some radials are linked to form circular routes. A few routes have been curtailed or cut completely. However, in total the coverage of the

network is much the same as that prior to deregulation. Plymouth City Council identified only three areas of the city which would not be served by the registered commercial network, and another eight which would not be served in the evenings and on Sundays. All of these areas meet the City Council's criteria for subsidy. This criteria is that services will be augmented where there is no commercial service within half a mile. CityBus Ltd have purchased 81 small (25 seater) buses, on these minibus routes the frequency of service has been substantially increased, typically from two or three an hour to six or eight. At certain times of day this results in a better service to the passenger, but at other times the service deteriorates because buses are full.

Initial registrations in February 1986 were from the two established operators Plymouth CityBus and Western National, and two taxi operators. One of these was to operate a service once a day from Southway to the City Centre, but this failed to operate. The other service operates from St. Budeaux Square to the local health centre every 15 minutes, mornings only. This is not in competition with any other registered services.

Western National introduced their 'Hoppa' bus services in May 15th 1986. These consisted of 23 seater minibuses on two routes, Plymouth-Plymstock and Plymouth-Saltash at 10-15 minute frequencies.

Tendered Services

In the initial round of tendering a total of 43 tenders were sent out, 165 replies were received from 4 different operators. Two independent operators won contracts for tendered services, Plympton Coachlines and Webber's coaches.

Plymouth City Council was only involved in the subsidisation of capital expenditure prior to deregulation, so the vast savings experienced in other areas have not been experienced in Plymouth. However, fears that huge subsidies would be required to support non-commercial services have proved to be unfounded. The subsidy now being paid by the City Council to subsidise concessionary fares and to support tendered services is roughly the same as that paid previously.

3. THE RESEARCH

The research has taken the form of a series of surveys and data collection, both preceding deregulation and following, in order to build up a before and after picture of Plymouth's public transport system and peoples' perceptions of it. The first survey was carried out in February 1986, following a pilot survey in January 1986. Questionnaires were sent out to 1,600 households in four areas of Plymouth in both surveys. The aim of the surveys was to compare changes in perception of bus and taxi services by identifiable population groups, segmented by frequency of modal use, geographical location, age, sex, occupation and car ownership.

The Four Study Areas

The first area, Glenholt, received an hourly bus service which remained unchanged, is located approximately 6 miles from the city centre, the housing is made up of 51% owner occupier, and 75% of the population have at least one car available. Southway received a 10 minute bus service which was altered to a 4 minute minibus service, it is located about 6 miles from the city centre, is made up of 38% owner occupied housing and car ownership is 69%. Plympton received a 15 minute service which was increased to 6 minutes, it is a large self contained population area about 5 miles from the city centre, housing consists of 84% owner occupier and 81% of the population have access to one or more cars. Compton is situated on one of the main corridor routes from the city centre and received a 6-8 minute service increased to 2 minutes in the peak, although it is situated only 1-2 miles from the city centre it contains a well used shopping centre, 73% of housing is owner occupied and car ownership is 68%.

The questionnaires were of similar format in order that the results be easily comparable. A different sample was used for each survey due to the unwillingness of respondents to participate in further questionnaires. Data obtained in occupation, age and sex permitted a comparison of the two samples.

Respondents were asked to rate the following characteristics on a scale ranging from -3, very bad to +3, very good.

- (i) fares
- (ii) frequency of service
- (iii) comfort
- (iv) punctuality
- (v) friendliness
- (vi) luggage space
- (vii) convenience of route
- (viii) journey time
- (ix) bus stop siting
- (x) access to timetabling information
- (xi) ease of understanding timetables
- (xii) timing of services

Respondents were also asked to rate on a scale of 1-10, 1 being very important, 10 being not at all important or irrelevant, the following attributes of a bus service:

- (i) value for money
- (ii) frequent service
- (iii) no smoking
- (iv) punctuality
- (v) circular routes around the city centre
- (vi) limited stop service
- (vii) door to door service
- (viii) friendly staff
- (ix) good timetables
- (x) plenty of room

The Results

The distribution of ages and occupation between the two samples was quite different, this was probably due to four questionnaires being included in the second survey per household, rather than asking just two members of the household to fill in the one questionnaire. This resulted in the inclusion of a larger proportion of younger respondents. In order to obtain a clear comparison of the two sets of results, the difference in attribute rating was calculated (see Table 1).

From the table of attribute score differences it can be seen that in Southway every attribute was rated more favourably than in the 1986 survey. The only attribute rated less favourably in Glenholt was convenience of route. Plympton, despite receiving an improved frequency faster minibus service rated punctuality, bus stop siting, access to timetables, ease of understanding timetables, comfort and friendliness less favourably. Users in Compton rated punctuality, access to timetables, ease of understanding timetables, friendliness and luggage space less favourably. Overall only Compton had a negative mean score.

TABLE 1

Differences in scores given in 1986 and 1987 surveys

	Glenholt	Southway	Plympton	Compton
Fares	+11.5	+11.6	+8.4	+6
Frequency	+9	+30.7	+11.9	+7.6
Timing	+6.9	+16.6	+7.9	+1.5
Convenience of route	-1.5	+12.2	+5.9	+5.7
Journey time	+8.3	+16.6	+11.3	+4.4
Punctuality	+5	+6.8	-14.7	-10.7
Bus stop siting	+13.5	+6.9	-0.6	+4.6
Access to timetables	+6.4	+1.8	-4.9	-9.5
Understanding of timetables	+8.5	+4.5	-12.2	-10.2
Friendliness	+0.6	+10.4	-2.8	-1.5
Comfort	+12.5	+10.5	-0.1	+3.1
Luggage space	+2.7	+4.6	+1.9	-6.9
MEAN	+6.9	+11.1	+1.0	-0.5

Respondents were also asked to rank the importance of different attributes of a bus service (see table 2). Little difference occurred in the two surveys with value for money, punctuality and frequency still being the most important characteristics, although punctuality overtook value for money in three of the four areas as being the most important attribute. No smoking also became a more important feature of the bus service, reflecting general health awareness.

Many public transport operators have introduced high frequency minibus services, and although these results indicate that frequency is an important feature of a bus service, reliability and value for money are more important. Some of the problems occurring in both Plympton

and Compton have been due to minibuses in peak periods being full and refusing to pick up passengers.

TABLE 2

Ranking of the importance of attributes of the bus service

	Glenholt	Southway	Plympton	Compton
No smoking	6(10)	6(10)	5(8)	6(8)
Frequent service	3(3)	3(3)	3(3)	3(2)
Value for money	2(1)	1(1)	2(1)	1(1)
Door to door service	8(9)	8(8)	7(4)	7(4)
Limited stops	9(7)	9(6)	9(10)	10(9)
Plenty of room	7(6)	7(5)	8(6)	8(7)
Punctuality	1(2)	2(1)	1(2)	1(3)
Friendly staff	4(4)	4(7)	6(7)	5(6)
Good timetables	5(5)	5(4)	4(5)	4(5)
Circular routes	10(8)	10(9)	10(9)	9(10)

The deregulation process resulted in many changes in Plymouth, not only to service frequencies, but also routeing changes, service number and bus stop alterations. This resulted in considerable confusion initially and this is reflected in the perception of timetabling information and the understanding of it. Punctuality was perceived less favourably in both Plympton and Compton, in Plympton some routeing problems have occurred with double deckers being used on a route designed for a minibus service, some congestion has occurred and complaints received from passengers concerning punctuality and reliability. Compton now receives a greatly increased service frequency, however a lack of reliability and confusion over which services to use could be reflected in the perception of punctuality. Compton contains a fairly high proportion of old aged pensioners for whom major changes in bus services may cause considerable confusion and distress.

One of the problems associated with minibuses has been the lack of luggage space, however, this has not been reflected in ratings given following the introduction of minibus services in either Southway or Plympton. Respondents in Compton did however rate luggage space less favourably, again the high levels of old age pensions could account for this as this group tends to have high levels of shopping trolley use.

The advantages associated with minibus services have been postulated as increased comfort, faster journey times, higher frequencies and a willingness of passengers to pay a higher fare for this improved service. This has been reflected in respondents' ratings of the 'new' bus service in Southway, who gave more favourable responses to fare levels (although fares have remained constant), service frequencies, journey time and comfort.

The poor ratings given in Plympton could be due to differences in the type of users, the sample contained a large number of respondents in the 26-45 age category and higher numbers of unskilled workers than the other areas. In addition, because of the geographical location of

Plympton most shopping trips are performed locally, most bus journeys into Plymouth city centre are either for major household items or work journeys, therefore punctuality and reliability are especially important to users in Plympton. Minibuses used in the peak periods have experienced capacity problems, the replacement with double deckers at times has resulted in congestion and reports have been received of buses diverting because of roads being too narrow for the double deckers.

Increases in Ridership

Data on passenger ridership figures were obtained for a 'typical' week in 1985 for Plympton in the off-peak 9.30 a.m. - 3.30 p.m. period. During the first week of December 1986 a cordon survey of the 21/51 service from Plympton to Plymouth was conducted, in order to ascertain whether there had been any increase in ridership. Passengers were only surveyed on the inward journey from Plympton to Plymouth, not on the return journey.

Weekly ridership for typical week in 1985:	2669
Ridership for week commencing 1.12.86.:	2695

The increased usage can be explained as pre-Christmas shopping and would be expected at this time of year. Therefore the increased frequency appears to have had little initial effect on usage. Future counts may indicate greater changes. The revised service introduced on 26th October not only increased service frequencies, but also made routeing changes, the link from Woodford to Plympton centre has now been lost. Passenger movement figures obtained for 1985 indicate that during the off-peak period 177 passengers per week will be lost. One of the aims of undertaking household surveys is to attempt to include the perception of those passengers travelling within Plympton and those who now have to walk further in order to obtain a service to Plymouth.

4. CONCLUSIONS

Plymouth, like many other areas, has experienced a significant degree of innovation, in the form of the introduction of high frequency minibus services. Response to The Act by taxi operators has been very limited, partly due to City Council policy on the use of 4 seater black hackney type vehicles.

Complaints from bus passengers have been received regarding timetable changes, driving skills and drivers' attitudes. No complaints have been made to the Traffic Commissioners or the Office of Fair Trading. No great savings in subsidy payments have been made. Wages of CityBus employees have remained comparable to levels in previous years, no differential pay scale for minibus drivers has been introduced. Western National have introduced a differential pay scale of approximately 30 pence an hour less for minibus drivers.

The purpose of the two questionnaire surveys was to establish whether passengers rated the bus service as 'better' or 'worse' following

deregulation, rather than simply using such data as service frequencies, journey times or passenger loadings. Results have shown that users in Southway consistently rate every named characteristic of the bus service more favourably in the January 1987 survey. The less favourable ratings given to some attributes of the service received in Plympton do reflect the objective conditions, punctuality has been a problem and confusion did result over timetabling changes, with both the route and the service number alterations. In Compton capacity problems in the peak period have been reflected in less favourable ratings of punctuality. Glenholt receives the same service frequency, but by a different operator. Respondents rated almost every aspect of the bus service more favourably, some of these are reflected objectively, for example, punctuality and friendliness, but others are not easily explained just by referring to the changes taking place. The more favourable ratings must reflect a generally more favourable attitude overall to the bus service.

This paper contains a brief outline of some of the research conducted, more detailed analysis is contained in a Working Paper, obtainable from the author at the Department of Shipping & Transport, Plymouth Polytechnic. Further analysis segments respondents by frequency of use and journey purpose, and thus provides a greater understanding of attitudes to the changes in bus service provision.

Subsequent research has sought to investigate the attitude formation process and the underlying belief structure following deregulation. In-depth interview sessions have provided information on users' salient beliefs, belief strength and attribute importance. Further details can be obtained from the author at the above address.