

**Transport problems of disadvantaged people:
case studies of the elderly in four areas of
Sheffield**

A thesis submitted in
fulfilment of the requirements
for the degree of Ph.D

at

University of Sheffield

by

Jebril El-Telbani

BA, Bir Zeit University 1987

M.Phil., Sheffield University 1991

Department of Geography

1993

To: *My wife Nihaya El-Telbani and
my sons Ahmed and Sharraf*

Abstract

The major concern of this thesis is to describe and identify the main transport problems which may affect the elderly's levels of participation in activities, and also to examine the relationship between transport problems and the elderly's levels of participation. The main objectives of this thesis are: to identify the main activities in which the elderly participate; to identify the transport problems which may affect or prevent the elderly from taken part in some or all activities; to identify which activities the elderly fail to achieve and the level of participation they wish to achieve and the main reasons which underline these problems; to examine how the characteristics of individuals affect the use of transport methods; and finally to identify the main transport difficulties encountered by the elderly in using transport system. This thesis is divided into twelve chapters, which can be structured into four main parts: the first part reviews the literature on transport policy for the elderly; the second part includes background information to the research problems, the survey methodology and the case studies; the third part contains detailed discussion of the main transport problems affecting the elderly's participation in the organised activities (from the organisers' point of view), the fourth part contains discussions of achieved activities, desired level of participation in activities, transport methods used by the elderly, and finally transport difficulties encountered by the elderly; this includes fully achieved, modified, and frustrated activities, in order to explain the relationship between the transport needs and demands of the elderly people.

The main survey method used in collecting the data was a postal questionnaire and SPSS (Statistical Package for Social Science) was used in analysis.

The thesis concludes by providing a summary of the main findings and the implications of the results obtained in the study.

Acknowledgements

This thesis has benefited by the support and contributions of many individuals and institutions. I would like to thank Department members for their help and assistance in the production of this thesis. In particular, I am indebted to my supervisors, Professor A. M. Hay, and Dr. G. Rowley, for their great support and excellent supervision. They provided me with constant and generous attention needed in all the facets of the development of the thesis. All the errors and omissions in the thesis are solely my responsibility.

I wish to express my special thanks and gratitude to research students for their help and for offering all sorts of moral support, in particular Miss Juliet Carpenter, Mr Martin Clark, and Mr Andrew Russell.

My sincere appreciation is also due to Family Health Services Authority in Sheffield in particular Mr G. Thompson for his help and cooperation in the early stage of the survey. Thank also due to Transportation Policy Unit, in Sheffield City Council, in particular Mrs Mary Croft, and City Library staff for their help.

My sincere gratitude is also expressed to Mr Thomas Hallawell from The Arab-British Chamber Charitable Foundation, and Mr J. L. Christie, Director of: Arab Student Aid International, UK, for their financial help.

I wish to express my profound gratitude to my wife Nihaya El-Telbani and my sons Ahmed and Sharraf for having to cope with my absence and whatever my absence from them might have meant to them.

I owe a debt of gratitude to my parents for their care and love and to my father and mother-in-law for offering all sorts of moral support.

My thanks are also expressed to my brothers Ismail El-Telbani, Mohammed El-Telbani, and Odah El-Telbani, thanks are also due to my sisters Jamelah, Measer, and Raja El-Telbani for their financial and/or moral support.

I wish to express my special thanks and gratitude to all my friends in Gaza

Strip in particular Mohammed El-Masri (Abu-Rami). Special thanks are also due to all my friends in Norway in particular Mrs Liv Oland and her husband Rolf Lϕvsjϕ .

Appreciation is also expressed to Mrs Kate Schofield for her enthusiasm, love and patience not only in typing but also in her help during my study, for this I express my sincere love and gratitude.

Thanks are also due to all the ladies in the department office, all members of the computer center, and all the staff in the geography library.

Finally, I wish to thank God, who has been at the helm of my affairs and all the individuals and groups with whom I have shared His love during my stay in Sheffield.

Jebril El-Telbani

Sheffield 1993

Contents

1	Introduction	1
1.1	Objectives of the thesis	2
1.2	Sheffield	3
1.3	The need for detailed inventory and analysis	3
1.4	The structure of the thesis	4
2	Literature Review	6
2.1	Introduction	6
2.1.1	Travel disadvantage	7
2.1.2	The size of the problem	11
2.2	Transport demands and needs of the elderly	14
2.2.1	Transport demands and activities	15
2.2.2	Transport needs of the elderly	20
2.2.3	Required characteristics of transport modes for the elderly	29
2.3	Transport supply for the elderly	35
2.3.1	Conventional bus	36
2.3.2	Minibuses as a transport mode for the elderly	39
2.3.3	Taxi	41
2.3.4	Demand responsive and community services	42
2.3.5	Car	44
2.3.6	Walking as a travel mode for the elderly	46

2.3.7	Other modes	47
2.3.8	Pattern of mode use	48
3	Transport policy for the elderly	52
3.1	Introduction	52
3.2	National case studies	53
3.2.1	United Kingdom policy	53
3.2.2	United States policy	58
3.2.3	French policy	62
3.2.4	Swedish policy	64
3.2.5	Japanese policy	65
3.3	Main policy approaches	68
3.3.1	Responsibility	68
3.3.2	Forms of intervention	68
3.3.3	Policy questions	69
4	Research problems	70
4.1	Introduction	70
4.2	The central problems	71
4.2.1	Desired level of activities	72
4.2.2	Fully achieved activities	72
4.2.3	Modified activities	72
4.2.4	Frustrated activities	73
4.2.5	Actual travel	73
4.2.6	Latent demand	74
4.3	Transport needs of the elderly	74
4.3.1	Broad definitions of need	74
4.3.2	Narrow definition of need	75
4.4	Relationship to earlier studies	75

4.5	The objectives of this study summarised	77
5	Research design	78
5.1	Introduction	78
5.2	Type of data collection	78
5.2.1	Asking respondents to identify latent demands	79
5.2.2	Travel and activity records	81
5.3	Type of survey design	86
5.3.1	Random sampling methods for large populations	86
5.3.2	Sample size	87
5.3.3	Stratified and controlled samples	88
5.3.4	The problems of sampling frames	89
5.3.5	Some examples	90
5.4	Methods of analysis	91
5.5	The research methodology used in this study	93
5.5.1	Selection of study areas	94
5.5.2	The sampling procedure	95
5.5.3	The main questionnaire	96
5.5.4	Outcome of the survey and respondent characteristics	99
5.5.5	The main method of analysis	103
5.5.6	Supplementary survey of organisers	104
6	The case study	106
6.1	Introduction	106
6.2	The elderly in the Sheffield population	107
6.3	Residence characteristics of Sheffield's elderly	110
6.4	Disabled elderly in Sheffield	113
6.5	Some of elderly activities	113
6.5.1	Local community involvement	114

6.5.2	Use of leisure services	114
6.5.3	City Centre and Markets	115
6.6	The target areas	116
6.6.1	Area 1; Walkley	116
6.6.2	Area 2; Manor	117
6.6.3	Area 3; Birley	118
6.6.4	Area 4; Chapel Green	119
7	The organisers' perspective: transport problems and the elderly activities	121
7.1	Introduction	121
7.2	Who are the organisers?	122
7.3	How many elderly have transport problems in attending special clubs and organisation activities?	123
7.3.1	Proportion of elderly people with transport difficulties in each area	124
7.3.2	Types of transport assistance	126
7.4	How many elderly have transport difficulties in participating in other activities?	131
7.4.1	Proportion of elderly people effected by transport problems	131
7.4.2	Proportion of type of effect for each of the activities . .	138
7.5	The conclusions	143
7.5.1	Main conclusions	144
7.5.2	Comparison with other studies	145
7.5.3	Relate to next stage of thesis	146
8	Activities in which the elderly currently participate	147
8.1	Introduction	147
8.2	Descriptive analysis	148

8.2.1	Economic activities	148
8.2.2	Social activities	149
8.2.3	Health related activities	151
8.2.4	Other activities	153
8.2.5	Summary of results	155
8.3	The factors affecting the fully achieved activities	156
8.3.1	Testing method	157
8.3.2	The effect of age	157
8.3.3	The effect of disability	159
8.3.4	The effect of income	160
8.3.5	The effect of car availability	162
8.3.6	Compound disadvantage	163
8.4	Conclusions	164
9	Activities in which the elderly currently wish to participate	167
9.1	Introduction	167
9.2	Methods of analysis	168
9.3	Descriptive analysis by areas	168
9.3.1	Economic activities	168
9.3.2	Social activities	170
9.3.3	Health related activities	172
9.3.4	Other activities	174
9.4	Analysis by factors	175
9.4.1	Testing method	176
9.4.2	The effect of age	177
9.4.3	The effect of disability	178
9.4.4	The effect of income	180
9.5	The relationship between the fully achieved activities and the elderly desired level of participation	182

9.5.1	Comparison between the current level of participation and desired levels of participation	182
9.5.2	The effect of personal characteristics on the mismatch between existing activities and desired level of participation	185
9.6	Conclusion	186
10	Transport methods used by the elderly	189
10.1	Introduction	189
10.2	Transport methods available to the elderly	190
10.2.1	Public transport	190
10.2.2	Private transport	194
10.3	Analysis of the transport methods used by the elderly for different activities	199
10.3.1	Economic activities	199
10.3.2	Social activities	201
10.3.3	Health related activities	202
10.3.4	Other activities	204
10.4	The factors affecting the use of transport methods in the activities	205
10.4.1	Testing method	205
10.4.2	The effect of age	206
10.4.3	The effect of disability	207
10.4.4	The effect of income	209
10.5	Conclusions	210
11	Transport difficulties encountered by the elderly in using transport	215
11.1	Introduction	215
11.2	Transport difficulties: data and method of analysis	216

11.3	Descriptive analysis of the main transport difficulties by area .	216
11.3.1	Economic activities	217
11.3.2	Social activities	218
11.3.3	Health related activities	219
11.3.4	Other activities	221
11.4	Modified activities	222
11.5	Factors identified as modifying levels of activity	225
11.5.1	Time	225
11.5.2	Access	226
11.5.3	Transport cost	227
11.5.4	Physical problems	228
11.6	The effect of modifying factors on frequency of participation .	229
11.7	Frustrated activities	231
11.8	Latent demand	232
11.9	Other problems encountered in travelling about the city	234
11.10	Conclusions	237
12	Conclusions and recommendations	239
12.1	Introduction	239
12.2	The elderly transport problems in the four study areas	240
12.3	The overall picture and some implication	242
12.3.1	Main patterns of transport methods used by the elderly	245
12.3.2	Main patterns of transport disadvantage	248
12.3.3	Policy implications	252
12.4	Critical assessment of this study	255
A	Questionnaire for organisers	279
B	Questionnaire for participant	282

C Main tabulations of the questionnaire data	291
D Open questionnaire for individuals	301

List of Tables

2.1	Elderly people and population change in the United Kingdom 1951 - 2025 (figures in millions)	12
2.2	The proportion of journeys for some trips purposes made by elderly people in the U.K. and U.S.A.	16
5.1	The main advantages and disadvantages of the interview and postal methods	85
5.2	Outcome of the survey (rates are as % of all those with whom first contact was made.	99
5.3	Residence characteristics of respondents (figures give % of all respondents).	100
5.4	The proportion of elderly by accommodation type (figures give % of all respondents).	100
5.5	Tenure by which the elderly occupy their accommodation (figures give % of all respondents).	101
5.6	A comparison between characteristics of elderly population and respondents characteristics	102
5.7	Outcome of the organisers' survey (rates are as % of all those with whom first contact was made.	105
6.1	Provisional 1991 population estimates for Sheffield (variation by ward and age).	108

6.2	The population of the elderly people in Sheffield.	109
6.3	Dependency of elderly population in Sheffield.	109
6.4	Estimated number of Sheffield people requiring care by amount of care required, and age group	110
6.5	Type of household by age group	111
6.6	Variation between electoral wards, 1981	112
6.7	Estimates of prevalence of disability among adults in private households in Sheffield (by age and severity category).	113
6.8	Elderly persons use of leisure services	114
6.9	Elderly visitors at least once a week to city centre and markets	115
7.1	Proportion of organisations having members unable to attend regular events because of transport difficulties.	124
7.2	Proportion of the elderly people whose attendance at events is affected by transport problems (table values reporting the numbers of organisers reporting that level of effect).	125
7.3	Dependence on transport mode for attendance at the club activ- ities (table figures record the average for all respondent groups in the area).	127
7.4	The proportion of organisers whose members required help by each type of transport available to them: Walkley area.	129
7.5	The proportion of organisers whose members required help by each type of transport available to them: Manor area.	129
7.6	The proportion of organisers whose members required help by each type of transport available to them: Birley area.	130
7.7	The proportion of organisers whose members required help by each type of transport available to them: Chapel Green area.	130
7.8	Proportion of clubs members affected by transport problems on economic activities.	134

7.9	Proportion of clubs members affected by transport problems on social activities.	136
7.10	Proportion of clubs members affected by transport problems on medical activities.	137
7.11	Proportion of clubs members affected by transport problems on other activities.	138
7.12	Proportion of type of effect for each of the activities on economic activities.	139
7.13	Proportion of type of effect for each of the activities on social activities.	141
7.14	Proportion of type of effect for each of the activities on medical activities.	142
7.15	Proportion of type of effect for each of the activities on other activities.	143
8.1	Proportion of elderly people who take part in economic activities	149
8.2	Proportion of elderly people who take part in social activities .	150
8.3	Proportion of elderly people attending medical services or using medical facilities.	152
8.4	Proportion of elderly people who take part in other activities .	154
8.5	A summary comparison of the most commonly reported frequency of participation by area and type of activity	155
8.6	Results of the chi-squared test for the effect of age on activities.	158
8.7	Results of the chi-squared test for the effect of severe walking disability on activities.	160
8.8	Results of the chi-squared test for the effect of income category on activities.	161
8.9	Results of the chi-squared test for the effect of car availability on activities.	163

8.10	Number of respondents with multiple disadvantage by each area	164
8.11	A summary comparison between the areas with overall effect of personal characteristics	166
9.1	Frequency at which elderly people currently participate, and the levels they would like to take part in economic activities if transport permitted.	169
9.2	Frequency at which elderly people currently participate and the levels they would like to take part in social activities if transport permitted.	171
9.3	Frequency at which elderly people currently take part in health related activities and the levels they would like to attend medical services or to use medical facilities if transport permitted. .	173
9.4	Frequency at which elderly people currently participate and the levels they would like to take part in other activities if transport permitted.	175
9.5	Results of the chi-squared test for the effect of age on the desired level of participation in the activities.	177
9.6	Results of the chi-squared test for the effect of disability on the desired level of participation in the activities.	179
9.7	Results of the chi-squared test for the effect of income on activities.	181
9.8	Results of the chi-squared test for the effect of personal characteristics on the mismatch between existing activities and desired level of participation	185
10.1	The proportion of elderly people who travel by bus or coach as a form of public transport.	191
10.2	The proportion of elderly people who travel by minibus as a form of public transport.	193

10.3	The proportion of elderly people who travel by Taxi as a form of public transport.	194
10.4	Driving licence characteristics of respondents.	195
10.5	The frequency of use of a household car as driver.	196
10.6	The reasons for ceasing to drive on a regular basis (% of all respondents).	196
10.7	The proportion of elderly people who travel in a household car as a passenger.	197
10.8	The proportion of elderly people frequency of travel in some other car as a passenger (excluding Taxi trips).	198
10.9	The proportion of the elderly people according to the main transport method used to take part in economic activities.	200
10.10	The proportion of the elderly people according to the main transport method used to attend social activities.	201
10.11	The proportion of the elderly people according to the main transport method used to attend medical services or medical facilities.	203
10.12	The proportion of the elderly people according to the main transport method used to attend other activities.	205
10.13	Results of the effect of age on activities by each of transport method.	207
10.14	Results of the effect of disability on activities by each of transport method.	208
10.15	Results of the effect of income on activities by each of transport method.	209
10.16	A summary comparison of the most commonly reported frequency transport method used by the elderly by area and type of activity.	213

11.1	The proportion of elderly people by type of difficulties encountered in using transport when they take part in economic activities.	217
11.2	The proportion of elderly people by type of difficulties encountered in using transport when they take part in social activities.	219
11.3	The proportion of elderly people by type of difficulties encountered in using transport when attending medical services or facilities.	220
11.4	The proportion of elderly people by type of difficulties encountered in using transport when they take part in other activities.	222
11.5	The proportion of elderly people who report having modified their activities because of difficulties encountered in using transport (figures give % of all respondents).	224
11.6	A comparison by area of the proportions of elderly people who modified their activities because of travel time.	226
11.7	A comparison by area of the proportions of elderly people who modified their activities because of access to transport.	227
11.8	A comparison by area of the proportions of elderly people who modified their activities because of the cost of transport.	228
11.9	A comparison by area of the proportions of elderly people who modified their activities because of the physical problems.	229
11.10	A comparison between elderly with and without transport difficulties and the frequency of participation by areas.	230
11.11	The proportion of elderly people who recorded activities frustrated because of transport difficulties.	232
11.12	The proportion of elderly people who recorded wishes, difficulties, modification or frustrated activities by area.	233

11.13	The proportion of elderly people who recorded wishes, difficulties, modification or frustrated activities by area: diagrammatic form.	234
12.1	A summary results and a comparison between the study areas	241
12.2	Summary of transport need in areas according to population characteristics, area characteristics and travel patterns.	250
12.3	Summary of transport need according to personal characteristics, area of residency characteristics and travel patterns.	251

List of Figures

4.1	The relationship between activities and travel	71
7.1	The relationship between reported proportion of members experiencing transport difficulty and level of dependence on special club transport.	127
8.1	The relationship between elderly fully achieved activities and the affect of the factors	157
9.1	The relationship between the desired participation in the activities of the elderly people	176
10.1	The relationship between transport method used by elderly and the affect of the personal characteristics	206
11.1	The effect of transport difficulties in modifying the frequency and or location of activities.	223
12.1	Summary of transport need in areas according to combinations of personal characteristics and area characteristics.	252

Chapter 1

Introduction

The major purpose of this thesis is to identify and describe the main transport problems affecting the life of elderly people, their level of participation in different activities, and the relationship between transport problems and the elderly's levels of participation in these activities.

The transport problems facing the elderly people in the United Kingdom in general are well covered in the literature (Bailey and Layzell 1981, Skelton 1978, Norman 1977, Hopkin et al 1978, etc). Within this framework however, there are still many aspects which have great importance role in the life of elderly people. This study is therefore an attempt to fill part of the gap by researching the transport problems affecting the elderly's current level of participation in different types of activities (as reported by the elderly people and as perceived by the organisers who organise activities for the elderly). The work is also original in that the Sheffield case has not previously been investigated.

1.1 Objectives of the thesis

In order to accomplish the broad aim of this study, the following objectives were formulated:

- 1) To identify the main activities in which the elderly participate.
- 2) To identify the main transport problems facing the elderly in their participation in the activities.
- 3) To identify desired levels of participation which the elderly fail to achieve in some or all the activities, and the reasons for this failure.
- 4) To investigate how the characteristics of individuals affect the use of transport methods especially personal characteristics (e.g. age, health status, income).
- 5) To identify the main transport difficulties encountered by the elderly in using transport; this includes fully achieved activities, modified activities, and frustrated activities, in order to explain the relationship between the transport needs and demands of elderly people.

The main reasons for choosing the topics in the study are: first, most of these topics have not been widely researched in the case of the elderly before. Secondly, in the 1980's few studies were made mainly for the elderly, and the studies which were made examined one variable or one factor. In investigating these problems the main focus was the views of the elderly themselves but additional evidence was collected from those who organise activities for the elderly.

1.2 Sheffield

The study area defined for this thesis corresponds to the built-up area of the City of Sheffield. The case studies (the locations) were located in Sheffield which is one of the four Metropolitan Districts which comprise the County of South Yorkshire, the tier of local government responsible for the provision of public transport services being the Passenger Transport Authority which covers the whole county of South Yorkshire through a joint board of four metropolitan councils.

Sheffield lies on the borders of Yorkshire and Derbyshire amid some of the most spectacular scenery in Britain. Perhaps best known as the capital of the UK special steel and cutlery industries. A city with a population of 501,202, Sheffield is England's fifth largest city with an average density of 13.6 persons per hectare, compared with 3.2 for England and Wales as a whole (1991 Census). There are 91,535 persons in Sheffield aged 65 or over, representing around 18.3% of the total population, the equivalent figure for England and Wales was 15.8%.

1.3 The need for detailed inventory and analysis

Research on the travel patterns and problems of the elderly is important at two levels. First, as the elderly are an important section of the population their travel needs and problems are an important topic for description and explanation in their own right. Second, such a description (and may be prediction) are necessary as a basis for transport planning and policy (Bailey and Layzell 1981, Skelton 1978, Skelton 1979, Moseley 1979, Mitchell 1988, Oxley and Benwell 1985, National Council For Aged 1986, Rihany 1982, Garden

1978, Cooper 1978, Hopkin and Town 1978).

The detailed inventory and analysis of the transport problems facing the elderly people and individual travel characteristics as attempted in this study, is capable of leading to more realistic picture of the elderly life, this may help to draw more realistic solutions to their main problems encountered in using the transport system. To anticipate the long and short term travel needs of the elderly people in specific areas of the city (Sheffield) and to accomplish the set objectives of the present study, there seems to be no better approach than to take the inventory of travel characteristics for both individual and club members based on their level of participation in the activities, and also based on the socio-economic and demographic characteristics of each location within the main study area.

1.4 The structure of the thesis

In this section a brief summary of the studies described in later chapters is presented. This thesis, which is divided into twelve chapters, can be structured into four main parts. The first part, Chapters 2 and 3 review the literature on transport policy for the elderly, this provide the main background materials related to transport problems facing the elderly in their travel. Transport needs and demands of the elderly, transport modes and transport supply for the elderly are also reviewed in this part along with national case studies from five countries. The second part includes background information to the research problems, the survey methodology and the case study (Chapters 4 to 6), a description of the research design is also given in this part. The third part, Chapter 7, contains detailed of discussion of the main transport problems affecting the life of elderly people, their participation in the organised activities related to clubs, and the relationship between transport and the elderly's participation in these activities, as perceived by the organisers' who organise

activities for the elderly. The fourth part, Chapters 8 to 11 extends the discussion and seeks to describe and cover the transport problems and the elderly activities this includes: activities in which the elderly currently participate, activities in which the elderly wish to participate, transport methods used by the elderly, and finally transport difficulties encountered by the elderly in using the transport system; this includes fully achieved activities, modified activities, and frustrated activities, in order to explain the relationship between the transport needs and demands of the elderly people. Chapter 12 discusses the summary of the conclusions and the implications of the results obtained in the study.

Chapter 2

Literature Review

2.1 Introduction

There is a very large body of studies on elderly people's movement by public and private transport and there are many different topics which may be researched. In attempting to make it easier for the elderly people to meet daily requirements, it is important to determine whether the travel implications of these requirements and the difficulties that are encountered are specific to elderly people. If the problems and requirements of some or all elderly people are different from those of the rest of the population, it can be argued that these groups of elderly people demand special attention. Furthermore, if most elderly people are similar to younger people in their difficulties and requirements, there may be a case for making special provision only for the elderly people who are in greatest need, while improving conventional transport for benefit of other elderly and young alike. This literature review will investigate the factors which must be considered in understanding the provision of greater mobility for the elderly.

The first section will identify the elderly people as a category of transport disadvantaged. The second section will cover the transport needs and de-

mands of the elderly people, both as described by the elderly, themselves and as described by the experts. This section will also cover the conceptual approaches like activities, needs and demands and the mismatch due to latent and suppressed demand. The final section will investigate the transport modes available to the elderly.

2.1.1 Travel disadvantage

Transportation disadvantaged people are usually defined as those who have no access to an automobile (Saltzman and Amedee 1976). Although this is a useful statement for general purposes, a more precise and analytical definition is necessary to consider this group's travel needs and proposed solution to their problems. Sen et al (1982), and Davis et al (1982) used data on trip frequency per person as the prime determinant for describing degree of disadvantage and defined a transportation disadvantaged person as one who takes fewer trips per person per day than one who is not disadvantaged. This procedure is a modification of a procedure used by researchers in more detailed studies (Knapp and Logo 1983, Koffman 1978, and Reilly 1978). However the focus here is upon the distinct categories of individual who find themselves transport disadvantaged: two such categories are commonly identified: the poor and the physically handicapped.

2.1.1.1 Poor people

Poor people are one of the most readily identifiable groups of transportation disadvantaged people. They are, because of insufficient income, unable to conveniently fulfil their travel needs and desires: low incomes result in low trip making rates. The household trip rates for those with annual income of more than the average income are much higher than for those with lower income (Saltzman and Amedee 1976, Knapp and Lago 1983, Pio 1980, and Banister

and Mackett 1991). Saltzman and Amedee (1976) reported that the intervening variable between income and trip rate is automobile ownership, but because many of the cars owned by the poor people are old and not in good operating condition, the mere availability of a car does not necessarily guarantee mobility (Adams 1990). If income is held constant, members of carless households seem to take about one trip less per person per day than people from one car households. The difference in the total number of trips is much greater, however, between carless and one car household, than between one car and two car households (Adams 1990, Harrington and Parolin 1991, and Thompson and Cunningham 1987).

The location of carless individuals also has a considerable effect on available transportation alternatives and, therefore, on trip-making rates (Starrs and Perrins 1989, and Pucher 1990). In the larger cities where public transportation is more readily available, the trip frequency gap between individuals with and without cars is reduced. In these cities, public transport is used for a much larger percentage of trips taken by carless individuals (Serta and 1988, Oldfield 1981). Goodwin (1986), Allsop (1984), and Bamford et al (1987) reported that this is quite different from that which occurs in sparsely populated areas. Bly and Oldfield (1983), Roth and Zahavi (1981), Bendixson (1986), Gunn (1981) and Bruton (1985) found that in smaller cities, ride sharing and car borrowing carless households exist to a much greater degree than in larger cities. These informal methods, do not however allow poor residents of smaller cities the mobility afforded by the better transit system of the large cities (Mackett 1991, Paulley and Webster 1991, Simpson 1987, Goodwin 1989, and Evans 1991).

2.1.1.2 Handicapped people

The major transportation problem of handicapped people lies in their inability to find a convenient mode of transportation that does not cause them serious

discomforts (Mitchell 1988, and Heron et al 1983). The problems of elderly people when riding on conventional modes of public transportation are, to a large extent, associated with the physical impairment of persons 65 years of age and over (Hopkin et al 1978, Study by Leyland Vehicle 1980, and Department of transport 1987). Their difficulties in getting to the bus stop, boarding high entrance steps, safely riding on buses, and getting to their destinations, mean that handicapped people use public transport only when absolutely necessary (Mitchell 1988, Oxley and Benwell 1985, Hopkin and et al 1978, Lovely 1983, and Mitchell and Stokes 1982). Mitchell (1988) reported that their attempts to use inadequate public transport result in both physical endangerment and psychological frustrations.

There is a large gap between the trip frequencies of handicapped and non-handicapped people, handicapped people took 1.13 trips per person per day and the general population average 2.23 trips per person per day in the U.S.A. (Fleming and Silverstone 1983). There is a significant number of trips by handicapped people which are taken by taxi. Handicapped people for example take 14% of their trips by taxi, however non-handicapped people take 2% of their trips by taxi. Although the handicapped are generally less able to afford taxi fares, they need the door-to-door taxi services (Brog and Ribbeck 1985).

2.1.1.3 The elderly as a disadvantaged group

One group of the transportation disadvantaged that has received considerable attention from researchers in recent years has been elderly people who make up a significant portion of the population and will continue to increase as a proportion of total population in many countries. Studies which have been made of the elderly as a separate group identify the two features already discussed as being important: the elderly are often poor and often suffer from physical disabilities. Brog and Ribbeck (1985) reported that in the U.S.A.

53% of the handicapped people are elderly. Stamatiadis and his associates (1991) reported that two major factors are associated with the transportation problems of elderly people. The first is that many have limited incomes and are not able to pay for car or taxi expenses. The second is related to the physical condition of many elderly people as obstacle to operating a car and to use the conventional public transport system. These findings are reported in many studies, for example Mitchell (1988) and Hopkin et al (1978). The effect of low incomes is similarly recorded in a number of studies including Pagano and McKnight (1983), Burkhardt (1980), Mitchell (1988), and Oxley and Benwell (1985), Witkowski and Buick (1985), and Fowkes et al (1981). The effects identified are the inability to afford to own a car, some restraint on financial ability to use a car, and restraint on the amount of public transport use which can be afforded.

There is however an important additional point. Many of the elderly who are not sufficiently disabled to be separately classified nevertheless have minor disabilities (e.g. walking speed, eyesight etc) which restrict the type or amount of travel they can accomplish; similarly many elderly who have sufficient income not to be classified as poor nevertheless have to restrain their transport spending. When those two aspects are combined many elderly who are not clearly poor or disabled are nevertheless transport disadvantaged (see for example Mitchell (1988), Knapp et al (1985), and Oxley and Benwell (1983).

There is one aspect of the elderly which is currently important in terms of transport disadvantage. Many elderly people in the 1990's (especially women) have never been car drivers: so that even when there are no income or disability problems they are unable to become car drivers. But this is a transient effect: many of those currently retiring carry the ability to drive through into retirement.

2.1.2 The size of the problem

Before examining the mobility of the elderly in greater detail it is necessary to define the group under study more precisely.

2.1.2.1 Who are the elderly?

At first sight the term elderly appears to be unproblematic but closer investigation raises certain problems. In some studies the elderly are defined solely in terms of age (usually 60 or 65 years), in other studies the definition is related to pensionable age (whether or not the person has retired, and often discriminates between male and females), yet other studies define the elderly in terms of those who have retired from economic activity.

Whichever of these definitions is used two further points arise. First, the definition is often blurred because some of those defined as elderly have none of the elderly's characteristics (income, employment, disability) while some of those not meeting the definition do have the characteristics. Secondly, the mechanisms by which an elderly person is recognised as being elderly vary from place to place. These points can be illustrated by the U.S.A.'s Urban Mass Transportation Act of 1964 as amended in 1970 and the National Mass Transportation Assistance Act 1974 contain general definitions slanted at particular physical and mental disabilities, but as subsequently enlarged in the regulations, including all those over 65, at a minimum. At least one County authority has interpreted this minimum as a norm and revised the age at which they previously gave assistance upwards. In the U.S.A. the procedures required to establish eligibility are complex, and vary from county to county (Hitchcock, 1980 and 1982).

2.1.2.2 How many elderly?

In many countries, especially in the West, the elderly are a large and growing group in the population. Table 2.1 illustrates that the total population of the United Kingdom grew steadily between 1951 and 1971, but has since grown more slowly; growth is expected to quicken over the next 10 years then to fall back again. The age structure of the population has changed perceptibly in recent years, with a lower proportion of children age under 16 in 1989 than in 1971, and a higher proportion in the pensionable (65 and over) age groups. The number of people aged 65 or over (8.8 million in 1987) is over 50% greater than in 1951 (5.5 million). The number in 1989 represented just over 15% of the population compared with nearly 11% in 1951.

Mid-year estimates	65 to 79	80 and over	All elderly	all ages	% of elderly
1951	4.8	0.7	5.5	50.3	10.9
1961	5.2	1.0	6.2	52.8	11.7
1971	6.1	1.3	7.4	55.9	13.2
1981	6.9	1.6	8.5	56.4	15.1
1986	6.8	1.8	8.6	56.8	15.1
1989	6.9	2.1	9.0	56.9	15.8
Mid-year projections					
1991	6.9	2.2	9.1	57.5	15.8
1996	6.8	2.4	9.2	58.3	15.8
2001	6.7	2.5	9.2	59.0	15.6
2006	6.6	2.6	9.2	59.3	15.5
2011	7.0	2.7	9.7	59.4	16.3
2025	8.5	2.9	11.4	60.0	19.0

Table 2.1: Elderly people and population change in the United Kingdom 1951 - 2025 (figures in millions)

Sources: Social Trends 19 (1989), 20 (1990), and 21 (1991).

The age structure of the elderly has also changed. The younger pensionable population (65 to 79) has been fairly constant since 1971 and is expected to remain fairly stable for the next 20 or so years, and then grow more quickly. But it is notable that the number of people aged 80 and over increased from

about 1 million in 1961 to 2.2 million in 1991 and is expected to grow to about 3 million by 2025. In summary, within broad ranges the balance is expected to shift to the older ages (Social Trends 19 (1989), 20 (1990), and 21 (1991)). Earlier discussions of these patterns appears in Garden (1978), Rihany (1982), and Whelan and Vaughan (1982).

Similarly the elderly population in the U.S.A. was about 20 million in 1970 (Bell 1978), and about 11% of the total national population in 1980 was 65 years of age and older. By 2025 this percentage may increase to 19% (Roger and Woodward 1988, and U.S. House of Representative 1985). Five states played a major role in the redistribution of the elderly U.S. population between 1975 and 1980. Florida, California, and Arizona were the principal destination states, and New York and Illinois were the primary origin states for aged migrants (Bigger 1984, Flynn et al 1985, Longino et al 1984, and Roger and Watkins 1987). In the U.S.A. migration plays an important role in the changing geography of the elderly population. The social and economic characteristics of these elderly migrants may have important consequences for public health and social service demands (Bigger 1980, 1984, Barbsy and Cox 1975, Longino et al 1984, Meyer and Speare 1985, Wiseman (1979 and 1980), and Rogers and Watkins 1987).

A few authors have recognized the importance of adopting a sources of growth approach in analysing the evolution of the elderly population. Lichter et al (1981) and Clifford et al (1983), for example, used a components of growth disaggregation to examine the contribution of the two sources of elderly population (migrants and nonmigrants) growth in metropolitan and non-metropolitan areas at three dates from 1950 to 1975. Hugo et al (1984) examined the sources of elderly population growth in two suburban populations within the Adelaide Statistical Division of Australia and analysed some of the policy implications associated with changing elderly population in that country. None of these

studies, however, adopted a dynamic population growth model to describe the prospective evolution of the elderly population over time.

Rogers and Woodward (1988) developed a method that quantifies the changing sources of elderly population over time. It differs from past research on the sources of the elderly population growth in that it adopts a truly dynamic perspective of elderly population growth.

2.1.2.3 How many elderly are transport disadvantaged?

It is evident that not all elderly are necessarily transport disadvantaged. It is common to find those only a little over retirement age who are physically able, who have no financial restraint on mobility, and are able to drive cars. Gonda (1982) reported that it has been suggested some elderly do not use social services because it would hurt their pride.

It is also useful to note that quite a lot of studies and similarly some transport policies which do not specifically identify the “elderly” may nevertheless refer substantially to elderly groups. For example, many studies of the transport needs of the physically handicapped are relevant to substantial numbers of the elderly people (Mitchell, 1985 and 1988). Similarly any study of transport needs of low income household will include many elderly households, and any study of the carless households will again refer to elderly people. For this reason some publications are referred to in this chapter despite the fact they were not specifically about the elderly.

2.2 Transport demands and needs of the elderly

In this section three approaches to the transport demands and needs of the elderly are identified. The first (in 2.2.1) describes transport demand mainly

in terms of the activities in which the elderly participate and the travel which they perform. The second approach (in 2.2.2) identifies the existence of needs for transport which cannot be identified simply by looking at existing activities, but also shows how difficult it is to define and measure such needs. The third approach (in 2.2.3) identifies the characteristics of a transport service which are required by the elderly.

2.2.1 Transport demands and activities

In early studies authors find it difficult to give a precise definition of the elderly's demands, because they are different from country to country, and even in the same country there are differences between cities, within cities, and between urban and rural areas. These differences reflect the fact that residential location and lifestyle are closely linked, lifestyle in turn demands needs and demands for transport.

2.2.1.1 Trip based descriptions

One way of describing the travel demands of the elderly is by their existing trip purposes. The elderly have many of the same trip purposes as other people (for example to shop, to visit friends and relatives), but their trip patterns are distinguished by the lower frequency or absence of some purposes (notably work trips, education trips) and an increased frequency of other purposes (notably health related trips). For example studies in the U.K. and U.S.A. found that the main trip purposes for those aged 60⁺ were as shown in Table 2.2.

Hopkin and Town (1978) reported that the elderly people travelled less frequently for social or shopping purposes and also covered shorter distances, however, in travelling to medical facilities such as hospital and doctors, it is less easy to avoid a journey or to choose its destination. Compared with the population as a whole, the elderly made 25% of their journeys for social pur-

Source	Shopping %	Social %	Personal or medical %
Social Trends, 21 (1991) U.K.	33.3	28.0	14.4
Social Trends, 19 (1989) U.K.	33.7	29.1	16.3
Heraty (1984) U.S.A.	20.0	40.0	-
Wolfe and Miller (1983) U.S.A.	34.0	43.5	-
Mitchell (1982) U.K.	35.0	10.0	12.0
Kocur (1979) U.S.A.	45.0	16.0	35.0
Cooper (1978) U.K.	34.0	11.0	23.0
Hopkin and Town (1978) U.K.	14.0	25.0	14.0
Skelton (1978) U.K.	37.0	-	-

(-) there is no information.

Table 2.2: The proportion of journeys for some trips purposes made by elderly people in the U.K. and U.S.A.

poses, 14% for shopping and 14% for personal business. Another study done by Hopkin et al (1978) shows that shopping was the most common purposes for which elderly people travel, followed by social and recreational journeys, this finding is similar to that reported in the Social Trends, 1989, and 1990.

In the U.S.A shopping and recreation trips were considered by the elderly to be almost as important as medical or social service trips (Revis 1978 and Bailey). The differences between U.K and U.S.A related to some factors such as income, distribution of the elderly people, car availability in the household, and ability to drive a car. According to the last factors a large proportion of elderly people will continue to be dependent on some form of public transport for reaching destination beyond walking distance.

Todd and Walker (1980) found similar results to that found in the U.K in the early studies, in which that there is a difference between males and females in using the transport for health purposes. The results show that females use transport more often for health purposes than male. Todd and Walker (1980)

also found that a large part of trip demand for elderly transport is from women (who tend to survive longer than male counterparts), and this is likely to be true elsewhere (Revis 1978).

Many studies measured the travel demands for disadvantaged people (elderly) in Britain and U.S.A, it was found that there are some similarity between these theories and also some differences. The common belief in all theories is that transportation must have subsidies for disadvantaged groups.

Reilly (1978) named his theory the 'theory of consumer demand'. His programs efficiency can be measured by analysing the factors that influence consumer choice. He developed two models which measured the consumer demands. Firstly, by number of trips with income spent on non-transportation. However the consumer spends income on transportation and non-transportation in such a way that his or her utility or welfare is maximized subject to a budget constraint. Secondly, by number of trips with trip price. Knapp (1983) added that measuring the transportation demands can be done by analysing the cost per trip and cost per mile for both the consumer and the operators. There is a difference in cost per trip and cost per mile in urban and rural area, because of this the transportation for disadvantaged people should be subsidised to make it reasonable for this group across all areas.

Hutchinson and Said (1990), Atkins (1987), Volet and Hutchinson (1986), and Said (1982) reported that there is a difference in transport demands between the western countries and the developing countries. For example, the estimation of transport demand is still an important issue in many of the Gulf States, as they continue to grow under the stimulus of their oil-based and foreign investment revenues. The social and economic structure of the Gulf State is very different from western cities and the traditional models can only be applied with caution. The authors show that the location and transport behaviour of households in Kuwait, for example, is conditioned mainly by the constraints

of public policy and there are few opportunities for the utility maximizing behaviour implicit in the transport demands.

The taxi is an example of a public transportation system which is on call (or demand responsive) rather than regularly scheduled. It is perhaps the most ubiquitous public transportation service in many rural and urban areas, but it is often under-utilized by social service agencies, including those that provide service to the elderly (Teal et al 1983). In a manner which is similar to reduced fares on conventional transit, user-side subsidy has been implemented recently (Charles River Associates 1983) to reduce the cost of using taxis in an effort to make it a more viable alternative.

Chan (1987) reported that another form of demand responsive system (DR) is the van fleet operated by social service agencies. Since these agencies primary goal is social service provision in general, rather than operating a transportation system, many of the existing operations have room for improvement.

2.2.1.2 Activities based descriptions

Skelton (1978) argues that the activity patterns of individuals are the underlying motive for trip making. Activities are undertaken in response to various basic demands and needs, such as those to sustain physical and mental well-being, to make money, to fulfil social life or social obligations and sometimes just to fill time. A single activity can contribute toward the satisfaction of number of basic needs: for example, a single shopping trip may allow the acquisition of food, an excuse to get out of the house, the chance to meet people and participate in the life of the community and a way of simply spending time.

The choice of particular activities depends not just on the opportunities available, but on the individual's perception of them and on his or her inherent desire to undertake them. This desire will be modified by the ability and pre-

paredness to forego time and money, devote the necessary physical effort, etc., together with the ability and willingness to meet the generalised cost of travel (Skelton 1978, Mitchell 1988, Davis et al 1976, and Start 1982).

Hopkin et al (1978), Oxley and Benwell (1985), Knapp and Lago (1983), and Skelton (1978) did studies in different areas, in all the studies they found that the activity was affected by mobility. For example, in Skelton's study the respondents said they would have liked to do one-third of all their activities more often when they did. Of these, they saw a quarter as being constrained by travel, but said they would do a third of them more often in the absence of such constraints. Mitchell (1988) and Hopkin et al (1978) reported that as long as the mobility of elderly people remained approximately constant, they showed a strong tendency toward accepting their situation. However, Skelton (1978) reported that reductions in their mobility did cause some discontent. The study showed a strong relationship between wishing to go out more often than they did and feeling that they went out less than they used to. This relationship was much stronger than those between wishing to go out more often and feeling that they go out less often than other people of their age. These people were more concerned about changes in their own mobility, rather than their mobility compared with that of other people.

Mitchell (1985) reported that mobility for many elderly has been increased by concessionary fares. This will not result in radical change in their lifestyles, but they will realise more opportunities. Skelton (1978) reported that mobility affects people's lives on two levels. On one level, the accessibility of opportunities affects their perception of their existence and desire, and choosing particular activities can be affected by their mobility. On the other level, the effects of mobility are relative to that changes in an individuals mobility.

2.2.2 Transport needs of the elderly

The second approach identifies the existence needs for transport. In the early 1970s, when attention was first drawn to the transport problems of elderly people, work focused on their use of buses. Their problems were generally identified as high fares, inconvenient services, long waiting time and difficulty with access to the vehicle, particularly due to high steps (Oxley and Benwell 1985, Brook et al 1985, Heraty 1984, Mitchell and Stokes 1982, and Leyland Vehicles and MIRA 1980). In rural areas there was the additional problem of increasing isolation, caused by the loss of local village services combined with the withdrawal of uneconomic bus and rail services (Garden 1978). Because of this the authors in general find it difficult to identify the needs and demands for the elderly people.

While analysts can usually identify and provide broad estimates of target population in 'need' of transportation service, a problem arises in the attempts to specify how much transportation service should be provided to the target group in need. While specification of the number of persons in need poses no major problem, the specification of frequency of supply and attributes of the service which should be provided are more difficult (Lago and Burkhardt 1978).

Some four million people in Britain had great difficulty in using, or were unable to use the typical public transport. 9% of the elderly people over 65 years old were unable to use buses solely, because of physical difficulties, and a further 16% did so only with great difficulty. Oxley and Benwell (1985) reported that the Leyland Vehicle study had shown that lower entrance steps and better handrails would make buses for elderly and disabled people easy to use. South Yorkshire Passenger Transport Executive introduced into regular service double deck buses with a split front entry step, the rearward half of which was lower than normal entry steps, and single deck buses that could

'Kneel' to reduce the height to the first step of the entrance from the ground. Oxley and Benwell (1983) found that the lower part of the entrance step of the double deck buses was preferentially used by elderly and disabled people, and that the introduction of the split step did not lead to any change in overall boarding times. The study also found that people who had physical difficulties using buses considered the split step buses easier to enter.

It was not possible in the Sheffield study to estimate the size of any increase in bus ridership that would follow the general introduction of low step buses, nor to assess the effects of such modifications on people with different degree of physical impairment. Other design issues such as the location and dimensions of handrails obviously have a bearing on the use of buses by people with physical problems, those two were outside the scope of the Sheffield study.

Mitchell (1988) reported that in Britain about 20% of all bus passengers are above retirement age. More than 40% of people in this age range have physical problems that make walking, climbing and balancing difficult. Hopkin et al (1978) reported that these difficulties can cause elderly people to use buses less often than they wish to, or to stop using buses. Elderly passengers are also more likely to suffer accidents due to falling inside buses during normal journeys, and during boarding and alighting.

2.2.2.1 Demands, wants and social needs

Traditionally when we talk about travel, we are measuring it in terms of trips undertaken. An individual's demand for travel is the amount of travel he/she will undertake at various levels of prices and user costs; this is determined by his/her ability and willingness to pay. Thus, a starting point for assessing how much travel is needed, is the amount people are prepared to pay. However, this relies on a number of important assumptions.

Firstly, if the opportunity to travel is always available. The actual demands

expressed by the individual are of course limited to the choice of services with which he/she is presented. He/she may have a demand for a particular service, but be unable to express this demand because that particular type of service is not currently supplied. In this case the individual has a 'latent demand' represented by the difference between his/her desired demand (i.e. the amount of travel he/she would be prepared to undertake at given prices and costs), and his/her actual demand (i.e. the amount he/she is able to undertake at the same prices and user costs, in present supply conditions), (see for example Bailey and Layzell 1981, and Bochner and Stuart 1979). Latent demand is thus an important concept in assessing the likely demand for new types of services.

Secondly, the usefulness of the 'willingness to pay' principle depends on the existence of a market mechanism, or at least a system of user charges. Many special transport services are provided free so that demand is determined entirely by the non-price costs to users (e.g. effort and inconvenience of travel), whereas supply depends heavily on the operating costs of the services. In this case the supplier usually attempts to assess (in some way) whether the services he/she is providing are worth the costs of providing them. It is this wider concept of worth or 'social value' which is paramount in the social need concept.

At this stage it is also important to note that acceptance of the willingness to pay principle also implies acceptance of the existing distribution of income. But it is clearly possible to envisage situations where it may be desirable to give greater weight in the provision of services to those who are less willing (or more importantly, less able) to pay than others (see Bailey and Layzell 1981). In summary the concepts of demand and latent demand which describe an individual's consumption, or potential consumption of transport services provided.

There are however reasons for questioning their usefulness as the sole criterion for deciding the level of services that are needed. The concept of 'social needs' provides a somewhat wider perspective than that implied by demand alone. In general terms it can be defined as a set of value judgements concerned with the well being of individuals and the ways in which this can be improved. Bailey and Layzell (1981) reported that the choice depends of course on the value judgements of the individual(s) making the assessment. Individuals making such value judgements about themselves are simply expressing their 'want'. These again form a sub-set of the value judgements subsumed under the social need concept.

It is important to be clear on the distinction between the concepts of social needs, demands, latent demands and wants. This section illustrate how these concepts have been used in the literature.

2.2.2.2 The concept of social need in the travel and social services

A number of complications immediately arise in the application of the social need concept to a specific area such as transport. Firstly, since resources are limited, social needs in the abstract are not very useful; it is essential to have some measure of the relative priority between competing needs. Secondly, a given need can be met in a number of different ways. The aim therefore should be to choose the most efficient (i.e. least costly) means of meeting the needs. Thirdly, social needs can often (mistakenly) be formulated in terms of means rather than ends. Public transport needs are a good example of this (Bailey and Layzell 1981).

A number of these points have been taken up in the literature. Bradshaw (1972) was one of the few authors to address the concept in theoretical terms. He attempted a taxonomy as follows:

- (i) **Normative Need:** “is what the expert, professional administrator or social scientist defines as need in any given situation. A ‘desirable’ standard is laid down and is compared with the situation that actually exists”.
- (ii) **Felt Need:** “Here need is equated with want”.
- (iii) **Expressed Need or demand:** is felt need turned into action.
- (iv) **Comparative Need:** “by this definition a measure of need is found by studying the characteristics of those in receipt of a service”. If people with similar characteristics are not in receipt of a service then they are in need.

Bradshaw suggests that the policymaker be presented with estimates of each of these types of need, on the basis of which he is then able to decide on the priorities. Bradshaw’s individual concepts are important but they cannot all be described as ‘need’. He describes felt need as ‘want’ and ‘expressed need’ as ‘demand’. Bailey and Layzell (1981) asked why confuse need with these concepts? Normative need alone (comparative need in effect being a special case of normative need) comes anywhere near the general concept of need.

The important question of normative need versus demand was taken up in a book by Culyer (1976). He argues strongly, in the context of health care, that the role of a third party (in addition to the person(s) in need and the person(s) who might provide a means of meeting his need) is paramount. Patients are not necessarily the best judges of their own well being and doctors may not be in a good position to judge relative priorities. Whilst it is probably less tenable to argue, in the transport context, that individuals are not necessarily the best judges of whether they want to travel, the argument that individual suppliers are unlikely to take a sufficiently wide view of priorities does warrant closer attention. Most important, if one assumes that the individual is the

best judge of his/her own social needs and well being, it is crucial to ensure that he/she has sufficient information on which to make this judgement. This issue, however, has not been given the attention it deserves (see for example Bailey and Layzell 1981).

The confusion between means and ends is illustrated in a paper on needs in the social services by Thayer (1973). Because needs tend to be assessed by practitioners and suppliers it is not surprising that technology has been over-emphasized. Thayer (1973) has formalised the use of need in this way as 'prescriptive need'. He distinguishes this from 'need' as 'ends' by referring to the latter as 'diagnostic needs'. He recognises that "in attempting to meet diagnostic needs some forms of help will be more appropriate than others". However, he offers no means by which the policymaker is to decide between the alternatives, and says rather naively, that "need can only be said to have been met when the help or service provided has brought about an intended change in the circumstances of the recipient". Whether the need has been met in the most efficient way appears to have been ignored.

The welfare implication of the human activities approach to travel have been discussed by a number of authors. For example Benwell (1978) states that "transport fulfils social needs only to the extent that current arrangement fulfil the activity needs of users and would-be users". However for Benwell, social needs effectively measured as 'wants' i.e. policies are to be evaluated according to the degree to which they provide "access to desired activity opportunities". Bailey and Layzell (1981) reported that this proposed 'welfare perspective on travel' leaves many of the important welfare questions unanswered.

Hagerstrand (1974) has argued a similar point of view to that of Benwell, but for him the crux of the problem lies, not in the difficulty of evaluating costs and policies, but in the measurement of wants. Because of this difficulty he argues that evaluation should concentrate on what people are able to do (i.e.

opportunities) not what they 'want' or 'demand'. Bailey and Layzell (1981) argue that although not explicitly recognizing social needs, the assumption that adding to an individual's activity opportunities increases welfare, is a particular value judgement. In effect a judgement that potential activities are of equal value and that policies can be discriminated by the additional activity opportunities they provide. The nature of the activity therefore has no significance.

2.2.2.3 Measuring social needs in the transport sector

Many significant developments in the measurement of accessibility and social needs occurred in the late 1970s. For example, Moseley et al (1977) built on the ideas put forward by Hagerstrand (1974). In a survey of rural Norfolk the sample was segregated into five social groups: economically active males, economically active females (full or part time), housewife (under retirement age) and retired people. Car availability was also taken into account for each group. Twenty five separate activities were considered across the whole range of work, shopping and leisure.

This study team defined standards for: journey frequency with which people needed to reach activities, journey duration, walking distance, acceptable time at destination, start/finish time. Accessibility by each social groups (within small zones) to each of the activities, given the standards as constraints, was then measured as either yes or no. Aggregation was possible across social groups, activities and/or spatially, so that priorities could be established. They considered a number of alternative policy options on the basis of the extent to which accessibility opportunities were improved.

Cooper et al (1979) carried out similar work in the rural areas of West Yorkshire, but this study included work on urban accessibility. Standards were defined in this case as numbers of trips per month 'needed' by each of the

social groups to each of the facilities considered. The generalised cost (time plus money cost) was then calculated for car and public transport modes. The product of needs and costs therefore represented measured accessibility cost. Across the social groups and activities considered, this could be aggregated or disaggregated to facilitate policy decisions.

Although leaving many of the important value judgements still to be made, such studies represent a significant advance in assessing needs based on accessibility. The value judgements that have been made are explicit and it is quite clear what is left to the policymaker. Bailey and Layzell (1981) reported that three fundamental sets of value judgements were made in both studies:

- (i) the social groups (and relevant characteristics) to be included.
- (ii) the activities (and relevant characteristics) to be included.
- (iii) the characteristics of the transport system to be included.

In the Moseley study another set of value judgements defined 'need' in the sense of minimum values for all (or most) of these characteristics. If the standards were met then access was possible and need did not exist. A decision on whether or not there is still scope for improvement was left to the policymaker. If the standards were not met then need clearly did exist.

The Cooper et al study went slightly beyond this in the use of generalised cost. Access was possible in almost all cases in the urban area by car and/or bus, but the accessibility cost calculated across different social groups and activities also possible in case were implicit in the parameters of generalised cost (e.g. work time may have attracted a higher value than leisure time). From the view point of needs of the elderly and handicapped, such large studies have serious disadvantages. For example, use of a social grouping based on people aged 65 or more ignores the differences of this group. Further still neither of

the studies appears to have even recognised the importance of personal disability in restricting access. The handicapped appear to have been completely disregarded. The underlying assumption that the existence of a bus service allows access ignores the fact that 10% of the Hunt (1978) sample of elderly and 30% of the Gazeley and Morris (1977) sample of the handicapped were not able to use the buses at all. In addition, a number of the bus users included in these two groups experienced great difficulty.

Social needs are likely to differ amongst the different lifestyle groups: household structure, car availability and pre-retirement socio-economic group being of particularly importance. The failure to take account of domiciliary services and the degree of access to shopping and personal business afforded by other household member, friends and neighbours, has probably been the most significant drawback. The argument that shopping, for example, provides an important means of 'getting out' and engaging in social contact, is really a separate issue, and should be recognised as such. In this case the shopping trip is meeting more than one need.

Koutsopoulos (1980) began his argument on the basis of a very general consideration of activity 'needs', associated personal and environmental constraints and the means by which a person can adjust to these constraints (e.g. in time and space as well as by changing mode or linking trips). However his resulting 'index of needs' is based on a selection of these characteristics, i.e. 'need can (and should) be determined by considering the inverse of someone's ability to adjust, for a given trip related activity, aspects of their travel space in response to mobility constraints'. Two indices are then produced: (i) 'a travel index' i.e. the proportion of those able to adjust, who have a viable public transport alternative; (ii) 'a mobility index' i.e. the proportion of those unable to adjust who have a viable alternative. Needs are then measured as the inverse of these indices. Koutsopoulos has in fact applied his method to the specific case of

elderly and disabled people, but it has important practical problems e. g. the value judgements are un-clear and it takes no account of demand or wants.

2.2.3 Required characteristics of transport modes for the elderly

Another way of examining the transport needs of the elderly is to define the characteristics which they require from a transport system: physical service characteristics, access, time, and money cost.

2.2.3.1 Physical service characteristics of the system

The physical disabilities to which the elderly are subject means that they also need transport systems which meet certain physical characteristics. These can be summarised under two headings: ease of access to the transport system, and ease of use of the vehicle itself.

It is not easy to identify the characteristics of the service which the elderly wish to use. All the current studies focus on the problems facing the elderly in using the public transport. For example, Hopkin et al (1978), Hopkin and Town (1978), Hopkin (1981), Mitchell (1985), Mitchell (1988), Oxley and Benwell (1983), Oxley and Benwell (1985), and Leyland Vehicle Ltd (1980) and many other studies identify the problems and some of them suggested possible solution.

In general the main problem found in the design of the vehicle is the entrance and the high steps. Some studies mention the operator of the vehicle caused some problem to the elderly to get in, specially when the driver stopped far from the kerb and some found problems in moving within the vehicle while it was in motion. Mitchell (1988) reported that there is another kind of problems for the elderly; this is walking distance from homes to get to the bus stops and waiting at bus stops.

No study however identified exactly what kind of service characteristics the elderly wish to use, many studies have tried to find solutions to their difficulties and problems in using public transport. The studies suggested how public transport could be improved to meet the elderly's needs and demands as a special group, and also for all the disadvantaged groups, as well as the whole population.

A large number of studies on the physical characteristics of public transport (especially buses) have drawn attention to the problems faced by the elderly in using transport systems: boarding and alighting can be a critical requirement for the elderly (particularly for those who suffer some sort of disability). For example in public transport there is a need for a low step onto the bus or other vehicle, and this has often made minibus operation less suitable for the elderly (Turner and White 1987, Glaister 1986, Fowkes and Watkins 1986 and Guiver and Turner 1987). A second example relates to taxis and hire cars which, when using ordinary saloon cars, can be inconvenient for the elderly or disabled (Guiver and Turner 1987, and Hawkins 1986).

Another important physical characteristics for the elderly (because of physical infirmity) is the access to seating. This has implications both for the design of vehicle and for the effects of overcrowding. Some vehicle design (e.g. tram systems) provide seating for only a small proportion of the passengers and are thus ill suited for carrying the elderly. But even when more seating is provided the presence of overcrowding leads to no seats being available. El-Telbani (1991) recorded instances of elderly people who waited longer in order to avoid a crowded vehicle for this reason. It can also be noted that where vehicle are crowded the movement of physically less able people will be made more difficult.

2.2.3.2 Access to the transport system

As elderly people frequently have limited physical strength to walk to the transport system, ideally they need a system which provides a door to door service. When such a service is not possible they need as dense a network as can be provided to minimise access effort and time.

It can be noted that some authors have thought the increased use of minibuses will help to provide the lesser access time and distance required by the elderly. For example, it has been claimed that the replacement of large buses by small-ares may be associated with a finer network of services or 'demand responsive' services, rather than higher frequencies (Buchanan et al 1980, Oldfield and Bly 1988), and so may reduce access times by penetrating residential areas better (Bly and Oldfield 1986, Gomez-Ibranez and Meyer 1987).

It is of course possible for minibuses to be seen as complementary to large buses by acting as feeder services (Le Fevre 1981, and Walters 1982), rather than competing with them. In practice, many new routes served by minibuses have been introduced in recent years: many of these are a result of deregulation (Hall 1988, Turner and White 1987, Headicar and et al 1987, and Gwilliam et al 1988, Turner and White 1987). Where it occurs the elderly will benefit from reduced access distance.

2.2.3.3 Time characteristics

It is often argued that the time characteristics of a transport system are important for the users, and attention is drawn to the aspects of waiting time, delays, travel time, etc. In the case of the elderly these issues are less important for two reasons. First, the elderly do not have a high opportunity cost of time; they are therefore less concerned about the time spent waiting or in vehicle. Secondly, the elderly do not have strict schedules (e.g. working hours) and are therefore less affected by having to adjust their trip making to trans-

port availability. In these two senses the elderly are not highly demanding of transport system. However, due to physical disabilities they do need to avoid long delays (for example waiting at terminals) due to irregular running. This is the main time characteristics which the old require for transport systems (Gonda 1982).

It has been argued that taxi and minibuses will provide a higher service frequency (Glaister 1985, Oldfield and Bly 1988, Walters 1982, and Webster and Oldfield 1972). In practice minibuses do seem to be operated at a higher frequency, typically three times the frequency, but sometimes as high as six times the frequency of the large buses being replaced (Balcombe et al 1987, and Balcombe et al 1988). For example, in Exeter (five to six times the frequency), and Worcester (three to four times frequency) (Turner and White 1987), and Norwich (two buses replaced by six minibuses, with greater penetration into residential estates) (Turner and White 1987). Plymouth has had increased frequencies where new smaller (25 seat) vehicles are run at substantially higher frequencies (Hawthorne and Walmsley 1987, and Green and Pope 1987).

A higher frequency service will operate at a lower mean headway, and so offer a shorter average passenger waiting time at bus stops (El-Telbani 1991, and Oldfield and Bly 1988). This assumes that the passenger arrival time at the bus stop is independent of the arrival time of the bus, since if the passenger knows accurately the actual arrival time of the bus, he or she can reduce the waiting time to zero irrespective of the size of the bus. However, the waiting time for elderly people is less important than the cost or the easy use of the vehicle.

A very important point for the elderly is to find a seat on the bus, because of this they usually travel in the middle of the day (El-Telbani 1991). Hauer (1971) goes on to suggest that a change in the composition of the bus fleet produces a reduced mean waiting time. It could be the case that a potential

passenger perceives the quality of the service in terms of the number of full buses that reach the stop. If this is so, a service of minibuses or small buses operating at capacity may be perceived a poorer service than the equivalent large bus service.

There seems to be little or no empirical evidence on changes in passenger waiting times as a result of the introduction of minibuses or small buses. Just as it can be argued that excessive waiting times are a manifestation of a mismatch of demand and supply, it can also be argued that another such manifestation is overcrowding, which will cause some people to be left at bus stops. Thus causing passenger waiting time to increase. There are a number of examples of increased overcrowding. Green and Pope (1987) reported an example in Plymouth of minibuses being full and refusing to pick up passengers, and Hall (1988) reports overcrowding on minibus service to the Pennywell estate in Sunderland.

2.2.3.4 Money cost to user characteristics

The elderly as has been argued often, have lower disposable incomes. In as much as this is generally true, they require transport modes where the cost to user is low (this may be the result of economical operation or of subsidy). Clearly there are some modes for which unit costs and therefore cost to user tend to be high (private car, taxi etc).

Public transport service are claimed to enable the provision of transport to the relatively immobile, or those who suffer some transport disadvantage. Transport disadvantaged groups are never precisely defined but, in the literature, can include the elderly, the young, the handicapped, the poor, women, and those who do not drive or do not have access to a vehicle (Starrs and Perrins 1989). Trip rate per capital and modal shares are generally used to examine relative mobility levels of transport disadvantaged groups, but lower than av-

erage trips per capital does not necessarily imply mobility deprivation. People may live in areas which require fewer trips to be made, may not be able to travel, or may have a lifestyle that requires less travelling (Altshuler and et al 1979).

Starrs and Perrins (1989), Webster and Bly (1981), and Gaudry (1975) reported that in discussing mobility deprivation of specific groups, in the context of public transport subsidies, it is useful to distinguish between targeted and general subsidies. Targeted subsidies are generally in the form of low or no fare ridership for specific groups, e.g. elderly or handicapped, while general subsidies apply to all users, whether disadvantaged or not. Presumably targeted subsidies, as their name implies, are directed specifically at those who are assessed as having mobility problems or suffering some form of transport disadvantage. But it is more debatable whether general subsidies achieve the objective of meeting the mobility needs of disadvantaged groups.

Ideally the question of whether public transport subsidies assist the transport disadvantaged would be measured between two points in time, i.e. before the subsidy and after the subsidy. Most of the literature does not do so because of the lack of such situations, and simply reports usage by transport disadvantaged groups at a particular point in time.

The full sized bus, minibus and taxi require the same number of staff to operate. So the operating cost of a fleet of small buses is likely to be higher than a fleet of large buses offering the same number of passenger seats. Thus, fares would have to be higher to offset the higher labour and capital costs (Farrington 1986, Walters 1982, and White and Turner 1987). Glaister (1985) argues that minibuses fares could be four times as high as conventional buses and still capture some of the market.

In the short term it seem that fares are set at the same level as for large buses. Gwilliam et al (1988) reported that in Preston there has been active competi-

tion between two minibuses operators offering matching fares. In the long run they may have the confidence to charge fares that more accurately reflected the operating costs and quality of service offered relative to conventional buses.

2.2.3.5 Summary

From the arguments and evidence outlined above it is clear that the elderly ideally require:

- Physical service characteristics of the vehicle.
- Access to the transport system.
- Time characteristics.
- Money cost to user characteristics.

It will be evident that rarely are all these requirements met by a single transport mode. For example, those which offer best access and least delay time (of which taxis and minibus are two) are not always the easiest to board and are not always low cost. Those which are easiest to board and have low unit costs (e.g. trains and buses) often suffer from overcrowding, long waiting time, journey running etc. These points will be examined in a reviews of the individual modes in the next section.

2.3 Transport supply for the elderly

The concept of transport disadvantage or deprivation implies that some demands or needs are not being met (wholly or in part) by the transport systems available. In this section each of the main modes are identified and the characteristics which particularly affect the elderly (favourably or unfavourably) are noted.

The difference in mode use between the elderly and the population as a whole means that distances travelled and duration of journeys also differ (Hopkin and Town 1978). Heraty (1984) reported that elderly women formed over 84% of elderly passengers and 70% of passengers were over 60 years old. This indicates that women travelled on public transport more frequently than men, and the under 60s more frequently than the over 60s. Heraty (1984), and Bowlby et al (1984) reported that about a quarter of the passengers were being accompanied by an escort, but by the spring of 1983 this proportion had dropped slightly to about a fifth. Some users also made a limited number of journeys by conventional public transport, but this was less frequently used than other special transport and lifts in cars; the bus was the most common means of travel.

In Ireland the National Council For The Aged (1986) reported that the use of public transport was highest in Galway MB reflecting the better level of service. In the rural areas distances to bus stops were greater and this was important for elderly persons who frequently experienced difficulties in walking even a short distance.

2.3.1 Conventional bus

The use of buses as one of the main choices for elderly people on their travel has been studied by many authors. Ashford (1981), and Hopkin et al (1978) reported that the British National Travel Survey indicated that 16% of all journeys made by the elderly are made by bus. This compares with a 10% national average figure. In the U.S.A. the elderly were three times as likely to use bus transit as adults in the 35 to 44 age group (Ashford and Holloway 1971).

Mitchell (1985) reported that almost half of all elderly people have physical problems that make getting about on foot difficult and that people with such

problems make less than average use of buses. Brooks et al (1980) reported that about 8% of elderly people never use buses, though they travel by other means of transport, and a further 12% use buses less than once a week. However, Bailey and Layzell (1981) found that 32% of the elderly made their trips mainly by bus.

Oxley and Benwell (1985) reported that to allow elderly and disabled people to be seated before the bus moves off, and to stay in their seats until the bus has stopped, would add only about 40 seconds in the hour of running time (1%) in the worst circumstances of no other passengers boarding or alighting at the same time. In practice other people will be boarding or alighting at the same time which makes this percentage even less than 1%. Leyland Vehicles (1980) estimates an increase in bus ridership that might result from having all buses as easy to use as the best in service at the time.

Mitchell (1985) reported that, in general, the policy of bus operators in Britain has been: i) to use vehicles that are designed to be as accessible as possible to elderly and ambulatory disabled people; ii) to make low cost modifications to the vehicles as necessary; iii) not to attempt to routinely carry wheelchair bound people on general bus services, (because wheelchair passengers can be carried by local authority social services vehicles, voluntary organisations and by the many dial-a-ride services that have started since 1980).

Oxley and Benwell (1985), Hensher (1987), Donald and Pickup (1991), and Anderson (1983) reported that as bus usage has declined, the proportion of elderly passengers has increased. This is partly due to their lower car ownership and lower incomes. Hopkin et al (1978) reported that income has an effect on the frequency of bus travel by elderly people. When elderly people who had less need of the bus were excluded, those who had additional incomes used the bus more frequently. In the first half of the 1970s, the elderly made most of their trips by bus, and most of the elderly did not use the car or taxi frequently.

because of limited income (Gaudry 1975).

Hopkin et al (1978) reported that the main reasons given for not taking up fare concessions were that it was possible to use a car or walk instead of travelling by bus. The National Council For The Aged (1986) stated that the use of the free bus travel pass amongst the elderly in Ireland was lowest in the rural areas where almost 70% never used their pass. This contrasted with Galway MB where 50% used their pass on one or more occasions per week. This raises questions as to the suitability of this scheme for the rural elderly.

Studies since the mid-1970s have identified many of the problems experienced by bus passengers with mobility handicaps and passengers who are elderly (Mitchell 1988, Mitchell 1985, Leyland Vehicles Ltd 1980, Feeney et al 1979, Oxley and Benwell 1983, Hopkin et al 1978, GLAD 1986, and Brooks et al 1974, Blundred 1991, Anderson 1983, Pucher et al 1983, Bly and Oldfield 1985, Pickrell 1985, Wachs 1989, and Blundred 1991). These can be broadly classified as getting to the bus stop, waiting at the bus stop, boarding the vehicle, moving within the vehicle, sitting in the vehicle and leaving the vehicle. It is clear that, of the aspects of using buses that are affected by vehicle design, getting on and off presents difficulties to the highest percentage of elderly and disabled people. These difficulties increase substantially as the age of a person and degree of disability increases. Mitchell (1985), Peal (1991), Blundred (1991), Markstedt and Hirschman (1983), and Cervero (1984) reported that operational as well as vehicle design orientated factors cause difficulties particularly in the use of bus services, (e.g. buses moving off before passengers were seated or stopping too far from the kerb). Mitchell (1988) Harrington and Parolin (1991), and Simpson (1988) reported that there is extensive information available on ways in which buses of the type commonly used local services can be designed to be as easy as possible to use by elderly and ambulant disabled people. This report reviews the information that is available.

In particular it covers the design of entrances and exits, of gangways and stanchions of seats and other aspects of internal arrangements. It has been estimated that the consistent use of buses built to the best current practice would increase patronage in urban areas by 2%.

Bus operations also have a significant effect on the ease with which elderly and ambulant disabled people can use a bus services. It is shown in the report that elderly and disabled people are not sufficiently strong to prevent themselves falling inside the bus, if they are required to stand while the bus is in motion. The running time penalties of allowing elderly and disabled passengers time to be seated before the bus starts, and to remain seated until after it has stopped, are about 1 minute per hour. It has been estimated that allowing this extra time for elderly and disabled people would increase patronage by about 2%. Oxley and Benwell (1983), Peal (1991), Blundred (1991), Hensher (1987), Donald and Pickup (1991), and Cervero (1984) reported that the main problems in using buses were: steps (whether for boarding or alighting) and moving within the vehicle. They suggest that if the elderly and disabled find it easy to get on and off the bus, then the number of elderly using the buses will increase and the total travel time will be reduced. Oxley and Benwell (1985) estimated that consistent use of buses designed to the best current practice would increase patronage on urban routes by at least 2%.

2.3.2 Minibuses as a transport mode for the elderly

A major change brought about by the deregulation of buses in the United Kingdom has been the increase in the number of minibuses. By definition minibuses are small vehicles, which means that they are more manoeuvrable than large buses. They accelerate well and decelerate faster, but can carry fewer passengers, and so have a lower passenger capacity to staff ratio for a given system of operation. The lower capacity means that, on average, fewer

passengers will be carried, so that total boarding and alighting times at each stop will be lower. Hence end-to-end journey times will be lower than for large buses (Banister and Mackett 1990), reducing generalized cost for passengers. So if all other factors are equal, minibuses should attract more passenger. This is not true however for the elderly passenger, they are looking for easy to use vehicle rather than reduced travel or waiting time (El-Telbani 1991).

Minibuses may be perceived differently by passengers, so that the level of patronage is influenced by factors other than those in the conventional generalized cost. For example, patronage may be higher because minibuses are perceived to be a higher quality product more akin to taxis, or patronage may be lower, because certain market segments, such as the elderly, find minibuses more difficult to use (Banister and Mackett 1990).

Minibuses do have some characteristics favourable to the elderly. Firstly, there is route coverage; minibuses are more suited for serving lower density areas, and can offer greater route coverage as more are used to carry a given load (Glaister 1985, Webster and Oldfield 1972). Secondly, the minibus provides a higher service frequency (Glaister 1985, Oldfield and Bly 1988, Walters 1982, and Webster and Oldfield 1972). Thirdly, the quality of service offered by minibuses reinforces the perceptions of convenience. Passengers also tend to feel more secure in a smaller vehicle where everyone is close to the driver (Gomez-Ibanez and Meyer 1987), and several researchers have commented on the friendliness of minibus services; for example, Hall and Robson (1988) in Sunderland, Turner and White (1987) in Exeter, and Stafford and Prentice (1987) in Swansea.

On the other hand there are unfavourable characteristics for the elderly in terms of using the minibuses. For example, accessibility to minibuses does cause difficulties for elderly due to the high step, and to the elderly person with shopping or luggage because of the restricted entrance widths (Hall and

Robson 1988).

Most researchers have assumed that demand is fixed, with minibuses competing against large buses for part of that demand (Glaister 1985, Oldfield and Bly 1988). Based on notions of the elderly's choice, the individual trades of with a higher price for a smaller faster mode against the lower price of the larger slower mode. However, it would not seem unreasonable to argue that minibuses would also attract elderly passenger from the car, taxis, rail and perhaps other modes as well (e.g. cycle and walk). It is not merely a question of competition for the elderly within one mode (the bus), but between modes. Only limited research has identified elderly passengers switching to the minibus from non-bus modes (e.g. Oldfield and Bly 1988, and Glaister 1985).

With improvement in the quality of service, greater accessibility through deeper service penetrations into housing estates and greater flexibility in operation (e.g. hail and ride); it could be argued that demand should increase, as a result of an increase in the number of elderly which will use the service. Some researchers (Glaister 1985, Balcombe et al 1987) acknowledge that service improvement should generate new demand which in turn generates extra revenue for the bus industry, in particular for the minibus.

2.3.3 Taxi

The 1985 Transport Act required all district Councils in England and Wales, except London, to licence taxis and to be satisfied that there was no significant unmet demand for taxis, before refusing applications for further licence (Fairhead, 1990). In 1989 all except one of the 364 districts licensed taxis; 323 of them chose also to licence private hire vehicles, with more councils intending to do so during 1989. There were 27,777 licensed taxis in 1989. The increase from 1985 to 1989 in districts which licensed throughout was 37%.



Hopkin et al (1978) reported that although taxis are more convenient for the elderly than buses, they are used very infrequently. In their study they found that two thirds of the elderly never used taxis, 23% used them less than once a month, and only 4% used them once a week or more often. Wolfe and Miller (1983), and Kendall (1980) found that taxi use is limited because of cost, with only 2.5% to 1.2% of all trips made by elderly people. In another study by Bailey and Layzell (1981) only 3% of the elderly people made their trips by taxi.

The most common journey purpose for which taxis were used was going to the railway station with heavy luggage. Allred and Saltzman (1978) found that increasing the availability and lowering the cost of taxi service will increase the mobility of the elderly. It should also be noted that taxi-cabs offer improved mobility to other transportation disadvantaged groups, such as poor and handicapped persons. All of the suggestions that would increase the supply of taxi-cabs or reduce their costs to the elderly would have corresponding positive impact on these other groups.

2.3.4 Demand responsive and community services

In addition to the conventional of bus, minibus and taxi services there is increasing use of two other modes of supply: demand responsive and community services.

Demand responsive service is ridership service that traditionally has been provided by private taxi-cab services (Davis et al. 1976, Harrington and Parolin 1991, and Simpson 1988). This much higher level of personalized service to the user, however, is typically offset by the higher fare structure (Davis et al 1978, Starks 1982, Peal 1991, and Blundred 1991). In the 1980s attention has been turned to the implementation of demand responsive services that could attract riders for whom traditional transit service levels were not acceptable,

and decrease the cost of traditional taxi-cab service levels through the use of ride sharing. A shared ride demand responsive system has been viewed as a more economical means of providing a service to captive riders residing in low density areas, where traditional transit vehicles are too expensive, and fuel intensive, and private taxi fares are prohibitive (Eisenberg and Baker 1980, Knapp and Lago 1983, Markstedt and Hirschman 1983, Anderson 1983, and Cervero 1984).

Community services are those provided by local government or voluntary organisations (or some combination of both) to meet specific transport needs (e.g. rural dwellers, the disabled, the elderly). Such services are seldom profitable and therefore depend on grants, subsidies, and voluntary fund raising as well as any fares charged to users. Community services may be of a fixed schedule type, related to particular activities (e.g. lunch club, for the elderly), or demand responsive. In this study no attempt was made to distinguish these types as it was felt that respondents would not be able themselves to identify the exact form of provision (for example seeing a community transport minibus as simply a minibus) (Meadows 1993, and Cassidy 1992).

In the Sheffield case a variety of community transport schemes exist but most of these are relatively recent and relatively small scale. The reason for this is that existing public transport systems are still relatively good and the local authority relied on that system combined with tendered services (since 1986) and concessionary fares to meet most needs of the elderly. Increasingly however the welfare and community organisations have recognised the need for specialised community transport to assist those with acute mobility problems to attend clinics, day centres and social events.

2.3.5 Car

The private car has many characteristics which make it appropriate for the elderly, but it may be used in two forms: as driver (and usually therefore as owner) or as passenger.

2.3.5.1 Car use by elderly as drivers

After people reach age 65, it is quite common for the car to be given up; income is a contributory factor in this. It is probable that the Retirement Pension is not adequate to pay for running car.

The Institute of Consumer Ergonomics (1985) reported that of the 42 million in the U.K. old enough to drive cars, nearly 18 million (43%) were age 50 or more and 12 million (29%) were over 60 year old. The number of those who are car buyers is unknown but the proportion may be expected to rise steadily because today's elderly people are more conditioned to the use of public transport during their working lives than the rising generation who take car ownership as the norm.

Bly and Oldfield (1978) reported that the National Travel Survey 1964, 1965, 1972-73 and 1975-76 shows that a household who owned a car and have driving licence, used the car for most of their journeys, however, the use of car by disadvantaged groups still decline up to 1977. Haslegrave (1986) reported that Britain had the highest percentage of elderly and disabled drivers in Europe about 0.68 in Britain, France 0.02, Belgium 0.4, Holland 0.02, Sweden 0.12, and Norway 0.06.

Gonda (1982) reported that many elderly, regardless of income level, could be and are competent enough to meet the demand of driving. However, the fact that older drivers do have a lower average of miles driven annually might suggest that some older driver self-select themselves out of certain driving situations, such as night driving, due to age-related visual and/or reaction

time deficits in these situations.

11% of drivers reported that they were unable to use the car as much as they wished because of the expense (Hopkin et al 1978). Bailey and Layzell (1981) reported that 27% of the elderly made their trips mainly by driving a car. Hopkin (1981) reported that level of car availability and use, varies within the elderly population and according to personal and household circumstances. National Council For The Aged (1986), Golant (1972), and Gonda (1982) also found that few elderly people had a car of their own. The vast majority had to depend on public transport and private transport provided by others. However, Hopkin et al (1978) reported that few elderly people own cars, and the majority of the journeys they make are either by public transport or on foot. Wenger (1981) reported that car ownership amongst the elderly was extremely low, and that car ownership declines with advancing age. It may also reflect historical factors certainly relevant for women, that people of earlier generation did not learn to drive.

2.3.5.2 Car use by the elderly as passengers

This mode has not been widely or deeply researched in the case of the elderly, it is nevertheless important for a number of reasons. Firstly, it can provide the elderly person with door to door transport at the times required. secondly, if the car is provided and driven by friends or relatives it will neither be affected by the elderly person income or ability to drive, because of this only 6% of the elderly made their trips as car passengers (Bailey and Layzell 1981).

On the other hand not all private cars are well adapted to the physical needs of the handicapped (wheelchair access, height of seats and doors), and there is a problem that the elderly person becomes dependent upon the friend or relative for the level of mobility achieved (Mitchell 1985, Mitchell 1988, Webster et al 1986, Gonda 1982, and Hopkin et al 1978).

2.3.6 Walking as a travel mode for the elderly

A number of studies have shown that walking is an important travel mode for the population as a whole. For example, Mitchell (1982) reported that 35% of all journeys in Britain are made wholly on foot, and many elderly and disabled people make most of their local journeys on foot (Mitchell and Frye 1985, and Hitchcock and Mitchell 1984).

There are substantial numbers of elderly people use walking as the main transport modes, about a third of all trips made by the elderly, and about a sixth of the distance travelled by the elderly is in the form of walk trips. On average people in urban areas make about 0.9 wholly walk journeys a day, and in rural areas 0.6 journeys per day.

Bailey and Layzell (1981) reported that 31% of the elderly people made their trips mainly by foot. Mitchell (1973), and Mitchell and Stokes (1982) reported that distance might be expected to have a greater effect on walking, than on travel by other modes, because of the physical effect and time involved in walking. The study shows that 45% to 75% of trips of 1 Km were made on foot, and 10% to 25% of trips of 2 Km. Mitchell (1982) reported that in 1975/76 over 70% of all walk journeys were shorter than 1.6 Km, but the type of area in which the traveller lives had a significant effect on the length of the trip by foot. He also found that when walk is the main journey mode this is related to age, sex, and socio-economic group.

Mitchell (1973), Trevellyan (1973), Daor and Goodwin (1976), and Hillman and Whalley (1979) reported that walking was a mode used for different purposes and by all people. The elderly travel on foot for particular purposes, frequently for shopping or short social trip (see e.g. Dalby 1973, Dalby 1976, Stewart 1979, Grayson 1975, Wilson and Grayson 1980, and Downing and Spendlove 1980). Mitchell (1982) reported that there is a higher proportion of journeys for some purposes than others are made on foot. He found that there

is 12% for work, 35% for shopping and personal business, and 12% social trips. However, the trip purposes most often served by walking are social trips and convenience shopping. For example, Wolfe and Miller (1983) recorded about 43.5% of the elderly's walking trips were made for social purposes, followed by shopping at 34%.

Two further key points need to be made. First, by its nature walking is most suited to short trips usually under 1 Km; so although elderly persons dependent on walking may make a good number of trips they are nevertheless restricted in the range over which they can move by this mode. Secondly, it must be remembered that for some elderly with limited physical abilities even the shortest walk will be difficult or impossible; and those people are often do not make any trips outside the home. Todd and Walker (1980) showed in a U.K. study that of the 5% who never leave the house, about half are the victims of physical disability.

2.3.7 Other modes

The last section reviewed the main modes used by the elderly. However there are modes used by the elderly, like cycling or the train but it cant be reviewed with each mode in a separate section, because these modes have not been researched in the case of the elderly.

Ashley and Banister (1989)¹, (1989)², and Williams (1990 and 1989) studied the cycling mode. They found that the main factors effecting the use of pedal-cycles are: personal characteristics like age, state of health, personal attitude to physical fitness, and 'social trends'.

There is a strong relationship between cycling and both age and health. Because most of the elderly are not in good health, they did not use the cycle as the first or second choice mode. The other factors affecting the use of cycle are social class and income. Webster et al (1986) reported that very small number

of elderly made any of their journeys by a cycle.

It should also be remember that in some cities the train (surface or underground) is at least potentially an important part of the transport system. For the elderly most such system play a limited role because they are often expensive, the access distances are often great, and the lay out of terminals and vehicles pose problems for those who are not physically able (stairs, escalators, access to the vehicle, seating etc).

2.3.8 Pattern of mode use

A number of studies have been carried out to examine the travel patterns of the elderly. In the United Kingdom they report an average of 39% fewer journeys, completing 1.55 journeys per person per day, compered with the national travel average of 2.26 journeys (Hopkin et al 1978). Webster et al (1986) reported that the average trip rate is nearly three trips per person per day for all modes. They also found that the average trip rate made by all modes in Britain is 2.69 and France 3.05 per person per day. Not only has the overall frequency of travel changed, also the relative frequency of trips for different purposes is strikingly different. Ashford (1981) reported that the frequency of non-work travel by people in households without a car. The most common case for households of the elderly in the United Kingdom.

There are, however, strong indication that where elderly people are provided with high mobility, their travel demand, while of a different character, can be at the level of that of the younger adult population (Ashford and Holloway 1971). Similarly Keefer (1962) identified that some elderly persons are highly mobile and have average trip lengths not significantly different from other adults and were more likely to use public transport.

Ashford (1981) reported that a medium sized provincial city in the U.K. showed a very similar levels of trips making by those who were mobile (when

walking and bicycle trip were included). However, when all elderly persons are considered, the inclusion of those who do not make trips makes it obvious that many elderly people have considerable difficulty in obtaining levels of mobility, comparable to that of the general population. This is borne out by the findings of a survey carried out in Belgium in 1974, which showed that of those over 65.2% were bedridden, 15% never go out and a further 15% find going out very difficult. As the age of the individual increases it is increasingly probable that he or she will not be able to go out at all (Harboot, 1978).

Webster et al (1986) reported that trip patterns vary with circumstances: Consequently, the relative importance of different modes for different purposes varies in different types of city and from country to country. Factors which affect trip patterns: include the level of affluence; the age structure, the level of quality and availability of each transport mode; and their relative suitability for journeys of different length and purposes. In Ireland the National Council For The Aged (1986) reported that the most favourable attitudes towards public transport were found among the elderly in Galway MB where the service is of a much higher level than in the rural areas.

Ashford (1981) reported that for a very large proportion of the elderly and handicapped, conventional urban public transport is the most important vehicular mode of travel. It is used extensively for journeys which are too long to walk. The bus is the most important of the public transport modes. Hopkin and Town (1978) reported that for the whole population, 44% of all journeys were made by car, while the elderly made only 28% of their journeys by this mode. While 69% of the elderly people lived in households without a car, only 37% of the whole population did so.

Hopkin and Town (1978) reported that the patterns of the elderly are different from those of the population as whole. Some of these differences are removed if the elderly are compared with other people who have a similar choice of trans-

port modes. People aged 17 to 64 without a car made an average of 1.53 non work-journeys per day, the elderly people without a car made 1.34 non-work journeys per day. In 1975 people age 65 and over made up 14% of the population. In the transport field they make fewer journeys than the population as a whole, they made 12% fewer journeys than did younger adults (Hopkin et al 1978). Ashford (1981) reported that the daily rate of trips generation by age group 65 and over in Sheffield is 2.6 per person per day for all modes and for all purposes (from Benouda, 1978).

According to Cox and Love (1991), and Hill and Talley (1991) the public transport environment in the U.S.A. differs from that of other nations. Generally, U.S. urban areas have far lower ridership per capital than in urban areas of similar size in Australia, New Zealand, Canada, and the United Kingdom.

Henderson and Whalley (1976), and Hopkin (1978) suggested that the patterns of the elderly have shown that only a small proportion of elderly people own and drive a car. In addition that for most elderly people who do not live in a household with a car, buses are the most common means of transport for journeys beyond walking distance.

Jones and Tanner (1979) reported that the rise in level of car ownership among the population as a whole has been accompanied by a steady decline in public transport provision. Since the early 1950s car ownership in Great Britain has increased five-fold while the number of bus kilometres per person per year on stage services has fallen by 35%. Hopkin (1981) reported that the provision of local services (e.g. shops) has declined over this period as facilities have become increasingly centralised. The need to use motorised transport for meeting daily requirement has therefore become greater.

The effect of these tendencies in car ownership and transport provision on the elderly need to be assessed to inform transport planning. To do this, it is important to know both the extent to which increasing levels of car ownership

will affect car availability among the elderly, and the proportion of elderly people who are likely to rely on some form of public transport in the future. Hopkin et al (1978) reported that for elderly people living in households without cars, buses were the normal method of travel to destinations beyond walking distance. Those elderly people were more likely to have low incomes. This closely reflected the availability of alternative methods of transport.

Hopkin (1981), Henderson and Whalley (1976), Hopkin (1978), Jones and (1979), Hopkin et al (1978), Tanner (1975), McFarland et al (1964), Tanner (1977), and Bates et al (1978) reported that after walking, the car is the mode of transport most frequently used by elderly, although there are large variations in car availability and use between different groups of elderly people. Bus travel is the main motorised mode for elderly people without a household car, but is not used enough by these people to compensate for the relatively small amount of car travel which they undertake. The elderly without their own car tend to travel by car primarily for particular types of journeys which are difficult to make by other modes, such as journeys for medical care.

Differences between the travel patterns of elderly people and younger adults can be attributed partly to differences in car availability, and partly to the absence of work journeys from the travel patterns of the elderly. Even with increased car ownership, travel pattern of the elderly will never be similar to those of younger adults. However other factors, particularly health and income, will continue to limit the proportion of people who can have cars during old age. Webster et al (1986) reported that even households without cars make about 10% of their journeys by car, mostly as passengers. A number of studies have noted that the French elderly make about 15% more car trips than their British counterparts. This is because of higher car ownership levels among the elderly in France (Golob and Recker 1977, Daly and Zachary 1977, Dasgupta 1983, and Joints 1983).

Chapter 3

Transport policy for the elderly

3.1 Introduction

The essential defect of transport provision for elderly people, as it now stands, is that it does not fully meet their needs for transport in that for many of the elderly, it does not provide them with the degree of personal mobility they require to be able to lead a full and independent life. Even worse, significant numbers of elderly people are left immobile and house-bound because of inadequacy in public transport provision.

This chapter reviews the forms of transport policy for elderly people (national and international). The first section identifies the policy statements in a number of national case studies. The second section covers the policy approaches, which include attempts to increase the suitability of general systems for the elderly; also, this section includes the physical standards for vehicles and operation, and the fare subsidy.

3.2 National case studies

The question of the needs and demands of the elderly have been the subject of policy statements by governments and similar agencies which have attempted to define those needs in order to define the objectives for transport policy

3.2.1 United Kingdom policy

In 1971 an attempt was made to achieve a basic transport policy for the elderly and disabled. Age Concern on Transport (1971) which identified the following points:

- 1- *Concessionary fares on buses should be made available to all state retirement pensioners at hours which meet their needs (unless or until off-peak concessions are available to all the travelling public). The cost to local authorities should be met in part by an Exchequer Grant.*
- 2- *A lower step should be added to existing buses and new one-man-operated buses should be designed with steps lower than 15 inches from the ground.*
- 3- *A safety device on electrically operated exit doors should be made compulsory on one-man-operated buses.*
- 4- *Seats must be provided near the entrance of all one-man-operated buses.*
- 5- *Some seats near the entrance on every bus must be reserved for the old and disabled.*
- 6- *A shelter, including a narrow bench, should be provided at every bus stop, and planning of new routes should take this requirement into account.*
- 7- *Local authorities should use methods of traffic planning (such as bus priority lanes) which will speed the smooth flow of buses.*

- 8- *Buses must operate on realistic timetables: in particular one-man-operated schedules must take into account the extra stopping time added.*
- 9- *Bus parking places should be lengthened to allow the entrance of the bus up to the kerb, and parking laws should be strictly enforced.*
- 10- *Bus companies should be made strictly liable for accidents inside the bus caused by the driving of the bus.*
- 11- *Where bus regulations instruct crews not to move off until passengers are safely mounted, this instruction should be defined for elderly and disabled passengers, as 'seated'.*
- 12- *Bus companies should conduct regular assessments of the quality of service provided by bus crews.*

And two points were added with respect to rural areas:

- 13- *Local authorities should ensure that commercial services can continue to meet the bulk of transport needs; to this end the regulation allowing authorities to grant-aid to rural buses should be made mandatory. Adequate alternative and lasting arrangements must be made whenever a bus service is withdrawn.*
- 14- *A transport co-ordinating officer should be appointed to every county.*

This policy statement has never been reflected as a whole in legislation. Individual aspects have however appeared in specific legislation and subsequent guidance. For example the problem of high fares and low incomes has been dealt with through what are termed "Concessionary fares". These were first introduced through the Transport Act of 1968. Under the terms of this legislation, although it has not mandatory, local authorities could make provisions for concessions i.e. reduced fares for pensioners, the blind and the disabled.

The value of the concession was at the discretion of each local authority, as a result both their value and their availability varied widely throughout the country. Concessionary fares are therefore a local political matter and have often been the subject of bitter disagreements (Garden, 1978).

Basic transport policies for elderly and disabled people also appeared as in the Chronically Sick and Disabled Persons Act 1970 (Department of the Environment HMSO, 1973), which focused attention on the needs of the disabled traveller. In particular sections 4 to 7 of the Act applied to port facilities, bus stations, railway stations and airports and are increasingly affecting their design.

Subsequent to the above Act, the Department of Environment issued a circular concerned with *"The Disabled Traveller on public transport (include the elderly people)"*. In this circular the D.O.E. noted that there were problems in applying the 1970 Chronically Sick and Disabled Act 1970 to moving vehicles but that the spirit of the Act should be applied in these cases. The circular considers a few details concerned with modifications to existing buses and rail carriages and makes some general recommendations to remove the barriers, which prevent most elderly and disabled people from using public transport. An important point was that the departure and arrival points of vehicles and the vehicles themselves, must be designed in relation to each other.

Another was that *"appropriate aspects of staff training should not be overlooked, care for instance is necessary to enable a disabled passenger to reach a seat before the bus moves off, since even the most expert driver cannot guarantee a smooth journey in congested urban areas"*.

In addition two important lines of action were suggested:

- a. *In the short term, wherever minor modifications of transport system could alleviate hardships experienced by the disabled, operators and manufacturers should endeavour where possible to implement them.*

b. *In the longer term, the need of the disabled call for increasing thought at the research and development stage of transport design and manufacture.*

Another relevant Act came into force in 1977: this is the Minibus Act 1977 (HMSO 1977), which has had a direct effect on transport provision for elderly and disabled people. Accompanying the Act are two sets of statutory instruments concerned with permits and designated bodies. There is also a Department of Transport circular (7/77) which gives an explanation of both the Act and the statutory instruments, and this was followed by a second circular early in 1978. The Act makes "provision" for the use of certain motor vehicles by bodies concerned with education, with religion, with social welfare or with other activities for the benefit of the community and for purposes connected there with (HMSO, 1977). This Act is particularly important for voluntary organisation as it is concerned with payment and charging for transport provision.

In 1985 a major Transport Act was passed. In section IV of this Act (Passenger Transport areas, Authorities and Executives), the duty of Passenger Transport Authority (PTA) to make policies appropriate to meet passenger transport requirements which would not otherwise be met. The Passenger Transport Executive (PTE) shared the responsibility with PTA, the 1985 Act, section IV, point 57-7 *it shall be the duty of both of the Authority and of the Executive for any passenger transport area, in exercising or performing any of their functions under the preceding provisions of this section, to have regard to the transport needs of members of the public who are elderly or disabled.* In this it was following the chronically Sick and Disabled persons Act 1970: local authorities (LA's) have a duty to provide transport services to enable clients to reach facilities provided by former (LA's). Local authorities are not obliged to provide transport as a social service in itself (i.e. to satisfy the general travel needs of clients), but they do have the power to do so.

In the period since 1985 the consequences of the Act have had considerable implications for the elderly. The removal of general subsidy and its replacement by tendered services has resulted in higher fares, and in some areas in changes in service density and frequency. In addition the deregulation of bus services resulted in a proliferation of new operations and services which in some areas led to general confusion among users including the elderly. Furthermore government instructions issued under the Act have removed the requirement to submit public transport plans, but have encouraged local authorities to include packages of transport policies (including public transport) under the annual TPP submissions. More generally central government restrictions on local government spending have led to reductions in the resources available for concessionary fares and other subsidy schemes.

There is also legislation which affects the provision of voluntary transport services for the elderly and disabled people; these services have tended to operate alongside the statutory services ('filling in the gaps'). In some cases, ambulance services and social services transport providing good examples, the voluntary sector has been a catalyst in the emergence of the legislation. Traditionally voluntary organisations have aimed to serve what they consider to be justifiable welfare or social 'needs', which in transport terms have mainly been confined to those without a car and/or unable (for a variety of reasons) to use public transport; or increasingly where public transport has ceased to exist. Much depends on the enthusiasm and abilities of local organisers. There are three important pieces of recent legislation which have had, or are likely to have, important implications for voluntary transport. Firstly the Minibus Act of 1977 provided for voluntary organisations to obtain permits allowing them to charge separate fares. Secondly, the Transport Acts of 1978 and 1980 further extended the freedom of voluntary organisations to charge fares. Since 1981, the International Year of Disabled People, there have been signifi-

cant developments in Britain in the provision of customised transport services for the elderly and disabled, yet much remains to be done. In the 1970s, and 1980s an increasingly large body of legislation was developed to protect the diverse interests of elderly and disabled people in Britain. Their general welfare is presently safeguarded by the Chronically Sick and Disabled Persons Act 1970, and the Disabled Persons (Services, Consultation and Representation) Act 1986. Sections in other Acts are also important. The Transport Act 1968 introduced concessionary fares, and the Building Regulations of 1987 helps to secure access to new public buildings for disabled people. National organisations continue to campaign for the mobility and access rights of their members through public demonstrations and parliamentary lobbying. RADAR (The Royal Association for Disability and Rehabilitation) acts as the focus for such initiatives. Through parliamentary influence, this organisation has recently protected the rights of Orange Badge Holders along London's Red Routes; ensured that disabled people are granted the fullest possible access to the Jubilee Line Extension; and launched the *Disability Manifesto: An Agenda for the 1990s* in the House of Commons (Gant 1992, Gant and Smith (1991)¹ and (1991)² and Department of Transport 1989).

3.2.2 United States policy

In the United States responsibility for these policies is divided between two main federal Agencies (UMTA and PHWA) and state and local government. The Urban Mass Transportation Administration's (UMTA) and Federal Highway Administration's (FHWA) joint regulations require 'the urban transportation planning process to include special efforts to plan public mass transportation facilities and services that can be utilized effectively by the elderly and handicapped persons.' (See regulations 23 CFR Part 450 and 49 CFR Part G13.)

In addition, Section 502(c) of Public Law 93-112 established that the Architectural and Transportation Barriers Compliance Board '*...shall determine what measures are being taken ... to eliminate barriers from public transportation systems (including vehicles used in such systems), and to prevent their incorporation in new or expanded transportation systems.*' Further, Section 504 specifies that '*No otherwise qualified handicapped individual in the United States ... shall, solely by reason of his handicapped, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.*' (Public Law 92-112; September 26th 1973).

Providing equal service to the elderly poses perplexing problems to which urban officials are attempting to respond in a humane and efficient way. Service to the transportation disadvantaged (elderly and handicapped) is often found to be costly, poorly coordinated, and a source of vested interest for existing social service programs. By taking a marketing approach to this area of transportation planning, it is possible to offer solutions to at least some of the difficulties of providing transportation for this important segment of the urban population. The marketing approach taken here provides for equal service to all user groups in order to meet the requirements of the law.

It is clear that the American approach has centred much more on the constitutional guarantee of equal right and equal protection under the law. Based on court decisions with respect to racial segregation where separate but equal provisions were found to be unconstitutional, the disabled have argued that all public facilities, especially transport, must be equally accessible to the handicapped. This is based on the contention that public monies for public facilities must not be spent on schemes which are exclusive to a particular segment of the population.

After the 1973 Act the Department of Transportation (DOT) had the respon-

sibility to clarify these guide-lines in administering programmes for financial assistance to local transportation operators. Regulations for that purpose took effect in July 1979. They required that:

All buses purchased after July 2nd, 1979, must be equipped with features that enable wheelchair users to ride them.

All buses must adhere to the Transbus design (as mentioned in the previous chapter) with low floors and one less step inside than present buses.

Key stations, defined according to criteria in the regulations on subways and rail systems, must be equipped with elevators within 30 years. Key stations on light rail system must be equipped with elevators within 20 years.

At least one car per train on subways and commuter commuter rail systems must be adapted to allow wheelchair users to board. Half the fleet of street cars must be accessible within 20 years.

Where all changes are not completed within three years, each city must make available some form of temporary service (like fitting lifts to old buses, or supplying some form of temporary taxi service).

The regulations also permits operation of existing subway systems, light or commuter rail systems to provide handicapped persons with some form of bus or taxi service instead of adapting the rail system, if local handicapped person and D.O.T. agree to the alternative.

The ways in which these ideas were implemented at state level is illustrated by the case of California and the concept of equivalent facilitations. '*Equivalent facilitation*' is a concept used in California's architectural barriers law to determine when a building may be excused from full accessibility. Thus, all parts of a building need not be fully accessible if, in portions that are usable

by the handicapped, all facilities normally sought and used by the public are available. According to Chapter 7, Division 5 of Title 1 of the California Code, if these criteria are met '*... it is clearly evident that equivalent facilitation ... is thereby secured.*'

Any alternative transit service, to have full accessibility, must pass the following test for equivalent facilitation.

1- Equivalent origin/destination. The average able-bodied user of public transportation has a choice of destinations determined primarily by the matrix of the current transit system. In a reasonably extensive system, the user may choose equally between work, shopping, entertainment, visiting friends, and so on. Demand-responsive modes that restrict options may not provide such equivalency.

2- Equivalent trip-decision time. An equivalent alternative system must require no more advanced decision to travel than the average able-bodied user on the primary system. Thus, on a system with an average 20 minute headway, for example, the trip user needs to decide to travel a maximum of 20 minutes prior to departure plus travel time to point of entry to the system, and cannot decide to change destinations enroute.

3- Equivalent travel time. Average travel time between any two points should be no longer on an alternate system than it is on that used by the able-bodied population.

4- Equivalent transfer frequency. A system in which, to get from any two points in the service area, one transfer is considered usual, two are considered acceptable, and three are unacceptable, the same should be true of the alternate system.

5- Equivalent service range. Service for the handicapped must ultimately extend over the entire service area.

6- Equivalent fare. The fares charged on an alternate system must be no

higher than those charged to the able-bodied using the primary system, including transfer charges, reduced fare requirements notwithstanding (Hood, et al 1979); U.S. public Tech. Inc. 1976, U.S. Department Commerce 1979, Kocur 1979, Urban Mass Transportation 1979, and Cooper 1978).

3.2.3 French policy

In France a number of provisions to help in the education and the re-integration of handicapped individuals in social and professional life was the objective of a law called *A law of Orientation of Handicapped Persons*, presented by the Government, passed by Parliament and promulgated on 30th June 1975 (Law No.75 534).

This law sets out very clearly the principle of national unity. *'...social integration (of) handicapped persons...constitutes a national obligation. A concerted action of the state, of families, of local communities, of public establishments, of social security system, of associations should provide the focus for measures the assure handicapped persons all the autonomy of which they are capable'*. It is application required the use of more than forty regulatory texts, determined mostly by circumstance, concerning all the administrations. The integration of the disabled person into social life evidently comes about by the adoption of a certain number of measures which are designed to allow them to lead a life, which as much as possible, resembles that of a person who is not disabled. Article 49 of the Orientation Law provides that facilities open to the public will have to be accessible to the handicapped and that the progressive means of implementing this principle will be defined by regulatory means. The French Government ordered that as from March 1st, 1979, all facilities designed for public use must be accessible to individuals with reduced mobility (Artaud-Macari, 1978).

With respect to transport, Article 52 of Orientation Law provides *...in order*

to facilitate travel for the handicapped, provisions are adopted by regulatory means to adapt public transport services and to modify progressively public transport vehicle construction standards as well as the conditions of access to these vehicles or moreover, to assist the development and operation of specialized transport services for the disabled, or failing that, the use of private cars. An Inter-ministerial Working Party was created on the 18th August 1975 by the Secretary of State for Transport to:

- Survey the problems posed by the transport of handicapped people.
- Analyse the possible solutions
 - modification of special community transport modes.
 - use of private cars.
- Prepare objectives and a calendar of implementation.
- Prepare the texts of regulations.

Order 78-109 of the 1st February 1978, provides that as from the 1st March 1979, all new facilities designed for public use, whether they require a contraction permit or not, must be accessible to individuals with reduced mobility. There is, therein, an extremely general provision, which covers among other things, facilities designed for transport.

The 'Orientation Law', while appearing to give preference to the modification of public transport or to the creation services, also considered the possibility of facilitating the use of taxis and private cars by handicapped and elderly individuals. When the government set up the Liaison Committee for the Transport, they announced that a package of measures was under study, aimed at allowing handicapped people to use their vehicles more easily. Even now some municipalities grant free parking to the disabled at a certain number of positions (Artaud-Macari, 1978).

3.2.4 Swedish policy

In 1967, the Swedish central government gave private welfare agencies the responsibility for meeting the special transport needs of elderly and handicapped people. A.S. Storstockholms Lokaltrafik (SL) and Goteborg's parvager (GS) were given this responsibility in their respective areas.

According to Morris (1976), SL policy is, where possible, to adapt ordinary public transport to meet the needs of the elderly and disabled, and to supplement these with special provisions. The policy of GS, however, is to cater for the transport needs of most elderly and disabled people by special provision. The result is that its standard public transport system has little special provisions for the disabled.

Special transport in both cities means that eligible disabled people can, depending on their degree of disablement, travel by either taxi or minibus for the normal public transport fare. Morris (1976), reported that in Stockholm in 1975, 3.5% of the population were eligible for the scheme, of whom over 90% were only able to use taxis. This means that about 0.35% of the population were eligible for the special adapted minibus services.

Since 1971 the total responsibility for service was transferred to the local transit authority. For the elderly and handicapped the transit authority has an arrangement with the taxi-cab company of each city. The traveller contact the taxis company directly and request transportation just as any one would request taxi service. However they pay with special vouchers which cover 80% of the total cost and the traveller pays the remaining 20%. This is reported by Andersson (1981).

Roos (1981) reported that every municipality in Sweden offers a special local transport service to most of the elderly and handicapped person. The basic criteria for entitlement to this service is a permanent disability. Which means that: the person cannot at all, or with the greatest of difficulty, move from

one place to another. Detailed regulations for this service are in general not laid upon municipalities by the government but municipalities can outline this service like many other services in the municipality according to the specific demands of their area. There are only some recommendations and rules given from the central authority. This means that the local transport provision for the elderly varies considerably in Sweden.

There has been very strong pressure from many elderly and handicapped groups in Sweden to have provision also for long distance transport. This was initially put into operation for a trial period of 5 years from 1979.

The aim of this service was to enable a special group of people who are severely handicapped and cannot use standard long distance transport. In fact persons who are entitled to use the local transport service, may have enough movement to reach an aircraft, train or a bus and then travel without any extra problems for long distance. There is however a limited group of those who are entitled to local transport services but cannot travel over long distances without extra help, which in fact means extra cost. It is estimated that about 10% of those who are entitled to local transport service need these long range transport services too (Roos, 1981).

3.2.5 Japanese policy

In recent years there has been a sharp increase in concern over the transportation problems faced by the elderly in Japan. However, there have been relatively few comprehensive discussions of an overall policy framework; its individual countermeasures to the problems; or of the details of the same which include the objectives of transport policy for the elderly, alternative policy measures and their effects, or methods of evaluation.

The current status of transport policy for the elderly in Japan can be divided to National and Local policy. The Transport Ministry of Japan, in a report by

its Transport Policy Council, considers the elderly as weak or disadvantaged in relation to transport. They stress the need for provision of public transport facilities which are easy to use, primarily through facilities oriented policies such as the improvement of pedestrian environment or facilities for vertical motion, etc.

The ministry's policy for the disadvantaged in terms of transport, including the physically handicapped, comes mainly in the form of directives to each transport enterprise. The substance of the policy, moreover, primarily concerns improvement of facilities but also administration, such as the establishment of special 'Silver Seats' on public transport vehicles for the elderly or handicapped and the drawing up of guidebooks for the handicapped.

The Construction Ministry emphasizes the provision of a high-quality road and transport environment in terms of safety and comfort for the elderly pedestrian or motorists. It concentrates on physical measures to secure and to maintain such roadways.

A greater variety of attempts at transport policy for the elderly have been made at the local level than at the national level. According to a survey of transport programs for the elderly conducted in 315 cities throughout the nation by the Office for the Elderly under the Prime Minister's Secretariat, there were programs related to public transport tickets or bus service (14.0%) and 4 programs related to traffic safety (1.3%). The rate of diffusion of these programs was not very high in comparison with that of other programs for the elderly such as supplements for medical treatment costs or promotion of respect for age societies.

Although the data released by 'Trends in Local Government Programs' is limited. The data shows that more diverse policies are progressing at the local rather than at the national level, and that the number of municipalities conducting programs in the field of transport for the elderly is gradually in-

creasing.

More specifically, these programs come in four major forms:

- 1) direct provision of exclusive or specialized transport service,
- 2) commission of and support for specialized transport service,
- 3) user subsidy for transport costs, and
- 4) travel invitations.

Specialized service consists of transport to and from hospital or facilities for the aged such as nursing homes, and clubs or classes for the elderly, or transport to various events put on for the elderly. Looking at these services from the stand-point of travel objective or target recipients, it becomes apparent that user subsidy is designed to cover transport expenses for daily activities by the elderly. On the other hand, specialized transport service is limited to certain types of movements or transport. Travel invitations provide for assistance outside the realm of daily activities for the elderly, in the form of group travel, but they do not give the individual any leeway of choice.

Even in the case of user subsidy for transport costs, it is often confined to the use of specified public transport modes or services provided by specified public enterprises. There is almost none in the general form allowing for free choice of modes among taxi, bus or private car.

Volunteer services by private citizens are usually directed to the physically handicapped or old persons living alone. Nevertheless, volunteers do play a large role in assisting the transportation disadvantaged in other nations such as Great Britain. Steps ought to be taken to foster this same type of activity in Japan in order to supplement transport programs by the public sector (Ohta 1984, Koutsopoulos 1980, and Polonsky 1978).

3.3 Main policy approaches

From these case studies two major themes can be identified: the responsibility for provision for the elderly's transport needs and the form of intervention.

3.3.1 Responsibility

It will be evident that in these case studies most central governments have accepted some responsibility for the provision of transport for the elderly. However in most cases this has resulted in laying down guide-lines which other agencies are required to meet.

In some cases these agencies are other level of governments, for example in the United Kingdom by requiring the Passenger Transport Authority (PTA) to share the responsibility with Passenger Transport Executive (PTE). This requirement is recognised by law, where Metropolitan County Councils and non-metropolitan County Councils must consider the transport needs and problems of the elderly and disabled when they formulate their Transport Policies and Programmes.

In other cases the responsibility lies with transport operators for example the requirement that buses should be driven in a manner acceptable to disabled persons. In yet other cases the responsibility has been given to voluntary organisations recognised by the law, which are expected to serve what they consider to be justifiable welfare or social 'need' for those without a car and unable to use public transport.

3.3.2 Forms of intervention

A number of different forms of intervention can be identified. In some cases the intervention is simply financial, the subsidy of transport which ranges from blanket subsidy of public transport (on the assumption that this will

help the elderly and disabled), through subsidy of specific routes (e.g. to hospitals, in rural areas) and specific subsidy of specialised services for the disabled (whether operated by local government, ordinary operators or voluntary organisation) to the individual subsidy of disabled and elderly travellers (thus allowing them to overcome income restrictions on their use of standard services). Case studies have show that such methods do not necessarily help those with physical or financial needs (see Hitchcock 1980, Hay 1986, and Le Grand 1982).

In other cases the intervention consists of establishing regulations and standards which other providers must observe. In some cases there are general requirements but in other cases are directed more specifically to the needs of the old and similar mobility disadvantaged groups. For example, designing the entrance of the bus to facilitate boarding, or reserving the front seats for the elderly and mobility disadvantaged groups. Similar initiatives have been adopted by taxi cabs in other European countries, that are now being designed to be accessible to wheelchair users.

3.3.3 Policy questions

A third theme evident in all these policies is the continuing uncertainty about the relevant target groups and their needs. It is evident that in some policy contexts the group and needs are very narrowly defined (e.g. the group might be defined only in terms of acute physical disability, and the needs might be defined only in terms of access to essential services), but increasingly the groups and their needs are defined more broadly (as for example in the California case quoted above). But clearly these definitions determine the form and to some extent the responsibility for policy. It is these issues, rather than the assessment of policy, which make up the main subject matter of this thesis.

Chapter 4

Research problems

4.1 Introduction

In this chapter an attempt is made to define the central research problems of the thesis: the following chapter will outline the research methodologies available and identify an appropriate research design for tackling these problems. The main reasons for choosing these topics are: first, that most of these topics have not been widely researched in the case of the elderly before. In the 1980's few studies were made mainly for the elderly, and the studies which were made examined one variable or one factor. Secondly, there is no study of the elderly in Sheffield. This study covers the transport problems and the elderly activities, activities in which the elderly currently participate, activities in which the elderly currently wish to participate, transport methods used by the elderly, and finally transport difficulties encountered by the elderly in using transport. The last stage of this study will explain the relationship between the transport need for the elderly people and their activities.

4.2 The central problems

Earlier studies, especially in the 1970s and 1980s have attempted to examine the transport needs of the elderly, but most of them were confined to the impact of one factor (e.g. access to a car) or a group of factors (e.g. location, lifestyle). In this study the central problem will be to examine the relationship between desired level of activities and the transportation needs and demands of the elderly people using a conceptualization which includes actual activities, modified activities and frustrated activities. The relationship is conceptualised in the form shown in Figure 4.1. The argument is that the interrelationship between desired level of activities and transport availability leads to a subdivision of activities into three categories, and a consequent division of transport demand into realised actual travel and latent or suppressed demand. It is only when these relationship have been fully understood that the nature of “transport need” can be properly defined.

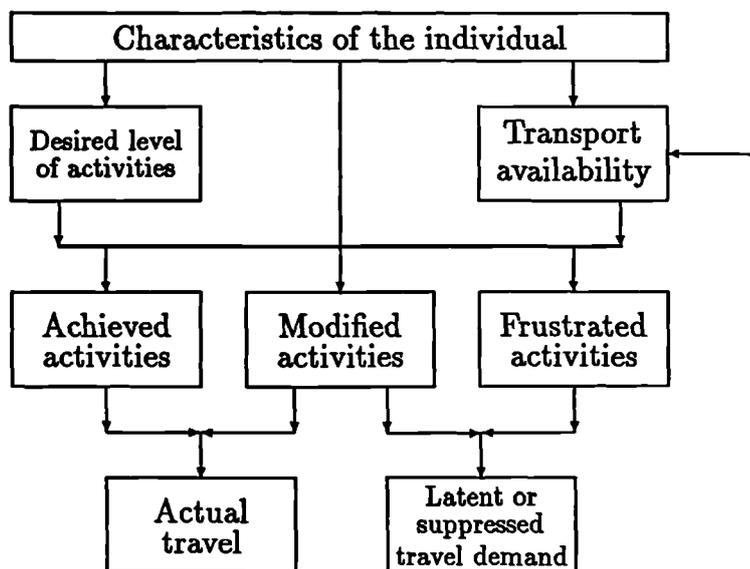


Figure 4.1: The relationship between activities and travel

4.2.1 Desired level of activities

The desired level of activities is given a key role in the conceptualisation in Figure 4.1. The argument is that any study which confines itself to actual activities and travel fails to understand the extent to which problems of transport and mobility lead to the suppression of activities and their consequent transport demands. In Figure 4.1 these levels of activity are seen as being determined by the personal characteristics of elderly people, and as being reflected in actual activities, modified activities and frustrated activities each of which has consequences for travel behaviour and travel demand.

4.2.2 Fully achieved activities

In 4.2.1 it was noted that the elderly have many desired activities which are no different from those of the whole population. An important question here is to ask which of their desired activities are fully achieved in the sense that the elderly person participates in the activity in the form and at the times and locations they perceive as optimal. These fully achieved activities will then be reflected in actual travel behaviour.

4.2.3 Modified activities

Where an individual is unable to participate fully in a desired activity she/he may nevertheless participate in modified form. From a transport point of view a key question is how the elderly's mobility problems modify the participation:

- by changing the location of participation.
- by changing the frequency of participation.

It is also important to note the distinction between temporary modifications (which will be reversed if mobility conditions change) and permanent modifications, although the difference may be only one of degree.

It will be clear from this discussion that modified activities both contribute to actual travel and represent latent or suppressed travel demand.

4.2.4 Frustrated activities

The third category refers to those activities in which the elderly would like to participate but cannot do so: once again the focus will be on activities which are affected by mobility and transport problems, but it must be remembered that reduced mobility may arise from more than one cause, and the cessation of an activity may also arise from reasons in addition to reduced mobility. For example the inability of an elderly person to use the bus may be related to access to the nearest stop, physical difficulties of using the vehicle, and the cost of the fare. Similarly an elderly person may cease to use a supermarket for shopping because the shopping activity itself has become difficult (self service, long distances in the store, difficulty of handling trolleys, queues at check-out. The reasons for frustrated activities can be explained only after examining the effect of two sets of factors; personal characteristics (e.g. age, income, the degree of disability, health, social status, etc.), and transport factors (e.g. car ownership, fares, quality of service, transport policies). These two sets of factors affect the actual activities and the frustrate activities at the same time, and thus control the elderly's mobility.

4.2.5 Actual travel

The relationships outlined in Figure 4.1 suggest that actual travel is an outcome of both achieved activities and modified activities. It is these two sets of activities which result in the frequency, length, and spatial pattern and modal split of actual travel. All of these aspects will be subject to change if increased mobility allows activities to be fully achieved. For example, mode choice associated with modified activities may be changed significantly by im-

provements in provision (e.g. substitution of walking trips to local facilities by public transport).

4.2.6 Latent demand

Latent demand for travel is usually understood to cover all those trips which individuals would choose to make if the transport system were cheaper, quicker or easier to use. The diagram 4.1 suggests that there are two types of latent demand. On the one hand there are demands which have been modified by modification of activities: so the elderly travellers may travel less often, less distance, to a different destination or by a different mode as a consequence of the modification. On the other hand there are travel demands associated with activities which have been frustrated by limited mobility.

From the above explanation for the existing activities and the factors effecting these activities, the exact definition of latent demands for elderly people will exist after covering sections 4.2.1, 4.2.2, 4.2.3, and 4.2.4. The last sections will open the way for exact definition to latent demands according to what activities the elderly participate in and how the variables affect their participation.

4.3 Transport needs of the elderly

The elements identified in Figure 4.1 and explored in section 4.2 permit a more precise examination of transport need. A number of definitions for need can be operationalised within that framework.

4.3.1 Broad definitions of need

Two broad definitions of need could be derived from the examination of activities:

- (a) transport need exists if the elderly have any activities which are frustrated or modified by mobility problems, or;
- (b) transport need exists if the elderly have activities in which the rest of the society can participate but which for the elderly are frustrated or modified by mobility problems.

Both these definitions however pose problems: the first because it would suggest that the elderly have a right to transport much greater than the population at large; the second because it fails to identify those activities and therefore transport needs which are special to older people.

4.3.2 Narrow definition of need

The approach outlined can also be the basis for a more narrow definition of need: where needs are specified in relation to the activities judged essential by or for the elderly. For example, it might be argued that access to basic shopping and medical services are the only essential needs of the elderly and that transport provision should be judged on that basis. This is clearly much more restricted than the definition given as (a) and (b) in 4.3.1 above.

4.4 Relationship to earlier studies

Travel is one of many activities which the elderly people engage in. In most cases it will provide the important link between activities at different locations and what the elderly need. If travel is basically a means of gaining access to activities then it is accessibility not travel. Accessibility is the case in which an individual is able to reach activities. A useful discussion of the concept can be found in Moseley (1979), with additional useful material in Skelton (1978), and Mitchell (1979). Accessibility comprises two main factors: the mobility of

the individual (i.e. his/her ability to move around) and the characteristics of the activities which are available to him/her. These factors are based in two main groups which mentioned earlier in sections 4.3.2 and 4.3.4. The transport needs and demands are also affected by the lifestyle. It is closely linked with the human activities approach in that activities (i.e. what elderly people do) are very much part of their lifestyle.

It is clear from the above discussion that there is a very strong relationship between transport needs and demands for the elderly people and their actual participation in activities. When the elderly people use the transport facilities provided to them, this does not mean they meet their needs and demands, to make judgement for what the elderly need, you need to research and cover the last topics 4.2, 4.2.1, 4.2.2, 4.2.3 and 4.2.4 with much concentration on 4.2.3 and 4.2.4. After researching the last topics, the transport needs for the elderly will be more clear.

The need and demands were researched by many authors in the 1970's and early 80's in the U.K., U.S.A. and Europe. However, most of the early studies did not separate between needs and demands, and could not give exact definition for needs or demands. For example, Oxley and Benwell (1985), Brook et al (1974), Brook et al (1978), Leyland Vehicles and MIRA (1980), Oxley and Benwell (1983), Mitchell (1988), Hopkin et al (1978), Mitchell and Stokes (1982), Hopkin and Town (1978), Todd and Walker (1980), Revis (1978), Bailey (1978), Reilly (1978), Knapp (1983), Hutchinson and Said (1990), Atkins (1987), Volet and Hutchinson (1986), Said (1982), Teal et al (1991), Charles River Associates (1983), Chan (1987), Wachs (1979), Bochner and Stuart (1979), Abrams, (1978 and 1980), Bamford (1987), Coombe (1991), Cooper et al (1979), Faulks (1981), Gandry (1975), Gibson et al (1989), Hillman (1976), Jansson (1980) Jeffs (1990), Johnston (1983), Larner (1984), Mc-Fariand et al (1964), Nash (1985), Pickrell (1985), Rosenbloom (1980), Spear (1982), Trav-

ellyan (1973), Wachs (1979), Wegener et al (1991), Dijlestra and Der-Zouwen (1982), Culyer (1976), Thayer (1973), Benwell (1978), Hagerstrand (1974), Deen et al (1976), Moseley et al (1977), Cooper et al (1979), Hunt (1978), Gazeley and Morris (1977), Koutsopoulos (1980) and Skelton (1978), studied the transport need for the elderly people, but most of these studies did not distinguish between needs and demands for the elderly, others did not examine the needs from the elderly point of view, so they reported their results as they feel it might meet the elderly needs. On the other hand other studies covered the subject fully and reported there results from the elderly point of view and also what they suggest for the elderly, for example, Moseley et al (1977), Skelton (1978), and Bailey and Layzell (1981), examined the elderly needs and demands. This study will examine what the elderly need and what transport system they wish to have.

4.5 The objectives of this study summarised

The main objective of this research is to examine the elderly's activities under the following topics: transport problems and the elderly's activities, activities in which the elderly currently participate, activities in which the elderly currently wish to participate, transport methods used by the elderly, and finally transport difficulties encountered by the elderly in using transport; this includes fully achieved activities, modified activities, and frustrated activities, in order to explain the relationship between the transport needs and demands of elderly people.

Chapter 5

Research design

5.1 Introduction

This chapter will be divided into two main parts. The first part (5.2 to 5.4) discusses general issues of research design with special reference to transport and the elderly. The second part (5.5) describes how these issues were resolved in the specific research carried out in this project.

5.2 Type of data collection

Studies of transport demand can be approached in two ways. The first one is by asking respondents not only about the trips and activities which they make, but also asking them about the activities and trips they would wish to make if circumstances were different. The second method looks only at actual trip and activity participation and seeks to interpret differences between groups of individuals as evidence of latent or suppressed demand.

5.2.1 Asking respondents to identify latent demands

It was noted in the literature review that Bradshaw (1972) identified the case for asking individuals directly about their own needs and the extent to which those needs were being met. A number of studies have attempted to do this in transport and two basic approaches can be identified.

5.2.1.1 In depth interviews

The first approach uses in depth interviews which may be structured or unstructured attempting to elicit the views of respondents. For example, Miller (1976) measured "latent demand" directly by asking respondents:

- i) Whether they participated in an activity and the extent to which they wanted to participate more often. Latent demand for participation was then the difference between desired and actual levels of participation.
- ii) If they had implied a latent demand for activity participation, whether this was affected by transport difficulties.

The number of individuals with restricted participation as a result of transport difficulties was expressed as a proportion of those who were restricted for all reasons. He then assumed that latent demand for transport can be expressed as an equal proportion of the latent demand for participation. Similarly Hartgen et al (1976) identified another approach based on the respondents own expressed desires: basically they obtained from respondents: (i) current public transport trip rates, (ii) a ranking of the significance of different travel barriers and (iii) an estimate of the number of trips they would make if all barriers were removed. The existing and desired number of trips could therefore be expressed as a function of the barrier ranking. The possible change in trips as a sequence of barrier removal (due to some policy) could then be calculated, based on both current trip rates and desired trip rates. The model

did however fail to identify the link between barriers, it may overstate the significance of removing several barriers at the same time.

5.2.1.2 Simulation

The second approach is the “simulation” approach in which respondents are asked to speculate about trips they would make if transport conditions were to change. The most sophisticated example of this approach is the HATS methodology (Bailey and Layzell 1981) developed at Oxford. In their study respondents recorded not only their own activities but the pattern of use of the household vehicle. In the study a special version was developed to examine the needs of elderly people. The study showed people’s views of their current level of shopping and social activities. As a general rule they found the majority of the elderly participate in these activities and are happy with the extent of their participation, but almost a quarter (and nearly half for social activities in a case study in Sussex) were not happy. This raised some important issues with regard to social needs which they addressed later in their study.

5.2.1.3 Strengths and weaknesses of this approach

In the case of the elderly people, the researcher must take into consideration every aspect which may affect the survey directly or indirectly. Particular problems concern the general unreliability of this sort of evidence. Firstly, in the studies where the elderly have been asked directly whether they participated in activities they want, or they would like to participate more if the circumstances should change, unless prompted they may “forget” activities in which they would like to have participated. The researcher must therefore design the survey recognising and attempting to overcome these problems, by helping the elderly to recall and to record their desired and actual activities. On the other hand the results can be distorted if the respondents are prompted

in a way which they “agree to” too readily.

Secondly, in “simulation”, studies the respondents are asked to speculate about trips or activities they would make if transport conditions or personal circumstances were to change. In the case of the elderly people this type of questions take more than one form. For example, the researcher might ask the respondent to imagine or suppose changes in transport conditions and personal circumstances, and to identify the likely consequences. But the respondent may not find it easy to respond to such “hypothetical questions”.

Thirdly both the methods may pose problems in coding responses. If open questions are used the variety of responses and words used in responding make it difficult to code or categorise information accurately, the volume and complexity of the material increases the problem further.

Fourthly it must be recognised that not all respondents will use language in the same way as the investigator or indeed as other respondents. There will therefore be considerable uncertainty in analysis, especially in response to open questions.

5.2.2 Travel and activity records

Another possible approach is to examine the travel behaviour of one group of elderly, and compare this with similar group making more trips, then need or “latent demand” for the former group is measured as the difference between the travel of the two groups. Group differentiation may be on the basis of car ownership, income or area of residence. For example, Markovitz (1971) compared trips by the elderly according to income, on the other hand Paaswell and Recker (1978) compared carless households with those in which at least one car was available.

To operate this method successfully it is necessary to have good records of travel and activity from the groups under study. The two main methods

available are the diary and the questionnaire.

5.2.2.1 Diary method

The diary is one of the methods which has been used by researchers to record the information required about the elderly's activities or accessibility. Basically the diary method requires the respondents to record the information required day by day in a special form or booklet. This method was used by Bailey and Layzell (1981), and National Council For The Aged (1986). The diary method is the most difficult method to use in the case of elderly people, because the elderly person may feel that he/she is not free to do what he/she used to do, because the researcher will see their record, so, they may be influenced by the act of recording their activities and travel. Furthermore, the way they record the activities will be different from person to person. Because of this, it will be difficult for the respondents to record exactly the information needed and also for the researcher to analyse the information. Some researchers have tried to solve these problems, for example, Bailey and Layzell (1981), arranged personal appointments and/or meetings, so that the researchers could explain in detail to each of the participants, how to fill in the questionnaires. Other studies collected the information using this method day by day, in order to minimise the error in the information recorded if the respondents forgot or did not know how to record particular activities (e.g. Dorset County Council 1977, London Borough of Hillingdon 1973, and Dudley Metropolitan Borough 1975).

5.2.2.2 Questionnaire method

Questionnaire methods have been widely used to record activities of the elderly and their travel. Within questionnaire methods there are two types of questionnaires the short term and longer term recall questionnaire. The short

term recall questionnaire can be used for special purposes and the questions in the form usually designed to be specific and direct. In this type of questionnaire the researcher asks the question and offers answers, so, the respondent is required to choose one of the answers offered for each question. In some cases one or more open questions may be asked. However, this type of questionnaire can not give the researcher any picture of the longer term patterns of activity and travel carried out by a single individual.

If it is decided to ask respondents about travel behaviour over a long time period (i.e. more than 48 hours) the problems of memory and recall are so great that a different approach is needed. Instead of asking for a complete record questions of the form "how often do you" or "when did you last" tend to be used. For example, Bailey and Layzell (1981) used that type of question: how often do you receive visits from relatives/friends? how often do you use the telephone for both incoming and outgoing calls? how often do you drive a) the household car(s). (b) other cars.? Another type of question they asked was for example, where do you do your food shopping? when did you last shop? what means of transport do you use to reach this/these shopping centre(s)?

5.2.2.3 Strengths and weaknesses of these methods

The weaknesses inherent in these methods are well documented in the literature, and most of them will be encountered, often in acute form, when dealing with the elderly.

Firstly; many elderly people have very weak memories, so they may forget important information. The researcher's responsibility is to encourage them to record information, by reminding them and/or asking the questions directly on the information required.

Secondly; unless the researcher designs the questionnaire to be very clear and

easy to understand for the elderly, then they may record unneeded information. Even if they realised that they have made a mistakes, they may not correct it, because they have spent a long time to record the first one. On the other hand if they want to correct the information it will be difficult for them to remember the accurate information.

Thirdly; where a question asks for a respondents "usual" behaviour two errors occur. In some cases the most usual or frequent pattern conceals a pattern which accounts for a substantial minority of occasions. In other cases the respondent may report as 'usual' an activity which a strict count would reveal to be not the most frequently adopted. In the case of the elderly the reported 'usual' behaviour may also reflect past rather than current patterns.

Finally; the researcher may fail to collect all relevant information required, if the design of the questionnaire does not cover every aspect of the information required. But if the question is asked indirectly, this may confuse the elderly and make their answers un-clear or not relevant to the purpose of the question. Sometimes the researcher is forced to use more than one form of questionnaire, e.g. Bailey and Layzell (1981) used three separate types of forms for collecting the data and complementary procedures were adopted in presenting the information.

5.2.2.4 The choice between interviews and postal questionnaires

The discussion above has raised, if only indirectly, the choice between directly administered questionnaires and postal methods. The main advantages and disadvantages of the two methods can summarised in table form.

The mail questionnaire does of course avoid the problems associated with the use of interviewers. Mail questionnaire also have something to commend them when information concerning several members of a household is required. The method can only be considered when the questions are sufficiently simple

	Interview	Postal
Researcher time	Higher	Lower
Postage cost	Lower	Higher
Travel	Higher	Lower
Response rate	Higher	Lower
Respondent errors	Lower	Higher
Classification	Possible	Difficult
Date	Possible	Never

Table 5.1: The main advantages and disadvantages of the interview and postal methods

and straightforward to be understood with the help of the printed instructions and definitions.

The answers to a mail questionnaire have to be accepted as final, unless re-checking or collection of the questionnaires by interviewers can be afforded. From the table it is clear that the main strengths of a postal questionnaire are lower time and travel cost, but there are disadvantages in terms of respondents errors and postage. In addition it is some times argued that avoidance of interviewer bias, and ability to reach respondents who live at widely dispersed addresses are other advantage of postal questionnaire. On the other hand there are some other disadvantages which are: unsuitability for respondents of poor literacy; for the visually handicapped, the very old or for children below the age of, say, ten; often unsuitable for people with language difficulties; no opportunity to correct misunderstandings or to probe, or to offer explanations or help; no control over the order in which questions are answered, no check on incomplete responses, incomplete questionnaires or the passing on of questionnaires to others; no opportunity to collect ratings or assessments based on observation. By contrast the main strengths of a directly administered questionnaire are: lower research time, and lower travel cost. In addition it is sometimes argued that insure high respondent rate with minimum respon-

dent errors, the questionnaires should reach respondents who live at widely dispersed addresses, and to provide assistance in filling the questionnaire for the visually handicapped, the very old or for children below the age of, say, ten, and those with language difficulties.

5.3 Type of survey design

In whatever way respondents are asked to reveal information relevant to latent demand there are also questions of survey design: how should a sample of persons be selected for interview or questionnaire and how many such persons are necessary. Once again a review of existing studies reveals a variety of methods (sometimes used in combination). It is clear that any decisions about appropriate survey design have to consider not only the method of data collection (see above), but also the proposed methods of data analysis.

5.3.1 Random sampling methods for large populations

A random method of selection is one which gives each of the N units in the population to be covered a calculable (and non-zero) probability of being selected. In the American literature the term 'probability sampling' is used in place of 'random sampling'; sampling methods which do not embody the feature of randomness, such as quota and purposive sampling are called judgement samples.

The use of the term "random" has give rise to a certain amount of confusion in the American literature, due to a looseness in distinguishing between random sampling and simple random sampling. In simple random sampling each possible sample of n units from a population of N has an equal chance of being selected, which in term implies that every member of the population has an equal chance of selection. It is equality of chance of selection which is

the characteristics of simple random sampling; for random sampling generally, what matters is only that the chance is calculable and not zero.

The importance of randomness in the selection procedure cannot be over-emphasised. It is an essential part of the protection against selection bias and is the basis of the whole theoretical framework for statistical analysis. If it is not possible to assign to each population unit a calculable probability of selection, then the theory is not applicable and standard errors cannot be calculated; in other words, the precision of the sample estimate cannot properly be assessed (for more information see Moser 1968, Dijkstra and Zoumen 1982, and Bradburn and Sudman 1981).

5.3.2 Sample size

Most urban transport studies have used large samples: the large random sample being seen as the best way to ensure results representative of the population. However, in the case of elderly people many problems face the researcher in achieving such samples. For example, (Bailey and Layzell 1981) found that it was not possible to select a random sample of elderly people from the electoral register, because of the large number of households that would need to be contacted initially and the associated costs. They estimated that only 1 in 7 electors would fall within the appropriate categories. In any case cost of contacting and processing are high with large samples.

A small sample has the advantage of being less expensive in terms of postage, printing, visits etc. but even if randomly chosen it is difficult to be sure about its representative nature there will be high error terms in all resulting estimates, and it is difficult to split a small sample into subgroups for separate analysis. So, for example, Rihani (1982) and National Council For The Aged (1986) and Bailey and Layzell (1981) all used small samples and met problems in subdividing their data sets.

5.3.3 Stratified and controlled samples

A common method for reducing standard errors of sampling without increasing sample size is to use stratification. Stratification does not imply any departure from the principle of randomness. All it means is that before any selection takes place, the population is divided into a number of strata pre-defined or sub populations; then a random sample is selected within each stratum. This allows a random sample to ensure a sufficiently large sub-sample within important sub groups of the population. This reduction of the play of chance is reflected in a reduction of the standard error which, after all, is simple a measure of the influence of chance on sample composition. Thus stratified random sampling tends to have somewhat greater precision than simple random sampling, and it is also generally convenient for practical reasons. But it is of course vital that the selection within strata is made randomly.

Sampling within pre-defined sub populations may also be used to achieve “control”. The objective here is to ensure that certain variables are held constant (or at least within a narrow range) within all or part of sample. For example, if a study is intended to exclude the effect of car ownership the sample might be defined to include only those households or individuals without access to a car. A further aspect of control is to ensure that there are sufficiently large sub-samples with contrasting values on the same variable: so a survey might be targeted to include a sufficient number of responses from those without access to a car and from those with access. For example in the studies by Bailey and Layzell (1981), and Rihani (1982) they had a full control in the variables effecting the samples. Because of this they studied sub-sample with specific variables (e.g. access to a car, to shopping centres, Telephones, type of accommodation, etc.) and compared these samples with others not having these characteristics.

But it must be noted that unlike stratification which is intended to give more

accurate estimates for the wide target populations, controlling is a quasi-experimental approach which reduces the possibilities of descriptive inference to the whole population in order to make more precise explanatory inferences about the effect of specific variables.

5.3.4 The problems of sampling frames

One of the decisive factors in sampling design is the availability of sampling frames; the lists, indexes, maps or other population records from which the sample can be selected at each sampling stage. The population coverage, the stages of sampling, the stratification used, the process of selection itself, every aspect of design is influenced by the available sampling frames, which need to meet the following requirements (summarised from Bradburn and Sudman, 1981).

- The first desideratum is that the frame should be adequate, in the sense that it should cover the whole of the population to be surveyed. This relative to each survey, not a general characteristic of the frame.
- The sampling frame should be complete, in that all the population members who are supposed to be on it are in fact on it.
- A frame should not be subject to duplication. This may happen if people move from area to another and are included in the lists for both areas.
- The information for each sampling unit listed on the frame should be accurate. In addition the frame ideally should not include “non-existent” units.
- As a particular aspect of the last point, the frame should be as up-to-date as possible.

- Finally, it is convenient, though not essential, to have the frame available in one central place.

Most of the frames used for large scale household surveys are constructed for administrative purposes and it would be pure coincidence if they happened to be ideal for sampling. However, the first thing a sample designer needs is to know what frames are available and how far they enable him/her to sample the population completely, accurately and conveniently.

It is very difficult to find satisfactory sampling frames for studies of the elderly. Sampling frames which cover the whole population and are commonly used in social surveys (e.g. lists of electors) inevitably include large numbers of individuals who are not elderly. On the hand lists of the elderly prepared for specific purposes may not meet the six criteria outlined above. Most transport research on the elderly in the British Isles have nevertheless used such lists (for example Rihani 1982, and National Council For Aged 1986). Bailey and Layzell (1981) tried to use a local authority list of the electoral register, the social security, or the county council, but found it inadequate, because these lists or frames include some non-elderly and sometimes exclude some elderly.

5.3.5 Some examples

In this section a number of previous studies are briefly described to show how the researchers have solved the problems of research design. For example, in the survey by Moseley et al (1977) in his survey of rural Norfolk the sample was divided the sample into 5 social groups, and twenty five distinct activities were considered across the whole range of the study, and measured the accessibility by each of the social groups (within small zones) to each of the activities. Similar work was carried out in the rural areas of West Yorkshire (Cooper et al 1979). Bailey and Layzell (1981) covered two study areas: Coventry and Wealden (East Sussex), for each study area four samples were selected and a

large number of surveys were carried out during the study covering both areas. In this study two methods were used diary and questionnaire. This procedure resulted in generally high response rate. On the other hand they found some difficulties for example, on Coventry there were some delays due to refusal by the trade unions to take part in a vehicle log survey.

5.4 Methods of analysis

Researchers on travel demands of the elderly have used a variety of techniques to analyse questionnaire data. They can be broadly characterised as descriptive accounting methods, classification methods and modelling methods.

In the descriptive accounting methods the emphasis is on the frequency of respondents having particular characteristics and making particular trips. The resulting tables may be directly interpreted or subjected to non-parametric tests (e.g. chi-square). For example Banister (1980) used this method to distinguish between categories of respondents. However, sometimes it may also be used to make sensitivity tests of the sampling results, to detect the effect of additional variables. The weakness of such a method is that the overall proportion may hide quite large variations between individual cases. The limitations of such techniques are well known: in particular they do not easily handle multi-variate problems and the magnitude of effects is not directly measured. A classificatory approach seeks to identify categories of persons (in this case categories of older persons) which are distinctive in terms of personal characteristics travel behaviour, and in the context of this study modified or frustrated activities. A wide variety of methods have been used in this way including association analysis (Bamford et al 1987), automatic interaction detection (Gazeley and Morris 1977), and cluster analysis (Bailey and Layzell 1981). Many of these techniques can use nominal as well as ratio or interval data. Although classification methods can establish a multivariate description of travel

behaviour and travel need they are weak in establishing the strength of causal relationships within the data. In many cases too they require very large samples if they are to be effective (for more information about cluster methods see Everitt 1974 and 1986).

Modelling methods take the approach that a specific aspect of travel or activity can be statistically “explained” by one or more independent variables. For example in multiple correlation and regression analysis the number of social trips might be used as a dependent variable and the various contributing factors as independent variables in regression format and the statistical significance of the correlations examined. If the data are not of the form to justify formal significance tests the multiple R^2 statistic can nevertheless be used as a descriptive measure of the proportion of the variation which can be accounted for by the equation and so by each of the contributing factors (Upton and Fingleton 1985 and 1989, and Hensen et al 1956¹ and 1956²).

Another possible approach which to some extent combines modelling and classification is “discriminant analysis” a method used by Moseley et al (1977), Cooper et al (1979), Wachs (1979), Skelton (1979), and Bailey and Layzell (1981). By using predefined samples and a given set of variables or characteristics relating to the sample, discriminant analysis shows how much the sample can be regarded as separate on the basis of the variables chosen. The discriminant function is of the form:

$$Y_i = W_1X_i + W_2X_2 + \dots + W_nX_n$$

Where the X_j are the variables selected. The aim is to devise the weights W_i such that the mean values of Y_i for each of the samples (i.e. the group centroids) are as far apart as possible. The mechanics of this process are not dealt with here, but a simple explanation can be found in Bennett and Bowers (1976). The discriminant function coefficients (W_i) can be interpreted in a similar way to regression coefficients if expressed in standardised form

(e.g. standard deviation units). They therefore show the relative importance of each variable in the function. It is possible then to drive a classification function of the form:

$$i = V_0 + V_1Z_1 + V_2Z_2 + \dots\dots\dots + V_nZ_n$$

for each sample i , where V_0 is a constant, V_j the classification coefficients and Z_j the scores in the discriminating variables. The functions could be derived by using the centroids of the discriminatory variables for each sample, for priori knowledge of the probability of sample elements. A classification score for each individual with respect to each group is obtained. Under the assumption of a multivariate normal distribution the classification scores can be converted into probability of sample elements, so, that the case is assigned to the sample for which it has the highest probability. The classification procedure allows the researcher to check the accuracy of his/her original discriminant analysis, as well as providing a means of classifying other individuals into the appropriate groups. The discriminant procedure thus allows the researcher to separate out the variables against which sample differ most, from those on which they do not.

5.5 The research methodology used in this study

In the preceding sections the main issues in data collection and analysis were reviewed. In this section the main methods adopted in this study are outlined and assessed. The main method chosen was a postal questionnaire survey to samples of elderly people in four areas of Sheffield using lists prepared by the Family Health Service Authority as a sampling frame. A supplementary postal questionnaire survey was carried out of those who organise activities for the elderly using lists prepared by the Sheffield City Council.

5.5.1 Selection of study areas

It was decided to carry out the surveys in four selected areas within Sheffield.

The reasons for adopting this approach were:

- This approach would allow the researcher to build up detailed background to the interviews (e.g. activities available, shopping provision, transport network).
- The approach would make it possible to use local lists in establishing sampling frames.
- It would reduce the amount of variance in background variables - thus introducing an element of control.
- It would reduce the travel time needed by the researcher.

It will be noted that this type of approach is similar to that applied by other transport researchers (e.g. Bailey and Layzell 1981, and Skelton 1979) and rural studies (e.g. Banister 1980, and Moseley 1977).

5.5.1.1 The selection of research locations

The locations for the study were selected according to the following points:

- Contrasts in available local facilities/activities.
- Contrast in public transport provision.
- Distance from city centre and type of housing.

It will be noted that other variables (e.g. car availability) were not used in this research design but were covered in the questionnaire.

The following areas were therefore chosen for the survey:

	Public transport High	Public transport Low
Local facility high	1	3
Local facility low	2	4

- Public transport high and facilities high:
Area: Ward of Walkley.
- Public transport high and facilities low:
Area: Ward of Manor.
- Public transport low and facilities high:
Area: Ward of Birley.
- Public transport low and facilities low:
Area: Ward of Chapel Green.

5.5.2 The sampling procedure

The two main topics coming under sampling procedure are choice of sampling frame and method of approach to respondents.

5.5.2.1 The sampling frame

After investigating a number of possible methods it was decided to use the lists prepared by Family Health Service Authority as the main sampling frame. The advantages of these lists are that:

- 98% of the elderly are included in these lists.
- The lists are regularly updated.

- They can be used to select specific groups using basic information on age, gender, etc.
- They can be used to select specific areas using postal codes.

5.5.2.2 The method of approach to respondents

To ensure the confidentiality of the respondents, it was agreed that the first letter should be sent through the Family Health Service Authority direct to the respondents, with a stamped addressed envelope provided for reply. If the elderly agreed to participate then a second letter and questionnaire form and stamped addressed envelope were posted to individuals.

5.5.2.3 Sample size

The target was to achieve 100 complete questionnaires from each of the four study areas. As a high response rate could not be guaranteed the numbers of first approaches (from the F.H.S.A.) was initially, set at 200, but the first phase of the survey in Walkley yielded only 70 initial responses and 62 finally completed responses. In the three subsequent survey therefore the numbers of first approaches was increased to 250. The resulting responses are reported in 5.5.4 below.

5.5.3 The main questionnaire

In this study two main types of data collection were used a questionnaire for individuals and a similar questionnaire for those who organise activities for the elderly people.

5.5.3.1 Questionnaire for individuals

The object of this questionnaire was to record simple facts about the individual, the activities in which he or she is involved and the travel undertaken. It included both general questions about "usual" activities and travel, and about activities which are modified or frustrated by mobility problems. The questionnaire is given in Appendix B. It was hoped that most respondents would be able to complete the form by themselves or with the assistance of friend or relative, In a few cases it was necessary to help the respondent in telephone conversation.

5.5.3.2 The design of the questionnaire

Oppenheim (1984, and 1992) states that before writing a questionnaire, three decisions must be made:

- 1- The build up of question sequences and order of questions: to achieve this, the questionnaire was divided up into five sections The order of the questions after that was to ask questions (e.g. How many cars or vans are available in the household where you live? 1 car/van, 2 cars/vans, 3 or more cars/vans). I believed that this order of question will make it easy for the respondents to following the questions.
- 2- The order of questions: This involved a choice between factual and attitudinal questions. This choice was limited because the purpose of the research is to find out the level of elderly participation in the activities and the factors effecting such participation. This is why all the questions were about attitudes.
- 3- The use of pre-coded as opposed to free-response questions: The format of the questionnaire was a tick box. In addition to a certain number

of free-response questions to give the respondents chance to feel free to write what they like.

The design of the research questionnaire depended heavily on the information that needed to be gathered. This is why the questionnaire was designed after a series of interviews with a number of organisers and expert who work with the elderly people.

Six main elements were covered in the questionnaire which are: questions 1 to 11 covered the used of private car as driver or as a passenger, in the household car or in some other car, and the use of public transport, bus, minibus, or taxi. Question 12 covered the activities in which the elderly currently participate. Question 13 covered the activities in which the elderly currently wish to participate. Question 14a asked the elderly to report the main transport methods used in their participation in the activities. Question 14b asked the elderly to report the main transport difficulties encountered in using transport. Question 15 to 21 covered respondent characteristics. Finally at the end of the questionnaire two questions 22 and 23 were left as open questionnaires for elderly to report other transport problems and their suggestion to improve public transport.

The following stage was to pilot the questionnaire in order to get feedback from a few elderly people. *Eight copies of the questionnaire were sent to eight elderly (two in each area) who provided constructive comments on the questionnaire.* This was repeated four times until it was possible to produce the final draft of the questionnaire.

5.5.4 Outcome of the survey and respondent characteristics

5.5.4.1 Respondent characteristics

Table 5.2 reports the number of elderly contacted, agreeing to participate and finally responding in each area.

Areas	contacted	agreed	rate	responded	rate
Walkley	200	70	35.0%	62	31.0%
Manor	250	99	39.6%	92	36.8%
Birley	250	110	44.0%	104	41.6%
Chapel Green	250	103	41.2%	98	39.2%

Table 5.2: Outcome of the survey (rates are as % of all those with whom first contact was made.

It will be clear that the final response rate was low (especially in Walkley). This has two consequences for analysis. First because of the high rate of non-response it is possible (perhaps probable) that the respondents do not reflect the sample originally drawn, but there is no evidence of what bias is involved. It is possible for example that the non-response is associated with age, gender, eyesight or other aspects of the person and their mobility. Secondly the numbers in each sub-sample made it difficult to split sub-samples in analysis (especially for Walkley).

The characteristics of the respondents are nearly the same in all areas, with small differences; for example in all areas the respondent nearly have the same age groups, except those who are 80 years old or over, Walkley and Manor have the highest figure nearly 25% of all respondents.

Two main features stand out from Table 5.3. Firstly there are quite marked differences between the four areas with Walkley and Manor have the highest proportion of elderly living on their own and also of those living with a younger

Respondent lives:	Walkley	Manor	Birley	Chapel Green
On his/her own	42.6	45.7	36.5	27.6
With an elderly friend/ relative (65 or over)	37.0	29.3	59.6	59.2
With friend/relative (64 or under)	14.8	25.0	3.8	9.2
In a residential home	1.9	0.0	0.0	0.0
N/A or no answer	3.7	0.0	0.0	4.1

Table 5.3: Residence characteristics of respondents (figures give % of all respondents).

friend or relative (64 years old or under). In contrast Birley and Chapel Green have the highest proportion of elderly who live with an elderly friend or relative (65 years old or over).

Accommodation type	Walkley	Manor	Birley	Chapel Green
<i>A caravan or other mobile or temporary structure.</i>	0.0	0.0	0.0	0.0
<i>A whole house or bungalow:</i>				
* detached.	11.1	0.0	1.0	10.2
* semi-detached.	27.8	44.6	65.4	68.4
* terraced (includ end of terrace).	51.9	25.0	9.6	8.2
<i>The whole of a purpose built flat or maisonette:</i>				
* in a commercial building.	0.0	0.0	0.0	0.0
* in a block of flats.	5.6	18.4	15.3	9.2
<i>Part of a converted or shared house, bungalow, or flat:</i>				
* separate entrance into the building.	3.7	0.0	1.0	2.0
* shared entrance into the building.	0.0	12.0	7.7	2.0

Table 5.4: The proportion of elderly by accommodation type (figures give % of all respondents).

Table 5.4 shows that the elderly surveyed are living in three types of accommodation; semi-detached houses, terraced houses (including end of terrace), and in blocks of flats. It is clear from the table that Manor, Birley, and Chapel

Green have the highest proportion of elderly who live in semi-detached houses, however, Walkley have the highest figure living in terraced houses (including end of terrace). For those who live in block of flats Manor and Birley have the highest figure of elderly, this may reflect the high proportion of elderly living in Council estates in the two areas.

	Walkley	Manor	Birley	Chapel Green
As an owner occupier.	74.1	20.7	57.7	63.3
By renting the property furnished.	0.0	1.1	0.0	0.0
By renting the property unfurnished.	22.2	73.9	38.5	22.4
As resident in residential home.	1.9	0.0	0.0	0.0
In home of friend or relative.	0.0	0.0	1.9	13.3
N/A no answer	1.9	4.3	1.9	1.0

Table 5.5: Tenure by which the elderly occupy their accommodation (figures give % of all respondents).

It is clear from Table 5.5 that in the three areas Walkley, Birley, and Chapel Green there are substantial number of elderly who are owner occupiers (57.7% to 74.1%) but there are a significant difference between the three areas with higher figure in Walkley than the other areas. Manor has the lowest proportion of elderly living as owner occupiers, but the highest proportion of elderly 73.9% living by renting the property unfurnished. This reflects once again that most of the elderly in Manor live in a Council estate.

5.5.4.2 A comparison of respondents with the target population

Studies carried out by other researchers (Central Policy Unit 1992, OPCS: Office of Population Censuses and Survey 1989, and Sheffield Health Authority 1990) provide some descriptive statistics for the elderly population in each of the four study areas (these are shown in the top half of Table 5.6). The comparative figures for the respondents are given in the lower part of that

Characteristics of elderly population				
	Walkley	Manor	Birley	Chapel Green
Elderly population	3001	3112	4139	2932
(Age 65 ⁺)	17%	25%	22%	13%
Age 80 ⁺	25%	17%	16%	21%
On his/her own	Sheffield average 38%			
Owner occupiers	58%	8%	35%	61%
Access to car	59%	30%	n.a	64%
Respondents' characteristics				
Contacted	200	250	250	250
Agree	70	99	110	103
Respondent rate	31%	37%	42%	39%
Age 80 ⁺	26%	23%	8%	4%
On his/her own	42%	46%	37%	28%
Owner occupier	74%	21%	58%	63%
Access to car	35%	14%	37%	58%

Table 5.6: A comparison between characteristics of elderly population and respondents characteristics

Where; n.a. = not available, Sources = top half of the table from, Central Policy Unit 1992, Office of Population Censuses and Survey 1989, and Sheffield Health Authority 1990. Lower part from this study survey.

table. From this table it is evident that the respondents do not exactly reflect the target population in a number of respects. First the older elderly (80⁺) were under-represented in the surveys at Birley and Chapel Green. Secondly, owner occupiers were a larger than expected proportion in Walkley, Manor, and Birley. Thirdly, there are marked differences in access to car in Walkley and Manor with households having access to a car under-represented. It is not clear to what extent these differences represent defects in the sampling frame, bias in response, or simple sampling errors. They must however be kept in mind when interpreting the results in later chapters.

5.5.5 The main method of analysis

In this study the Statistical Package for Social Science (SPSS/PC) has been used in the analysis of the data. The main method of analysis used for the survey is the accounting method using the SPSS/PC (see chapters 7 to 11 above), supplemented in some cases by limited statistical testing. The detailed format of the analysis is described in relevant parts of the substantive chapters.

5.5.5.1 Problems in responses

The first problem was that there are substantial numbers of respondents in most of the activities who either do not carry out an activity or did not reply. This may reflect some misunderstanding of the question or the failure to distinguish between activities within the same category, but it may also reflect existence of suppressed demand which is met by using the service of friends, postal contact, etc.

The second problem was that due to misunderstanding the question, the respondent sometime tick more than one answer, e.g. if the respondent suffered from severe disability in walking and reported that bus and walking is the main transport method used in activity, then walking will be omitted.

The third problems was in the original design of the study assumed that most respondents would answer question 13 (activities in which the elderly currently wish to participate) and that the respondents would indicate desired levels of activity equal to or greater than the actual level of activity (question 12) reported in the earlier part of the questionnaire. The pilot trials of the questionnaire did not throw doubt on this assumption. In the main surveys however very large numbers of respondents for all or some activities ticked the columns "never" or made no responses, apparently because they misunderstood the question. This necessitated a change from the intended method of analysis. Because of this the results based on this question therefore refer only

to a small proportion of the total respondents in each area and there must be some doubt as to how far these results can be extrapolated.

The fourth problem was that in the original design assumed that most respondents would answer question 14b (transport difficulties encountered by the elderly in using transport), of the questionnaire either to record the difficulties actually encountered in travel or to record the difficulties which prevent travel. Although this appeared to work in the pilot questionnaire in the postal questionnaire many did not respond. There appear to be two reasons for this high level of non-response. In some cases the respondents were unaffected by any of the four difficulties, in other cases those not making trips for a particular purpose saw the question as not applicable. This means that the figures reported in the tables related to this question must be interpreted with caution.

5.5.6 Supplementary survey of organisers

In addition to the main survey a supplementary survey was carried out at an early stage of the project by approaching organisers of activities for the elderly. The organisers were able to contribute two types of data through phone interviews and open questionnaires. First, the organisers may be aware of aspects of the elderly's activities, travel and travel problems which were not known to the researcher and might not be fully evident even to elderly respondents. Secondly, they may be aware of travel problems which affect participation by the elderly in the activities which they provide as organisers, and of the problems posed by the need to ensure adequate transport (minibuses, car pools, etc.).

5.5.6.1 Sampling

It was decided to approach all the organisers of activities for the elderly in the four study areas using a list prepared by Sheffield Information Service.

Areas	contacted	agreed	rate	responded	rate
Walkley	29	15	51.7%	13	44.8%
Manor	11	11	100%	10	90.9%
Birley	23	16	69.6%	12	52.2%
Chapel Green	15	11	73.3%	7	46.7%

Table 5.7: Outcome of the organisers' survey (rates are as % of all those with whom first contact was made.

Table 5.7 shows that not all those first contacted agreed to take part: there were clear differences between areas with 100% in the Manor area, 51.7% of the organisers in Walkley. After the second contact the results show that in all areas a substantial number of organisers filled in and returned the questionnaire form (44.8% to 90.9%), but there were a significant differences between the four areas with the highest success rate in Manor, and much lower figures in Walkley, Chapel Green and Birley.

5.5.6.2 Questionnaire and methods of analysis

The questionnaire form used included two main parts: in the first part the organisers were asked to identify the main problems which their group activity has in the transport field. In the second part they asked to report from their point of view the main problems caused by transport for their members more general. The questionnaire is given in Appendix A.

The analysis of these questionnaire followed the same methods described in 5.5.5 as used for the individual questionnaire.

Chapter 6

The case study

6.1 Introduction

The study area defined for this thesis corresponds to the built-up area of the City of Sheffield. The case studies (the locations) were located in Sheffield which is one of the four Metropolitan Districts which comprise the County of South Yorkshire, the tier of local government responsible for the provision of public transport services being the Passenger Transport Authority which covers the whole county of South Yorkshire through a joint board of four metropolitan councils.

Sheffield lies on the borders of Yorkshire and Derbyshire amid some of the most spectacular scenery in Britain. Perhaps best known as the capital of the UK special steel and cutlery industries, the city now enjoys an international reputation as a thriving conference and tourist centre, attracting two million visitors each year to the region. With a population of over half a million, Sheffield is England's fifth largest city and has all the amenities expected of a modern, active centre.

6.2 The elderly in the Sheffield population

People in Sheffield were living at an average density of 13.6 persons per hectare, compared with a provisional figure of 3.2 for England and Wales as a whole. The Sheffield population in 1991 is 501,202 which is 42,498 lower than 1981; this means that the resident population of Sheffield decreased between 1981 and 1991 by 7.8% (1991 Census). The total population is projected to fall further to 486,900 by the year 2005. However, this overall reduction masks substantial changes in different age groups: for example a projected 23% decrease in the population aged 0 to 4 years, but a 36% increase in those over 85 years old (Sheffield Health Authority, 1990).

There were 91,535 persons in Sheffield aged 65 or over, representing around 18.3% of the total population (1991 Census). The equivalent figure for England and Wales was 15.8%. It is projected that the number of pensioners in Sheffield will decline until the turn of the century, but they will remain a substantial proportion of the city's population. In Sheffield less than 1% of the elderly people are members of ethnic minority groups. High birth rates in the early years of the twentieth century, together with increased life expectancy means, however, that the number of very elderly (aged 85⁺) is set to increase dramatically from around 8,368 in 1991 to around 11,000 in the mid 1990's (Central Policy Unit 1991). It is clear now that Sheffield has a significantly large number of elderly adults, especially those who are over 85 years old (Halliday, 1991). Table 6.1 indicates the proportion of elderly people in Sheffield in the 29 electoral wards. Long-stay residents in hospitals, old people's homes and other institutions are included in these figures. This increases the proportion of elderly people in certain wards (South Wortley, Broomhill, and Norton are examples (Central Policy Unit 1992).

Ward	65 - 69	70 - 74	75 - 79	80 - 84	85+	Total
BEAUCHIEF	894	938	848	589	423	3790
BIRLEY	1636	1136	693	424	250	4139
BRIGHTSIDE	621	535	449	259	173	2037
BROOMHILL	469	397	451	379	343	2039
BURNGREAVE	697	599	518	356	292	2462
CASTLE	672	543	458	229	172	2074
CHAPEL GREEN	938	774	610	375	235	2932
DARNALL	907	888	753	483	309	3340
DORE	1320	1100	840	620	420	4300
ECCLESALL	900	720	640	480	400	3140
FIRTH PARK	918	808	700	503	305	3232
HALLAM	994	754	718	515	350	3331
HANDSWORTH	1325	1199	877	537	322	4260
HEELEY	779	724	668	445	334	2950
HILLSBOROUGH	856	837	744	539	353	3329
INTAKE	1072	998	709	479	288	3524
MANOR	1083	971	535	311	212	3112
MOSBOROUGH	1418	1103	819	504	252	4096
NETHER EDGE	605	570	587	427	374	2563
NETHERSHIRE	1021	972	745	486	340	3564
NETHERTHORPE	607	656	623	443	302	2631
NORTON	1279	1076	796	546	374	4071
OWLERTON	768	652	603	359	212	2592
PARK	921	888	687	452	285	3233
SHARROW	580	515	467	370	274	2206
SOUTHEY GREEN	1037	941	654	383	223	3238
SOUTH WORTLEY	1148	1056	849	551	367	3971
STOCKSBRIDGE	655	614	423	259	178	2129
WALKLEY	777	741	724	459	300	3001
TOTAL	26993	23703	19186	12762	8642	91286

Table 6.1: Provisional 1991 population estimates for Sheffield (variation by ward and age).

Sources: Central Policy Unit, Sheffield city Council, January 1992.

Table 6.2 indicates that there will be increasing numbers of very old people in the population over the next 10 years. Measuring dependency among the elderly could be achieved by looking at functional criteria, like mobility and capability for self care and domestic tasks, and at clinical criteria, for example incontinence and mental state (Bond and Carstaires 1982). Four categories of dependency were defined according to how long an individual could manage alone without assistance. The categories are:

- 1- Independent.
- 2- Long interval (requiring only occasional assistance).
- 3- Short interval (requiring regular assistance).

Age group	1989	1995	2000	2005	% change 1989 to 2005
65 - 74	50.5	48.7	43.3	42.2	-17
75 - 84	32.8	31.5	31.7	30.3	-8
85+	08.4	10.5	11.7	11.6	+36
Total	91.7	90.7	86.7	84.1	-8
Male					
65 - 74	22.3	22.1	20.1	19.8	-11
75 - 84	11.7	11.6	12.1	12.0	+3
85+	01.9	02.7	03.2	03.3	+74
Female					
65 - 74	28.2	26.6	23.2	22.4	-21
75 - 84	21.1	19.9	19.6	18.3	-13
85+	06.5	07.8	08.5	08.3	+28

Table 6.2: The population of the elderly people in Sheffield.

Sources: OPCS short-term population extrapolation for 1989. OPCS 1985 based projections for 1995-2005.

Adapted from Sheffield Health Authority 1990

- 4- Critical interval (requiring assistance on demand, either because of severe functional incapacity, incontinence or mental impairment).

Dependency categories	% in each category	Number at each level of dependency
1- Independent	54.0	49734
2- Long interval	31.1	28643
3- Short interval no night help required	08.0	07368
night help required	01.0	00921
4- Critical interval	05.7	05434
Total		92,100

Table 6.3: Dependency of elderly population in Sheffield.

Sources: OPCS mid-term population estimate 1988. Adapted from Sheffield Health Authority 1990

Tables 6.3 and 6.4 estimate the elderly population in each dependency category in Sheffield. This demonstrates that there are about 14,000 people over the age of 65 years in Sheffield who have substantial care needs (categories 3 and 4). For almost 5500 of them the care needs to be available on

demand. This has major implications for families, informal carers, voluntary organisations and statutory organisations providing care in the city.

Dependency Category By Age Group					
Dependency categories	Number in each age group at each level of dependency in Sheffield				
	65 - 69	70 - 74	75 - 79	80 - 84	85+
1- Independent	18958	13176	09662	02845	01531
2- Long interval	08583	06803	06376	05309	02090
3- Short interval					
no night help required	00867	01582	02099	02261	01725
night help required	00173	00226	00297	00165	00203
4- Critical interval (no demand).	00318	00836	01406	02096	02471
Total in categories 3 + 4	01358	02644	03802	04522	04399

Table 6.4: Estimated number of Sheffield people requiring care by amount of care required, and age group

Sources: OPCS mid-term population estimate 1988. Adapted from Sheffield Health Authority 1990

As can be seen from Table 6.4 that the number of people in the very dependent categories increases with increasing age.

6.3 Residence characteristics of Sheffield's elderly

In Sheffield approximately 94% of elderly people live in their own homes, however there are around 40,000 of them living alone (Halliday 1991), and 6% in long term residential or nursing homes with a small number in long term hospital care. Government policy is that elderly people be given the choice of staying in their own home as long as possible and not admitted to residential care unless social and health care services cannot feasibly be provided in any other way (Sheffield Health Authority 1990).

There were around 91,535 persons in Sheffield aged 65+, of the total number

of elderly persons in Sheffield in 1991, 89,200 were estimated to be resident in private households (1991 Census), the remainder in institutions such as hospitals and homes for elderly. This mean that around 3,000 elderly persons in Sheffield, or 3% of the population aged 65+, lived in public or private sector institutions.

Persons 65+	65 - 74	75 - 84	85+	total %
Living alone.	28	49	71	38
In couples 65+.	52	42	12	46
With others under 65.	20	09	16	16
Total	50,000	31,000	7,000	89,000

Table 6.5: Type of household by age group

Sources: Central Policy Unit 1991.

Table 6.5 shows the proportion of elderly in each of 3 age groups living in each of 3 different household types, which included at least one person aged 65 or over, just over half comprised one elderly person living alone. These households included over 38% of all persons aged 65+, which suggests a total of around 34,000 elderly persons (Central Policy Unit 1991). Another study estimated that there were around 37,000 persons of pensionable age living alone in Sheffield in 1990 (Sheffield Health Authority 1990), out of a total in private households of around 89,000.

The very elderly were most likely to be living alone, 71% compared with only 28% in the 65 - 74 age group. Just over half this younger age group lived with another person aged 65+, whilst 20% lived with persons aged under 65. Very few of the middle age group, 75 - 84, lived with other persons aged under 65 (Central Policy Unit 1991).

Table 6.6 indicates the highly diverse population structures of different wards of Sheffield: the variation in the proportion of people living alone, in home ownership, in access to private transport, and the proportion belonging

	% Hallam	% Manor	% Sharrow	% Nether- thorpe	% Broomhill	% Chapel Green
Elderly living alone	06.3	06.7	07.9	10.7	06.8	03.8
Households lacking indoor bathroom and WC.	01.8	00.3	04.9	03.1	01.6	00.8
Home ownership	71.7	07.7	34.8	26.9	58.5	60.8
Access to car	69.4	30.0	31.5	28.9	58.5	64.1
Ethnic minorities	00.7	00.5	05.7	01.7	01.7	00.2

Table 6.6: Variation between electoral wards, 1981

Sources: Health care and Disease - A Profile of Sheffield.

to ethnic minorities. Resources are scarce and there is an increasing gulf between the better off and the worst off in society-both in terms of income (from pensions and investments) and in terms of property ownership (Smith et al 1990). Targeting of resources to where they are most needed might also involve taking into account a person's own financial circumstances (Sheffield Health Authority 1990). The absolute number of elderly people who are poor is still very high (Halliday 1991). Central Policy Unit (1991) reported that many elderly persons live in council accommodation. Almost half the households with persons aged 65+, over half the elderly persons living alone, were renting from the council. Elderly couples, however, were more likely to own their own homes than single persons.

However Tables 6.6 and 6.5 indicate that there is no relationship between the number of elderly people living in the area and type of accommodation or access to the car. For example, Manor has 3112 elderly and the lowest percentage of elderly home ownership and access to car. On the other hand Chapel Green has 2932 elderly and one of the highest percentage of elderly home ownership and access to car.

6.4 Disabled elderly in Sheffield

The highest proportions of disabled people are to be found among the elderly and the very elderly nevertheless there are substantial proportions of disabled people, especially among the lower categories of severity, in the younger age groups (Sheffield Health Authority 1989). The OPCS estimates of the prevalence of disability among adults in Great Britain living in private households by age and severity category, are applied to the elderly population of Sheffield in the following table:

Age group	OPCS Severity Category										total	% of population
	1	2	3	4	5	6	7	8	9	10		
60 - 69	3305	2419	1829	1652	1593	0885	0826	0649	0590	0177	13925	23.6
70 - 79	3437	2901	2365	2008	1964	1651	1250	1026	0759	0268	17629	39.5
80+	1594	1204	1257	1204	1523	1222	1417	1009	1063	0443	11936	67.4

Table 6.7: Estimates of prevalence of disability among adults in private households in Sheffield (by age and severity category).

Sources: National rate from Sheffield OPCS surveys of disability in Great Britain, Report 1, "The prevalence of disability among adults" 1988. Population mid 1986, (excluding population in long-stay institutions and halls of residence), revised estimates, Central Policy Unit 24-11-87.

Adapted from Sheffield Health Authority 1989

Table 6.7 indicates that there are approximately 50% of the elderly people in Sheffield are disabled people.

6.5 Some of elderly activities

A major objective of this section is to report some of the elderly activities, and concentrates in the use of some services by elderly persons as well as use of the city centre and markets and involvement with the local community.

6.5.1 Local community involvement

The Central Policy Unit in the City Council carried out a household survey in 1990. The survey asked to what extent the elderly were involved with activities in their local community. The response from elderly persons was very similar to that of all adults interviewed for the survey around 20% were at least fairly involved in local activities whilst 60% said they were not involved at all.

6.5.2 Use of leisure services

Information on the usage of a range of leisure services was recorded by the same household survey. Table 6.8 shows the proportion of persons within 3 age groups who used each of the services listed. It should be noted that the time period covered varied for different services for museums and art galleries usage over the last year was requested (from the survey date), whilst for swimming the period was the previous four weeks. The last column in the table shows the rate of usage for persons of all ages, including children.

leisure services	65 - 74	75 - 84	85+	all 65+	all persons
Libraries	40%	31%	18%	35%	40%
Parks	30%	25%	16%	27%	42%
Art Galleries	19%	12%	02%	15%	24%
Museums	16%	11%	02%	13%	26%
Passport to leisure	16%	07%	00%	12%	16%
Swimming	03%	02%	00%	02%	20%

Table 6.8: Elderly persons use of leisure services

Sources: Central Policy Unit 1991.

Not surprisingly, few elderly persons took advantage of the more active leisure activities such as swimming, although a significant proportion of those in the 65 to 74 age group hold a passport to leisure. The leisure services used

most commonly by the elderly were the Libraries and Parks, over one-third of all elderly persons had used a Library in the six months prior to interview and over one quarter used Parks at least monthly. These two services were used by elderly persons of all ages including those aged over 85 years.

6.5.3 City Centre and Markets

Central Policy Unit (1991) in their survey "household survey" also they were asked the respondents about the city centre and the markets. In both cases the frequency of usage was recorded in Table 6.9.

Age group	City centre	Markets
65 - 74	61%	39%
75 - 84	46%	30%
85 ⁺	29%	19%
All elderly persons	53%	34%

Table 6.9: Elderly visitors at least once a week to city centre and markets

Sources: Central Policy Unit 1991.

Table 6.9 shows that elderly persons visited the city centre less frequently than other adults, although the differences were not very great. The biggest difference was in those who never visited the city centre 17% of elderly respondents compared with only 5% of all adults. The most frequent elderly visitors to the city centre were the 65 to 74 age group, although over one-quarter of respondents aged 85 and over still visited the city centre at least weekly. In contrast, elderly persons were more frequent visitors to the Sheaf and Castle market than other adults interviewed around one-third of elderly respondents visited the markets at least weekly compared to just over one-quarter of all adults.

6.6 The target areas

Because the intention of carrying out the research was to investigate the activities (fully achieved, modified, and frustrated activities), of the elderly survey had to be undertaken in different areas as explained in Chapter 5. It was decided to select four location (wards) within Sheffield. In selecting these wards three major characteristics taken into consideration: number of elderly population, the area's provision public transport (high or low), and the level of local facilities available, but the distance from the city centre and the type of housing were also be taken into consideration. The wards selected to be the main study areas for this study were Walkley, Manor, Chapel Green, and Birley.

6.6.1 Area 1; Walkley

This is a well established residential area with a mixture of housing types. Walkley lies approximately 3Km North West the city centre.

Walkley has a total population of 17,650 of whom 17% are aged 65 years old or more. In Walkley 58% of the elderly are owner occupiers, the others living in council houses or flats, and some living in residential homes for the elderly. However, Sheffield City Council are currently building new houses for the elderly and people on low income, and improvements are being made to housing and the environment in Netherthorpe. In this area about 2% of the elderly people are members of ethnic minority groups. About 59% of the elderly in Walkley have access to a car.

The area is served by a district shopping centre north of the area and also there are local shopping centres in South Road down to Walkley Road, and another in the east of the area in Addly Street. The area is served by a main medical centre "Walkley Medical Centre" at Greenhow Street, also there

are other medical centres around the area including the Hillsborough Health Centre at Limbrick Road, Kelvin Health Centre at Albert Terrace Road, Stanington Health Centre at Uppergate Road (serving South West Walkley) and Broomhill Clinic at Taptonville Road (serving South of Walkley). There is no main Park in Walkley, but the people of Walkley can use the nearby Weston Park and Crookes Valley Park, there are other open spaces in the area for public use (e.g. Recreation Ground, Walkley bank plantation).

The area is served by about 15 bus routes which provide links to the city centre via Infirmery Road to the north via Walkley Road to the south, and yet other services provide links to areas around Walkley (e.g. Loxley, Crookes, Marchwood, Wisewood), also there are two circle services (the first from City Centre to Crookes then to Walkley via Walkley Road, the other one from City Centre to Walkley then to Lodge Moor via South Road, Walkley and Walkley Road). About 90% of the area is within 0.5 Km of at least one of these routes. These services provide links to all main hospitals in Sheffield, for example 902 circle provides links to Lodge Moor Hospital, 97 to Northern General Hospital, 95 to the Jessop and Childrens' Hospital and 52 to Hallamshire Hospital.

6.6.2 Area 2; Manor

This is a residential area with one District shopping centre and many local shopping centres. It includes area special characteristics of housing types, it also includes areas of older Council housing on Sheffield. Manor lies approximately 3Km East of the city centre.

Manor has a total population of 12,450 of whom 25% are 65 years old or over. There are only 8% who are owner occupiers, the majority of living in Council houses or flats and some living in residential homes for the elderly. Sheffield City Council are currently building new houses for people on low income and the elderly will be provided on sites such as those on Manor estate, another

sites for new houses will be on clearance land in the Manor estate. In this area less than 1% of the elderly people are members of ethnic minority groups. About 30% of the elderly people have an access to private car.

The area is served by a district shopping centre at the end of City Road and at the beginning of Mansfield Road, also there are many small shopping centres. The area is served by a main medical clinic called "Manor Clinic" at Ridgeway Road. A key factor of the area is the City Road which provides not only the main shopping centre but also a variety of other residential, commercial and open space land uses (including parks and a cemetery).

The area is served by about 20 bus routes which provide links to the city centre via City Road and Sheffield Parkway to the south and the east. On the other hand Sheffield Parkway and Mansfield Road provide links to the M1 Motorway, Prince of Wales Road provide links to the main industrial area in Sheffield and also to Meadowhall Shopping Centre, also there are about 8 services which provide links to Rotherham via Rotherham Road and via Prince of Wales Road. About 70 to 80% of the area is within 0.5Km of at least one of these routes. Some of these services provide links to hospitals (like 52 to the Jessop and Childrens Hospitals), but for other hospitals there are no direct routes.

6.6.3 Area 3; Birley

Birley is a well established residential area, with one district shopping centre at Birley Moor Road, and two other small shopping centres. Birley lies approximately 7Km South East of the city centre.

Birley has a total population of 19,250 of whom 21.5% are aged 65 years old or over. In Birley 35% of the elderly are owner occupiers the others living in Council houses or flats or residential homes for the elderly people. In this area about 2% of the elderly people are member of ethnic minority groups.

The area is served by “Birley Health Centre” at East Glade Crescent, the main medical centre for the area, and there are two other medical centres around the area, which is “Gleadless Clinic” at White Lane and “Hackenthorpe Health Centre” at Main Street. In the area there are many playing field, sports grounds and open space areas for public use.

The area is served by about 8 bus routes which provide links to the city centre via Mansfield Road and Ridgeway Road to the North and to the South. Other services provide links to other areas, for example, the circle service via Ridgeway provides links to Manor, to Meadowhall via Prince of Wales Road, also to Norton and Charnock via Birley Moor Road. Birley Moor Road provides links to the M1 Motorway and to North east Derbyshire. There are no direct bus links to hospitals in the city.

6.6.4 Area 4; Chapel Green

Chapel Green was a quite historic village surrounded (not on all sides) by woods and farmland which is now a residential suburb of Sheffield with one District shopping centre in Station Road and many small shopping centres. Chapel Green lies approximately 10Km North of the city centre and has a total population of 23,450 of whom 13% are aged 65 years old or over. In Chapel Green 61% of the elderly are owner occupiers, the others living in council houses or residential homes for the elderly people. The area includes some council housing, some of these housing need modernisation and repair, for example, Council housing at High Green and The Fosters Tower Block. Sheffield City Council have proposed to built sites of new houses at Greenhead Gardens, Hunshelf Road, Charlton Inronworks and Hillside West, Thorncliffe (Department of Land and Planning 1991). In this area only 0.2% of the elderly people are members of ethnic minority groups. About 64% of the elderly have access to private cars.

The area is served by two main medical centres which are the “Chapel Town Clinic” at Bevan Way and “High Green Health” at Thompson Hill, but “Ecclesfield Health Centre” at Mill Road, Ecclesfield also serves the south of the area. There are also many Parks and open spaces, for example, Mortomley Park.

The area is served by about than 10 bus routes which provide links to the city centre via Ecclesfield Road and Penistone Road to the north and to the east. Some routes provide links to other areas within Sheffield like Bradway and Lowedges, other services provide links to other areas out of Sheffield, for example, to Mexborough to Windhill via Doncaster Road, to Rotherham via Centenary Way, also to Barnsley via Potter Hill Lane and Thompson Hill via Station Road. Less than 50% of the area is within 0.5Km of a bus route. Cowley Lane and Station Road are provide links to the M1 Motorway. On the other hand there are no direct links to the Hospitals except the Northern General Hospital.

Chapter 7

The organisers' perspective: transport problems and the elderly activities

7.1 Introduction

The purpose of this chapter is to identify the main transport problems affecting the life of elderly people, their participation in different activities, and the relationship between transport problems and the elderly participation in these activities as perceived by the organisers who organise activities for the elderly. All the results reported in this chapter are therefore from the organisers' point of view. It should also be stressed that organisers were asked to report on the experiences of their members, not of the elderly in that area in general. In as much as members of clubs are often more mobile than the elderly in general their views may understate the extent of mobility problems.

The main questions to be examined in this chapter are:

- How many elderly have transport problems?

- For which activities are problems most acute?
- What is the impact of transport problems on participation in activities?
- To what extent are the specific activities run by the organisers dependent on special transport provision?
- Is there a consistent pattern of similarity / difference between the four study areas?

In addition the various sections of the chapter examine the extent to which the subjective judgements of those who organise activities for potentially distinct subsets of elderly people give rise to different points of view even within the same area of the city.

7.2 Who are the organisers?

The organisers of activities for the elderly are voluntary persons or organisations in Sheffield concerned with elderly people. This voluntary sector includes local branches of national charities, local charities, city wide campaigning groups, and neighbourhood support groups. Among the groups and the activities, the study in this chapter concentrated on senior citizens clubs, and lunch clubs. In Sheffield there are about 132 of these clubs, 68 of them serving the areas covered by this study. The organisers organise the meetings and the activities, and if special transport or equipment is needed it is the organisers' responsibility to provide. In the study areas all the clubs meet at least twice a month. The organisers see the transportation for the elderly as an integral part of their general human service delivery system, but often lack the expertise to provide a professional transportation service. The problem is compounded because transportation for the elderly has to be individualised due to the special needs of particular club members. This not only drains the

resources of social-service for the clubs, but also contradicts the ideology of full accessibility of a very special group of people by providing them with a common, regularly scheduled public or private transportation. However, all the organisers agree that providing transportation to the elderly is typically a socio-humanistic service. Because of this, the performance of the transportation system for the elderly people has to be measured ultimately in terms of satisfaction to the subject clients.

During 1991/1992 the Family and Community Services Department in Sheffield began a review of the Grant Aid system for transport and lunch club support and its own transport resources. During 1992/93 the Family and Community Services Department developed new partnerships with voluntary bodies to provide transport for older people to a range of activities; to develop joint assessment of volunteer drivers, and to streamline the system for payment of car mileage for volunteer drivers in partnership with Sheffield Community Transport. As the survey was carried out in June 1992 some of the results reported here may therefore describe conditions which no longer exist.

7.3 How many elderly have transport problems in attending special clubs and organisation activities?

It is evident from our results that not all elderly necessarily have transport problems when they want to participate in the clubs or social activities surveyed. However, this chapter reports the difficulties as seen by the organisers who were asked if their organisation has members unable to attend regular events because of transport difficulties.

Table 7.1 shows that in all the four study areas transport difficulties affect

The area	Number	% Yes	% No
Walkley	13	69.2	30.8
Manor	10	90.0	10.0
Birley	12	66.7	33.3
Chapel Green	7	85.7	14.3

Table 7.1: Proportion of organisations having members unable to attend regular events because of transport difficulties.

attendance at the activity, with higher figures in Manor and Chapel Green than in Walkley and Birley. Some of the possible reasons for these differences were suggested by respondents' answers and comments. For example, some Walkley respondents noted that some members have cars, in both these areas reference was made to convenient and frequent bus services and in the case of Birley to the location of the activity surveyed being close to members' homes. In contrast in Manor and Chapel Green the bus system was seen as inadequate and reference was made to late-running.

7.3.1 Proportion of elderly people with transport difficulties in each area

It is recognized that the degree of effect of transport problems on an elderly person will vary depending upon the area, the club's activities, the personality and the ability of the elderly person as well as on transportation available. Further the type of transportation itself may vary depending upon both the particular area and the particular characteristic of individual case. However, the results from this survey show that, even in the same area and at the same

club there are differences between the elderly and how they affected by the transport problems. The results shows that the transport difficulties have a different type and degree of effect in the participation in clubs activities or preventing them to attend the regular meetings.

The area	No: of orgs.	Proportion of members affected				
		< 10%	10 – 39%	40 – 59%	60 – 89%	90 – 100%
Walkley	13	7	2	4	-	-
Manor	10	3	4	2	-	1
Birley	12	5	4	2	1	-
Chapel Green	7	1	2	2	1	1

Table 7.2: Proportion of the elderly people whose attendance at events is affected by transport problems (table values reporting the numbers of organisers reporting that level of effect).

Table 7.2 records the proportions of the elderly affected by transport problems as perceived by the organisers of the activities in which they take part. The key features of the table are firstly that organisers in Chapel Green more often perceived a majority of their members as being affected: secondly that the least affected are those in Walkley and Birley (Manor appears to have an intermediate position). The third important point is that even within an area there may be great differences in the experience of organisers: this is especially clear in the case of Chapel Green and Manor where some organisations have less than 10% of members affected but others have more than 90%.

7.3.2 Types of transport assistance

The differences in Table 7.2 are partly due to differences in the amount and form of transport assistance available to club members. This aspect was included in the questionnaire by asking organisers to record the dependence of their members on various forms of transport (see Table 7.3). Two points need to be explained about this table. First the values in each cell record the average percentage for all respondent groups in the area unweighted by group size: they should not therefore be read directly as the proportion of people dependent. Secondly the category “none” includes those elderly who were able to make their own way to the activity without any third party assistance (in most cases walking but including in some cases their own vehicle). From the table it is evident that the greatest dependence on special provision for the club occurs in Chapel Green (c. 63%) and the least in Walkley and Birley: The Manor occupies an intermediate position. It is notable that lifts from friends and relatives and trips by taxi play a very small role.

Figure 7.1 shows that the results from the two different parts of the questionnaire are consistent. In the Figure it is clear that as difficulty in attendance increases so also dependence on special transport provision, although the degree of dependence is higher in Chapel Green than in Manor even though general difficulty in attendance was a little lower.

Type of help	Walkley	Manor	Birley	Chapel Green
Depend on special transport connected with club	23	29	17	47
Depend on lift from volunteer driver	10	19	14	16
Depend on lift from friend/relative	1	4	1	5
Depend on Taxi	4	2	2	1
Depend on public transport only	32	26	44	31
None	24	20	15	0

Table 7.3: Dependence on transport mode for attendance at the club activities (table figures record the average for all respondent groups in the area).

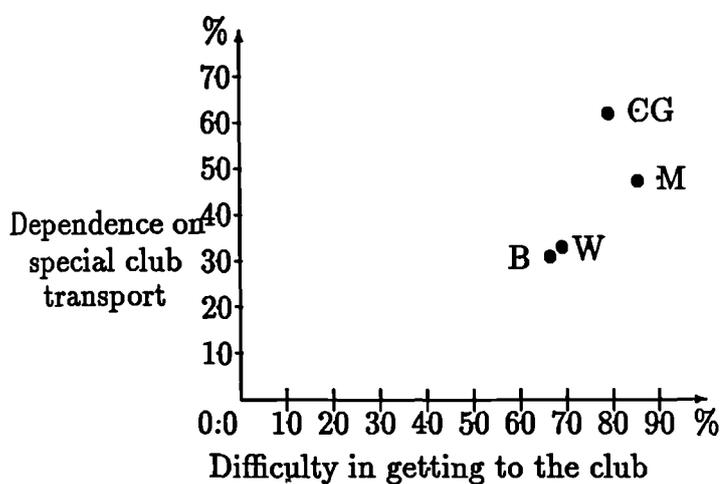


Figure 7.1: The relationship between reported proportion of members experiencing transport difficulty and level of dependence on special club transport.

From the analysis of the data Chapel Green is the area most affected by transport problems. Tables 7.4, 7.5, 7.6, and 7.7 report the proportion of organisers whose members required help by type of transport provided for them. The summary figures in Table 7.3 once again conceal important variations within each area: this is clear from the data in Tables 7.4 to 7.7. From those tables it is clear that Chapel Green is the area most dependent on special transport connected with club, Walkley and Birley are the least dependent areas, and Manor appears to have an intermediate position. Walkley and Birley are the areas most reliant on public transport however, and Manor and Chapel Green are the least reliant. The tables show there are no significant differences between the four areas in dependence on lifts from volunteer drivers, lifts from friends or relatives, and taxis.

Type of help	Walkley			
	0 - 9%	10 - 29%	30 - 59%	60 - 100%
Depend on special transport connected with club	46.1	23.1	07.7	23.1
Depend on lift from volunteer driver	53.8	38.5	-	07.7
Depend on lift from friend/relative	38.5	53.8	07.7	-
Depend on Taxi	92.3	-	07.7	-
Depend on public transport only	30.8	07.7	46.1	15.4

Table 7.4: The proportion of organisers whose members required help by each type of transport available to them: Walkley area.

Type of help	Manor			
	0 - 9%	10 - 29%	30 - 59%	60 - 100%
Depend on special transport connected with club	50.0	10.0	10.0	30.0
Depend on lift from volunteer driver	30.0	50.0	10.0	10.0
Depend on lift from friend/relative	70.0	30.0	-	-
Depend on Taxi	90.0	10.0	-	-
Depend on public transport only	30.0	30.0	20.0	20.0

Table 7.5: The proportion of organisers whose members required help by each type of transport available to them: Manor area.

Type of help	Birley			
	0 - 9%	10 - 29%	30 - 59%	60 - 100%
Depend on special transport connected with club	33.3	41.7	16.7	08.3
Depend on lift from volunteer driver	58.4	16.6	25.0	-
Depend on lift from friend/relative	50.0	50.0	-	-
Depend on Taxi	91.7	08.3	-	-
Depend on public transport only	08.3	16.7	41.7	33.3

Table 7.6: The proportion of organisers whose members required help by each type of transport available to them: Birley area.

Type of help	Chapel Green			
	0 - 9%	10 - 29%	30 - 59%	60 - 100%
Depend on special transport connected with club	14.3	14.3	28.6	46.8
Depend on lift from volunteer driver	28.6	57.1	14.3	-
Depend on lift from friend/relative	85.7	14.3	-	-
Depend on Taxi	100	-	-	-
Depend on public transport only	28.6	28.6	28.6	14.2

Table 7.7: The proportion of organisers whose members required help by each type of transport available to them: Chapel Green area.

7.4 How many elderly have transport difficulties in participating in other activities?

In the second part of the questionnaire club organisers were asked to comment on their members' experience of transport difficulties for a range of activities. Three points need to be made about the analysis which follows: first, in a few cases the activity categories will overlap with the activity of the club; second, low sample sizes mean that results must be interpreted with caution and cannot be further broken down for analysis, and thirdly the format for data collection from the organisers of activities for elderly people raises a question about the consistency of results: because the activities differ (lunch clubs, etc) the type of elderly person involved will also differ, in such a case the questionnaire's focus on "your members" may result in differences between patterns reported by activity organisers within the same area. Similarly the element of subjective judgment required by organisers in answering the questionnaire may have led to some differences. In this section the extent and nature of such differences are explored.

7.4.1 Proportion of elderly people effected by transport problems

Thirteen main activities were considered in this study. The surveys have shown the significant different in travel behaviour and participation in the activities amongst the respondents. In this case the results reported in this section will be reported by the average according to individual study area. This section therefore concentrates on the elderly activities which affected by transport difficulties. The following tables will show the current level of elderly partici-

pation in these activities, from the organisers' points view.

The degree to which it is possible to generalise on these issues is of course an important matter from the organisers' and the elderly's point of view in evaluating social needs. Tables 7.8, 7.9, 7.10, and 7.11 show the proportion of club members affected by transport problems in each area. For each area thirteen main activities were considered. For each activity organisers were asked to comment on the proportion of their members affected, and on the type of effect (frequency of activity, location of activity). As a general rule the tables show that the majority of the elderly peoples' participation in these activities has been affected by transport problems. However, a small proportion of elderly people particularly in Manor and Chapel Green, do not participate in most of the activities and they it seems have no desire to do so. This raises some important questions which will be addressed in the following chapters, when a comparison will be made between the response of the organisers and the response of the elderly. For example, does this represent the failing of the transport system available to them in these areas, the lack of perception of what opportunities or potential opportunities are available to them, or simply an acceptance (with or without contentment) of the constraints imposed on their lifestyle by their limited access to most of the activities available to them and need transport, if they want to participate in this activities. On the other hand even if the transport mode is easy to use and available to them, they may still have problems in walking the distance to the transport made available to them by the transport system in the area.

7.4.1.1 Economic activities

The tables show the degree of affect by transport problems on the elderly people in connection with each of the activities, This activities have been divided into four groups of activities (economic, social, medical, and others).

The most frequent or may be daily activities for the majority of the elderly people is the economic activities (see Table 7.8). Economic activities which have been surveyed in this study are shopping, personal business (e.g. bank, post office, building society), and betting shop. The analysis of the data shows that the proportion of elderly people in Chapel Green and Manor which affected by transport problems is high compared to Walkley and Birley for shopping. However, the respondents classified to two groups in Walkley and Birley for shopping, first group, reported that there are *some* of their members affected by transport problem, the other reported *most or nearly all* of their members have been affected. For the personal business (e.g. bank, post office, building society) the effect by transport problems on the elderly people in Walkley and Chapel Green is high compared to Manor and Birley. However, in Manor one third of the respondent reported that there are *most* of their member affected by the transport problem when they want to participate in personal business. The high level of public transport and facilities available to the elderly people appears to play a very significant role in shopping activities especially if the response relates to Walkley or Birley. The elderly people in Walkley and Birley are more likely to walk or use bus. This is different from Manor and Chapel Green, where the majority of the elderly depend on special transport or on lifts from volunteer drivers. However, the elderly in Manor and Birley are more likely to walk for personal business, however, the opportunity more wider for the elderly people in Walkley because they could walk or use bus. Furthermore, when we talk about walking we exclude some of the elderly which they could not walk and they haven't access to the transportation system. These elderly mainly in Manor and Chapel Green areas. For Betting shop activities the tables reported that the results were the same for Manor, Birley, and Chapel Green. The respondents reported different answers in these areas, they distinguish between having *very few*,

some, nearly half, or most of their members affected by transport problems when they participate in Betting activities. However, in Walkley they reported two types of elderly, first, some reported that they have *very few* of their member affected, the other reported *nearly all* of their member affected. The explanation of this because in Walkley most of the Betting shops are in the reach of the majority of the elderly population within the area and they did not need to use transport, because it is in the walking distance.

Activities	proportion of members affected by transport problems					
	very few	some	nearly half	most	nearly all	N/A
Walkley area						
Shopping	23.0	30.8	-	30.8	15.4	-
Personal business (e.g. bank, post office, building society)	23.1	23.1	-	30.7	23.1	-
Betting shop	46.2	-	-	-	30.8	23.0
Manor area						
Shopping	20	20	20	20	20	-
Personal business (e.g. bank, post office, building society)	-	30	10	50	-	10
Betting shop	40	20	-	10	-	30
Birley area						
Shopping	08.3	41.8	08.3	33.3	08.3	-
Personal business (e.g. bank, post office, building society)	16.7	25.0	25.0	33.3	-	-
Betting shop	33.3	16.7	16.7	33.3	-	-
Chapel Green area						
Shopping	-	42.9	-	57.1	-	-
Personal business (e.g. bank, post office, building society)	-	28.6	-	57.1	14.3	-
Betting shop	57.1	28.6	14.3	-	-	-

Table 7.8: Proportion of clubs members affected by transport problems on economic activities.

7.4.1.2 Social activities

The second group of the elderly activities which surveyed in this study are social (see Table 7.9): this includes, social activities (e.g. pub, etc.), regular social meeting (e.g. social club, lunch club, whist drive), and visiting friends or

relatives at home. The tables show that the proportion of the organisers with members affected by transport problems is higher in Birley than in Walkley and Chapel Green, and Manor appears to have an intermediate position. The explanation for this is that in Walkley and Chapel Green the elderly participate locally, and it is therefore within walking distance for the majority of the participants. However, in Birley not only do most elderly live at such a distance that they require transport to visit pubs, but also many of the elderly are unsufficiently able to walk even short distance. Because of this Birley has been highly affected. For regular social meeting (e.g. social club, lunch club, whist drive), and visiting friends or relatives at home, the tables show that Chapel Green is the area highly effected by the transport problems, Walkley and Birley are the least effected, and Manor once again appears to have an intermediate position.

7.4.1.3 Health related activities

Health related activities are the third group of activities which have been surveyed in this study (see Table 7.10). This includes visiting friends or relatives at hospital, medical (e.g. visiting doctor, day centre, clinic), visiting hospital as an out patient, visiting dentist, and visiting chiropodist. The effect of transport problems on the elderly participation in these activities does not vary much between the areas except that Chapel Green has higher proportion. In Walkley, Manor, and Birley nearly one third of the organisers reported that *nearly all* of their members have transport difficulty when they participate in these activities, however in Chapel Green *most* of their member having transport problems. There are two reasons why the problems are greater in Chapel Green than the other areas. First, more special transport is available to the elderly people in Walkley, Birley, and Manor than in Chapel Green, and secondly, the facilities are of higher quality and quantity in these areas than

Activities	proportion of members affected by transport problems					
	very few	some	nearly half	most	nearly all	N/A
Walkley area						
Social (e.g. pub, etc.)	07.7	46.2	15.4	-	15.4	15.3
Regular social meeting (e.g. social club, lunch club, whist drive)	15.4	30.8	07.7	07.7	38.4	-
Visiting friend/relative at home	15.4	46.2	-	-	30.8	07.6
Manor area						
Social (e.g. pub, etc.)	20	-	30	20	10	20
Regular social meeting (e.g. social club, lunch club, whist drive)	10	30	10	10	40	-
Visiting friend/relative at home	20	30	-	20	20	10
Birley area						
Social (e.g. pub, etc.)	08.3	16.7	33.3	41.7	-	-
Regular social meeting (e.g. social club, lunch club, whist drive)	16.7	16.7	-	33.3	33.3	-
Visiting friend/relative at home	16.7	41.6	-	25.0	16.7	-
Chapel Green area						
Social (e.g. pub, etc.)	-	14.3	71.4	14.3	-	-
Regular social meeting (e.g. social club, lunch club, whist drive)	-	28.6	-	14.3	57.1	-
Visiting friend/relative at home	14.2	-	-	42.9	42.9	-

Table 7.9: Proportion of clubs members affected by transport problems on social activities.

in Chapel Green. The facilities are within walking distance for most of the elderly in these areas especially Walkley and Birley, but in Chapel Green they are not.

7.4.1.4 Other activities

The final group of the elderly activities surveyed in this study is other activities. This includes travel to hairdresser and religious services (e.g. church) (see Table 7.11). The tables show that there is no significant different between the areas and the affect of transport problems nearly the same.

Activities	proportion of members affected by transport problems					
	very few	some	nearly half	most	nearly all	N/A
Walkley area						
Visiting friend/relative in hospital	07.7	46.2	-	-	30.8	15.3
Medical (e.g. visiting doctor, day centre, clinic)	07.7	53.8	-	-	30.8	07.7
Visiting hospital as an out patient	-	61.5	15.4	-	23.1	-
Visiting Dentist	07.7	38.5	07.7	-	30.8	15.3
Visiting Chiropodist	15.4	38.5	07.7	-	30.8	7.6
Manor area						
Manor Visiting friend/relative in hospital	-	50	-	10	30	10
Medical (e.g. visiting doctor, day centre, clinic)	10	30	-	20	20	20
Visiting hospital as an out patient	10	40	-	20	20	10
Visiting Dentist	10	30	-	10	30	20
Visiting Chiropodist	20	20	-	10	30	20
Birley area						
Visiting friend/relative in hospital	16.7	25.0	16.7	08.3	33.3	-
Medical (e.g. visiting doctor, day centre, clinic)	16.7	16.7	08.3	33.3	25.0	-
Visiting hospital as an out patient	25.0	08.3	25.0	08.3	33.4	-
Visiting Dentist	08.3	16.8	08.3	33.3	33.3	-
Visiting Chiropodist	16.7	08.3	-	41.7	33.3	-
Chapel Green area						
Visiting friend/relative in hospital	-	14.3	-	28.6	57.1	-
Medical (e.g. visiting doctor, day centre, clinic)	14.3	-	-	28.6	57.1	-
Visiting hospital as an out patient	14.3	-	-	28.6	57.1	-
Visiting Dentist	-	-	28.6	14.3	57.1	-
Visiting Chiropodist	-	14.3	-	28.6	57.1	-

Table 7.10: Proportion of clubs members affected by transport problems on medical activities.

Activities	proportion of members affected by transport problems					
	very few	some	nearly half	most	nearly all	N/A
Walkley area						
Hairdresser	15.4	69.2	-	-	15.4	-
Religious services (e.g. Church)	07.7	61.5	15.4	07.7	07.7	-
Manor area						
Hairdresser	10	40	-	20	10	20
Religious services (e.g. Church)	10	40	20	10	10	10
Birley area						
Hairdresser	08.3	33.3	08.3	33.3	16.8	-
Religious services (e.g. Church)	25.0	08.3	16.7	33.3	16.7	-
Chapel Green area						
Hairdresser	-	57.1	14.3	14.3	14.3	-
Religious services (e.g. Church)	-	28.6	42.8	14.3	14.3	-

Table 7.11: Proportion of clubs members affected by transport problems on other activities.

7.4.2 Proportion of type of effect for each of the activities

This section shows the proportion of type of effect for each of the activities. The results for this section are reported in Tables 7.12 to 7.15 and show how transport problems affect the participation of elderly in each of the activities according to the type of effect with implications for latent or suppressed demand, either because trips do not occur, or because they occur less often, or because the location has to be changed.

7.4.2.1 Economic activities

The economic activities which surveyed in this study are; shopping, personal business, and betting shop (see Table 7.12). According to the organisers nearly one third of the their members are never able to take part in shopping. In

Walkley and Manor one fifth of the organisers reported having members only able to participate in shopping activities at a different location, and about one third reported that their members participate but less often. However, in Birley and Chapel Green about two third of the organisers reported that their members participate in shopping activities, but less often and they would like to increase their participation if they could. The explanation is that in Walkley and Manor there are more opportunities for the elderly to shop at different locations. On the other hand Walkley and Manor are closer to the city centre than Birley and Chapel Green, and this plays a significant role in the elderly's participation in economic activities.

Activities	proportion of type of effect economic activities			
	never able to take part	take part less often	take part at a different location	N/A
Walkley area				
Shopping	38.5	38.5	23.0	
Personal business (e.g. bank, post office, building society)	30.8	61.5	07.7	-
Betting shop	46.2	30.8	-	23.0
Manor area				
Shopping	40	40	20	-
Personal business (e.g. bank, post office, building society)	40	50	-	10
Betting shop	30	50	-	20
Birley area				
Shopping	33.3	66.7	-	-
Personal business (e.g. bank, post office, building society)	41.7	50.0	08.3	-
Betting shop	75.0	25.0	-	-
Chapel Green area				
Shopping	28.6	71.4	-	-
Personal business (e.g. bank, post office, building society)	42.8	28.6	28.6	-
Betting shop	57.1	28.6	14.3	-

Table 7.12: Proportion of type of effect for each of the activities on economic activities.

7.4.2.2 Social activity

The social activities which surveyed and studied are; non-regular social activity (e.g. pub, etc), regular social activities (e.g. social club, lunch club, whist drive), and visiting friends or relatives at home (see Table 7.13). For social activities (e.g. pub, etc.) the survey shows no big difference between the areas because all the organisers reported that more than 80% of their members participate less often and that they wish to increase their participation if they could. In Birley some of the elderly can only participate in this activity at different locations. The results show that all the elderly are affected by transport problems when they participate in social activity. Because most of the elderly participate locally it is difficult to distinguish between the effect of different mobility problems.

For regular social meetings the tables show that for all the areas the elderly participate less often and would like to increase their participation if they could. The group of the elderly who are never able to participate in this activities, the tables show nearly the same figures for Walkley, Manor, and Chapel Green, however, Birley appears to have the highest figure. On the other hand in Walkley, some of the elderly can only participate at different location when they take part of this activity. For visiting friends or relatives at home the tables show no significant difference between the areas, except Birley with about of a quarter of the organisers having members never able to take part in this type of activity.

7.4.2.3 Health related activities and other activities

Because there is no major different in the affect of the health related activities and the other activities, they reported in this section together. Tables 7.12 to 7.15 give details on the degree of effect for the activities.

The table shows that for all the other activities the majority of the elderly

Activities	proportion of type of effect on social activities			
	never able to take part	take part less often	take part at a different location	N/A
Walkley area				
Social (e.g. pub, etc.)	-	84.6	-	15.4
Regular social meeting (e.g. social club, lunch club, whist drive)	07.7	84.6	07.7	-
Visiting friend/relative at home	07.7	84.6	-	07.7
Manor area				
Social (e.g. pub, etc.)	-	80	-	20
Regular social meeting (e.g. social club, lunch club, whist drive)	10	90	-	-
Visiting friend/relative at home	10	80	-	10
Birley area				
Social (e.g. pub, etc.)	-	91.7	08.3	-
Regular social meeting (e.g. social club, lunch club, whist drive)	41.7	58.3	-	-
Visiting friend/relative at home	25.0	75.0	-	-
Chapel Green area				
Social (e.g. pub, etc.)	-	85.7	14.3	-
Regular social meeting (e.g. social club, lunch club, whist drive)	14.3	85.7	-	-
Visiting friend/relative at home	-	100	-	-

Table 7.13: Proportion of type of effect for each of the activities on social activities.

participate less often and they wish to participate more if they could. Some of the elderly reported they never able to take part on some activities because of the transport problems. The results for this activities are quite similar for Birley and Chapel Green, but it is different from Walkley and Manor. For example, there are more than 50% of the organisers at Birley and Chapel Green reported that they have members never able to take part of the following activities: visiting Dentist, visiting Chiropodist, visiting Hairdresser, and religious services (e.g. Church), however, at Walkley and Manor only up to 20% doing so. There are up to 10% of the organisers at Walkley and Manor reported that their members participate at different locations for this activities.

The tables shows that there are differences between the areas, this is because

Activities	proportion of type of effect medical activities			
	never able to take part	take part less often	take part at a different location	N/A
Walkley area				
Visiting friend/relative in hospital	-	84.6	-	15.4
Medical (e.g. visiting doctor, day centre, clinic)	23.1	69.2	-	07.7
Visiting hospital as an out patient	-	84.6	15.4	-
Visiting Dentist	07.7	69.2	07.7	15.4
Visiting Chiropodist	15.4	69.2	07.7	07.7
Manor area				
Visiting friend/relative in hospital	10	80	-	10
Medical (e.g. visiting doctor, day centre, clinic)	20	50	10	20
Visiting hospital as an out patient	-	80	10	10
Visiting Dentist	20	50	10	20
Visiting Chiropodist	10	60	10	20
Birley area				
Visiting friend/relative in hospital	41.7	58.3	-	-
Medical (e.g. visiting doctor, day centre, clinic)	16.7	83.3	-	-
Visiting hospital as an out patient	08.3	91.7	-	-
Visiting Dentist	50.0	50.0	-	-
Visiting Chiropodist	66.7	33.3	-	-
Chapel Green area				
Visiting friend/relative in hospital	28.6	71.4	-	-
Medical (e.g. visiting doctor, day centre, clinic)	42.9	57.1	-	-
Visiting hospital as an out patient	-	100	-	-
Visiting Dentist	42.9	57.1	-	-
Visiting Chiropodist	57.1	42.9	-	-

Table 7.14: Proportion of type of effect for each of the activities on medical activities.

of the difference in the characteristic of the areas (e.g. distance from the city centre), and high or low transport facility in the area and also the other facilities provided in the area and in elderly use. The degree of effect are high in Birley and Chapel Green for most of the activities, because in these areas there are low facilities and low quality of transport system (e.g. buses not running to time cause problems for elderly people living away from the centre i.e. either missing or late so if they want to participate they have to leave earlier than necessary, however, a large number have difficulties to do so, because of

this the two areas is highly affected by transport at most of the activities). On the other hand for Walkley and Manor the majority of the elderly make their own way to the activities. The majority are within walking distance to most of the activities, or they could get from friends supply transport, for those who are not actually house bound but find distance a problem. In Birley and Chapel Green reported the elderly have difficulty in getting regular drivers for their activities within the community. Even when they are able to obtain transport, the difficulty is in finding voluntary drivers. However, the effect of this problem is less in Walkley and Manor, because most of the members live within walking distance.

Activities	proportion of type of effect other activities			
	never able to take part	take part less often	take part at a different location	N/A
Walkley area				
Hairdresser	15.4	84.6	-	-
Religious services (e.g. Church)	07.7	92.3	-	-
Manor area				
Hairdresser	20	50	10	20
Religious services (e.g. Church)	30	60	-	10
Birley area				
Hairdresser	58.3	41.7	-	-
Religious services (e.g. Church)	66.7	33.3	-	-
Chapel Green area				
Hairdresser	57.1	42.9	-	-
Religious services (e.g. Church)	57.1	42.9	-	-

Table 7.15: Proportion of type of effect for each of the activities on other activities.

7.5 The conclusions

It is evident from this chapter that not all elderly people necessarily have transport problems when they want to participate in clubs or social activities

surveyed. The organisers see the transportation for the elderly as an integral part of their general human service delivery system, but often lack the expertise to provide a professional transportation service. The problem is compounded because transportation for the elderly has to be individualised due to the special needs particular club members. However, all the organisers agree that providing transportation to the elderly is typically a socio-humanistic service. Because of this, the performance of the transportation system for the elderly people has to be measured ultimately in terms of satisfaction to the subject clients.

7.5.1 Main conclusions

The study shows that in all the four study areas transport difficulties affect attendance at the organised activity, with higher figures in Manor and Chapel Green than in Walkley and Birley. Some of the possible reasons for these differences were suggested by respondents' answers and comments (see section 7.3). The study shows that the proportions of the elderly affected by transport problems as perceived by the organisers of the activities in which they take part. The analysis indicated three key features which are; firstly that organisers in Chapel Green more often perceived a majority of their members as being affected: secondly that the least affected are those in Walkley and Birley (Manor appears to have an intermediate position). The third important point is that even within an area there may be great differences in the experience of organisers: this is especially clear in the case of Chapel Green and Manor where some organisations reported less than 10% of their members affected but others reported more than 90%.

It is evident that the greatest dependence on special provision for the club occurs in Chapel Green and the least in Walkley and Birley: the Manor occupies an intermediate position. It is notable that lifts from friends and relatives and

trips by taxi play a very small role. Furthermore, the results from the two different parts of the questionnaire are consistent. From the analysis it is clear that as difficulty in attendance increases so also does dependence on special transport provision, although the degree of dependence is higher in Chapel Green than in Manor even though general difficulty in attendance was a little lower.

In depth analysis for individual area shows that the degree of dependence on any type of transport indicates the degree of help required by this type of transport in a particular area. The summary figures in Table 7.3 once again conceal important variations even within a single area: this is clear from the data in Tables 7.4 to 7.7. From those tables it is clear that Chapel Green is the area most dependent on special transport connected with club, Walkley and Birley are the least dependent areas, and Manor appears to have an intermediate position. Walkley and Birley are the areas most reliant on public transport, however, and Manor and Chapel Green are the least reliant. The tables show there are no significant differences between the four areas in dependence on lifts from volunteer drivers, lifts from friends or relatives, and taxis.

7.5.2 Comparison with other studies

Most of the results reported in this study are consistent with those reported in other studies, for example, these results are similar to those of Skelton (1978) in her study when he used an in depth survey approach, attempted to understand the importance of different activities and the extent to which they were influenced by travel difficulties. The results of the elderly participation in the activities and how the transport problems effects their level of participation are similar to those found by Bailey and Layzell (1981), Norman (1977), and Hopkin et al (1978).

However, the performance of the transportation system for the elderly people has to be measured ultimately in terms of satisfaction to the subject clients. A good example of satisfaction measure is "convenience". Claffey (1964, in Chan 1987) defines convenience as being "greatest when users least have to adjust their personal plans and living habits to use transit, and when difficulties of getting to transit stations and aboard transit vehicles are minimized". This definition includes both the ability of a transportation to satisfy the daily activities of the elderly (whether they be shopping, socializing, medical care, etc.). Satisfaction to the elderly in gaining easy access to their socio-humanistic activities may in fact be the most important aspect of transportation service provision.

7.5.3 Relate to next stage of thesis

The use of organisers as the source of information for this chapter necessarily leaves some problems unanswered. First, the organisers may themselves have an incomplete or distorted view of their members problems. Secondly as noted before, the organisers are reporting the experiences of a special subgroup (those who attend organised activities). Thirdly the organisers could not provide more detailed personal information about their members. These deeper questions can only be tackled by a direct approach to the elderly people which is reported in the chapters which follow.

Chapter 8

Activities in which the elderly currently participate

8.1 Introduction

The objective of this chapter is to describe and explain the activities in which the elderly participate. The first main section (8.2) describes the level of participation in the four study areas according to four main categories of activities. The second section (8.3) identifies some of the characteristics of individuals which are correlated with level of activities. A simple chi-squared test is used to test the effect of personal characteristics (age, health status, income, car availability) on level of activities. The presence of elderly with multiple disadvantages is examined in a final short section.

8.2 Descriptive analysis

In this section the existing pattern of participation in activities is described. This description has three purposes: first it helps to identify the existing level of activity and associated mobility achieved by the elderly, secondly it provides some understanding of the variations in participation between activities, and thirdly the comparison between areas suggests differences in participation which may represent evidence of activities which are modified or prevented by mobility problems.

8.2.1 Economic activities

It will be clear from Table 8.1 that the dominant economic activity is shopping in that in all areas substantial numbers shop *daily* or *weekly* (74% to 98%), but there are significant differences between the four areas with more of elderly involved in *daily* or *weekly* shopping activity in Chapel Green than in the other three areas.

The second economic activity is personal business (e.g. bank, post office, building society) which is most commonly done on a *weekly* basis (43% to 75%), although there are substantial numbers (13% to 37%) who either do not carry out this activity or did not reply. This may reflect some misunderstanding of the question or the failure to distinguish this category from shopping, but it may also reflect the existence of a suppressed demand which is met by using the service of friends, postal contact, etc. once again Chapel Green shows up as the area with the highest level of activity. The third type of activity (Betting) was of too little importance to draw any conclusions (in no area did it exceed 10% on a regular basis).

Activities	How often the elderly take part					N/A
	daily	weekly	at least once a month	less than once a month	never	
Walkley area						
Shopping	37.0	37.0	5.6	13.0	0.0	7.4
Personal business (e.g. bank, post office, building society)	3.7	46.3	5.6	14.8	0.0	29.6
Betting shop	0.0	0.0	0.0	0.0	37.0	63.0
Manor area						
Shopping	34.8	52.2	2.2	1.1	3.3	6.5
Personal business (e.g. bank, post office, building society)	0.0	56.5	2.2	9.8	4.3	27.2
Betting shop	0.0	6.5	2.2	2.2	43.5	45.7
Birley area						
Shopping	32.7	50.0	4.8	3.8	2.9	5.8
Personal business (e.g. bank, post office, building society)	1.9	43.3	10.6	6.7	9.6	27.9
Betting shop	0.0	5.8	1.0	1.0	46.2	46.2
Chapel Green area						
Shopping	53.1	44.9	1.0	0.0	1.0	0.0
Personal business (e.g. bank, post office, building society)	2.0	75.5	7.1	2.0	1.0	12.2
Betting shop	0.0	4.1	0.0	0.0	50.0	45.9

Table 8.1: Proportion of elderly people who take part in economic activities

8.2.2 Social activities

Social activities are the second category surveyed in this study: this category includes social activities (e.g. pub, etc), regular social meetings (e.g. social club, lunch club, whist drive), and visiting friend or relative at home. Table 8.2 shows the proportion of elderly who take part in social activities. and their level of participation in connection with each of the activities.

It is clear from Table 8.2 that the elderly participate in social activities at three main levels; *weekly*, *at least once a month*, and *less than once a month*. However, *daily* participation was too little important to draw any conclusions, because in no area did it exceed 7% except in Manor where 12% of the respondents visit a friend or relative on a *daily* basis.

From the analysis of the data it is clear that in all areas substantial numbers participate in social activity (e.g. pub, etc) *daily* or *weekly* (9% to 27%), the results show a significant differences between the four areas with more frequent

Activities	How often the elderly take part					
	daily	weekly	at least once a month	less than once a month	never	N/A
Walkley area						
Social (e.g. pub, etc.)	1.9	7.4	3.7	11.1	27.8	48.1
Regular social meeting (e.g. social club, lunch club, whist drive)	0.0	13.0	3.7	3.7	29.6	50
Visiting friend/relative at home	0.0	22.0	18.5	18.5	5.6	35.2
Manor area						
Social (e.g. pub, etc.)	6.5	20.7	6.5	4.3	25.0	37.0
Regular social meeting (e.g. social club, lunch club, whist drive)	2.2	29.3	3.3	6.5	27.2	31.5
Visiting friend/relative at home	12.0	25.0	5.4	19.6	9.8	28.3
Birley area						
Social (e.g. pub, etc.)	0.0	8.7	1.9	10.6	30.8	48.1
Regular social meeting (e.g. social club, lunch club, whist drive)	0.0	17.3	3.8	1.0	39.4	38.5
Visiting friend/relative at home	1.9	36.5	11.5	17.3	1.9	30.8
Chapel Green area						
Social (e.g. pub, etc.)	5.1	9.2	9.2	15.3	23.5	37.8
Regular social meeting (e.g. social club, lunch club, whist drive)	2.0	10.2	11.2	2.0	42.9	31.6
Visiting friend/relative at home	3.1	28.6	22.4	22.4	5.1	18.4

Table 8.2: Proportion of elderly people who take part in social activities

social activities in Manor, and the least frequent in Birley and Chapel Green. The second social activity is regular social meeting (e.g. social club, lunch club, whist drive) which is most commonly done on a *weekly* basis (10% to 29%). The results show that in all areas the elderly take part in regular social meeting with higher figure in Manor than in the other three areas.

The third type of activity is visiting friend or relative at home. Table 8.2 reported that this is the main social activity in which the elderly participate. The results show that in all areas substantial numbers visit friends or relatives *weekly* (22% to 37%), but there are a significant differences between the four areas with more frequent visiting in Birley than in the other three areas.

Furthermore, there are substantial numbers; 11% to 25% in social (e.g. pub, etc), 5% to 13% in regular social meeting (e.g. social club, lunch club, whist drive), and 25% to 45% in visiting friend or relative at home, who participate either *at least once a month* or *less than once a month*. The results show that

there are significant differences between the four areas with more frequent social activity, regular social meeting, and visiting friend or relative at home in Chapel Green than in the other three areas. There are substantial numbers who either do not carry out these activities or did not reply to this question. Analysis shows that Manor and Walkley have the highest figure for such negative response, this may be connected with age of the respondents, because Manor and Walkley also have about 25% of the respondents age 80+. It may therefore reflect the existence of a suppressed transport demand which is met by using the telephone, postal contact, etc.

8.2.3 Health related activities

The third category of activities surveyed in this study are health related activities. This category includes medical (e.g. visiting doctor, day centre, clinic), visiting hospital as an outpatient, visiting friend or relative in hospital, visiting dentist, and visiting chiropodist. Table 8.3 show the proportion of elderly people attending medical services or using medical facilities, and their level of participation in connection with each of the activities.

Table 8.3 records the proportion of the elderly people attending medical services or using medical facilities, and their level of participation in each of the medical activities. The key features of the table are firstly; in all areas participation in medical activities or using the medical facilities *daily* or *weekly* was too little importance to draw any conclusions (in no activity in any area did it exceed 7%). Secondly; it is clear from the table that the majority of the elderly attend medical services or use medical facilities *at least once a month* or *less than once a month*. The analysis of the data shows that the dominant health related activity is medical services (e.g. visiting doctor, day centre, clinic), in that in all areas substantial numbers attend medical services *at least*

Activities	How often the elderly take part					N/A
	daily	weekly	at least once a month	less than once a month	never	
Walkley area						
Medical (e.g. visiting doctor, day centre, clinic)	0.0	3.7	33.3	16.7	16.7	29.6
Visiting hospital as an outpatient	0.0	1.9	11.1	16.7	27.8	42.6
Visiting friend/relative in hospital	0.0	1.9	3.7	14.8	20.4	59.3
Visiting Dentist	0.0	0.0	1.9	13.0	31.5	53.7
Visiting Chiropodist	0.0	0.0	13.0	22.2	31.5	33.3
Manor area						
Medical (e.g. visiting doctor, day centre, clinic)	1.1	0.0	23.9	31.5	4.3	39.1
Visiting hospital as an outpatient	2.0	6.5	3.3	17.4	32.6	38.0
Visiting friend/relative in hospital	0.0	2.2	1.1	7.6	32.6	56.5
Visiting Dentist	0.0	0.0	0.0	26.1	28.3	45.7
Visiting Chiropodist	0.0	0.0	3.3	23.9	28.3	44.6
Birley area						
Medical (e.g. visiting doctor, day centre, clinic)	0.0	1.0	27.9	29.8	13.5	27.9
Visiting hospital as an outpatient	1.9	1.9	6.7	17.3	31.7	40.4
Visiting friend/relative in hospital	0.0	0.0	2.9	26.0	18.3	52.9
Visiting Dentist	1.0	0.0	1.9	33.7	23.1	40.4
Visiting Chiropodist	1.0	0.0	2.9	26.9	34.6	32.7
Chapel Green area						
Medical (e.g. visiting doctor, day centre, clinic)	1.0	0.0	43.9	31.6	6.1	17.3
Visiting hospital as an outpatient	0.0	0.0	5.1	33.7	28.6	32.7
Visiting friend/relative in hospital	0.0	0.0	0.0	34.7	22.4	42.9
Visiting Dentist	2.0	0.0	0.0	25.5	31.6	40.8
Visiting Chiropodist	1.0	0.0	9.2	34.7	24.5	30.6

Table 8.3: Proportion of elderly people attending medical services or using medical facilities.

once a month or less than once a month (50% to 76%), but there are significant differences between the four areas with more frequent participation in medical services in Chapel Green than in the other three areas. However in all areas substantial numbers of elderly visit hospital as outpatients (24% to 39%), and visit friends or relatives in hospital (9% to 35%) which is most commonly done *at least once a month or less than once a month*. From the results there are a differences between the four areas with more frequent participation in Chapel Green than in the other three areas. However, Manor has a very low proportion of elderly visiting friends or relatives at hospital, the explanation of this is probably that Manor has the greater transport problems with less transport

available to the elderly, and the long journey to hospitals because there is no direct bus route from Manor to any hospital in Sheffield.

Visiting a dentist is one of the medical activities surveyed in this study, Table 8.3 reported that there are substantial numbers of elderly who visit the dentist *at least once a month* or *less than once a month* (15% to 36%). The table shows a differences between the four areas with more frequent participation in Birley, than in the other three areas.

The last health related activity surveyed in this study is visiting a Chiropodist. It is clear from the results in Table 8.3 that visiting the Chiropodist is the second important medical activity to the elderly people, they visiting a Chiropodist *at least once a month* or *less than once a month* with proportion between (27% to 44%), Chapel Green once again has a higher proportion of elderly visiting a chiropodist than in the other three areas. Although there are substantial numbers (23% to 89%) who either do not carry out this activity or did not reply.

8.2.4 Other activities

The final category of activities surveyed is other activities: a category which includes, travel to Hairdresser and religious services (e.g. go to Church). Table 8.4 shows the proportion of elderly people who take part in other activities. It is clear from the results that Chapel Green has the highest proportion of respondents who visit a hairdresser with 61% and go to Church 49%. However, Walkley has the lowest proportion visiting hairdresser with 43% and 9% going to Church, while Manor and Birley appear to have an intermediate position. The following table reports the proportion of elderly people who take part in other activities and the level of participation.

It is clear from Table 8.4 that participation by the elderly in other activities

Activities	How often the elderly take part					N/A
	daily	weekly	at least once a month	less than once a month	never	
Walkley area						
Visiting Hairdresser	0.0	7.4	20.4	14.8	22.2	35.2
Religious services (e.g. go to Church)	0.0	5.6	0.0	3.7	31.5	59.3
Manor area						
Visiting Hairdresser	0.0	6.5	21.7	27.2	9.8	34.8
Religious services (e.g. go to Church)	6.5	13.0	2.2	7.6	29.3	41.3
Birley area						
Visiting Hairdresser	1.0	7.7	6.7	30.8	23.1	30.8
Religious services (e.g. go to Church)	0.0	1.0	1.9	17.3	30.8	49.0
Chapel Green area						
Visiting Hairdresser	1.0	9.2	26.5	24.5	14.3	24.5
Religious services (e.g. go to Church)	3.1	12.2	15.3	8.2	24.5	26.7

Table 8.4: Proportion of elderly people who take part in other activities

daily or *weekly* is less than *at least once a month* or *less than once a month*. The first of these activities (visiting Hairdresser) show that many of the elderly participate *at least once a month* or *less than once a month*, in all areas (35% to 51%). The results show significant differences between the four areas with a higher figure in Chapel Green than in the other three areas.

The second form of activity is religious services (e.g. go to Church), the table shows that there are a significant differences between the areas, in the numbers who go to Church *daily* or *weekly* (1% to 20%), with more frequent participation in Manor and Chapel Green than in Birley with 1%, Walkley appears to have an intermediate position. It is clear from Table 8.4 that the main level of participation religious services is *at least once a month* or *less than once a month* (4% to 24%), once again Chapel Green has a higher figure than the other three areas. Furthermore, there are substantial numbers of elderly (39% to 91%) who either do not carry out this activity or did not reply. The table shows that Walkley has the highest figure and Chapel Green the lowest.

8.2.5 Summary of results

Activities	Study areas			
	Walkley	Manor	Birley	Chapel Green
Economic activities				
Shopping	D	W	W	D
Personal business (e.g. bank, post office, building society)	W	W	W	W
Betting shop	*	W	W	W
Social activities				
Social (e.g. pub, etc.)	L	W	L	L
Regular social meeting (e.g. social club, lunch club, whist drive)	W	W	W	W
Visiting friend/relative at home	W	W	W	W
Medical activities				
Medical (e.g. visiting doctor, day centre, clinic)	M	L	L	M
Visiting hospital as an outpatient	L	L	L	L
Visiting friend/relative in hospital	L	L	L	L
Visiting Dentist	L	L	L	L
Visiting Chiropodist	L	L	L	L
Other activities				
Visiting Hairdresser	M	L	L	M
Religious services (e.g. go to Church)	W	W	L	M

Table 8.5: A summary comparison of the most commonly reported frequency of participation by area and type of activity

• **Where:**

D = Daily, W = Weekly, M = At least once a month, and L = Less than once a month, * = none.

Table 8.5 reported the highest level of participation in each activity by those who participate in it. The analysis of the data shows that the most frequent activities for the majority of the elderly people is the economic activities. The table shows that the minimum level of participation in economic activities is *weekly* (exclude Betting) in all the four areas except shopping in Walkley and Chapel Green which are done daily on a regular basis. The second frequent group of activities in which the elderly participate the social activities, in the four areas the level of participation is nearly the same for each activity with more frequent *weekly* participation in social (e.g. pub, etc) at Manor, than in the other three areas. The third frequent group of activities

in which the elderly participate is the other activities. However, this group of activities have level of participation more than the medical activities, but less than economic or social activities. The table shows that Walkley has the highest figure and Birley the lowest. Finally the medical activities appear to have the lowest level of participation in all areas (*less than once a month*).

In summary Table 8.5 does not suggest major differences in participation between the four areas (the main differences relate to shopping and Church attendance and there is some evidence of higher social activity in Manor). It seems therefore that if there is suppressed demand (due to travel differences) it occurs to a similar extent in all the study areas.

8.3 The factors affecting the fully achieved activities

In this section an attempt is made to correlate the level of participation in activities with certain personal characteristics of the individual respondent. The personal characteristics examined are;

- Age,
- Health,
- Income,
- Car availability.

The relationships are examined separately for each of the activity categories but omitting those activities for which there is a very low overall participation (e.g. Betting).

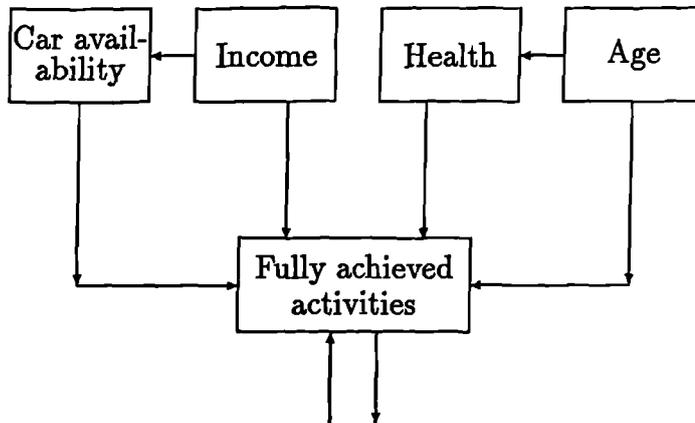


Figure 8.1: The relationship between elderly fully achieved activities and the affect of the factors

8.3.1 Testing method

To test the relationship in Figure 8.1 a simple chi-squared test was used. In each area the sample was split into two categories (successively on the basis of age, health status, income, car availability), and the frequencies reporting each of the five levels of participation were compared. In a number of cases adjoining levels of participation categories were merged to ensure sufficient numbers of observations in the expected values. In the sections which follow a distinction is made between those comparisons which showed significant differences in the expected direction, those which showed no significant difference, and those which were significant but in an unexpected direction. Only those activities with a substantial number of positive responses have been analysed in this way.

8.3.2 The effect of age

It is implied in Figure 8.1 that there will be a negative relationship between age and the level of participation in activities. To test this hypothesis the sample

for each of the areas was split into two age groups: 65-69; and 70⁺. The frequency distribution across the five frequency categories was then compared between the two age categories. The effect of age on health activities may be more debatable because although the effect of age may be to reduce mobility and thus ease of attendance, the age factor may itself lead to increased need to attend surgeries, clinics, etc. The results are summarised in Table 8.6 in which the significance and direction of the differences is reported.

activities	Walkley	Manor	Birley	Chapel Green
Shopping	Δ	o	o	o
Personal business (e.g. bank, post office, building society)	•E	o	o	o
Social (e.g. pub, etc.)	•E	o	•E	o
Regular social meeting (e.g. social club, lunch club, whist drive)	o	o	o	•E
Visiting friend/relative at home	o	o	Δ	Δ
Medical (e.g. visiting doctor, day centre, clinic)	o	Δ	o	o
Visiting hospital as an outpatient	o	o	Δ	o
Visiting friend/relative in hospital	o	o	o	o
Visiting Hairdresser	o	o	Δ	o
Religious services (e.g. go to Church)	o	Δ	o	o

Table 8.6: Results of the chi-squared test for the effect of age on activities.

Where; •E: Significant difference in expected direction at 5%. o: Not significance at 5%. Δ: Significant difference in an unexpected direction at 5%.

Table 8.6 reported that the age had no effect on elderly participation in economic activities, except that at Walkley the young elderly do more shopping than the older ones, but the older ones participate in personal business more than the young elderly. The test showed significant differences in social activity (e.g. pub, etc.) at Walkley and Birley, and in regular social meeting at Chapel Green. However, there are significant differences in an unexpected direction in visiting friends or relatives at home on Birley and Chapel Green. This

means that the older the respondent the more visiting friends or relatives at home occurs in the two areas. Furthermore, for the health related activities and other activities, the test shows no differences except on Manor and Birley there are significant differences but in an unexpected direction, at Manor in medical and religious, and at Birley in visiting hospital as an outpatient and visiting hairdresser. It is clear from the table that there is no consistent effect of age across the four areas.

8.3.3 The effect of disability

From figure 8.1 it is argued that there will be negative relationship between disability and the level of participation in activities. To test this hypothesis difficulty in walking has been selected for this test, because in all areas there are more than 60% of the elderly with difficulties in walking (minor or severe or both). The sample for each area was split into two groups; elderly with no or only minor difficulties in walking; and elderly with severe difficulties. The frequency distribution across the five frequency categories was then compared between the two categories. The results are summarised in Table 8.7 in which the significance and the direction of differences is reported.

Table 8.7 shows that severe disability in walking had significant effect on all areas in most of the activities. The table shows that the elderly with minor disability do more shopping than those with severe disability at Walkley and Manor, also in personal business at Manor, on the other hand the test showed no differences in the level of participation between elderly with minor or severe disability at Birley and Chapel Green. For social (e.g. pub, etc) the test showed significant differences in the expected direction in Walkley and Chapel Green, also in visiting friends or relatives at home in Birley and Chapel Green, but for Walkley and Manor the results showed no significant differences. For health related activities the table reported significant differences in the

activities	Walkley	Manor	Birley	Chapel Green
Shopping	● <i>E</i>	● <i>E</i>	○	○
Personal business (e.g. bank, post office, building society)	○	● <i>E</i>	○	○
Social (e.g. pub, etc.)	● <i>E</i>	○	○	● <i>E</i>
Regular social meeting (e.g. social club, lunch club, whist drive)	○	○	○	○
Visiting friend/relative at home	○	○	● <i>E</i>	● <i>E</i>
Medical (e.g. visiting doctor, day centre, clinic)	○	● <i>E</i>	○	● <i>E</i>
Visiting hospital as an outpatient	● <i>E</i>	○	○	● <i>E</i>
Visiting friend/relative in hospital	● <i>E</i>	○	○	○
Visiting Hairdresser	○	○	○	● <i>E</i>
Religious services (e.g. go to Church)	○	○	○	● <i>E</i>

Table 8.7: Results of the chi-squared test for the effect of severe walking disability on activities.

Where; ●*E*: Significant difference in expected direction at 5%. ○: Not significance at 5%. △: Significant difference in an unexpected direction at 5%.

expected direction in medical at Manor and Chapel Green in visiting hospital as an outpatient in Walkley and Chapel Green, in visiting friends or relatives in hospital at Walkley. However, for other activities the test showed that only Chapel Green has significant differences in the expected direction. At Chapel Green the test results show that there are significance differences in social, medical, and other activities, but no significance in economic activities. Finally in general the hypothesis that there is some relationship between disability and level of participation in activities can be accepted for all areas except Birley, with the stronger effects evident in Chapel Green.

8.3.4 The effect of income

It is implied that in Figure 8.1 that there will be a negative relationship between income and the level of participation in activities. To test this hypothesis

the sample for each of the areas was split into two groups; the first group with low income included two income categories (people living on state pension and benefits only including DHSS, and people living on state pension plus other income up to £50 p.w.); the second group included two income categories as well (people living on state pension plus other income £50 to £99 p.w., and people living on state pension plus income over £100 p.w.). The frequency distribution across the five frequency categories was then compared between the two income groups. The results are summarised in Table 8.8 in which the significance and direction of differences is reported.

activities	Walkley	Manor	Birley	Chapel Green
Shopping	o	o	o	o
Personal business (e.g. bank, post office, building society)	o	o	o	o
Social (e.g. pub, etc.)	o	o	o	o
Regular social meeting (e.g. social club, lunch club, whist drive)	o	o	o	o
Visiting friend/relative at home	•E	Δ	Δ	Δ
Medical (e.g. visiting doctor, day centre, clinic)	o	o	o	Δ
Visiting hospital as an outpatient	o	o	o	o
Visiting friend/relative in hospital	o	Δ	o	o
Visiting Hairdresser	o	o	o	o
Religious services (e.g. go to Church)	•E	o	o	Δ

Table 8.8: Results of the chi-squared test for the effect of income category on activities.

Where; •E: Significant difference in expected direction at 5%. o: Not significance at 5%. Δ: Significant difference in an unexpected direction at 5%.

Table 8.8 shows that the only area in which the income had a significant effect is Walkley in visiting friends or relatives at home and in religious services. The test showed significant differences but in an unexpected direction in visiting friends or relatives at home on Manor, Birley, and Chapel Green. This

prove that the less income is the more visiting friends or relatives at home. Also there were significant effects but in an unexpected direction at Manor in visiting friends or relatives in hospital and at Chapel Green in medical and religious services. The hypothesis that low income affects activities undertaken by elderly cannot be accepted on the basis of this study.

8.3.5 The effect of car availability

In Figure 8.1 a negative relationship is hypothesised between car availability to the elderly and the level of participation in activities. To test this hypothesis the sample for each of the areas was split into two groups; the first group being those with no access to car and the second group with access to a car or cars. The frequency distribution across the five frequency categories was then compared between the two groups. The results are summarised in Table 8.9 in which the significance and direction of differences is reported.

Table 8.9 shows that there are some significant differences between elderly with access to car or cars and those with no access, but these differences were in an unexpected direction at Walkley, Manor, and Birley. Elderly with no access to car participate more than those with access in personal business, social (e.g. pub, etc), regular meeting and visiting hairdresser. At Manor those with no access to car participate more in visiting friends or relatives at home, medical, and visiting hospital as an outpatient. At Birley they participate more in personal business, social, and regular social meeting. Chapel Green is the only area which has a significant differences in the expected direction in social, regular social meeting, visiting hairdresser, and religious services. Because of this the hypothesis can be accepted in Chapel Green only.

activities	Walkley	Manor	Birley	Chapel Green
Shopping	o	o	o	o
Personal business (e.g. bank, post office, building society)	Δ	o	Δ	o
Social (e.g. pub, etc.)	Δ	o	Δ	●E
Regular social meeting (e.g. social club, lunch club, whist drive)	Δ	o	Δ	●E
Visiting friend/relative at home	o	Δ	o	o
Medical (e.g. visiting doctor, day centre, clinic)	o	Δ	o	o
Visiting hospital as an outpatient	o	Δ	o	o
Visiting friend/relative in hospital	o	o	o	o
Visiting Hairdresser	Δ	o	o	●E
Religious services (e.g. go to Church)	o	o	o	●E

Table 8.9: Results of the chi-squared test for the effect of car availability on activities.

Where; ●E: Significant difference in expected direction at 5%. o: Not significance at 5%. Δ: Significant difference in an unexpected direction at 5%.

8.3.6 Compound disadvantage

It is recognised that the results reported above assume that each of these disadvantages carried by the elderly acts in isolation, but it is probable that the greatest effects occur with combinations of disadvantage. For example a person suffering from severe disability and no car access is likely to be more affected than those who carry only one such disadvantage. In order to examine this the number of respondents needs to be sufficiently large for the comparison to be made between those with and those without a particular compound disadvantage. It will be seen from Table 8.10 that the numbers experiencing such disadvantage were relatively small except for those suffering from low incomes and no car availability in Manor and Birley. The result of carrying out a chi-square test on these two cases, revealed that those with low income and with no access to car are more affected than those without that compound

disadvantage, an effect which is more clear in Birley than in Manor.

	LI + NC	NC + SD	LI + SD	LI + NC + SD	Total sample
Walkley	19	12	7	6	62
Manor	66	12	11	10	92
Birley	55	16	13	11	104
Chapel Green	11	10	14	9	98

Table 8.10: Number of respondents with multiple disadvantage by each area

Where; LI: Elderly with low income. NC: Elderly with no access to car. SD: Elderly with severe disability in walking.

8.4 Conclusions

It is evident from this chapter that not all the elderly people who took part in this study participate in all activities. This chapter described the level of participation in the four study areas according to four main categories of activities. This description helped to identify the existing level of activity and associated mobility achieved by the elderly. For example the study showed that the dominant economic activity is shopping in that in all areas substantial numbers shop daily or weekly (74% to 98%), but there are significant differences between the four areas with more of elderly involved in daily or weekly shopping activity in Chapel Green than in the other three areas. There are substantial numbers who either do not carry out an activity or did not complete the questionnaire. This may reflect some misunderstanding of the question or the failure to distinguish between categories of activity, but it may also reflect the

existence of a suppressed demand which is met by using the service of friends, postal contact, etc. The study showed that some activities (e.g. Betting) were of too little importance to draw any conclusions.

A summary comparison of the most commonly reported frequency of participation by area and type of activities showed that the most frequent activities for the majority of the elderly people are economic. The second most frequently recorded group of activities in which the elderly participate is social. The third most frequently reported group of activities is "other activities": this group of activities having a level of participation more than the health related activities.

In summary Table 8.5 does not suggest major differences in participation between the four areas (the main differences relate to shopping and church attendance and there is some evidence of higher social activities in Manor). It seems therefore that if there is suppressed demand (due to travel difficulties) it occurs to a similar extent in all the study areas.

The factors affecting the fully achieved activities (personal characteristics; age, disability, income, and car availability) are examined separately for each of the activity categories, but omitting those activities for which there is a very low overall participation (e.g. Betting). A simple chi-squared test was used, in each area the sample was split into two categories (successively on the basis of age, health status, income, car availability), and the frequencies reporting each of the five level of participation were compared. The results of the test were reported in Tables 8.6 to 8.9. Table 8.11 summarises the effect of personal characteristics in each area. The table shows that Chapel Green and Walkley are the areas in which the elderly's travel is most clearly affected by personal characteristics, Birley has the lowest effect. The personal characteristic most often affecting travel is physical disability.

activities	Walkley			Manor			Birley			Chapel Green			
	A	H	I	A	H	I	A	H	I	A	H	I	C
Shopping	Δ	●E	○	○	○	○	○	○	○	○	○	○	○
Personal business (e.g. bank, post office, building society)	●E	○	○	Δ	○	○	○	○	○	○	○	○	○
Social (e.g. pub, etc.)	●E	●E	○	Δ	○	○	○	○	○	○	○	○	○
Regular social meeting (e.g. social club, lunch club, whist drive)	○	○	○	Δ	○	○	○	○	○	○	○	○	○
Visiting friend/relative at home	○	○	○	○	○	○	○	○	○	○	○	○	○
Medical (e.g. visiting doctor, day centre, clinic)	○	○	○	○	○	○	○	○	○	○	○	○	○
Visiting hospital as an outpatient	○	○	○	○	○	○	○	○	○	○	○	○	○
Visiting friend/relative in hospital	○	○	○	○	○	○	○	○	○	○	○	○	○
Visiting Hairdresser	○	○	○	○	○	○	○	○	○	○	○	○	○
Religious services (e.g. go to Church)	○	○	○	○	○	○	○	○	○	○	○	○	○

Table 8.11: A summary comparison between the areas with overall effect of personal characteristics

Where; A = Age, H = Health, I = Income, and C = Car availability.

Chapter 9

Activities in which the elderly currently wish to participate

9.1 Introduction

In this chapter an attempt is made to investigate one of the central research problems of this study. The first section (9.2) describes the methods of analysis used. The second section (9.3) describes the levels at which the respondents wish to participate in the activities in the four study areas according to four main categories of activity. The third section (9.4) identifies some of the personal characteristics of individual which are correlated with their wishes. A simple chi-squared test is used to test the effect of personal characteristics (age, health status, income). In the fourth section (9.5) an attempt is made to make comparisons between the elderly's existing activities (chapter 8) and their wishes. The differences are correlated with the personal characteristics of the respondents.

9.2 Methods of analysis

The original design of the study assumed that most respondents would answer this section of the questionnaire and that the respondents would indicate desired levels of activity equal to or greater than the actual level of activity recorded in the earlier part of the questionnaire. The pilot trials of the questionnaire did not throw doubt on this assumption. In the main surveys however very large numbers of respondents for all or some activities ticked the columns "never" or made no responses, apparently because they misunderstood the question. This necessitated a change from the intended method of analysis. In the tables which follow only those respondents who recorded their desired level of activity as yearly or more frequently are shown. The results therefore refer only to a small proportion of the total respondents in each area and there must be some doubt as to how far these results can be extrapolated.

9.3 Descriptive analysis by areas

In this section the current wishes of the elderly to participate in activities are described. The purposes of this description are, firstly to highlight the activities for which the elderly express a wish for high frequency of participation, and secondly to identify differences in those wishes between areas. In this discussion the main attention is therefore on that section of the table which records the respondents' desired frequencies of participation.

9.3.1 Economic activities

Economic activities are the first category surveyed in this study, this category includes, shopping, personal business (e.g. bank, post office, building society), and Betting activity. Table 9.1 shows the proportion of all respondents (%)

with the current levels of participation and the frequency at which they would like to participate in this group of activities, if transport permitted (The relatively small percentages reflect the questionnaire problem referred to above, and in the case of Chapel Green the numbers are so small that no discussion is attempted).

	The current levels						The level they wish				
	D	W	M	L	Y	N	D	W	M	L	Y
Walkley area											
Shopping	*	*	*	15.2	*	7.6	7.6	7.6	7.6	*	*
Personal business	*	*	*	11.4	*	7.6	*	15.2	3.8	*	*
Betting shop	*	*	*	*	*	*	*	*	*	*	*
Manor area											
Shopping	*	15.4	4.4	*	*	2.2	15.4	6.6	*	*	*
Personal business	*	4.4	6.6	*	*	*	4.4	6.6	*	*	*
Betting shop	*	*	*	*	*	*	*	*	*	*	*
Birley area											
Shopping	*	*	*	3.8	3.8	22.8	20.9	5.7	3.8	*	*
Personal business	*	*	*	3.8	3.8	1.9	*	*	9.5	*	*
Betting shop	*	*	*	*	7.6	*	*	*	7.6	*	*
Chapel Green area											
Shopping	*	4.0	*	*	*	*	4.0	*	*	*	*
Personal business	*	*	2.0	*	*	2.0	*	4.0	*	*	*
Betting shop	*	*	*	*	*	2.0	*	2.0	*	*	*

Table 9.1: Frequency at which elderly people currently participate, and the levels they would like to take part in economic activities if transport permitted.

- Where: D = Daily, W = Weekly, M = At least once a month, L = Less than once a month, and Y = Yearly, N = Never.

From the right hand side of Table 9.1 a number of features are evident. First there is clear evidence of a wish for very frequent access to shops with most respondents wanting the possibility of daily shopping. For personal business the respondents would apparently be satisfied with weekly or monthly access. secondly there is some evidence of differences between the three areas: for shopping the highest level of demand for access occurs in Birley and Manor,

for personal business the highest demand is apparently in Manor and Walkley: but it must be remembered that the sample sizes are small.

The analysis of the data shows that there are numbers of elderly who wish to shop *daily* or *weekly* (4.0% to 27%), but there are significant differences between the four areas with more elderly people who wish to be involved in *daily* or *weekly* shopping activities in Birley than in the other three areas. The second economic activity is personal business (e.g. bank, post office, building society), Manor is the only area with some elderly wish to do take part in personal business *daily*. The table shows that some elderly wish to take part in personal business *weekly* (4.0% to 15%), the results shows that in Walkley more elderly wish to take part in personal business *weekly* than in the other three areas.

9.3.2 Social activities

Social activities are the second category surveyed it includes, social (e.g. pub), regular social meeting (e.g. social club, lunch club, whist drive), and visiting friend or relative at home. More respondents recorded desired levels of participation in social activities, the data in Table 9.2 therefore give a fuller picture including Chapel Green.

It is clear from the right hand side of Table 9.2 that in the four areas there are substantial numbers of elderly people who wish to take part in social activities (8% to 57%). The table shows the extent to which elderly people wish to take part in social activity (e.g. pub, etc): Birley has the highest figure about 36%. In all areas there are some elderly who wish to take part in this *daily* or *weekly* (4.0% to 15%), but there are significant differences between the four areas with more of the elderly wishing to take part *daily* or *weekly* in Birley than in the other three areas. In contrast Chapel Green has the highest figure 26% of the elderly who wish to take part less than once a week.

	The current levels						The level they wish				
	D	W	M	L	Y	N	D	W	M	L	Y
Walkley area											
Social (e.g. pub, etc.)	*	*	*	*	*	7.6	*	7.6	*	*	*
Regular social meeting	*	*	*	*	*	7.6	*	7.6	*	*	*
Visiting friend/ relative at home	*	3.8	*	7.6	*	3.8	3.8	11.4	*	*	*
Manor area											
Social (e.g. pub, etc.)	*	4.4	2.2	4.4	4.4	*	4.4	6.6	4.4	*	*
Regular social meeting	*	*	2.2	*	4.4	11.0	*	8.8	4.4	4.4	*
Visiting friend/ relative at home	*	*	*	15.4	4.4	15.4	*	15.4	11.0	8.8	*
Birley area											
Social (e.g. pub, etc.)	*	*	*	*	20.9	15.2	*	15.2	*	20.9	*
Regular social meeting	*	*	3.8	*	39.9	13.3	*	47.5	*	9.5	*
Visiting friend/ relative at home	*	*	1.9	7.6	*	32.3	1.9	26.6	13.3	*	*
Chapel Green area											
Social (e.g. pub, etc.)	*	*	4.0	2.0	24.0	*	4.0	*	6.0	20.0	*
Regular social meeting	*	*	4.0	*	42.0	4.0	*	38.0	8.0	4.0	*
Visiting friend/ relative at home	*	*	*	26.0	10.0	4.0	*	10.0	30.0	*	*

Table 9.2: Frequency at which elderly people currently participate and the levels they would like to take part in social activities if transport permitted.

- Where: D = Daily, W = Weekly, M = At least once a month, L = Less than once a month, and Y = Yearly, N = Never.

The second social activity is regular social meeting (e.g. social club, lunch club, whist drive), the analysis of the data shows that in all areas substantial numbers of elderly wish to take part in regular social meeting *weekly* (8% to 48%), but there are clear differences between the four areas with more of the elderly wishing to take part in regular social meeting *weekly* in Birley and Chapel Green than in Walkley and Manor. However, in all areas except Walkley substantial numbers wish to take part in regular social meeting less than once a week.

The third form of social activity is visiting friends or relatives at home it

is clear from the right hand side of Table 9.2 that this is a dominant social activity, in that in all areas substantial numbers of elderly wish to visit friends or relatives at home *daily*, *weekly*, or *at least once a month* (15% to 42%), but there are significant differences between the four areas with more of the elderly wishing to visit friends or relatives at home *daily* or *weekly* in Birley than in the other three areas.

9.3.3 Health related activities

The third category of activities surveyed in this study are health related activities. This includes; medical (e.g. doctor, day centre, clinic), attending hospital as an outpatient, visiting friend or relative in hospital, visiting a dentist, and visiting a chiropodist. Table 9.3 reported the proportion of all respondents in each area who wish to attend medical services or wish to use medical facilities and the frequency level at which they wish to participate.

It is clear from the right hand side of Table 9.3 that in general health related activities have the lowest figures of elderly people who wish to attend medical services or to use medical facilities. This may be because of some misunderstanding of the question, or because the majority of the elderly people are satisfied with the health services. The table shows that for medical activities (e.g. visiting doctor, day centre, clinic) in Walkley, Manor, and Birley areas there are some elderly who reported a wish to attend medical services or to use medical facilities.

The second form of health related activity is visiting hospital as an outpatient, the analysis of the data shows that there are differences between the areas, However, Birley, Manor, and Chapel Green have some elderly who wish to visit hospital as an outpatient *weekly* or *less than once a week*. On the other hand there are 8% of the elderly people at Birley who wish to visit hospital as an outpatient *yearly*.

	The current levels						The level they wish				
	D	W	M	L	Y	N	D	W	M	L	Y
Walkley area											
Medical (e.g. visiting doctor, day centre, clinic)	*	*	*	*	*	3.8	*	3.8	*	*	*
Visiting hospital as an out-patient	*	*	*	*	*	*	*	*	*	*	*
Visiting friend/relative in hospital	*	*	*	*	*	3.8	*	*	3.8	*	*
Visiting Dentist	*	*	*	*	*	7.6	*	*	*	7.6	*
Visiting Chiropodist	*	*	*	*	*	*	*	*	*	*	*
Manor area											
Medical (e.g. visiting doctor, day centre, clinic)	*	*	*	*	*	6.6	4.4	*	2.2	*	*
Visiting hospital as an outpatient	*	*	*	*	*	4.4	*	*	*	4.4	*
Visiting friend/relative in hospital	*	*	*	*	*	*	*	*	*	*	*
Visiting Dentist	*	*	*	*	4.4	*	*	*	*	4.4	*
Visiting Chiropodist	*	*	*	24.2	4.4	*	*	*	28.6	*	*
Birley area											
Medical (e.g. visiting doctor, day centre, clinic)	*	*	*	3.8	*	3.8	*	*	3.8	3.8	*
Visiting hospital as an outpatient	*	*	*	*	3.8	9.5	*	1.9	*	3.8	7.6
Visiting friend/relative in hospital	*	*	3.8	*	3.8	*	*	3.8	3.8	*	*
Visiting Dentist	*	*	*	*	*	15.2	*	*	*	*	15.2
Visiting Chiropodist	*	*	*	*	11.4	*	*	1.9	7.6	1.9	*
Chapel Green area											
Medical (e.g. visiting doctor, day centre, clinic)	*	*	*	*	*	*	*	*	*	*	*
Visiting hospital as an outpatient	*	*	*	4.0	*	*	*	4.0	*	*	*
Visiting friend/relative in hospital	*	*	*	8.0	*	*	*	4.0	4.0	*	*
Visiting Dentist	*	*	*	*	*	*	*	*	*	*	*
Visiting Chiropodist	*	*	*	*	*	4.0	*	*	4.0	*	*

Table 9.3: Frequency at which elderly people currently take part in health related activities and the levels they would like to attend medical services or to use medical facilities if transport permitted.

- Where: D = Daily, W = Weekly, M = At least once a month, L = Less than once a month, and Y = Yearly, N = Never.

The third type of health related activity is visiting friends or relatives in hospital, the results reported in the right hand side of Table 9.3 shows Manor with results similar to those reported in the last chapter section 8.2.3. In the other three areas there are some elderly reported a wish to visit friends or relatives in hospital *weekly* or *at least once a month*.

The fourth form of health related activity is visiting Dentist, the table shows in Walkley, and Manor there are some elderly who wish to visit the Dentist

less than once a month, in Birley there about 15% of the elderly who wish to visit the Dentist *yearly*.

The last type of health related activity is visiting Chiropodist, the results shows in Manor, Birley, and Chapel Green there are some elderly who wish to visit Chiropodist *at least once a month* or *less than once a month* (4.0% to 29%), but there are significant differences between the three areas with more of elderly wish to visit Chiropodist *at least once a month* in Manor than in the other two areas.

9.3.4 Other activities

The final category of activities surveyed in this study is the other activities, This includes travel to hairdressers and religious services (e.g. go to Church). Table 9.4 records the current levels of participation and the frequency at which the respondents would like to take part in other activities if transport permitted.

It is clear from the right hand side of Table 9.4 that there are some elderly people who wish to visit the Hairdresser. The results shows Walkley with no elderly in which who wish to visit the Hairdresser. However, for the other three areas there are some elderly who wish to visit Hairdresser *daily*, *weekly*, or *at least once a month* (9% to 36%), but there are significant differences between the four areas with more of elderly wish to visit Hairdresser *weekly*, or *at least once a month* in Chapel Green than in the other two areas.

The second type of other activity is religious services (e.g. go to Church), the analysis of the data shows that there are some elderly who wish to go to Church *weekly* or *at least once a month* (8% to 44%), but there are significant differences between the four areas with many more elderly people wish to take part in religious activities in Birley than in the other three areas.

	The current levels						The level they wish				
	D	W	M	L	Y	N	D	W	M	L	Y
Walkley area											
Hairdresser	*	*	*	*	*	*	*	*	*	*	*
Religious services	*	3.8	*	*	*	3.8	3.8	*	3.8	*	*
Manor area											
Hairdresser	*	*	*	*	*	8.8	4.4	*	4.4	*	*
Religious services	*	*	*	*	5.5	9.9	*	4.4	*	11.0	*
Birley area											
Hairdresser	*	*	3.8	3.8	*	*	*	3.8	3.8	*	*
Religious services	*	*	*	26.6	15.2	1.9	*	22.8	20.9	*	*
Chapel Green area											
Hairdresser	*	*	6.0	6.0	22.0	2.0	*	8.0	28.0	*	*
Religious services	*	*	2.0	*	*	6.0	*	8.0	*	*	*

Table 9.4: Frequency at which elderly people currently participate and the levels they would like to take part in other activities if transport permitted.

- Where: D = Daily, W = Weekly, M = At least once a month, L = Less than once a month, and Y = Yearly.

9.4 Analysis by factors

The aim of this section is to define and examine the desired participation of the respondents, from their own perception of their needs. The exact definitions of desired activities will be discussed later in this chapter. As stated earlier (in chapter 4) the aim of researching the desired participation of the elderly people is to examine the relationship between what the elderly wish and their transport demands. The importance of taking into account the demands and wants of the elderly with respect to particular activities, as well as their personal and travel characteristics, is to examine this relationship. There are some factors effecting the wish of the elderly people.

This study covered three factor's which were hypothesised to play major roles in determining desired participation in activities. Figure 9.1 outlines the relationship between the factors and the desired participation of the elderly

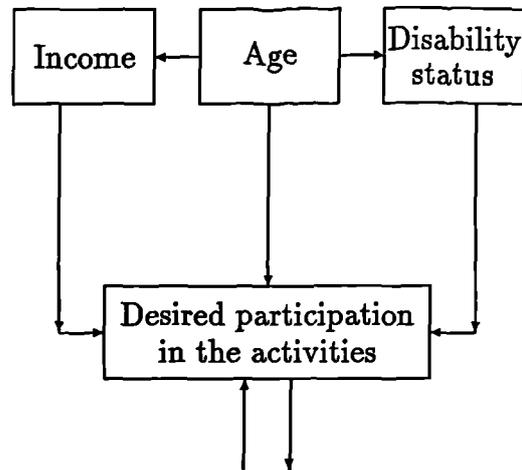


Figure 9.1: The relationship between the desired participation in the activities of the elderly people

people, and also the internal relationship between the factors.

9.4.1 Testing method

To test the relationship in Figure 9.1 once again a simple chi-squared test was used. In each area the sample was split into two categories (successively on the basis of age, health status, income), and the frequencies reporting each of the five levels of participation were compared. In all the cases adjoining levels of participation categories were merged to ensure sufficient numbers of observations in the expected values. In the sections which follow a distinction is made between those comparisons which showed significant differences in the expected direction, those which showed no significant difference, and those which were significant but in an unexpected direction. Only those activities with a substantial number of positive responses have been analysed in this way.

9.4.2 The effect of age

It is implied in Figure 9.1 that there will be a relationship between age and the desired level of participation in activities. To test this hypothesis the sample for each of the areas was split into two age groups: 65-69; and 70+. The frequency distribution across the five frequency categories was then compared between the two age categories. The effect of age on health activities may be more debatable because although the effect of age may be to reduce mobility and thus of ease attendance, the age factor may itself lead to increased need to attend surgeries, clinics, etc. The results are summarised in Table 9.5 in which the significance and direction of the differences is reported.

activities	Walkley	Manor	Birley	Chapel Green
Shopping	•E	•E	•E	o
Personal business (e.g. bank, post office, building society)	Δ	•E	Δ	o
Social (e.g. pub, etc.)	Δ	•E	Δ	Δ
Regular social meeting (e.g. social club, lunch club, whist drive)	Δ	•E	Δ	o
Visiting friend/relative at home	o	o	•E	o
Medical (e.g. visiting doctor, day centre, clinic)	o	o	•E	Δ
Visiting hospital as an outpatient	o	•E	•E	o
Visiting friend/relative in hospital	Δ	o	•E	o
Visiting Hairdresser	o	•E	o	o
Religious services (e.g. go to Church)	o	o	Δ	o

Table 9.5: Results of the chi-squared test for the effect of age on the desired level of participation in the activities.

Where; •E: Significant difference in expected direction at 5%. o: Not significance at 5%. Δ: Significant difference in an unexpected direction at 5%.

Table 9.5 reported that age had a clear effect on elderly desired level of participation in economic activities, in which the older ones wish to do shopping more than the young elderly, except at Chapel Green there is no differences

between the two age groups. However, in shopping activities the test showed significant differences in the expected direction in Walkley, Manor, and Birley. In personal business the test showed that only Manor had significant differences in the expected direction. However, there are significant differences but in an unexpected direction at Walkley and Birley. The test only showed significant differences in the expected direction at Manor in social (e.g. pub, etc) and regular social meeting, and in Birley in visiting friends or relatives at home. However, there are significant differences but in an unexpected direction in social (e.g. pub, etc) on Walkley, Birley, and Chapel Green, This mean that the young elderly wish to participate in social more than the older ones in these areas, the same results showed in regular social meeting on Walkley and Birley. Furthermore, for health related activities the test shows that at Birley the older wish to take part more than the young elderly in all health related activities, Manor has the same results only on visiting hospital as an outpatient. The test showed significant differences, but in an unexpected direction for medical activities in Chapel Green and for visiting friends or relatives in hospital at Walkley. However, for other activities the test shows that the age had no effect at Manor where there is significant effect in the expected direction for using hairdresser, and at Birley where there is significant differences in an unexpected direction for religious services. It is clear from Table 9.5 that there is no consistent effect of age across the four areas.

9.4.3 The effect of disability

In Figure 9.1 it is argued that there will be a relationship between disability and the desired level of participation in activities. To test this hypothesis, difficulty in walking has been selected for this test, because in all areas the majority of the elderly with difficulties in walking (minor and severe or both). The sample for each area was split into two groups; elderly with no or only

minor difficulties in walking; and elderly with severe difficulties. The frequency distribution across the five frequency categories was then compared between the two categories. The results are summarised in table 9.6 in which the significance and the direction of differences is reported.

activities	Walkley	Manor	Birley	Chapel Green
Shopping	o	•E	•E	o
Personal business (e.g. bank, post office, building society)	Δ	•E	o	o
Social (e.g. pub, etc.)	Δ	•E	•E	o
Regular social meeting (e.g. social club, lunch club, whist drive)	o	o	o	•E
Visiting friend/relative at home	•E	•E	•E	•E
Medical (e.g. visiting doctor, day centre, clinic)	o	o	o	•E
Visiting hospital as an outpatient	o	•E	•E	o
Visiting friend/relative in hospital	•E	•E	•E	o
Visiting Hairdresser	o	o	o	o
Religious services (e.g. go to Church)	•E	o	•E	o

Table 9.6: Results of the chi-squared test for the effect of disability on the desired level of participation in the activities.

Where; •E: Significant difference in expected direction at 5%. o: Not significance at 5%. Δ: Significant difference in an unexpected direction at 5%.

Table 9.6 shows that severe disability in walking had a significant effect in all areas on most of the activities. The table shows that the elderly with minor disability wish to do more shopping than those with severe disability at Manor and Birley, on the other hand the test showed no differences in the desired level of participation between elderly with minor or severe disability at Walkley and Chapel Green. However, for personal business the effect of disability is different for example at Manor it had a significant effect in the expected direction but at Walkley had significant effect in a contrary direction. At Birley and Chapel Green the test showed no differences in the desired level

of participation between elderly with severe or minor disability. For social (e.g. pub, etc) the test showed significant differences in the expected direction in Manor and Birley, also in visiting friends or relatives at home in all areas, but for regular social meeting the test showed no significant differences except at Chapel Green. However, at Walkley the test showed that in social (e.g. pub, etc) elderly with severe disability wish to take part more than those with minor disability in walking.

For health related activities the table reported significant differences in the expected direction in medical at Manor and Birley, in visiting hospital as an outpatient in Chapel Green, and in visiting friends or relatives in hospital at Walkley, Manor, and Birley. However, for other activities the test showed that only Walkley and Birley with significant differences in the expected direction in the religious services.

At Manor and Birley the test results show that there are significance differences in most of the activities and the disability had very clear effect in these areas than Walkley and Chapel Green. Finally in general the hypothesis of the relationship between disability and the elderly desired level of participation in the activities can be accepted for all areas, with stronger effects of evident in Manor and Birley.

9.4.4 The effect of income

It is implied that in Figure 9.1 that there will be a relationship between income and the desired level of participation in activities. To test this hypothesis the sample for each of the areas was split into two groups; the first group with low income include two income categories (people living on state pension and benefits only including DHSS, and people living on state pension plus other income up to £50 p.w.); the second group include two income categories as well (people living on state pension plus other income £50 to £99 p.w., and

people living on state pension plus income over £100 p.w.). The frequency distribution across the five frequency categories was then compared between the two income groups. The results are summarised in Table 9.7 in which the significance and direction of differences is reported.

activities	Walkley	Manor	Birley	Chapel Green
Shopping	o	o	o	•E
Personal business (e.g. bank, post office, building society)	Δ	o	•E	o
Social (e.g. pub, etc.)	•E	•E	•E	o
Regular social meeting (e.g. social club, lunch club, whist drive)	o	o	o	•E
Visiting friend/relative at home	Δ	o	o	o
Medical (e.g. visiting doctor, day centre, clinic)	o	•E	•E	o
Visiting hospital as an outpatient	o	o	•E	o
Visiting friend/relative in hospital	o	o	o	•E
Visiting Hairdresser	o	o	•E	•E
Religious services (e.g. go to Church)	o	o	•E	o

Table 9.7: Results of the chi-squared test for the effect of income on activities.

Where; •E: Significant difference in expected direction at 5%. o: Not significance at 5%. Δ: Significant difference in an unexpected direction at 5%.

Table 9.7 shows that for economic activities income had a significant effect Chapel Green on shopping and in Birley on personal business, however, in Walkley there was a significant effect in a contrary direction in that elderly with low income wished to take part in personal business more than those with high income. For social (e.g. pub, etc) the test showed that there are a significant differences in the expected direction at Walkley, Manor, and Birley, and there is a significant effect in the expected direction at Chapel Green in regular social meeting. However, for visiting friends or relatives at home the test showed only Walkley had significant differences but in an unexpected direction, for the other areas the test shows no differences between the income

groups.

For medical travel the test showed significant differences in the expected direction at Manor and Birley, in visiting hospital as an outpatient at Birley, and in visiting friends or relatives in hospital at Chapel Green. For the other activities the test showed no differences in Walkley or Manor in the desired level of participation related to elderly income. However, the test showed that there are significant differences in the expected direction at Birley in the two type of activities (visiting Hairdresser, and go to Church), and the is significant effect in visiting Hairdresser at Chapel Green in the expected direction. The hypothesis that income affects desired level of participation on the activities of the elderly can be accepted for all areas except Walkley, with the stronger effects of evident in Birley and Chapel Green.

9.5 The relationship between the fully achieved activities and the elderly desired level of participation

In this section an attempt is made to make comparisons between the elderly's existing activities (chapter 8) and their desired level of participation. The differences are correlated with the personal characteristics of the respondents.

9.5.1 Comparison between the current level of participation and desired levels of participation

In this section the comparisons will be made between the current level of participation and the desired level of participation. The analysis only refers to those who recorded a wish to take part or to increase their level of participation in an activity, (those who did not answer this part of the questionnaire are not

included in this comparison).

9.5.1.1 Economic activities

It is clear from Table 9.1 that the right hand side of the table shows evidence of a wish for very frequent access to shops with most respondents wanting the possibility of *daily* shopping. To compare this with the left hand side of the same table, it is clear that the current level of participation is *less than once a month* or they *never* participate in shopping, except at Manor where they do shopping *weekly* but would wish to shopping *daily*.

For personal business the comparison between the right hand side and the left hand side of Table 9.1 shows that the current level of elderly participation is *less than once a month* and they would apparently be better satisfied with *weekly* or *monthly* access to personal business. The table also show that Manor and Birley with highest level of demand for access to shopping activity, for personal business the highest demand is apparently in Manor and Walkley.

9.5.1.2 Social activities

From the comparison between the right hand and the left hand side of Table 9.2 it is clear that most of the elderly who wish to increase their levels of participation are currently from those who take part in the activity *yearly* or even those who did not take part at all (category *never*), and they wish to take part *weekly* or *at least once a month*. This could be seen very clear in case of Birley with 48% of the elderly wish to participate in regular social meeting *weekly* instead of *yearly* or *never*. Similarly Walkley has some elderly who *never* participate in social or regular social meeting and yet wish to do so *weekly*. It is evident from the table that the majority of those who wish to take part or to increase their level of participation in the activities are from those who currently classified under categories *yearly* or *never*.

9.5.1.3 Health related activities

The elderly did not record participation in Health related activities as expected, because of this the number of responses analysed in this section (desired level of participation) is very small. From Table 9.3 there are some elderly at Walkley and Manor who wish to take part in medical activity *daily* or *weekly* instead of *yearly*. For visiting hospital as an outpatient, and visiting friends or relatives in hospital the table reported that some elderly at Manor and Birley wish to participate in these activities *weekly* instead of *yearly*. However, Birley have some elderly who *never* visit the Dentist, but would wish to do so *yearly*. There are some elderly at Manor and Birley who wish to visit the Chiropodist more frequently than the current levels.

9.5.1.4 Other activities

It is clear from Table 9.4 that there are numbers of elderly people who wish to increase their level of participation in the other activities. For example, for visiting Hairdresser the table reported numbers of elderly at Manor who *never* visited Hairdresser, but they wish to do so *daily* or *at least once a month*. On the other hand elderly at Birley and Chapel Green they wish to visit Hairdresser *weekly* or *at least once a month* instead of *yearly* or *less than once a month*.

For religious services the table reported that elderly at Manor and Chapel Green wish to go to Church *weekly* instead of *yearly* or even some of them never been in Church. In Birley the elderly wish to participate in religious services *weekly* or *at least once a month* instead of *yearly* or *less than once a month*.

9.5.2 The effect of personal characteristics on the mismatch between existing activities and desired level of participation

In the section which follows the responses which included both current levels of activity and desired levels were re-analysed to see whether the mismatch was correlated with age, disability, and income using the same procedures as before. The questionnaire problems referred to earlier made it impossible to carry out the analysis for all activities. However, four activities were covered in this section: shopping, personal business, visiting friend or relative at home, and attending medical services or using medical facilities.

activities	Walkley	Manor	Birley	Chapel Green
The effect of disability				
Shopping	•E	•E	•E	o
Personal business (e.g. bank,	•E	•E	•E	o
Visiting friend/relative at home	o	•E	•E	o
Medical (e.g. visiting doctor, day	•E	•E	•E	o
The effect of age				
Shopping	•E	•E	o	•E
Personal business (e.g. bank,	•E	•E	•E	•E
Visiting friend/relative at home	o	o	•E	o
Medical (e.g. visiting doctor, day	•E	•E	•E	•E
The effect of income				
Shopping	o	•E	•E	•E
Personal business (e.g. bank,	•E	•E	•E	•E
Visiting friend/relative at home	•E	•E	•E	•E
Medical (e.g. visiting doctor, day	•E	•E	•E	•E

Table 9.8: Results of the chi-squared test for the effect of personal characteristics on the mismatch between existing activities and desired level of participation

Where; •E: Significant difference in expected direction at 5%. o: Not significant at 5%.

The Table 9.8 therefore identifies the effect of personal characteristics on

the mismatch between existing activities and desired levels of participation. It is clear from the table that the degree of disability does effect the current and the desired levels of participation in Walkley, Manor, and Birley. In addition, in all areas age of the elderly had a clear effect except in visiting friend or relative at home. Finally income of the elderly had a clear effect in their participation and desired level of participation in activities in all areas. It is therefore evident that personal characteristics do have a significant effect on the mismatch between existing activities and desired levels of participation of the respondents.

9.6 Conclusion

In this chapter not all the respondents recorded desired level of participation or wish to increase their level of participation. This chapter refer substantially to those respondents who recorded their desired level of participation. It must be noted that the results reported in this chapter refer only to a small proportion of the total respondents in each area and there must be some doubt as to how far those results can be extrapolated.

The results shows that in the economic activities there is clear evidence of a wish for very frequent access to shops with most respondents wanting the possibility of daily shopping. For personal business the respondents would apparently be satisfied with weekly or monthly access. However, there is some evidence of differences between the three areas: for shopping the highest level of demand for access occurs in Birley and Manor, for personal business the highest demand is apparently in Manor and Walkley: but it must be remembered that the sample sizes are small.

In social activities the results shows that in the four areas there are substantial numbers of elderly who wish to take part in social activities (8% to 57%), Birley have the highest figure of respondents who wish to take part daily or

weekly in social (e.g. pub, etc) than in the other three areas. However, Chapel Green and Birley have the highest figure of respondents who wish to take part in regular social meeting weekly than Walkley and Manor.

The results show that in general health related activities have the lowest figures of respondents who wish to attend medical services or to use medical facilities. This may be because of some misunderstanding of the question, or because the majority of the respondents are satisfied with the health services. For other activities the results shows that there are some respondents who wish to visit Hairdresser daily, weekly, or at least once a month (9% to 36%), but there are significant differences between the four areas with more respondents wish to visit Hairdresser weekly or at least once a month in Chapel Green than in the other areas. For religious services the results shows that there are some respondents who wish to go to Church weekly or at least once a month (8% to 44%), but there are significant differences between the four areas with many more respondents wish to take part in religious services in Birley than in other three areas.

The factors affecting the respondents desired level of participation in the activities (age, disability status, income) are examined separately for each of the activity, but omitting those activities for which there is a very low overall participation (e.g. Betting). A simple chi-squared test was used, in each area the sample was split into two categories (successively on the basis of age, disability status, income), and the frequencies reporting each of the five level of participation were compared. The results of the test were reported in Tables 9.5, 9.6, and 9.7. The relationship between the fully achieved activities and the respondents desired level of participation have been covered. A comparison have been made between the current level of participation and the desired level of participation for those who only wish to take part or to increase their level of participation in the activity (see Tables 9.1, 9.2, 9.3, and 9.4). How-

ever, for those who did not answered this part of the questionnaire they are not included in this comparisons. There are two possible explanation for this first, they may satisfied with their level of participation, secondly they may misunderstand the question. It was found that personal characteristics (age, disability, income) had a significant effect on the mismatch between existing activities (chapter 8) and desired level of participation, and the degree of effect are correlated with personal characteristics of the respondents.

The desired level of participation may defined as “the difference between the elderly current level of participation and the level they wish to participate, however, in other cases where the respondent did not currently participate, the desired level is the level in which they wish to take part”.

Chapter 10

Transport methods used by the elderly

10.1 Introduction

The purpose of this chapter is to investigate the use of main transport modes by the elderly. The first section 10.2 describes the main transport modes available to the elderly and explains the use of public transport (bus, minibus, taxi) and the private transport (e.g. cars) by the elderly people. The second section 10.3 describes the main transport methods used by the elderly people in the four study areas according to four main categories of activities. A comparison between the method of transport most commonly used by the elderly by area and type of activity is also reported in this section. The third section 10.4 identifies some of the characteristics of individuals which affect the transport methods used especially the effect of personal characteristics (age, health status, income).

10.2 Transport methods available to the elderly

It is important to be clear from the outset exactly which services come within the scope of this chapter and correspondingly which are outside it. However, the study refers to particular type of public and private transport services. In recent years public transport has taken on a much wider definition amongst transport planners and researchers reflecting a growing awareness of the existence and relative importance of services other than conventional bus services. Transport methods available to the elderly are divided into two groups, public and private transport services, each group will be studied separately.

10.2.1 Public transport

Bailey and Layzell (1981) in their study defined public transport as *“passenger transport services provided on an organised basis for all or part of the community”*. According to this definition, this includes all forms of passenger transport, except use of the private car for informal (i.e. un-organised) lift-giving. However, the focus of this study comprises public and private transport services which are used, or could be potentially be used, by elderly and implicitly includes transport provision which is “special” in the sense that use is restricted in some way (e.g. subscription buses, social car schemes, ambulance services, and workers buses). But this type of transport was not separately identified in the questionnaire, and is therefore included within broader categories like bus, minibus, and car.

In the following sections each of the main modes of public transport will identified and the frequency and proportion of respondents using the mode of transport will be reported in tables. It is evident that the difference in mode use between the elderly related to the distance travelled, duration of journeys,

and journey purpose.

10.2.1.1 Buses

The use of buses as one of the main travel choices for elderly people including both the frequency of use and the proportion of elderly involved in such uses. Table 10.1 shows the proportion of elderly people who travel by bus or coach as a form of public transport in each area.

Travel by bus or coach				
	Walkley	Manor	Birley	Chapel Green
daily	3.7	14.1	6.6	14.3
more than once a week	50.0	60.9	42.3	46.9
once a week	13.0	15.2	19.2	9.2
at least once a month	9.3	1.1	16.3	6.1
less than once a month	7.4	4.3	3.8	8.2
never	5.6	4.3	4.8	12.2
don't know/no answer	11.1	0.0	3.9	3.0

Table 10.1: The proportion of elderly people who travel by bus or coach as a form of public transport.

It is clear from Table 10.1 that the bus is a major transport mode used by the elderly people in their travel. The table reported in all areas substantial numbers using buses more than once a week on regular basis (66% to 90%), but there are significant differences between the four areas with more of elderly used buses more than once a week in Manor than in the other three areas.

On the other hand there are some elderly who never used buses, the figures are difference between the four areas with more elderly who never use buses in Chapel Green than in the other three areas. The average proportion of the respondents who never used buses In the four areas is 7%. The results in Table 10.1 can be compared with those reported by Boots, et al (1980), who found that 8% of the elderly people never used buses (though they travelled by other

means of transport), and a further 12% used buses less than once a week. In this study 7% of respondents never used buses and 14% used buses less than once a week.

10.2.1.2 Minibuses

A major change brought about by the deregulation of public transport has been the increase in the number of minibuses. As these are smaller than conventional buses they are better able to use narrow streets in residential areas (with reduced access distances for passengers) and might therefore be expected to attract elderly passengers (see e.g. Glaister, 1985; Webster and Oldfield 1982). On the other hand some authors have reported that the high step and the narrow entrance make them more difficult for the elderly to use, especially if carrying bags, parcels etc (Hall and Robson, 1988).

It will be recalled that an earlier chapter described the level of minibus public transport service available to the four study areas ranged from the situation in Walkley and to some extent in Birley where there are many minibus services (but often on routes also served by conventional single and double decker buses), to the situation in Manor and Chapel Green where minibuses serve areas unserved by other buses.

It is clear from Table 10.2 that the use of minibuses by the elderly is very low, in that in all areas there are no elderly who reported using the minibuses daily, and very few use it weekly. This low level of patronage may be lower, because elderly find minibuses more difficult to use, this results is consistent with that reported by Banister and Mackett (1990).

10.2.1.3 Taxi

The word taxi as used in the questionnaire covers both private hire cars and hackney cabs (licensed to ply for hire at ranks etc). The provision of the first

Travel by Minibus				
	Walkley	Manor	Birley	Chapel Green
daily	0.0	0.0	0.0	0.0
more than once a week	0.0	2.2	0.0	0.0
once a week	1.9	9.8	1.9	1.0
at least once a month	0.0	0.0	1.9	6.1
less than once a month	1.9	5.4	1.0	2.0
never	11.1	17.4	31.7	37.0
don't know/no answer	85.2	65.2	63.5	53.1

Table 10.2: The proportion of elderly people who travel by minibus as a form of public transport.

category has always been weakly regulated but the 1985 Transport Act also attempted to deregulate the hackney cab industry, since it required all councils in England and Wales outside London to licence taxis and to be satisfied that there was no significant unmet demand for taxis before refusing applications for further licence (Fairhead, 1990). It was assumed that the resulting increase in supply and competition in fare levels would attract more trade, including the elderly to travel by taxi, but there is little evidence for this in this study. Table 10.3 shows the frequency and the proportion of elderly use of taxis as recorded in the survey.

It is clear from the table that only a small number of elderly used taxis in their travel, it shows that in all areas there are practically no elderly who report using taxi a daily, more than once a week, or even once a week. The table shows that the main frequency for use of taxis is less than once a month. Finally the results show that 16% of the respondents in all areas never used taxis, if we add to this those who did not reply to this question and those who answered "don't know" the total average is 79%, this compares with the work of Hopkin et al (1978) who found two thirds of the elderly never used taxis. Similarly the results of this study give lower levels of reported use than

Travel by Taxi				
	Walkley	Manor	Birley	Chapel Green
daily	0.0	0.0	0.0	0.0
more than once a week	0.0	0.0	0.0	0.0
once a week	1.9	0.0	0.0	1.0
at least once a month	0.0	2.2	7.7	5.1
less than once a month	13.0	12.0	20.2	19.4
never	9.3	13.0	13.5	26.5
don't know/no answer	75.9	72.8	58.7	47.9

Table 10.3: The proportion of elderly people who travel by Taxi as a form of public transport.

were reported by Hopkin et al (1978): for example this study recorded 16% of respondents using taxis less than once a month, whereas the other study recorded 23% in this category.

10.2.2 Private transport

There are several methods of private transport available to population in general, but private car is the only method which comes within the scope of this study. The private car has many characteristics which make it appropriate for the elderly, including door to door service. Private car use may be in two forms: as driver (and usually therefore as owner) or as passenger.

10.2.2.1 Car use by elderly as drivers

The use of car by elderly people as drivers depends on; firstly, car availability in the household where they live, and secondly, on whether the elderly person is licensed, insured, and able to drive. The analysis of the data shows that the proportion of elderly people live in household with car available to them are; 58% at Chapel Green, 37% at Birley, 35% at Walkley, and 13% at Manor,

and that in Chapel Green 46%, Walkley 44%, Birley 26%, and Manor 16% are licensed, insured and able to drive. These figures are slightly difficult to interpret in that in the case of Walkley more respondents reported being licensed, insured and able to drive than had a car available. It must be assumed that these either misread the questionnaire or perhaps insured for another car not in the household.

Location	Licence held:		
	Currently	Formerly	Never
Walkley	44.4	18.5	37.1
Manor	16.3	16.3	67.4
Birley	26.0	19.2	54.8
Chapel Green	45.9	15.3	38.8

Table 10.4: Driving licence characteristics of respondents.

Table 10.4 reports the proportion of elderly people in each area who currently hold a driving licence and are able to drive, those who formerly held a driving licence, and those who never held a driving licence. Chapel Green has the highest figure of those who currently hold a driving licence, Birley and Walkley have the highest figure of those who formerly held a driving licence. On the other hand Manor has the lowest proportion of elderly in both currently and formerly, and so has the highest figure of those who never held a licence.

Table 10.5 reports the frequency of use of a household car by the respondent as driver. It is clear from the table that in all areas a substantial minority drive a car daily or more than once a week, but there are significant differences between the four areas with more respondents driving a car daily or more than

Frequency of use:	Walkley	Manor	Birley	Chapel Green
daily	11.1	4.3	5.8	21.4
more than once a week	3.7	5.4	13.5	14.3
once a week	0.0	0.0	0.0	2.0
at least once a month	0.0	0.0	4.8	0.0
less than once a month	1.9	0.0	0.0	3.1
never	33.3	8.7	12.0	8.2
don't know/no answer	50.0	81.5	63.5	51.0

Table 10.5: The frequency of use of a household car as driver.

once a week in Chapel Green than in the other three areas. On the other hand the table shows that in all areas the proportion of respondents who never drive the household car nearly the same.

	Walkley	Manor	Birley	Chapel Green
Reasons of health	9.3	6.5	6.7	19.4
Could not afford it	16.7	13.0	16.3	6.1
No longer needed, interested	5.6	5.4	3.8	5.1
Other reasons	3.7	4.3	0.0	0.0

Table 10.6: The reasons for ceasing to drive on a regular basis (% of all respondents).

Table 10.6 reports the proportion of all respondents who have ceased to drive on a regular basis. The analysis of the data shows that financial difficulty is the main reported reason for ceasing to drive, the second main reason being health related problems. However, health was seen as a more important reason than financial difficulty in Chapel Green.

10.2.2.2 Car use by the elderly as passengers

There are two types of car use by elderly as passengers; elderly people who travel in a household car as a passenger, and those who travel in some other car as a passenger (excluding taxi trips). The two modes have not been widely or deeply researched in the case of the elderly, however, in this study the two modes have been covered and are treated separately. The following table reports the proportion of elderly who travel in a household car as passengers in each area and the frequency of travel.

Frequency	Walkley	Manor	Birley	Chapel Green
daily	5.6	1.1	0.0	6.1
more than once a week	14.8	7.6	21.2	20.4
once a week	13.0	4.3	6.7	11.2
at least once a month	9.3	14.1	14.4	8.2
less than once a month	0.0	10.9	10.6	3.1
never	44.4	45.7	33.7	33.7
don't know/no answer	13.0	16.3	13.5	17.3

Table 10.7: The proportion of elderly people who travel in a household car as a passenger.

It is clear from Table 10.7 that the proportion of elderly people who travel in a household car as passengers is greater than those who use a household car as driver (see Table 10.5). The results in the table show that in all areas substantial numbers travel in a household car as a passenger daily, more than once a week, or once a week (13% to 38%), but there are significant differences between the four areas as more of respondents travel more frequently (especially daily travel) in Chapel Green and Walkley than in Manor and Birley. However, Manor and Birley have more elderly who travel at least once a month or less than once a month than Chapel Green and Walkley. In addition the survey identified the nature of the driver on these occasions: the pattern is

rather uneven between the four study areas but drivers from within the household play significant roles: in Manor there is greater dependence on those from outside, in Chapel Green greater dependence on another household member. The second mode of car use by elderly as a passenger is when they travel in some other car as a passenger (excluding taxi trips).

Frequency	Walkley	Manor	Birley	Chapel Green
daily	0.0	0.0	0.0	3.1
more than once a week	5.6	7.6	10.6	7.1
once a week	5.6	12.0	7.7	19.4
at least once a month	7.4	22.8	21.2	7.1
less than once a month	31.5	18.5	30.8	26.5
never	16.7	21.7	11.5	22.4
don't know/no answer	0.0	4.3	1.9	2.0
N/A	33.3	13.0	16.3	12.2

Table 10.8: The proportion of elderly people frequency of travel in some other car as a passenger (excluding Taxi trips).

Table 10.8 shows that elderly people travel as passengers in some other car (excluding taxi trips) less frequently than in a household car. The analysis of the data shows that there are some elderly between (11% to 30%) who travel in some other car as a passenger more than once a week or once a week. The table also reports that in all areas substantial numbers travel in some other car at least once a month or less than once a month (34% to 52%), but there are marked differences between the areas with more of respondents travelling in some other car as a passenger in Birley than in the other three areas. The study also found that in all areas substantial numbers of elderly (44% to 63%), reported that it is a friend or relative (not in same household) who mostly drives the car when they travel in some other car as a passenger. These results are similar to those reported in the literature by Mitchell (1985), Mitchell (1988), Webster et al (1986), Gonda (1982), and Hopkin et al (1978),

who showed that elderly persons become dependent upon friends or relatives for the level of mobility achieved.

10.3 Analysis of the transport methods used by the elderly for different activities

In this section the main transport methods used by the elderly in their activities are described. The description has three main purposes: first it identifies the most frequent method of transport used by elderly and the associated mobility achieved by the elderly, secondly, it provides some understanding of the variation in the use of transport methods between activities, and thirdly the comparison between areas suggests differences in use of the transport methods, which may help to show how some of the activities are modified or prevented by mobility problems. Since a high degree of detail about mode use by elderly in the activities are available in the following tables it was decided to concentrate discussion on the modes used by a high percentage of respondents.

10.3.1 Economic activities

Economic activities are the first category surveyed in this study, this category includes, shopping, personal business activity. Table 10.9 shows the proportion of all respondents (%) with transport methods (or modes) used in their participation in the activities.

It will be clear from Table 10.9 that different methods of transport have been used by the elderly in their participation in the activities. The table shows that the main transport methods are bus or coach, walking, and car (as driver, or as passenger). In this table travel by car as passenger include two type of travel; in the household car or in some other car car.

It is clear from the table that the use of buses is the main mode for the elderly

Activities	Main Transport method used								
	bus or coach	mini-bus	taxi	car as driver	car as passenger	walk	other	home visit	N/A
Walkley area									
Shopping	38.9	1.9	0.0	7.4	13.0	37.0	0.0	0.0	1.9
Personal business (e.g. bank, post office, building society)	18.5	0.0	0.0	9.3	5.6	33.3	0.0	0.0	33.3
Betting shop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100
Manor area									
Shopping	58.7	0.0	0.0	7.6	4.3	27.2	0.0	0.0	2.2
Personal business (e.g. bank, post office, building society)	35.9	0.0	0.0	1.1	5.4	33.7	0.0	0.0	23.9
Betting shop	4.3	0.0	0.0	0.0	0.0	9.8	0.0	0.0	85.9
Birley area									
Shopping	45.2	0.0	0.0	8.7	16.3	26.9	0.0	0.0	2.9
Personal business (e.g. bank, post office, building society)	19.2	0.0	0.0	3.8	3.8	48.1	0.0	0.0	25.0
Betting shop	0.0	0.0	0.0	0.0	1.0	14.4	0.0	1.9	82.7
Chapel Green area									
Shopping	28.6	0.0	8.2	23.5	19.4	18.4	0.0	0.0	2.0
Personal business (e.g. bank, post office, building society)	33.7	0.0	0.0	22.4	10.2	18.4	0.0	0.0	15.3
Betting shop	3.1	0.0	0.0	0.0	0.0	1.0	0.0	0.0	95.9

Table 10.9: The proportion of the elderly people according to the main transport method used to take part in economic activities.

when they travel for shopping. In all areas substantial numbers of elderly travel by bus when they participate in shopping activities (29% to 59%), but there are a significant differences between the four areas with more of the elderly using buses in Manor than in the other three areas.

The second method of transport used by the elderly is walking, it is clear that the number of elderly using walking as mode of transport for shopping is less than those who use buses, however, in all areas substantial numbers of elderly walk for shopping (18% to 37%). The third method is use of the car (whether as driver or passenger, but excluding taxi trips). The table shows that there are some elderly who travel by car as driver or as passenger, but there are significant differences between the four areas with more elderly travelling by this method in Chapel Green than in the other three areas, moreover Chapel Green is the only area where some elderly use taxis to travel for shopping.

For personal business walking is the main transport method used by elderly in Walkley and Birley, car is the main transport method used in Chapel Green, and once again the bus is the elderly's main mode in Manor.

10.3.2 Social activities

Social activities are the second category surveyed in this study: it includes, social activities (e.g. pub, etc), regular social meetings (e.g. social club, lunch club, whist drive), and visiting friends or relatives at home. Table 10.10 shows the proportion of elderly who take part in social activities by each transport method in connection with each of the activities.

Activities	Main Transport method used								
	bus or coach	mini-bus	taxi	car as driver	car as passenger	walk	other	home visit	N/A
Walkley area									
Social (e.g. pub, etc.)	3.7	3.7	0.0	1.9	7.4	5.6	0.0	0.0	77.8
Regular social meeting (e.g. social club, lunch club, whist drive)	5.6	0.0	3.7	0.0	1.9	9.3	0.0	0.0	79.6
Visiting friend/relative at home	31.5	1.9	0.0	7.4	11.1	9.3	3.7	0.0	35.2
Manor area									
Social (e.g. pub, etc.)	6.5	0.0	0.0	1.1	0.0	26.1	0.0	0.0	66.3
Regular social meeting (e.g. social club, lunch club, whist drive)	15.2	2.2	1.1	6.5	0.0	12.0	0.0	0.0	63.0
Visiting friend/relative at home	43.5	0.0	0.0	1.1	10.9	6.5	0.0	0.0	38.0
Birley area									
Social (e.g. pub, etc.)	6.7	0.0	0.0	0.0	3.8	18.3	0.0	0.0	71.2
Regular social meeting (e.g. social club, lunch club, whist drive)	13.5	1.0	0.0	1.9	4.8	8.7	0.0	0.0	70.2
Visiting friend/relative at home	38.5	0.0	0.0	8.7	21.2	9.6	0.0	0.0	22.1
Chapel Green area									
Social (e.g. pub, etc.)	9.2	0.0	0.0	3.1	9.2	7.1	0.0	0.0	71.4
Regular social meeting (e.g. social club, lunch club, whist drive)	7.1	0.0	0.0	8.2	8.2	3.1	0.0	0.0	73.5
Visiting friend/relative at home	29.6	0.0	0.0	28.6	14.3	6.1	0.0	0.0	21.4

Table 10.10: The proportion of the elderly people according to the main transport method used to attend social activities.

It is clear from Table 10.10 that the main transport methods used by elderly people when they participate in the social activities are buses and walking at

Walkley and Manor, however, at Birley and Chapel Green bus and car (as driver or as passenger) are the main transport methods. The table shows that buses are the most frequent method used by elderly in visiting friends or relatives at home, in all areas substantial numbers use buses (30% to 44%), but there are significant differences between the four areas with more elderly travelling by bus at Manor than in the other three areas.

Walking is the main transport method used by the elderly at Walkley, Manor, and Birley when they take part in social activities, and bus is used for regular social meetings and visiting friends or relatives at home, but elderly at Walkley use walk more to regular social meeting than the other modes. On the other hand the elderly at Chapel Green use car (as driver or as passenger) as the main transport method for all the social activities. This result is consistent with the results reported earlier when it was found that Chapel Green has a higher figure of car availability to the elderly in the household where they live, and also that they use cars more than the other three areas. However, it was found that in Manor where there is the lowest figure of cars, they are more dependent on public transport (buses) or walking to participate in the activities.

10.3.3 Health related activities

The third category of activities surveyed in this study are health related activities. This category includes medical (e.g. visiting doctor, day centre, clinic), visiting hospital as an outpatient, visiting friend or relative in hospital, visiting Dentist, and visiting Chiropodist. Table 10.11 shows the proportion of elderly people by transport method used to attend medical services or to use medical facilities.

Activities	Main Transport method used								
	bus or coach	mini-bus	taxi	car as driver	car as passenger	walk	other	home visit	N/A
Walkley area									
Visiting friend/relative in hospital	16.7	0.0	0.0	5.6	1.9	0.0	0.0	0.0	75.9
Medical (e.g. visiting doctor, day centre, clinic)	3.7	3.7	0.0	3.7	7.4	25.9	0.0	0.0	55.6
Visiting hospital as an outpatient	5.6	1.9	3.7	0.0	1.9	5.6	0.0	3.7	77.8
Visiting Dentist	0.0	3.7	0.0	3.7	3.7	9.3	0.0	0.0	79.6
Visiting Chiropodist	1.9	1.9	3.7	1.9	7.4	9.3	0.0	1.9	72.2
Manor area									
Visiting friend/relative in hospital	22.8	0.0	1.1	4.3	9.8	4.3	0.0	0.0	57.6
Medical (e.g. visiting doctor, day centre, clinic)	18.5	0.0	0.0	2.3	3.3	34.8	0.0	1.1	40.2
Visiting hospital as an outpatient	15.2	0.0	0.0	4.3	7.6	0.0	3.3	0.0	69.6
Visiting Dentist	16.3	0.0	0.0	1.1	5.4	15.2	0.0	0.0	62.0
Visiting Chiropodist	23.9	0.0	0.0	0.0	0.0	12.0	1.1	3.3	59.8
Birley area									
Visiting friend/relative in hospital	30.8	0.0	0.0	9.6	3.8	0.0	0.0	0.0	55.8
Medical (e.g. visiting doctor, day centre, clinic)	15.4	0.0	7.7	2.9	2.9	44.2	0.0	1.9	25.0
Visiting hospital as an outpatient	40.4	0.0	3.8	2.9	0.0	0.0	0.0	0.0	52.9
Visiting Dentist	18.3	0.0	0.0	4.8	1.9	26.9	0.0	0.0	48.1
Visiting Chiropodist	24.0	0.0	0.0	1.9	1.9	8.7	0.0	1.9	61.5
Chapel Green area									
Visiting friend/relative in hospital	21.4	0.0	0.0	22.4	16.3	0.0	0.0	0.0	39.8
Medical (e.g. visiting doctor, day centre, clinic)	15.3	0.0	0.0	25.5	22.4	16.3	0.0	0.0	20.4
Visiting hospital as an outpatient	16.3	0.0	0.0	18.4	6.1	0.0	0.0	0.0	59.2
Visiting Dentist	5.1	0.0	0.0	14.3	8.2	3.1	0.0	0.0	69.4
Visiting Chiropodist	13.3	0.0	0.0	20.4	6.1	8.2	0.0	0.0	50.0

Table 10.11: The proportion of the elderly people according to the main transport method used to attend medical services or medical facilities.

It is clear from Table 10.11 that the elderly use a variety of methods in their travel for health related activities. The main methods used in all areas are buses, walking, and car (as driver or as passenger), in all areas there are up to 40% of the respondents use buses in their travel to attend medical services or use medical facilities, 44% used walking as the main transport method, and 48% use car, however, the table shows that there are significant differences in the use of each transport method between the areas. In Walkley the elderly walk for all activities except visiting friends or relatives in hospital. This means that all facilities which the elderly need are within walking distance.

Buses are the main transport method used by elderly at Manor and Birley for health purposes, except for medical activities (e.g. visiting doctor, day centre, clinic) where walking is the main transport method used. This means that in these two areas the elderly need to travel by bus to attend medical services or to use medical facilities, because the facilities are not within walking distance. However, in Chapel Green the use of car (as driver or as passenger) is the main transport method used by the elderly to attend medical services or to use medical facilities. This underlines the distinctive situation in Chapel Green where public transport is not well supplied, medical facilities are not within walking distance, and car ownership is high. It is also consistent with the comments made by organisers as reported in Chapter 7.

10.3.4 Other activities

The final category of activities surveyed in this study (other activities) includes, travel to Hairdresser and Religious services. Table 10.12 show the proportion of elderly people by each of transport method in each area in connection with each of the activities.

It is clear from Table 10.12 that the elderly use different method of transport in their travel to attend other activities. Walking is the most frequent method used by elderly in their travel in all areas, followed by buses, and then by car (as driver or as passenger) except Chapel Green once again car is the main transport method used by the elderly in their travel. Hairdresser is the only activities in which some of the elderly received at home. In all areas the elderly could attend other activities by walking distance except in religious services at Manor and Chapel Green, they need to travel by bus or car to take part in religious activities.

Activities	Main Transport method used								
	bus or coach	mini-bus	taxi	car as driver	car as passenger	walk	other	home visit	N/A
Walkley area									
Hairdresser	9.3	0.0	0.0	1.9	1.9	27.8	0.0	5.6	53.7
Religious services (e.g. go to Church)	3.7	0.0	0.0	0.0	0.0	14.8	0.0	0.0	81.5
Manor area									
Hairdresser	18.5	0.0	0.0	3.3	4.3	32.8	1.1	5.4	44.6
Religious services (e.g. go to Church)	7.6	2.2	0.0	3.3	9.8	5.4	1.1	0.0	70.7
Birley area									
Hairdresser	7.7	0.0	0.0	9.6	5.8	29.8	0.0	0.0	47.1
Religious services (e.g. go to Church)	1.0	0.0	0.0	3.8	0.0	19.2	0.0	0.0	76.0
Chapel Green area									
Hairdresser	8.2	0.0	0.0	13.3	8.2	23.5	0.0	2.0	44.9
Religious services (e.g. go to Church)	5.1	0.0	0.0	18.4	10.2	7.1	0.0	0.0	59.2

Table 10.12: The proportion of the elderly people according to the main transport method used to attend other activities.

10.4 The factors affecting the use of transport methods in the activities

In this section an attempt is made to correlate the transport method used in activities with certain personal characteristics of the individual respondent. The personal characteristics examined are; age, disability in walking, and Income. The relationships are examined separately for each of the activity categories.

10.4.1 Testing method

To test the relationships in Figure 10.1 a simple comparison was used. In each area the sample was split into two categories (successively on the basis of age, health status, income), and the frequencies reporting each level of transport mode use were compared. The following tables report the respondent category with the higher level of use for each purpose and mode based on question 14a, in the questionnaire which asked respondents to identify the main mode of use. As the results are subject to sampling and other errors small differences

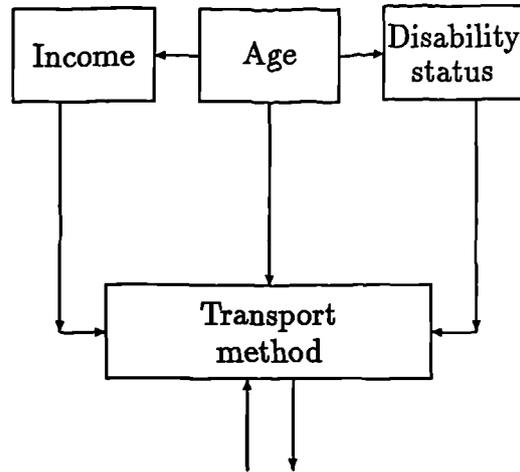


Figure 10.1: The relationship between transport method used by elderly and the affect of the personal characteristics

(less than 2%) were disregarded (and entered \approx in the tables)

10.4.2 The effect of age

It is implied in Figure 10.1 that there will be a relationship between age and the transport method used by elderly in activities. To carry out the comparison, the sample for each of the areas is split into two age groups: 65-69; and 70⁺. The frequency distribution across the four transport method was then compared between the two age categories. The results are summarised in Table 10.13 in which the marked and direction of the differences is reported.

It is clear from Table 10.13 that there is no clear cut overall pattern in the effect of age. Two features are however worthy of mention: first the young elderly are more likely to walk than the old elderly in Walkley and in Birley, and to some extent in Manor. There is no clear difference between activities in this respect. Secondly there are age related differences in car use in the different areas: in Chapel Green the younger elderly are more likely to use

	Walkley				Manor				Birley				Chapel Green			
	B	D	P	W	B	D	P	W	B	D	P	W	B	D	P	W
Shopping	o	•	•	o	•	o	o	•	o	≈	•	•	≈	•	o	o
Personal business	•	•	•	•	o	•	o	o	•	•	•	•	•	•	•	o
Betting shop	-	-	-	-	•	-	-	o	-	-	≈	•	•	-	-	-
Social	o	o	•	o	•	•	-	•	•	-	•	•	•	•	•	•
Regular meeting	o	-	•	≈	•	o	-	•	•	o	o	o	o	≈	o	•
Visiting at home	o	•	o	•	o	•	•	o	o	≈	•	•	≈	•	≈	≈
Medical	•	•	o	-	•	≈	o	o	•	≈	•	-	•	•	≈	-
outpatient	•	≈	o	•	o	o	o	•	o	•	•	•	•	•	•	o
Friend in hospital	•	-	•	•	•	≈	o	o	•	•	-	-	•	•	o	-
Visiting Dentist	-	•	•	•	•	•	o	o	•	≈	o	•	o	•	•	o
Visiting Chiropodist	o	o	o	•	o	o	-	•	o	o	•	•	•	≈	•	≈
Visiting Hairdresser	≈	o	o	•	o	o	o	•	o	≈	•	•	o	•	≈	•
Religious services	≈	-	-	•	o	o	•	•	≈	•	-	•	o	≈	≈	o

Table 10.13: Results of the effect of age on activities by each of transport method.

Where; •: Higher use by young elderly (65 to 69 years old), o: Higher use by older elderly (70+ years old), ≈: No differences between the two groups, -: No data available.

B = Travel by bus or coach, D = Travel by car as driver, P = Travel by car as passenger, and W = Walking as transport method.

cars as drivers, in Birley the same group are more likely to be passengers, while in Manor it is the older elderly who show a marked tendency to be passengers.

10.4.3 The effect of disability

From Figure 10.1 it is argued that there will be a relationship between disability and the transport method used by elderly in activities. In this comparison difficulty in walking has been selected for this test, because in all areas there are more than 60% of the elderly with difficulties in walking (minor and severe or both). The sample for each area was split into two groups; elderly with minor difficulties in walking; and elderly with severe difficulties. The frequency

distribution across the four transport methods was then compared between the two categories. The results are summarised in Table 10.14 in which the marked and the direction of differences is reported.

	Walkley				Manor				Birley				Chapel Green			
	B	D	P	W	B	D	P	W	B	D	P	W	B	D	P	W
Shopping	o	•	o	•	•	•	o	o	≈	•	o	≈	•	o	•	o
Personal business	•	•	o	•	•	-	•	•	o	•	o	•	o	•	o	o
Betting shop	-	-	-	-	•	-	-	•	-	-	•	•	•	-	-	•
Social	•	•	•	•	•	-	-	•	o	-	o	o	•	-	•	•
Regular meeting	•	-	-	•	•	•	-	•	•	•	o	•	•	•	•	o
Visiting at home	•	•	o	•	•	-	≈	•	o	•	o	•	•	•	o	•
Medical	•	•	o	-	•	-	o	•	o	•	-	-	o	•	o	-
outpatient	•	•	o	•	≈	•	•	•	o	•	o	•	o	•	o	•
Friend in hospital	•	-	o	•	•	-	•	-	o	•	-	-	o	•	o	-
Visiting Dentist	o	•	o	o	•	-	•	o	o	•	-	•	•	•	o	•
Visiting Chiropodist	-	•	o	•	o	-	-	•	•	•	o	≈	o	•	o	•
Visiting Hairdresser	o	•	o	≈	•	-	•	o	o	o	o	•	•	•	o	•
Religious services	o	-	-	≈	o	-	•	•	•	•	-	o	•	•	o	•

Table 10.14: Results of the effect of disability on activities by each of transport method.

Where; •: Higher use by young elderly with minor disability, o: Higher use by older elderly with severe disability, ≈: No differences between the two groups, -: No data available.

B = Travel by bus or coach, D = Travel by car as driver, P = Travel by car as passenger, and W = Walking as transport method.

It is clear from Table 10.14 that there is clear evidence of the effect of disability. Four features are worthy of mention: first the elderly with minor disability are more likely to walk than those with severe disability in the four areas. Secondly the elderly with minor disability are more likely to be involved as car drivers in Walkley, Birley, and Chapel Green. Thirdly in Walkley and Manor the elderly with minor disability are more likely to use buses than those with severe disability. Finally the elderly with severe disability are more likely to be passengers in Walkley, Birley, and Chapel Green, while in Manor it is the

elderly with minor disability who show a marked tendency to be passengers.

10.4.4 The effect of income

It is implied that in Figure 10.1 that there will be a relationship between income and the transport method used by elderly in activities. In this comparison the sample for each of the areas is split into two groups; first group termed "low income" include two income categories (people living on state pension and benefits only including DHSS, and people living on state pension plus other income up to £50 p.w.);

	Walkley				Manor				Birley				Chapel Green			
	B	D	P	W	B	D	P	W	B	D	P	W	B	D	P	W
Shopping	≈	o	•	•	•	o	•	o	•	o	•	o	o	o	•	•
Personal business	o	≈	o	o	•	o	•	•	≈	o	•	•	•	o	•	o
Betting shop	-	-	-	-	•	-	-	•	-	-	≈	o	•	-	-	≈
Social	o	o	o	•	•	o	-	•	•	-	o	•	o	•	o	o
Regular meeting	•	-	o	•	•	o	-	•	o	o	o	o	o	o	≈	o
Visiting at home	o	o	•	≈	o	o	•	o	•	o	•	o	•	o	•	o
Medical	o	•	•	-	o	o	o	o	•	o	o	-	•	o	•	-
outpatient	≈	o	o	≈	o	o	o	•	o	o	o	•	o	o	•	o
Friend in hospital	•	-	o	o	•	o	o	-	≈	o	-	-	•	o	≈	-
Visiting Dentist	≈	•	o	o	•	o	•	o	o	o	•	o	≈	o	•	•
Visiting Chiropodist	o	o	o	≈	•	-	-	•	•	o	•	≈	•	o	•	o
Visiting Hairdresser	o	o	o	•	o	o	o	•	o	o	o	•	≈	o	•	≈
Religious services	≈	-	-	•	•	o	•	≈	≈	o	-	o	≈	o	•	•

Table 10.15: Results of the effect of income on activities by each of transport method.

Where; •: Higher use by young elderly with low income (categories 1 and 2), o: Higher use by older elderly with high income (categories 3 and 4), ≈: No differences between the two groups, -: No data available.

B = Travel by bus or coach, D = Travel by car as driver, P = Travel by car as passenger, and W = Walking as transport method.

the second group includes two income categories as well (people living on

state pension plus other income £50 to £99 p.w., and people living on state pension plus income over £100 p.w.). The frequency distribution across the four transport method was then compared between the two income groups. The results are summarised in Table 10.15 in which the marked and direction of differences is reported. It is evident from Table 10.15 that the income of the respondents had a clear effect on their mode use. The table shows that there are two main effects of income on mode used. The first is the tendency of the low income category to make greater use of the bus in Manor and to a lesser extent in Chapel Green, but not in the other two areas. The second is the tendency for higher income groups to be more involved as car drivers in all four areas; the pattern in Chapel Green is particularly clear because in addition to low income groups we clearly identified as more likely to travel as passenger.

10.5 Conclusions

This chapter investigates the use of main transport modes by the elderly and describes the main transport modes available to the elderly, and seeks to explain the use of public transport (bus, minibus, taxi) and private transport (e.g. cars) by the elderly

It is evident from this chapter that bus is the main transport mode used by the elderly people in their travel, the study reported that Manor and Chapel Green with about 14% of the respondents used buses daily, however, the results reported in Table 10.1 show that the most frequent use of buses in all the four areas is more than once a week. The results show that in all areas substantial numbers using buses more than once a week (42% to 61%), but there are significant differences between the four areas with more of elderly used buses more than once a week in Manor than in the other three areas. The results in Table 10.1 can be compared with those reported by Boots, et

al (1980), who found that 8% of the elderly people never used buses (though they travelled by other means of transport), and a further 12% used buses less than once a week. In this study 7% of respondents never used buses and 14% used buses less than once a week.

The second mode of public transport is the minibus, the study found that the use of minibuses by the elderly is very low (see Table 10.2). The results show that in general in all areas there are no elderly reported use the minibuses daily or weekly. However, the use of minibuses is occasional and not in all areas. The results found in this study differ from those reported in some other studies; firstly, Glaister (1985), Webster and Oldfield (1972) reported that the minibuses have some characteristics favourable to the elderly (e.g. can offer greater route coverage). But this study is similar to the results of Hall and Robson (1988) who found the unfavourable characteristics for the elderly in terms of using the minibuses, for example, accessibility to minibuses does cause difficulties for elderly due to the high step heights and to the elderly person with shopping or luggage because of the restricted entrance widths.

For taxi and hire cars the study found that only a small number of elderly used these in their travel; the results show that 16% of the respondents in all areas never used taxis, if we add to this those who did not reply to this question and those who answered "don't know" the total average is 79% (see Table 10.3), this compares to Hopkin et al (1978) who found two thirds of the elderly never used taxis. Similarly the results of this study give slightly lower levels of reported use than were reported by Hopkin et al (1978): for example this study recorded 16% of respondents using taxis less than once a month, whereas the other study recorded 23% in this category.

Car use by the elderly as drivers this depends on; firstly, car availability in the household where they live; secondly, on the elderly as a person if he/she licensed, insured, and able to drive. It was found that in all areas a substantial

minority drive a car daily or more than once a week (10% to 36%), but there are significant differences between the four areas with more respondents driving a car daily or more than once a week in Chapel Green than in the other three areas (see Table 10.5). The study found that the financial difficulties is the main reported reason for ceasing to drive. The second main reason is health related problems (see Table 10.6).

The study found two types of car use by elderly as passengers; elderly people who travel in a household car as a passenger, and those who travel in some other car as a passenger (excluding taxi trips). The study found that the proportions of elderly people who travel in a household car as a passenger are greater than those who use a household car as driver (see Tables 10.5 and 10.7), and the elderly people who travel in some other car as a passenger (excluding taxi trips) have lower frequency travel than those who travel in a household car as a passenger (see Table 10.8). The study also found that in all areas substantial numbers of elderly (44% to 63%), reported that it is a friend or relative who lives somewhere else, who mostly drives the car when they travel in some other car as a passenger. These results are similar to that reported in the literature.

Transport methods used in the activities

The main transport methods used by the elderly have been reported earlier in section 10.3. This section an attempt is made to summarise the main transport modes used in each area by type of activity. It is clear from Table 10.16 that in three areas elderly use bus and walking to participate in economic and health related activities, however, in Chapel Green they use car and bus. For social activities the elderly in Manor and Birley once again use bus and walk, those in Walkley use car and walk, while those in Chapel Green use car and

Activities	Walkley	Manor	Birley	Chapel Green
Economic activities	Bus Walking	Bus Walking	Bus Walking	Car Bus
Social activities	Car Walking	Bus Walking	Bus Walking	Car Bus
Health activities	Bus Walking	Bus Walking	Bus Walking	Car Bus
Other activities	Bus Walking	Walking Car	Walking Car	Bus Car

Table 10.16: A summary comparison of the most commonly reported frequency transport method used by the elderly by area and type of activity.

Note: (The order in which modes are recorded in a cell represent the relative importance of the modes.)

bus, Walking is used in three areas, car used in Manor, Birley, Chapel Green, but in Walkley they used buses (see Tables 10.9, 10.10, 10.11, and 10.12).

Individual characteristics affecting the use of transport methods

This study examined the characteristics of individuals which affect the transport methods used (e.g. age, disability status, income). The analysis of the data shows that the age does not have a clear effect in the use of transport methods by the elderly in their participation in activities (see Table 10.13). For disability the test show that elderly with minor disability are more likely to use buses in Walkley and Manor. In all areas elderly with minor disabilities are more likely to drive a car or to walk, on the other hand elderly with severe disabilities are more likely to travel by car as passenger (see Table 10.14). For the income it is clear from the results reported on Table 10.15 that buses have been used by both income groups in Walkley, Birley, and Chapel Green,

however, at Manor elderly with low income is the main bus users. In all areas elderly who travel by car as driver is mainly those with high income, however, elderly from both income groups travel by car as a passenger at Walkley, Manor and Birley, but at Chapel Green it is clear that it is mainly elderly with low incomes who travel by car as passengers.

Chapter 11

Transport difficulties encountered by the elderly in using transport

11.1 Introduction

The purpose of this chapter is to identify and describe the main transport difficulties facing the elderly people in their travel, and the relationship between transport difficulties and the elderly's participation in activities, as perceived by the elderly themselves. The first main section (11.3) describes the main transport difficulties reported in using the transport available by the elderly (cost of transport, time taken, delays or waiting etc, physical problems in vehicle use, and walking to or from the bus, taxi, or car); the next sections examine the effect of transport difficulties on modifying activities (11.4), factors identified as modifying levels of activity (11.5), the effects of these factors on frequency of participation (11.6), and frustrating activities (11.7), and the final section seeks to identify the consequences of the analysis in terms of latent demand.

11.2 Transport difficulties: data and method of analysis

In earlier chapters the difficulties encountered by the elderly when using the transport system were reviewed. In the questionnaire used for this project four types of difficulties were identified and respondents were asked to identify the one of these which most affected their travel. The four categories were transport cost, time taken (including delay, wait time, etc), physical problems of vehicle use (e.g. difficulty in boarding bus), and access (walking to and from the transport used). The original design assumed that most respondents would answer this part of the questionnaire either to record the difficulties actually encountered in travel or to record the difficulties which prevent travel. Although this appeared to work in the pilot questionnaire in the postal questionnaire many did not respond (N/A in the tables which follow). There appear to be two reasons for this high level of non-response. In some cases the respondents were unaffected by any of the four difficulties, in other cases those not making trips for a particular purpose saw the question as not applicable. This means that the tables which follow must be interpreted with caution.

11.3 Descriptive analysis of the main transport difficulties by area

In this section the main transport difficulties are described. This description has three purposes: first it helps to identify the current transport difficulties facing the elderly and how these difficulties affect their mobility, secondly it provides some understanding of the variation in participation between activities, and thirdly the comparison between areas suggests differences in transport difficulties which may result in activities which are modified or frustrated (pre-

vented) by mobility problems.

Since a high degree of detail about transport difficulties facing the elderly in their participation in the activities are available in the following tables it was decided to concentrate discussion on the transport difficulties identified by a high percentage of respondents.

11.3.1 Economic activities

Economic activities are the first category surveyed in this study, it includes, shopping, personal business (e.g. bank, post office, building society), and betting. Table 11.1 shows the proportion of all respondents (%) who have transport difficulties in each area for each of the activities.

Activities	Travel difficulties for this activity				
	Cost	Time	Physical	Access	N/A
Walkley area					
Shopping	11.1	11.1	1.9	24.1	51.9
Personal business (e.g. bank, post office, building society)	1.9	13.0	1.9	7.4	75.9
Betting shop	0.0	0.0	0.0	1.9	98.1
Manor area					
Shopping	19.6	35.9	10.9	30.4	3.3
Personal business (e.g. bank, post office, building society)	8.7	20.7	7.6	12.0	51.1
Betting shop	0.0	4.3	0.0	1.1	94.6
Birley area					
Shopping	16.3	32.7	6.7	19.2	25.0
Personal business (e.g. bank, post office, building society)	5.8	18.3	3.8	14.4	57.7
Betting shop	0.0	0.0	0.0	0.0	100.0
Chapel Green area					
Shopping	11.2	38.8	4.1	21.4	24.5
Personal business (e.g. bank, post office, building society)	10.2	34.7	1.0	11.2	42.9
Betting shop	0.0	0.0	0.0	0.0	100.0

Table 11.1: The proportion of elderly people by type of difficulties encountered in using transport when they take part in economic activities.

It is clear from Table 11.1 that the main transport difficulties facing the elderly when they participate in economic activities or wish to do so can be

ranked in order: time taken, access, cost of transport and finally physical problems. In the four areas there are substantial numbers of respondents for whom the main transport difficulty is time taken (11% to 39%), but there are marked differences between the four areas with less of the elderly having difficulties in Walkley than in the other three areas: perhaps reflecting the fact that Walkley well served by public transport. The other two important sources of difficulty (access and cost) are seen as having similar importance in all four areas.

When the four areas are compared for overall difficulty experienced by the elderly the table shows that Walkley has the lowest proportion of elderly with transport difficulties with less than 50% in shopping and less than 25% in personal business, however, for the other three areas 75% or more of the elderly report transport difficulties in shopping activities (with Manor at the top with 97%), and more than 42% reported difficulties in personal business (with Chapel Green at the lead with 57%).

11.3.2 Social activities

Social activities are the second category surveyed in this study: it includes, social activities (e.g. pub, etc), regular social meetings (e.g. social club, lunch club, whist drive), and visiting friend or relative at home. Table 11.2 show the proportion of elderly who have transport difficulties in each area with each of the activities.

It is evident from Table 11.2 that in Walkley and Manor the main transport difficulties the elderly have when they take part in social activity and in regular social meeting is access to transport and the second main difficulty is the time taken. But for visiting friends or relatives the time taken is the main problem, followed by the cost of transport for both areas. In Birley and Chapel Green the main problem is the time taken followed by the cost of transport. It is clear from the table that Walkley and Manor have similar rankings of problems

Activities	Travel difficulties for this activity				
	Cost	Time	Physical	Access	N/A
Walkley area					
Social (e.g. pub, etc.)	1.9	3.7	0.0	5.6	88.9
Regular social meeting (e.g. social club, lunch club, whist drive)	0.0	1.9	0.0	1.9	96.3
Visiting friend/relative at home	7.4	20.4	1.9	7.4	63.0
Manor area					
Social (e.g. pub, etc.)	4.3	6.5	0.0	7.6	81.5
Regular social meeting (e.g. social club, lunch club, whist drive)	7.6	9.8	2.2	10.9	69.6
Visiting friend/relative at home	10.9	23.9	0.0	9.8	55.4
Birley area					
Social (e.g. pub, etc.)	5.8	7.7	1.9	3.8	80.8
Regular social meeting (e.g. social club, lunch club, whist drive)	9.6	8.7	0.0	3.8	77.9
Visiting friend/relative at home	21.2	24.0	4.8	11.5	38.5
Chapel Green area					
Social (e.g. pub, etc.)	0.0	11.2	0.0	6.1	82.7
Regular social meeting (e.g. social club, lunch club, whist drive)	4.1	6.1	1.0	3.1	85.7
Visiting friend/relative at home	12.2	35.7	2.0	6.1	43.9

Table 11.2: The proportion of elderly people by type of difficulties encountered in using transport when they take part in social activities.

(time, then access, then cost) which differs from the rankings in Birley and Chapel Green (time, then cost, then access). On the other hand it must be stressed that overall levels of difficulty are markedly lower in Walkley than in the other three areas. However, 19% of the respondents in Birley have transport difficulties when taking part in social activity, 30% in Manor have transport difficulties in attending regular social meetings, and 56% in Chapel Green have transport difficulties in visiting friends or relatives at home.

11.3.3 Health related activities

The third category of activities surveyed in this study are health related activities. This category includes medical (e.g. visiting doctor, day centre, clinic), visiting hospital as an outpatient, visiting friend or relative in hospital, visiting dentist, and visiting chiropractor. Table 11.3 show the proportion of elderly

people who recorded transport difficulties in attending medical services or using medical facilities in each area, in connection with each of the activities. In interpreting Table 11.3 care must be taken because of the large numbers of A/N responses.

Activities	Travel difficulties for this activity				
	Cost	Time	Physical	Access	N/A
Walkley area					
Visiting friend/relative in hospital	3.7	7.4	0.0	5.6	83.3
Medical (e.g. visiting doctor, day centre, clinic)	0.0	1.9	0.0	13.0	85.2
Visiting hospital as an outpatient	3.7	7.4	0.0	5.6	83.3
Visiting Dentist	0.0	5.6	0.0	7.4	87.0
Visiting Chiropodist	1.9	3.7	0.0	7.4	87.0
Manor area					
Visiting friend/relative in hospital	3.3	6.5	5.4	4.3	80.4
Medical (e.g. visiting doctor, day centre, clinic)	8.7	9.8	3.3	16.3	62.0
Visiting hospital as an outpatient	7.6	7.6	5.4	2.2	77.2
Visiting Dentist	2.2	6.5	0.0	5.4	85.9
Visiting Chiropodist	1.1	7.6	1.1	7.6	82.6
Birley area					
Visiting friend/relative in hospital	8.7	15.4	1.0	8.7	66.3
Medical (e.g. visiting doctor, day centre, clinic)	5.8	20.2	1.9	9.6	62.3
Visiting hospital as an outpatient	10.6	7.7	0.0	3.8	77.9
Visiting Dentist	2.9	8.7	0.0	2.9	85.6
Visiting Chiropodist	6.7	5.8	1.9	4.8	80.8
Chapel Green area					
Visiting friend/relative in hospital	3.1	21.4	1.0	8.2	66.3
Medical (e.g. visiting doctor, day centre, clinic)	4.1	21.4	1.0	11.2	62.2
Visiting hospital as an outpatient	3.1	16.3	0.0	8.2	71.4
Visiting Dentist	1.0	6.1	0.0	5.1	87.8
Visiting Chiropodist	4.1	13.3	1.0	9.2	72.4

Table 11.3: The proportion of elderly people by type of difficulties encountered in using transport when attending medical services or facilities.

Nevertheless there is some evidence in Table 11.3 that the respondents are having different transport difficulties in each category of health related activity and in each area. The table shows that in all areas the main transport difficulties for the elderly when visiting friends or relatives in hospital is time taken, but there are differences between the areas with more elderly having thus difficulty in Chapel Green than in the other three. For medical activities

the table shows Walkley and Manor with high proportions of elderly having difficulties in access to transport, however, Birley and Chapel Green have high figures of elderly experiencing the main difficulty in time taken. For visiting hospital as an outpatient the table shows that time taken is the main transport difficulty in Walkley, Manor, and Chapel Green, but in Birley the cost of transport is the main problem reported. For visiting dentist time taken once again is the main problem for the elderly people in Manor, Birley, and Chapel Green, however, in Walkley access is the main transport difficulty. Finally for visiting chiropodist, the main transport difficulties for the elderly in Manor and Chapel Green is the time taken, in Walkley access is the main transport difficulty, and in Birley the cost of transport is the main problem.

When the four areas are compared for overall difficulty experienced by the elderly, the table shows that for all categories of health related activities walkley have the lowest figure of elderly with transport difficulties (13% to 17%), however, Chapel Green has the highest figure between (12% to 38%).

11.3.4 Other activities

The final category of activities surveyed in this study is other activities. This category includes, travel to hairdresser and religious services (e.g. go to Church). Table 11.4 show the proportion of elderly people who have transport difficulties in each area with each of the other activities.

Table 11.4 shows that the main transport difficulties reported by the elderly people in their participation in other activities are the time taken, and access to transport. The table shows that access is the main transport problem for the elderly in Walkley and Manor in their travel to the hairdresser, and time taken is the main problem for attending religious services, but the absolute numbers are small. In Birley the cost of transport is the main problem for the elderly to travel to the hairdresser, and time taken is the main problem for

Activities	Travel difficulties for this activity				
	Cost	Time	Physical	Access	N/A
Walkley area					
Hairdresser	1.9	3.7	0.0	9.3	85.2
Religious services (e.g. go to Church)	0.0	1.9	0.0	0.0	98.1
Manor area					
Hairdresser	1.1	6.5	0.0	9.8	82.6
Religious services (e.g. go to Church)	1.1	9.8	4.3	4.3	80.4
Birley area					
Hairdresser	11.5	3.8	2.9	5.8	76.0
Religious services (e.g. go to Church)	0.0	3.8	0.0	3.8	92.0
Chapel Green area					
Hairdresser	5.1	13.3	1.0	7.1	73.5
Religious services (e.g. go to Church)	1.0	7.1	0.0	14.3	77.6

Table 11.4: The proportion of elderly people by type of difficulties encountered in using transport when they take part in other activities.

attending religious services. However, in Chapel Green time taken is the main transport problem for the elderly to travel to the hairdresser and access is the main problem for attending religious services.

When the four areas are compared for overall difficulty experienced by the elderly the analysis of the data shows that Walkley once again with the lowest figure of respondents with transport difficulties, and Chapel Green with the highest figure (Manor and Birley appear to have an intermediate position).

11.4 Modified activities

Modified activities are defined in this study as being where an individual is unable to participate fully in a desired or existing activity but nevertheless participates in modified form: by changing the location or changing the frequency. However, this study covered only the second aspect (changing the frequency). Changing the location is not covered by this study because it was not possible to devise a simple question which would successfully identify this effect, especially as there are many activities for which an alternative location

is available. It is also important to note the distinction between temporary modification (which will be reversed if mobility conditions change) and permanent modification, although the difference may be only one of degree: in this survey no distinction was possible between these two forms but they are clearly present in the responses to open questions as can be illustrated by quotation. For example:

“I do not go into the city because insufficient parking at reasonable cost. We travel to Chesterfield and Worksop to shop for 90% of the time. Parking is easy, convenient and cheap or free. We also visit Crystal Peaks for the same reason”. In this case the change of location is between two quite distant locations. Another respondent appears to modify both frequency and location:

“As my wife and I both have mobility problems in regard to walking difficulties, public transport is far from ideal for getting to and from places we need to visit. If we were without our own means of transport we would have to limit our journeys around and about as we would then be relying on friends or relatives and, occasionally, taxis for transport”.

	Frequency	
	High	Low
Local	Reduce frequency	No change
Non-local	Reduce frequency and change location	Change location if possible

Figure 11.1: The effect of transport difficulties in modifying the frequency and or location of activities.

The relationships outlined in Figure 11.1 suggest that activities which require access to places outside the locality and where participation is frequent (or desired to be frequent) are likely to show modification in both frequency

and location. Modification of location may occur when the activity has low frequency and takes places outside the locality (e.g. visiting the Dentist). On the other hand when the activity is available locally and frequency is high, then they modify the frequency (e.g. shopping).

	Walkley	Manor	Birley	Chapel G.
Shopping	44.7	90.2	73.0	75.5
Personal business (e.g. bank, post office, building society)	18.7	42.4	39.4	56.1
Betting shop	-	4.3	-	-
Social (e.g. pub, etc.)	7.5	14.0	14.4	16.3
Regular social meeting (e.g. social club, lunch club, whist drive)	3.8	26.1	19.2	12.3
Visiting friend/relative at home	28.2	34.8	49.9	55.0
Visiting friend/relative in hospital	5.6	11.9	15.4	23.5
Medical (e.g. visiting doctor, day centre, clinic)	5.6	11.9	28.0	29.7
Visiting hospital as an outpatient	3.8	29.4	25.1	33.7
Visiting Dentist	11.2	10.8	14.5	12.2
Visiting Chiropodist	11.2	16.3	21.1	27.6
Hairdresser	9.4	17.4	21.1	26.5
Religious services (e.g. go to Church)	1.9	18.4	7.6	22.4

Table 11.5: The proportion of elderly people who report having modified their activities because of difficulties encountered in using transport (figures give % of all respondents).

Two features stand out from the table. The first is once again, quite marked differences between the four areas with Walkley experiencing much less modification of activity than the other three areas, apparently because Walkley is well covered by the transport system and has a high level of facilities available to the elderly. The second feature is the marked difference between activities.

11.5 Factors identified as modifying levels of activity

In this section an attempt is made to correlate the transport difficulties or modifying factors facing the elderly people with participation in the activities of the individual respondent. The transport difficulties or modifying factors examined are; the cost of transport, the time taken (delays or waiting), physical problems in vehicle use, and walking to or from the bus, taxi, or car. The effect of these problems on the elderly's level of participation are examined separately for each of the activity categories. To examine the effect of transport difficulties in modifying activities the first step was to analyse responses to question 14b (see questionnaire Appendix B). The results of this analysis appear in this section (11.5). The second step was to estimate the degree of modification associated with each of these problems (this will be explained in 11.6).

11.5.1 Time

The first category of transport difficulties surveyed by this study is time taken (including delay, waiting, etc). The following table reports the proportion of respondents who reportedly modified their level of activity because of the effect of time taken for travel.

Table 11.6 shows that time taken (including delay, waiting, etc) had a clear effect on the elderly participation in the activities. Two features stand out from this table. The first is the marked difference between Walkley (reporting less modification of activities because of time taken) and the other three areas. However, the Table also shows that Chapel Green has rather more respondents reporting an effect of travel time (especially for shopping, personal business, and visiting friends) than Manor and Birley. The second feature is that the economic and social activities are the most affected by time, in particular

	Walkley	Manor	Birley	Chapel G.
Shopping	9.3	34.8	32.6	38.8
Personal business (e.g. bank, post office, building society)	9.3	17.3	14.5	33.7
Betting shop	-	4.3	-	-
Social (e.g. pub, etc.)	1.9	4.3	4.8	11.2
Regular social meeting (e.g. social club, lunch club, whist drive)	1.9	8.7	4.8	2.0
Visiting friend/relative at home	16.8	21.7	19.3	33.7
Visiting friend/relative in hospital	3.7	-	3.8	4.2
Medical (e.g. visiting doctor, day centre, clinic)	1.9	4.3	9.7	15.3
Visiting hospital as an outpatient	1.9	2.2	6.7	8.2
Visiting Dentist	5.6	4.3	5.8	2.0
Visiting Chiropodist	3.7	6.5	2.9	1.0
Hairdresser	1.9	6.5	3.8	1.0
Religious services (e.g. go to Church)	1.9	9.8	2.9	3.1

Table 11.6: A comparison by area of the proportions of elderly people who modified their activities because of travel time.

shopping and visiting friends or relatives at home.

11.5.2 Access

Access to transport system available to the elderly people is the second category of transport difficulties facing the elderly in their participation in the activities.

It is evident from Table 11.7 that access to transport is also a major modifying factor. The analysis of the data shows that Manor is the area most affected by this factor, with a high figure of elderly who modified their level of participation in economic, social, and other activities because they have access difficulties to transport system. Once again economic and social are the activities most affected by access difficulties. However, in all areas access had nearly the same effect on health related activities. This is presumably because it is difficult to change the frequency of participation or the location of these

	Walkley	Manor	Birley	Chapel G.
Shopping	22.3	25.0	14.4	21.4
Personal business (e.g. bank, post office, building society)	7.5	10.9	11.5	11.2
Betting shop	-	-	-	-
Social (e.g. pub, etc.)	5.6	7.6	-	4.1
Regular social meeting (e.g. social club, lunch club, whist drive)	1.9	9.8	2.9	1.0
Visiting friend/relative at home	3.8	5.6	8.7	2.0
Visiting friend/relative in hospital	-	-	3.8	5.1
Medical (e.g. visiting doctor, day centre, clinic)	3.7	4.3	6.7	6.1
Visiting hospital as an outpatient	1.9	7.6	5.7	4.1
Visiting Dentist	5.6	5.4	-	5.1
Visiting Chiropodist	5.6	4.3	4.8	9.2
Hairdresser	7.5	9.9	3.8	7.1
Religious services (e.g. go to Church)	-	4.3	-	1.0

Table 11.7: A comparison by area of the proportions of elderly people who modified their activities because of access to transport.

activities.

11.5.3 Transport cost

The third category of transport difficulties reported in this study is the cost of transport. The following table shows the proportion of elderly people who modified their activities because of the cost of transport.

Table 11.8 shows that the cost of transport had less effect than access and time on the level of participation. The table shows that the cost of transport had an apparent effect on shopping activities and visiting friends or relatives at home in that in all areas a number of respondents modified their level of participation to be less frequent. There is also evidence that Walkley has much less modification of activity than the other three areas: this is consistent with other aspects of Walkley less elderly with low incomes, well provided with transport, and with a high level of facilities available within the area.

	Walkley	Manor	Birley	Chapel G.
Shopping	11.2	17.4	16.4	11.2
Personal business (e.g. bank, post office, building society)	1.9	6.6	2.9	10.2
Betting shop	-	-	-	-
Social (e.g. pub, etc.)	-	2.2	2.9	-
Regular social meeting (e.g. social club, lunch club, whist drive)	-	5.5	2.9	1.0
Visiting friend/relative at home	5.6	7.6	17.3	11.2
Visiting friend/relative in hospital	1.9	2.2	2.9	3.1
Medical (e.g. visiting doctor, day centre, clinic)	-	3.3	6.7	3.1
Visiting hospital as an outpatient	-	4.3	1.0	4.1
Visiting Dentist	-	2.2	2.9	1.0
Visiting Chiropodist	1.9	-	3.8	4.1
Hairdresser	-	-	4.8	5.1
Religious services (e.g. go to Church)	-	-	3.9	1.0

Table 11.8: A comparison by area of the proportions of elderly people who modified their activities because of the cost of transport.

11.5.4 Physical problems

The last category of transport difficulties surveyed in this study is physical problems of vehicle use (e.g. difficulty in boarding or alighting from public transport).

It is clear from Table 11.9 that physical problems had only a slight reported effect on the level participation of the elderly people. The only activity markedly affected by physical problems in vehicle use is shopping. This may be related to the fact that those who have been shopping have to carry loads when boarding and alighting thus increasing any physical problems arising from vehicle design, but as shopping is an essential activity it still takes place though in modified form.

	Walkley	Manor	Birley	Chapel G.
Shopping	1.9	10.8	6.8	4.0
Personal business (e.g. bank, post office, building society)	-	7.6	3.8	-
Betting shop	-	-	-	-
Social (e.g. pub, etc.)	-	-	1.9	-
Regular social meeting (e.g. social club, lunch club, whist drive)	-	2.2	-	1.0
Visiting friend/relative at home	1.9	-	3.8	1.0
Visiting friend/relative in hospital	-	-	-	-
Medical (e.g. visiting doctor, day centre, clinic)	-	5.5	-	1.0
Visiting hospital as an outpatient	-	1.1	-	1.0
Visiting Dentist	-	-	-	-
Visiting Chiropodist	-	-	1.9	1.0
Hairdresser	-	-	3.8	1.0
Religious services (e.g. go to Church)	-	3.3	-	-

Table 11.9: A comparison by area of the proportions of elderly people who modified their activities because of the physical problems.

11.6 The effect of modifying factors on frequency of participation

The aim of this section is to examine the overall effect of the modifying factors (time, access, cost, and physical problems) on the elderly's level of participation. In each of the areas the sample was split into two groups those reporting difficulties (*with D* in the table) and those not reporting difficulties (*without D*). These two groups were then further split into two frequency of activity categories: daily or weekly (A) and less frequently (B). In interpreting the table it must be remembered that these are quite broad categories and would not record more subtle differences in frequency of activity. In general if, in this table, the value of A for those with difficulties is less than the value of A for those without this would be evidence of activity level reduced by transport difficulty (as within each section $A + B = 100\%$, it follows that if B for those with

difficulties is more than the value for those without that is similar evidence). Where these inequalities do not occur (as are indeed in the "wrong" direction) there is no evidence of reduced level associated with transport difficulty.

	Walkley				Manor				Birley				Chapel Green			
	With D A	Without D B	With D A	Without D B												
Shopping	87.2	12.8	73.0	27.0	95.1	4.9	33.3	66.7	85.8	14.4	94.8	5.2	97.2	2.8	100	-
P. busi.	80.2	19.8	73.3	26.3	76.9	23.1	92.8	7.2	63.5	36.5	62.0	38.0	83.8	16.2	96.5	3.5
Betting	-	-	-	-	100	-	33.3	66.7	-	-	75.0	25.0	-	-	100	-
Social	74.7	25.3	70.8	29.2	92.9	7.1	80.2	19.8	73.6	26.4	77.1	22.9	43.6	56.4	64.6	35.4
R. social	-	100	92.0	8.0	71.3	28.7	94.8	5.8	100	-	88.6	11.3	60.0	40.0	44.8	55.2
F/R home	39.7	60.3	41.3	58.7	46.8	53.2	56.1	43.9	52.1	47.9	64.8	35.2	37.1	62.9	41.4	58.6
F/R hosp.	-	100	61.0	39.0	-	100	78.4	21.6	-	100	-	100	-	100	-	100
Medical	-	100	17.3	82.7	-	100	10.4	89.6	21.1	78.9	-	100	-	100	5.7	94.3
Outpatient	-	100	31.3	68.7	22.1	77.9	70.9	29.1	11.6	88.4	61.3	38.7	-	100	-	100
V. Dentist	-	100	-	100	-	100	-	100	-	100	40.5	59.5	-	100	10.4	89.6
V. Chiropr.	-	100	-	100	-	100	-	100	-	100	65.9	34.1	-	100	4.7	95.3
Hairdresser	20.3	79.6	44.4	55.6	24.7	75.3	22.6	77.4	9.0	91.0	48.0	52.0	7.9	92.1	23.4	76.6
Religious	100	-	50.0	50.0	59.2	40.8	21.6	78.4	25.0	75.0	-	100	33.0	67.0	20.4	79.6

Table 11.10: A comparison between elderly with and without transport difficulties and the frequency of participation by areas.

(figures give % of all respondents from the total respondents who reported with or without transport difficulties).

Where: A= % of respondents who take part in the activities daily or weekly, B= % of respondents who take part in the activities at least once a month or less than once a month.

Table 11.10 shows inequalities in the expected direction in a number of area and activity combinations, but the results are not highly consistent. Looking at the areas Chapel Green and Birley appear to show fairly consistent tendency for reported transport difficulty to be associated with reduced activity level. Looking at the activities none of the major activities show a completely consistent pattern although visiting friends or relatives appears broadly consistent.

11.7 Frustrated activities

The term “frustrated activities” refers to those activities in which the elderly would like to take part but cannot do so: once again the focus will be on activities which are affected by mobility and transport problems, but it must be remembered that reduced mobility may arise from more than one cause, and the cessation of an activity may also arise from reasons in addition to reduced mobility. For example the inability of an elderly person to use the bus may be related to access to the nearest stop, physical difficulties of using the vehicle, and the cost of transport. Similarly an elderly person may cease to shop in person because the shopping activity itself has become difficult (self service, long distances in the store, difficulty of handling trolleys, queues at check-out).

Table 11.11 was constructed using responses to questions 12, 13, and 14b in the questionnaire (see Appendix B) in order to identify the extent to which activities were reported as frustrated by travel difficulties.

It is evident from the table that only a small proportion of the respondents reported that they have been prevented from taking part in activities. Table 11.11 shows that in all the four study areas transport difficulties are reported as preventing attendance at activities, with higher figures in Manor and Birley than in Walkley and Chapel Green. This conclusion is similar to that found in chapter 7 (in that chapter from the organisers’ point of view, in this chapter from the elderly’s point of view) especially for Manor area.

The table suggests that frustration in activities can be divided in to two main categories: firstly, there are activities which need transport and for which no alternative location is available; the table shows that this category has a relatively large proportion prevented from taking part in the activity (e.g. visiting friends or relatives at home, visiting friends or relatives in hospital, and visiting hospital as an outpatient). Secondly, there are activities which need

	Walkley	Manor	Birley	Chapel Green
Shopping	3.8	6.6	1.9	-
Personal business (e.g. bank, post office, building society)	1.9	6.6	2.9	1.0
Betting shop	1.9	1.1	-	-
Social (e.g. pub, etc.)	3.8	4.4	4.8	1.0
Regular social meeting (e.g. social club, lunch club, whist drive)	-	4.4	2.9	2.0
Visiting friend/relative at home	3.8	9.8	11.6	1.0
Visiting friend/relative in hospital	9.5	10.9	6.7	4.1
Medical (e.g. visiting doctor, day centre, clinic)	-	1.1	5.8	4.0
Visiting hospital as an outpatient	3.8	8.7	12.4	4.0
Visiting Dentist	1.9	1.1	-	-
Visiting Chiropodist	-	1.1	-	-
Hairdresser	-	-	2.9	-
Religious services (e.g. go to Church)	-	1.1	-	-

Table 11.11: The proportion of elderly people who recorded activities frustrated because of transport difficulties.

transport but for which there is an alternative location, the table shows that for this group less elderly are prevented from taking part (shopping, personal business, social services, regular social meeting, and medical services).

11.8 Latent demand

Latent demand for travel (to take part in the activities) is usually understood to cover all those trips which individuals would choose to make if the transport system were cheaper, quicker, or easier to use. This study suggests that there are two types of latent demand. Firstly are these demands which have been suppressed by modification of activities (section 11.4) in that the elderly may travel less often, less distance, to a different destination or by a different method of transport. Secondly there are travel demands associated with activities which have been frustrated by limited mobility (section 11.7).

In an attempt to draw an overall picture of latent demands for transport by the elderly Table 11.12 has been constructed summarising material from earlier sections. For each area the percentage of respondents who reported wishing to participate more (W), encountering transport difficulties (D), and experiencing modification or frustration of activities (MF) is recorded. There are some inconsistencies in the table in that the figures under the three headings are not identical but there is a broad consistency particularly between the proportions reporting difficulties (D) and those reporting modification and frustration (MF). It should also be noted that the figures in Birley and Chapel Green are very similar over a wide range of activities.

	Walkley			Manor			Birley			Chapel Green		
	W	D	MF	W	D	MF	W	D	MF	W	D	MF
Shopping	22.8	48.1	48.3	22.0	96.7	96.8	30.4	75.0	74.9	4.0	75.5	75.5
P. busi.	19.0	24.1	20.6	11.0	48.9	49.0	9.5	42.7	42.3	4.0	57.1	57.1
Betting	-	1.9	1.9	-	5.4	5.4	7.6	-	-	2.0	-	-
Social	7.6	11.1	11.3	15.4	18.5	18.4	36.1	19.2	19.2	30.0	17.3	17.3
R. social	7.6	3.7	3.8	17.6	30.4	30.5	57.0	22.1	22.1	50.0	14.3	14.3
F/R home	15.2	37.0	32.0	35.2	44.6	44.6	41.8	61.5	61.5	40.0	56.1	56.0
F/R hosp.	-	16.7	15.1	4.4	19.6	22.8	13.3	33.7	22.1	4.0	33.7	27.6
Medical	3.8	14.8	5.6	6.6	38.0	13.0	7.6	37.7	33.8	-	37.8	33.7
Outpatient	3.8	16.7	7.6	-	22.8	38.1	7.6	22.1	37.5	8.0	28.6	37.7
V. Dentist	7.6	13.0	13.1	4.4	14.1	11.9	15.2	14.4	14.5	-	12.2	12.2
V. Chirop.	-	13.0	11.2	28.6	17.4	17.4	11.4	19.2	21.1	4.0	27.6	27.6
Hairdresser	-	14.8	9.4	8.8	17.4	17.4	7.6	24.0	24.0	36.0	26.5	26.5
Religious	7.6	1.9	1.9	15.4	19.6	19.5	43.7	8.0	7.6	8.0	22.4	22.4

Table 11.12: The proportion of elderly people who recorded wishes, difficulties, modification or frustrated activities by area.

Where: W= % of respondents who reported a wish to increase participation in an activity see chapter 9. D= % of respondents who reported having transport difficulties when they take part in the activity. MF= % of the elderly who reported Modified and Frustrated activity.

	Walkley			Manor			Birley			Chapel Green		
	W	D	MF	W	D	MF	W	D	MF	W	D	MF
Shopping	≅	○	○	≅	♣	♣	♣	≅	≅	○	≅	≅
P. busi.	♣	○	○	≅	≅	≅	≅	≅	≅	○	♣	♣
Betting	-	○	○	-	♣	♣	♣	-	-	○	-	-
Social	○	○	○	≅	≅	≅	♣	♣	♣	≅	≅	≅
R. social	○	○	○	≅	♣	♣	♣	≅	≅	≅	≅	≅
F/R home	○	○	○	≅	≅	≅	♣	♣	♣	≅	≅	≅
F/R hosp.	-	○	○	≅	≅	≅	♣	≅	≅	○	♣	♣
Medical	○	○	○	≅	≅	≅	♣	♣	♣	-	≅	≅
Outpatient	○	○	○	-	≅	≅	≅	≅	≅	♣	♣	♣
V. Dentist	≅	○	○	○	≅	≅	♣	♣	♣	-	≅	≅
V. Chirop.	-	○	○	♣	≅	≅	≅	≅	≅	○	♣	♣
Hairdresser	-	○	○	≅	≅	≅	○	≅	≅	♣	♣	♣
Religious	○	○	○	≅	≅	≅	♣	≅	≅	≅	♣	♣

Table 11.13: The proportion of elderly people who recorded wishes, difficulties, modification or frustrated activities by area: diagrammatic form.

Where: ♣= represent the highest figure of respondents. ○= represent the lowest figure of respondents. ≅= intermediate position.

The table shows that the highest levels of W, D, and MF are associated with shopping, personal business, visiting friends or relatives and medical activities (these are also of course the activities with high levels of participation). Secondly the table shows that the highest levels of W, D, and MF are in Birley and Chapel Green with the lowest in Walkley (this pattern is made very clear in Table 11.13 which picks out the high values in diagrammatic form).

11.9 Other problems encountered in travelling about the city

The open question in the questionnaire allowed respondents to identify in their own words the problems which they encounter in travelling about the city, and the improvements which they would like to see. The responses to the ques-

tion identified the difficulties included in the main questionnaire (access, cost of transport, time taken, physical problems) but also identified other aspects especially the frequency and regularity of services and other perceived consequences of deregulation:

“There is a severe shortage of parking areas. I am unable to walk far so don’t go to town. Bus services and destination indicators are un-clear since deregulation.”

“Find crossing the High Street and surrounding roads very frightening since deregulation of buses.”

“Buses never come to time, then 3 come at once”.

“Too many bus companies. With some companies no timetables. Bad timing of buses whereby at some stops there are sometimes 3 or 4 buses going to the same destination”.

“Buses going to the same journey running in convoy of at intervals, miss one bus then wait twenty minutes for the next”.

“Excellent concept of regular minibuses made useless when they travel in convoy 3’s and 4’s, instead of spread single.”

“I can’t understand why some routes are starved of buses whilst other routes have buses at 3 minute intervals and travel empty.”

“I gave up visiting Sheffield centre 4 years ago. The journey by public trans-

port takes far too long. The air is far too polluted (ie buses), no easy parking therefore I visit Barnsley for weekly shopping and Meadowhall once a month”.

“Late buses not travelling to destination stated on timetable, e.g. bus from Handsworth to Crookes, late bus only travelling to Darnall when timetable states going through to Crookes.”

“I live at Birley and a lot of my time is wasted when visiting relatives living at Woodseats and Dronfield because the bus goes first into Sheffield City Centre to come right out again, no wonder we can’t move for buses in town. Couldn’t we have more buses running round the outskirts?”

When the respondents were asked if there is any thing they believe should be done to improve public transport in the city, they particularly identified three points: information, reliability, and services at low demand periods. Examples include:

“A comprehensive bus guide covering all services, as was the case before deregulation, would be helpful.”

“In comparison, the services run before deregulation were far better. Route indicators and numbers should be clearer, and there should be less companies running buses especially the old smelly ones.”

“Re-regulation of buses would bring back timetables that could be followed by the public, and adhered to by the operators. Thus eliminating 20 to 30 minutes waiting time between buses that run in fours consecutively. I would use public transport more often if it would be made more convenient.”

“A better Sunday service would be appreciated to enable people without cars to visit relatives.”

“Deregulation be scrapped, and let us go back to the old system when you knew what time a bus was due and could rely on it. There is too much emphasis placed on profit than on good service.”

“No 52 buses to run regularly, that is with a space of say 3 minutes between instead of 3 or 4 together then about 8 to 10 minutes wait.”

“Buses to start running earlier on Sundays to enable people who wish to get to Church. I am referring to Prince of Wales Road down to Darnall.”

“A better bus service after 6.00 pm on weekdays and all day on Sundays.”

“More courteous drivers on the SY Transport. They believe that senior citizens should stay at home, especially at times when the time arrives when you are allowed to use your pass. Thank you for enquiring about our travel problems. The drivers delight in telling you with only one minute to go - not time yet.”

11.10 Conclusions

The main conclusions from the analysis reported in this Chapter are as follows:

- 1) There is indeed substantial modification and frustration of activities by transport difficulties for elderly people.

- 2) The activities which are most often frustrated or modified are shopping, personal business, regular social meeting, visiting friend or relative at home, visiting friend or relative in hospital, and finally visiting hospital as an outpatient.
- 3) The places with most evidence of modification are Manor, Birley, and Chapel Green, however, the most evidence of frustrated activity is at Manor and Birley. Walkley appears to have the lowest figure of elderly reporting modification or frustration of activities.
- 4) It is a logical conclusion from these first three points that latent demand for transport exists. Furthermore this study shows that there are two types of latent demand; firstly demands which have been reduced by modification of activities: in that the elderly may travel less often, less distance, to a different destination or by a different method of transport. Secondly travel demands associated with activities which have been frustrated or suppressed by limited mobility.

The analysis also suggests some of the priorities in assistance which might reduce the travel problems. For economic activities the study suggests that time and access is more important than the cost for the elderly. This results differs from the usual expectation that for the elderly money budgets are more constrained than time availability. As a result of this the elderly require help to reduce the time taken and to improve the access to the transport system when they take part in economic activities. For social and health related activities there are two type of needs, first if the elderly could participate locally without special transport (e.g. pub, etc) in this case they require help in the access to his type of activity. Secondly for those activities which need transport, they report that they need help to reduce time taken and the cost of travel.

Chapter 12

Conclusions and recommendations

12.1 Introduction

The major aim of this thesis has been to describe and analyse the transport problems of the elderly by examining their current and wished for level of participation in activities, the transport methods used by them, the main transport difficulties they face, and the factors effecting their participation as seen by both organisers of activities for the elderly and individuals. In this chapter the main survey results are summarised on Table 12.1. The chapter concludes with brief comments on the implications of the results and the limitations of the methods adopted.

12.2 The elderly transport problems in the four study areas

It is evident from this study that not all elderly people necessarily have transport problems when they take part or want to take part in the activities surveyed and the same view was reported by those who organise clubs or social activities for the elderly. The study found that in all the four areas transport difficulties and problems affect participation in activities, but there are significant differences between the four areas in the degree of effect and in the proportion of respondents affected. The study also found that there are significant differences in activity in the four study areas. This may reflect the different needs of the elderly in different areas within the same city (Sheffield). Because of this the main survey results are summarised on Table 12.1. with reference to the main topics covered by the survey: activities in which the elderly currently participate, activities in which the elderly currently wish to participate, transport methods used by elderly, and transport difficulties encountered by the elderly.

It is clear from Table 12.1 that the differences between the four areas present a clear picture of contrast. Walkley is characterised by the lowest overall level of difficulty, high use of walk and bus for most activities, and with time the main transport difficulty. Manor and Birley present conditions of moderate difficulty, mostly due to the time taken and with a high dependence on bus and walk for most activities. The greatest problems were recorded in Chapel Green where the greater dispersion of population away from service locations led to a heavy dependence on motorised transport (little use of walking), but once again time was seen as the main reason for difficulty.

Current level of participation				
	Walkley	Manor	Birley	Chapel Green
Shopping daily or weekly	74%	87%	83%	98%
Personal business on a weekly basis	46%	57%	43%	78%
Frequency of social activities	weekly daily	weekly daily	weekly daily	weekly daily
Frequency of health related activities	weekly daily	weekly daily	weekly daily	weekly daily
Frequency of visiting to doctor	less than once a week			
Freq. of other activities	weekly	weekly	monthly	weekly
Desired level of participation				
Wishing greater frequency of: shopping	15%	22%	27%	4%
personal business	19%	11%	10%	4%
Desired frequency of social activities	daily weekly	daily weekly	daily weekly	weekly
Desired level of other act.	8%	15%	8%	8%
Main transport method used				
Economic activities	bus walking	bus walking	bus walking	car bus
Social activities	car walking	bus walking	bus walking	car bus
Health related activities	bus walking	bus walking	bus walking	car bus
Other activities	bus walking	walking car	walking car	bus car
Main transport difficulties				
Economic activities	access	time taken access	time taken access	time taken access
Social activities	time taken access	time taken access	time taken cost	time taken access
Health related activities	time taken access	time taken access	time taken cost	time taken access
Other activities	time taken access	cost access	time taken access	time taken access
Overall difficulties				
	lowest	highest moderate	highest moderate	highest
Compared to organisers' results				
	consistent	differs	differs	consistent

Table 12.1: A summary results and a comparison between the study areas

note: Where two items occur in one cell of the table they are listed in order of importance.

12.3 The overall picture and some implication

Table 12.1 can also be used to identify the overall picture. It has been found that the most frequent activities for the majority of the elderly people (in this study) are the various economic activities, the minimum level of participation being weekly (excluding Betting) in all four areas except shopping in Walkley and Chapel Green which is done daily on a regular basis. The second most frequent group of activities in which the elderly participate is social activities. In the four areas the level of participation is nearly the same for each activity, with more frequent weekly participation in social activities (e.g. pub, etc) in Manor than in the other three areas. The third most frequent group of activities is the other activities. However, this group has a level of participation greater than health related activities, but less than economic or social activities. The results show that Walkley has the highest figure and Birley has the lowest figure of elderly. Finally the health related activities appear to have the lowest level of participation in all areas (less than once a month). These results are similar to those reported in the literature by Social Trends, 21 (1991), Social Trends, 19 (1989), Mitchell (1979), Kocur (1979), Cooper (1978), and Skelton (1978). But these results are quite different from those found in the U.S.A by Heraty (1984), and Wolfe and Miller (1983).

It was found that in all the four study areas transport difficulties affect attendance to the activities covered by this study, with higher figures in the Manor and Chapel Green than in Walkley and Birley. Some of the possible reasons for these differences were suggested by respondents' answers and comments (see section 7.3). The study shows that the proportions of the elderly affected by transport problems as perceived by the organisers of the activities

in which they take part differs markedly between areas, organisers in Chapel Green more often perceived a majority of their members as being affected, the least affected are those in Walkley and Birley (Manor appears to have an intermediate position). The second important point is that even within an area there may be great differences in the experience of the organisers: this is especially clear in the case of Chapel Green and Manor where some organisations have less than 10% of the club members affected but others reported more than 90%.

Modified activities

Modified activities are defined in this study as being where an individual is unable to participate fully in a desired or existing activity but nevertheless participates in modified form by changing the frequency or changing the location. It is also important to note the distinction between temporary modification (which will be reversed if mobility conditions change) and permanent modification, although the difference may be only one of degree. In this study no distinction is possible between the two forms of modification.

It is clear from the study that there are quite marked differences between the four areas with Walkley experiencing much less modification of activity than the other three areas. This is because Walkley is well covered by the transport system and has a high level of facilities available to the elderly, also the results marked differences between activities (see Table 11.5 and Figure 11.1).

The effect of modifying factors (time, access, cost, physical problems) on the elderly's level of participation are examined separately for each of the activity categories. It was found time taken (including delay, waiting, etc) had the highest effect in the elderly's activities, and physical problems in vehicle use had the lowest effect (the results of this appear in section 11.5). The degree of modification associated with each of these problems is explained in section

11.6.

Frustrated activities

Frustrated activities were defined in this study as those in which an individual wishes to participate but cannot participate. It was found that only a small proportion of the respondents reported that they have been prevented from taking part in this way. Table 11.11 reported that in all the four study areas transport difficulties prevented attendance at activities, with higher figures in Manor and Birley than in Walkley and Chapel Green. This conclusion is similar to that found in chapter 7 (chapter 7 reports results from the organisers' point of view, this chapter from the elderly's point of view) specially for the Manor area.

The table suggests that the degree of frustration in activities can be divided into two main categories: firstly there are activities which need transport and for which no alternative location is available; the table shows that in this group a relatively large proportion are prevented from taking part in the activity (e.g. visiting friends or relatives at home, visiting friends or relatives in hospital, and visiting hospital as an outpatient). Secondly there are activities which need transport but for which there is an alternative location, and the activity can be done at any time: the table shows that in this group less elderly people are prevented from taking part in the activities (shopping, personal business, social services, regular social meeting, and medical services).

Transport need and demand

The unmet or incompletely met transport wishes of the respondents give a clear picture of transport need and demands of the elderly. Latent demand for travel (to take part in the activities) is usually understood to cover all those trips to activities which individuals would choose to make if the transport

system were cheaper, quicker, or easier to use. This study suggests that there are two types of latent demand; firstly demands which have been reduced by the modification of activities (section 11.4): in that the elderly may travel less often, less far, to a different destination or by a different method of transport as a consequence of this modification of their level of participation in the activities. Secondly there are travel demands associated with activities which have been frustrated or suppressed by limited mobility (section 11.7).

The analysis of the data in section 11.3 also give a clear picture of transport needs of the elderly and their demand for more reliable transport system to be available to them. Regarding economic activities, Table 11.1 suggests that time and access are more important than the cost for the elderly. This result differs from the usual expectation that for the elderly money budgets are more constrained than time availability. As a result of this the elderly require help to reduce the time taken and to improve access to the transport system when they take part in economic activities. For social and health related activities Tables 11.2 and 11.3 suggest that there are two types of need. First, if the elderly can participate locally without special transport (e.g. pub, etc) they require help in access to this type of activity. Secondly for those activities which need transport, they report that they need help to reduce the time taken and the cost of travel (see section 11.8).

12.3.1 Main patterns of transport methods used by the elderly

This study investigates the use of the main transport modes by the elderly describes the main transport modes available to them, and seeks to explain the use of public transport (bus, minibus, taxi) and private transport (e.g. cars) by the elderly population.

It is evident from this study that bus is the main transport mode used by el-

derly people in their travel, the study reported that in the Manor and Chapel Green about 14% of respondents used the buses daily. However, the results reported earlier in Table 10.1 show that the most common frequentation of buses in the four areas is more than once a week. The results show that in all areas substantial numbers use buses more than once a week (42% to 61%), but there are significant differences between the four areas with more elderly people using buses more than once a week in the Manor than in the other three areas. The results in Table 10.1 can be compared with those reported by Boots, et al (1980), who found that 8% of elderly people never used buses (though they travelled by other means of transport), and a further 12% used buses less than once a week. In this study 7% of respondents never used buses and 14% used buses less than once a week.

The second mode of public transport is the minibus, the study found that the use of minibuses by the elderly is very low (see Table 10.2). The results show that in general in all areas no elderly reported using the minibuses daily or weekly. However, the use of minibuses is occasional and not in all areas. The results from this study differ from those reported in some other studies; firstly, Glaister (1985), Webster and Oldfield (1972) reported that minibuses have characteristics that favour the elderly (e.g. they can offer greater route coverage). But this study is similar to the results of Hall and Robson (1988) who found that minibuses had unfavourable characteristics for the elderly. For example, accessibility to some minibuses causes difficulties for elderly persons due to the high step heights, and restricted entrance widths (affecting elderly persons with shopping or luggage).

The study found that only a small number of elderly people used taxis and hire cars; the results show that 16% of respondents in all areas never used taxis. If we add to this those who did not reply to this question and those who answered "don't know" the total average is 79% (see Table 10.3), this

compares to Hopkin et al (1978) who found two thirds of the elderly never used taxis. Similarly the results of this study give slightly lower levels of reported use than were reported by Hopkin et al (1978): for example this study recorded 16% of respondents using taxis less than once a month, whereas the other study recorded 23% in this category.

Car use by the elderly as drivers depends on car availability in the household where they live and on whether the elderly person is licensed, insured, and able to drive. It was found that in all areas a substantial minority drive a car daily or more than once a week (10% to 36%), but there are significant differences between the four areas with more respondents driving a car daily or more than once a week in Chapel Green than in the other three areas (see Table 10.5). The study found that financial difficulties are the main reported reason for ceasing to drive among those who had been car drivers. The second main reason is health related problems (see Table 10.6).

The study found that there are two types of car use by the elderly as passengers; elderly people who travel in a household car as a passenger, and those who travel in some other car as a passenger (excluding taxi trips). The study found that the proportion of elderly people who travel in a household car as a passenger is greater than those who use a household car as a driver (see table 10.5 and 10.7), and elderly people who travel in some other car as a passenger (excluding taxi trips) have a lower frequency of travel than those who travel in a household car as a passenger (see Table 10.8). The study also found that in all areas substantial numbers of elderly (44% to 63%), reported that it is a friend or relative who lives somewhere else, who mostly drives the car when they travel in some other car as a passenger. These results are similar to that reported in the literature by Hopkin (1978).

12.3.1.1 Individual characteristics affecting the use of transport methods

This study examined certain characteristics of individuals which affect the transport methods used (i.g. age, disability status, income). The analysis of the data shows that age does not have a clear effect on the use of transport methods by the elderly in their participation in activities (see Table 10.13).

For disability the test shows that elderly people with minor disabilities are more likely to use buses in Walkley and Manor. In all areas elderly people with minor disabilities are more likely to drive a car or to walk, on the other hand elderly people with severe disabilities are more likely to travel by car as a passenger (see Table 10.14).

For income it is clear from the results reported in Table 10.15 that buses are used equally by both income groups in Walkley, Birley, and Chapel Green. However, in the Manor elderly people with low incomes are the main bus users. In all areas elderly people who travel by car as the driver are mainly those with a high income. However, elderly people from both income groups travel by car as passengers in Walkley, Manor and Birley, but in Chapel Green it is clear that it is mainly the elderly with low incomes who travel by car as passengers.

12.3.2 Main patterns of transport disadvantage

The results reported in earlier chapters and summarised in earlier parts of this chapter make it clear that the elderly vary greatly in their demands for transport and the extent to which those demands are realised or suppressed. The question there arises as to whether it is possible to identify distinct types of area or person which characterise a level of transport need.

The first of these questions is answered in Table 12.2. In that table three types of area are identified (low, moderate, and high need) in terms of population

characteristics, characteristics of the area (transport and other facilities), and the resulting travel patterns.

The second question is answered in Table 12.3 which identifies three types of elderly person in terms of their transport needs based on personal characteristics which are usually (over 70%) or often (over 50%) present according to the surveys reported here.

The two analyses are brought together in Figure 12.1 which identifies the combinations of personal characteristics and area characteristics which give rise to low levels of need on the one hand and very high levels on the other.

Table 12.2: Summary of transport need in areas according to population characteristics, area characteristics and travel patterns.

Where: Very few = → 20%, Some = 21–40%, Many = 41–60%, Most = 61–80%, Nearly all = 81–100%,
(Figure % shows the percentage in each level of transport need)

Level of transport need	Population characteristics	Area characteristics	Travel patterns
Low	<ul style="list-style-type: none"> * Some have a car in the household where they live. * Some are able to drive a car. * Main transport problems are time taken and cost of transport. * Most without disability or with only minor disability in walking. * Some aged (65 - 69) years. * Some with high income more than £50 p.w. 	<ul style="list-style-type: none"> * High level of facilities and public transport. 	<ul style="list-style-type: none"> * Very few drive the household car daily. * Some travel in some other car as a passenger once a week. * Many rely on friends or relatives live somewhere else to drive the car. * Many travel by bus daily.
Moderate	<ul style="list-style-type: none"> * Most have no car in the household where they live. * Most are not able to drive a car. * Main transport problem is time taken. * Many with minor disability in walking. * Many aged (70 - 74) years. * Most with low income up to £50 p.w. 	<ul style="list-style-type: none"> * High level of facilities and low level of public transport, * Or low level of facilities and high level of public transport 	<ul style="list-style-type: none"> * Very few drive the household car once a week. * Some travel in some other car as a passenger less than once a week. * Most rely on friends or relatives live somewhere else to drive the car. * Most travel by buses more than once a week.
High	<ul style="list-style-type: none"> * Most have no car in the household where they live. * Nearly all are not able to drive a car. * Main transport problems are walking to or from bus, taxi, car, and time taken. * Many with severe disability in walking. * Some aged 80+ years. * Nearly all with low income up to £50 p.w. 	<ul style="list-style-type: none"> * Low level of facilities and public transport. 	<ul style="list-style-type: none"> * Some never drive the household car. * Many travel in some other car as a passenger less once a month. * Many rely on friends or relatives live somewhere else to drive the car. * Some never use buses. * Many use walking.

Table 12.3: Summary of transport need according to personal characteristics, area of residency characteristics and travel patterns.

Where: Usually = over 70%, and Often = over 50%, (Figure % shows the percentage in each level of transport need)

Level of transport need	Personal characteristics	Area characteristics	Travel patterns
Low	<p><u>Usually:</u> * A car driver.</p> <p>* Have a car in the household where he/she live.</p> <p>* No severe disability.</p> <p>* A house owner.</p> <p><u>Often:</u> * Under 70 years old.</p> <p>* With high income.</p>	<p>* High level of facilities and public transport.</p>	<p><u>Often:</u> * Drive the household car daily.</p> <p>* Travel in some other car as a passenger once a week.</p> <p>* Travel by bus daily.</p>
Moderate	<p><u>Usually:</u> * Not a car driver.</p> <p>* With no car in the household where he/she live.</p> <p>* Sometimes with severe disability.</p> <p><u>Often:</u> * Over 80 years old.</p> <p>* With low income.</p>	<p>* High level of facilities and low level of public transport,</p> <p>Or low level of facilities and high level of public transport</p>	<p><u>Often:</u> * Depend on friend or relative who live somewhere else to drive the car.</p> <p><u>Usually:</u> * Travel in some other car as a passenger less than once a week.</p> <p>* Travel by buses more than once a week</p>
High	<p><u>Usually:</u> * Never been a car driver.</p> <p>* Have no car in the household where he/she lives.</p> <p>* With severe disability.</p> <p><u>Often:</u> * Over 85 years old.</p> <p>* With low income.</p>	<p>* Low level of facilities and low level of public transport,</p>	<p><u>Usually:</u> * Never drive a car</p> <p>* Travel in some other car as a passenger less than once a month.</p> <p>* Never use buses</p>

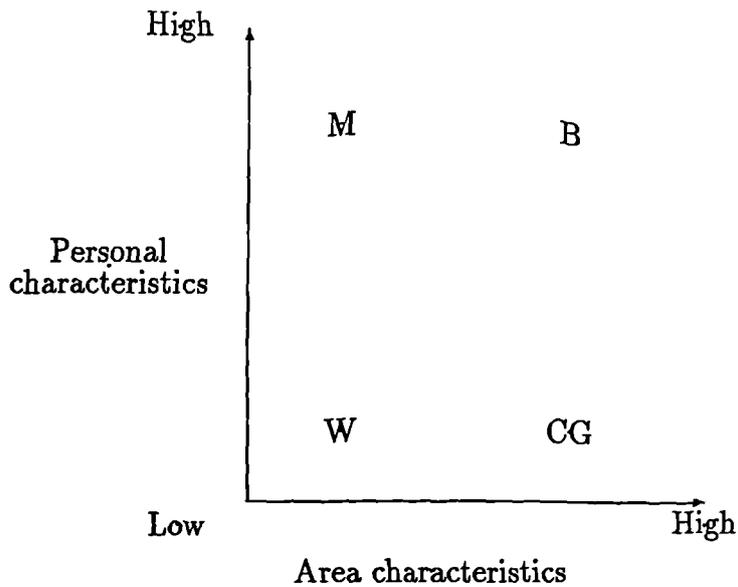


Figure 12.1: Summary of transport need in areas according to combinations of personal characteristics and area characteristics.

Where: W = Walkley, M = Manor, B = Birley, and CG = Chapel Green.

12.3.3 Policy implications

12.3.3.1 For public transport

In this section an attempt is made to bring together the results of the analysis of the previous chapters and the elderly's points of view reported in the open questions, in a discussion of the public transport policy needed for elderly people. Some elderly complain that since the deregulation and privatisation of public transport the main attention of the bus companies has been to emphasise improving the efficiency of existing services, rather than improving the quality of the services to be suitable for all ages. This is because as they want it to be more profitable, provision for the elderly (e.g. not providing minibuses which have poor access for elderly people) is given too little weight. It was found that it is important to give some attention to two main issues: firstly the quality of the service (this includes frequency, direction of journey, ease of access to the services and ease of access to the vehicle). Secondly the

question of fare level was not often noted (but this may be because fares for the elderly are already subsidised and because fare levels are only important for the elderly on longer trips).

Quality of service is the main issue which should be discussed between the policy makers in the local authorities and the public transport companies operating in the area. This study did not cover the frequency or direction of the journeys, but some elderly did report (in the open questions) some difficulties facing them related to frequency and reliability (e.g. buses did not keep to timetables) and direction of the journeys, (e.g. sometimes it is necessary to change buses more than once to reach a destination). On the other hand some elderly people simply give up visiting the city centre because "the journey by public transport takes far too long".

Access to the service is one of the main transport problems covered by this study and it was found that the majority of the elderly people suffered from not having easy access to the services. For example some of the elderly people reported that "we have quite a walk to the buses from where we live and this is one of the reasons why we do not use them". Access to the vehicle is also one of the main problems covered by this study, but it was found that only a few elderly reported being affected by this problem. However, it is still one of the main problems for at least some of the elderly, for example they reported that "the main problem is that some of the buses have a high step to get on and if they don't pull right in to the curb many elderly people, including myself find it difficult to lift your legs high enough to get on, without help specially when carrying shopping".

The second issue is the fare level, the usual expectation is that money budgets are more important than either the time taken in travel, or access to the service or vehicle, but this study found that a reduction in the time taken and improvements in access to the transport system are the most important

factors for the elderly.

12.3.3.2 For elderly's organisations

There are two main points that should be addressed in attempting to improve the policy of the elderly's organisations and to attract more elderly people to attend regular events. Firstly; the location of the activities is very important to the elderly. If it is within the area it should preferably be within walking distance, if that is not possible then the activity location should be chosen so that it is well served by bus routes offering a good service to elderly people (routes running close to residential areas, convenient timetable, accessible buses, etc.). This might reduce the effect of transport problems on the elderly's movement and increase the proportion of elderly people attending regular events as club members.

Secondly; the level of participation by the elderly in club activities could be improved by providing some other forms of transport to help elderly people to attend the events (e.g. special transport, car pools, minibuses, etc). It was found that the greatest dependence on special transport provision for a club occurs in Chapel Green (63%) and the least in Walkley and Birley (Manor appears to have an intermediate position). However, lifts from friends, relatives and trips by taxi play a very small role. It is important from the last explanation to note that to increase the elderly level of participation in club activities, door to door service could be the answer for some of the elderly, and secure transport related to the club could be the answer for the majority of the elderly who are club members.

12.3.3.3 Implication for research methods

The survey of this study and the methods used raised some questions and issues which need to be taken in to consideration in any further research survey similar to this study. Firstly, any questionnaire should be designed to encourage elderly people to answer the majority of the questionnaire. Sometimes the same question may be asked by different ways for the same purpose. Secondly, the survey should keep the possibility of direct interviews open in case respondents misunderstand the questions , have forgotten about their travel, or think that a question is not applicable to their case. These two points could also provide partial answers to some of the postal questionnaire problems (e.g. low response rate, and misunderstanding of the questions). By keeping the possibility for further contact, the researcher might also improve the position for monitoring actual behaviour. But even after improving the survey to obtain more data about the elderly, some difficulties and problems will still exist if latent demand is to be fully identified and defined.

12.4 Critical assessment of this study

It is important at this stage to look at this study and to assess it's strengths and weaknesses and to identify any gaps which could be filled by further research. The research methodology was quite successful as the response rate for both the individuals and the organisers is above the average rate compared to postal questionnaire methods used in other studies. The design of the questionnaire helped to obtain a sufficient coverage of the following topics: activities in which the elderly currently participate, transport methods used by the elderly for different activities, and transport difficulties encountered by the elderly in using transport. It was also very successful in obtaining the views of those who organise clubs and similar activities for the elderly on the problems faced

by both the clubs and their individual members. It has however been noted above that one of the key question about the elderly's desired level of activities failed to obtain the intended information. This made the results in Chapter 9 refer only to a small proportion of the total respondents in each area, because of this the elderly's wishes still need further research.

References

- ABRAMS, M. (1978), *Beyond Three Score and Ten. A first report on a survey of the elderly*. Age Concern Research Publication, London, U.K.
- ABRAMS, M. (1980), *Beyond Three Score and Ten. A second report on a survey of the elderly*. Age Concern Research Publication, London, U.K.
- ADAMS, J. G. U. (1990), Car ownership forecasting: Pull the ladder up, or climb back down?. *Traffic Engineering and Control*, Vol. 31,(3), pp 136-141.
- ALLRED, J. and SALTZMAN, A. (1978), Factors affecting the use of taxi-cabs by lower income groups. *Transportation Research Record 688*, Washington, D.C., pp21-27.
- ALLSOP, R. E. (1984), Transportation studies group; University College London: Progress report. *Traffic Engineering and Control*, Vol. 25,(2), pp 82-87.
- ALTSHULER, A. WOMACK, J. P. and PUCHER, J. P. (1979), *The Urban Transportation System*. Politics and Policy Innovation (Cambridge, MA: MIT Press). pp257-258.
- ANDERSSON, R. (1981), Transportation for the elderly and handicapped in Goteborg. *Voice of The Pedestrian*, Gothenburg transit authority, Goteborg, Sweden, Vol. XVI, pp187-193.
- ANDERSON, S. (1983), The effect of government ownership and subsidy on performance: evidence from the bus transit industry. *Transportation Research*, Vol. 17A,(3), pp191-200.
- ATKINS, S. T. (1987), The crisis for transportation planning modelling. *Transport Reviews*, Vol. 7, pp307-325.
- ARTAUD-MACARI, J. (1978), French Policy in Relation to The Transport of persons with Reduced Mobility. *Mobility For Elderly and Handicapped*. (Proceedings of the international conference on transport for the elderly and handicapped), edited by Norman Ashford and William G. Bell, Loughborough University, pp 20-26.
- ASHFORD, N. J. (1981), Transport for the elderly people and the handicapped. *Applied Ergonomics*, Vol. 12,(2), pp87-92.
- ASHFORD, N. J. and HOLLOWAY, F. M. (1971), The effect of age on urban travel behaviour. *Traffic Engineering and Control*, 1971, pp23-27

- ASHLEY C. A. and BANISTER, C. (1989)¹, Cycling to work from wards in a metropolitan area. 1. Factors influencing cycling to work. *Traffic Engineering and Control*, Vol. 30,(6), pp 297-302.
- ASHLEY C. A. and BANISTER,, C. (1989)², Cycling to work from wards in a metropolitan area. 2. Model development. *Traffic Engineering and Control*, Vol. 30,(7/8), pp 361-367.
- AUTOMOBILE ASSOCIATION (1991), *The Needs of Disabled Travellers*. Basingstoke: Automobile Association Research and Auditing Services Ltd.
- BAILEY, J. M. (1978), Community Transport Provision In Birmingham. *Mobility For Elderly and The Handicapped*. (Proceedings of the international conference on transport for the elderly and handicapped), edited by Norman Ashford and William G. Bell, Loughborough University, pp 156-163.
- BAILEY, J. M. and LAYZELL, A. D. (1981), *Special Transport Service for Elderly and Disabled People: Final report to the Department of Transport*. Transport Studies Unit, / Department of Transport, University of Oxford, pp 158-168.
- BALCOMBE, R. J., HOPKIN, J. M., PERRETT, K. E. and CLOUGH, W. S. (1987), *Bus deregulation in Great Britain: A review of the opening stages*. Transport and Road Research Laboratory, Report RR 107, Crowthorne, Berkshire.
- BALCOMBE, R. J., HOPKIN, J. M., and PERRETT, K. E. (1988), *Bus deregulation in Great Britain: A review of the first year*. Transport and Road Research Laboratory, Report RR 161, Crowthorne, Berkshire.
- BAMFORD, D. G., CARRICK, R. J., HAY, A. M. and MacDONALD, R. (1987), The use of association analysis in market segmentation for public transports: a case study of passengers in West Yorkshire. *Transportation*, UK. Vol. 14, pp21-32.
- BANISTER, D. J. (1980), *Transport Mobility and Deprivation in Inter-urban Areas*. Published by Teakfield, London, U.K.
- BANISTER, D. J. and MACKETT, R. L. (1990), The minibus: theory and experience, and their implications. *Transport Reviews*, Vol. 10,(3), pp 189-214.
- BARBSY, S. L. and COX, D. R. (1975), *Interstate Migration of The Elderly: An Economic Analysis*. Lexington, MA: Lexington Books.

- BATES, J., GUNN, H. and ROBERTS, M. (1978),** *A Disaggregate Model of Household Car Ownership*. Transport and Road Research Laboratory, Report RR 20, Crowthorne, Berkshire.
- BELL, W. G. (1978),** *Mobility for The Elderly and Handicapped*. Proceedings international conference on transport for the elderly and handicapped, edited by Ashford, N. and Bell, W. G., Loughborough University of Technology. pp 7-9.
- BENWELL, M. (1978),** Activity and Access to Opportunity - A Welfare Perspective In The Design of Transport Policies For The Elderly. *Mobility For Elderly and The Handicapped*. (Proceedings of the international conference on transport for the elderly and handicapped), edited by Norman Ashford and William G. Bell, Loughborough University, pp 140-145.
- BENDIXSON, T. (1986),** Orbital Road. *Transportation Planning and Practice*, Vol. 13,(1), pp 105-112.
- BENNETT, S. and BOWERS, D. (1976),** *An Introduction to Multivariate Techniques For Social and Behavioural Science*. London, Macmillan.
- BIEBER, A. (1980),** From Analysis to Decision-making. Report of The Fifty-first Round Table on Transport Economics Held in Paris on 20th-21st March, 1980, on The Following Topic: "Social Service" Transport For The Elderly and Handicapped Persons, pp 65-90.
- BIGGAR, J. C. (1980),** Who moved among the elderly: 1965 - 1975: A comparison of type of elderly mover. *Research on Aging*, Vol. 2,(1), pp73-92.
- BIGGAR, J. C. (1984),** The graying of the sunbelt: A look at the impact of U.S. elderly migration. *Population Trends and Public Policy*, No; 6. Washington. D.C: Population Reference Bureau Inc.
- BLUNDRED, H. (1991),** Buses: public service or private profit?. *Transportation Planning and Technology*, Vol. 15, pp 107-114.
- BLY, P. H. and OLDFIELD, R. H. (1978),** The effect of car ownership and income on bus travel. *Traffic Engineering and Control*, Vol. 19, pp 392-396.
- BLY, P. H. and OLDFIELD, R. H. (1983),** Future use of stage bus service. *Transportation*, Vol. 12, pp 45-58.

- BLY, P. H. and OLDFIELD, R. H. (1985)**, *Relationships Between Public Transport Subsidies and Fares Service Costs and Productivity*. Transport and Road Research Laboratory, Report 24, Crowthorne, Berkshire.
- BLY, P. H. and OLDFIELD, R. H. (1986)**, Competition between minibuses and regular bus services. *Journal of Transport Economics and Policy*, Vol. 20,(1), pp 47-68.
- BOCHNER, B. S. and STUART, D. G. (1978)**, Analysis latent travel demands of transit dependents. *Traffic Quarterly*, October, pp563-581.
- BOND, J. and CARSTAIRS, V. (1982)**, *Services For The Elderly* Scottish Home and Health Department.
- BOWLBY, S. R., KIRBY, A. M. and SWANN, V. (1984)**, *Use of demand-responsive Transport for Disabled people: the Readibus example*. transport and Road research Laboratory, report, Crowthorne, Berkshire.
- BRADBURN, N. M. and SUDMAN, S. (1981)**, *Improving Interview Method and Questionnaire Design*. London, Jessey-Bass Publishers.
- BRADSHAW, J. (1972)**, The concept of social need. *New Society*, Vol. 19, 30th March 1972, pp640-643.
- BROOKS, B. M. (1974)**, *An Investigation of Factors Affecting The Use of Buses by Both Elderly and Ambulant Disabled Persons*. Contract Report to Transport and Road Research Laboratory, (British Leyland U.K. Ltd.).
- BROOKS, B. M. (1978)**, *Passenger Problems on Moving Buses*. Contract Summary Report to Transport and Road Research Laboratory, (Leyland Vehicle Ltd.).
- BRUTON, M. J. (1985)**, *Introduction to Transportation Planning*. Hutchinson, London, U.K.
- BUCHANAN, M., BURSEY, N., LEWIS, K. and MULLEN, P. (1980)**, *Transportation Planning for Greater London*. (Farnborough, Saxon House).
- BURKHARDT, J. and LAGO, A. (1977)**, *Predicting The Demand For Rural Public Transportation System*. Paper presented at the 56th Annual Meeting. Transportation Research Board.
- BURKHARDT, J. E. (1980)**, Coordination and Consolidation of agency Transportation. *Transportation Research Record 784*, Washington, D.C., pp 1-6.

- CASSIDY, S. (1992), Leadership and the management of change in community transport organisations. Institute of British Geography, Transport Geography Study Group, *Transport and Welfare*, Kingston University, September 22, 1992.
- CENTRAL POLICY UNIT (1991), *The Elderly: Sheffield household survey 1990*, Sheffield City Council.
- CERVERO, R. (1984), Cost and performance impacts of transit subsidy programs. *Transportation Research*, Vol. 18A,(5/6), pp407-413.
- CHAN, Y. (1987), Measuring the efficiency, effectiveness and satisfaction of transportation services for elderly and handicapped persons. *Trans. Plann. Pract.*, U.S.A., Vol.2, pp279-301.
- CHARLES RIVER ASSOCIATES (1983), *User-side subsidies for taxi and buses in Montgomery*. AL. Report UMTA-AL-06-0003-83-1, Performed for the U.S. Department of Transportation, Washington, D.C.
- CLIFFORD, W. B., HEATON, T. B., LICHTER, D. T. and FUGUITT, H. V. (1983), Components of change in the age composition of non-metropolitan America. *Rural Sociology*, Vol. 48,(3), pp458-470.
- COOMBE, D. (1991), Urban transport strategy development. *Traffic Engineering and Control*, Vol. 32,(1), pp9-11.
- COOMBE, D. (1991), Practical urban transport strategy development. *Traffic Engineering and Control*, Vol. 32,(4), pp176-185.
- COOPER, J. S. L., DALY, P. M. and HEADICAR, P. G. (1979), West Yorkshire transportation studies 2: Accessibility analysis. *Traffic Engineering and Control*. January, pp27-31
- COX, W. and LOVE, J. (1991), Designing competitive tendering systems for the public good: A review of the U.S. Experience. *Transportation Planning and Technology*, Vol. 15,(4/5), pp367-389.
- CULYER, A. J. (1976), *Need and The National Health Service, Economic and Social Choice*, London, U.K.
- DALBY, E. (1973), *Pedestrians and Shopping Centre Layout: a review of the current situation*. Transport and Road Research Laboratory, Report LR 577, Crowthorne, Berkshire.

- DALY, A. J. and ZACHARY, S. (1977), *The Effect of Free Public Transport on The Journey to Work*. Transport and Road Research Laboratory, Report SR 338, Crowthorne, Berkshire.
- DAOR, E. and GOODWIN, P. B. (1976), *Variation in The Importance of Walking As A Mode of Transport*. Research Memorandum 487, Greater London Council, London, U.K.
- DASGUPTA, M. (1983), *Employment and Work Travel in An inner Area Context*. Transport and Road Research Laboratory, Report SR 780, Crowthorne, Berkshire.
- DAVIS, F. W., CUNNINGHAM, L. F., BURKHALTER, D. A. and LEMAY, S. (1982), Human service transportation at the crossroads. *Transportation Research Record 850*, Washington, D. C. pp1-7.
- DAVIS, F. W., HEATHINGTON, K. W., ALFORD, R. and SYMONS, R. (1976), Comparison of privately and publicly owned demand-responsive systems. *Transportation Research Record 559*, Washington, D. C. pp11-20.
- DEEN, T. B., KULASH, W. M. and BAKER, S. E. (1976), Critical decision in the rapid transit planning process. *Transportation Research Record 559*, Washington, D. C. pp33-43.
- DEPARTMENT OF TRANSPORT (1989), *A Guide to Transport For People With Disabilities*. London, Department of Transport.
- DEPARTMENT OF LAND AND PLANNING (1991), *Sheffield A City For People* Sheffield unitary development plan draft for public consultation. Sheffield City Council, pp44-46, 51-58, 87-90, 95-99.
- DIJLESTRA, W. and DER-ZOUWEN, J. V. (1982), *Response Behaviour in The Survey-interview*. London Academic Press, U.K.
- DONALD, R. and PICKUP, L. (1991), The effects of local bus deregulation in Great Britain on low income families- the case of Merseyside. *Transportation Planning and Technology*, Vol. 15,(4/5), pp331-347.
- DORSET COUNTY COUNCIL (1977), *Work Study Internal Report 129.02/02*. Social Services Department Transport Review. Confidential Report.
- DOWNING, C. and SPENDLOVE, J. (1980), *Campaign to Reduce Accidents Involving Children Crossing Roads Near Parked Cars*. Transport and Road Research Laboratory, Report LR 986, Crowthorne, Berkshire.

- DUDLEY METROPOLITAN BOROUGH (1975)**, *Report on Social Services Transport*. Confidential Report.
- EISENBERG, M. A. and BAKER, W. G. (1980)**, Characteristics of Dallas, Texas, taxi-cab petrong: results of a 1977 survey. *Transportation Research Record 784*, Washington, D. C. pp7-12.
- EL-TELBANI, J. (1991)**, *The Contribution of Travel Times and Waiting Times to The Total Time Costs of Passengers By Buses: Case Studies in Sheffield*. M.Phil, thesis, University of Sheffield, Department of Geography.
- EVANS, A. W. (1991)**, Are urban bus services natural monopolies. *Transportation*, Vol. 18,(2), pp131-150.
- EVERITT, B. (1974)**, *Cluster Analysis*. U.S.A., New York, 1st edition.
- EVERITT, B. (1986)**, *Cluster Analysis*. U.S.A., New York, 2nd edition.
- FAIRHEAD, R. D. (1990)**, *Taxi Licensing and The Size of The Industry in 1989*. Transport and Road Research Laboratory, Report RR 240, Crowthorne, Berkshire.
- FARRINGTON, J. H. (1986)**, Deregulation of the British bus system. *Geography*, Vol. 71,(3), pp258-260.
- FAULKS, R. W. (1981)**, *Urban and Rural Transport*. Ian Allan, Runcy, U.K. pp61, 70-75, 116.
- FLEMING, M. S. and SILVERSTONE, D. B. (1983)**, Inquiry of the Canadian transport commission into inter-city bus travel for disabled persons in Newfoundland. *Transportation Research Record 994*, Washington, D. C. pp23-31.
- FLYNN, C. B.; LONGINO, Jr; WISEMAN, R. F. and BIGGAR, J. C. (1985)**, The redistribution of america's older population: Major national migration patterns for three censuses decades, 1960 - 1980. *The Gerontologist*, Vol. 25,(3), pp292-296.
- FOWKES, M. and WATKINS, I. (1986)**, *Design of Small Passenger Vehicles: The Passenger's Needs*. Paper presented to the Community Transport Services Research Unit, 5th Annual Conference, Nottingham.
- FOWKES, M., SMOCKYNSKI, J. and NIGEL, H. M. (1981)**, Setting frequencies on bus routes: theory and practice. *Transportation Research Record 818*, Washington, D. C. pp1-7.

- GALASKO, C. S. B., MURRAY, P., HODSON, M., TUNBRIDGE, R. J., and EVERST, J. T. (1986), *Long-term Disability Following Road Traffic accidents*. Transport and Road Research Laboratory, Report RR 59, Crowthorne, Berkshire.
- GANT, R. and SMITH J. (1991), *The Elderly and Disabled in Rural Areas; Travel Patterns in The North Cotswolds*, in Champion, T and Watkins, C. (eds). *People in the Countryside*. London, Paul Chapman Publishing.
- GANT, R. (1992), Transport for the disabled. *Geography*, Vol. 77, part 1,(334), January 1992, pp88-91.
- GANT, R. and SMITH, J. (1991), The elderly and disabled in rural areas: Travel patterns in the North Cotswolds. In Champion, T. and Watking, C. (EDS), *People In The Countryside*, London Paul Chapman Publishing, pp108-124.
- GARDEN, J.M. (1978), The Mobility of The Elderly and Disabled in Great Britain : An Overview. *Mobility For Elderly and The Handicapped*. (Proceedings of the international conference on transport for the elderly and handicapped), edited by Norman Ashford and William G. Bell, Loughborough University, pp 27-32.
- GAUDRY, M. (1975), *An Aggregate Time-series Analysis of Urban Transit Demand: the Montreal case*, *Transportation Research*, 9, pp249-258.
- GAZELEY, D. J. and MORRIS, A. (1977), *Physically Handicapped Travellers in Coventry*. Travel and the Handicapped Report No 6. Consumer Ergonomics/Department of Transport Technology. Loughborough University of Technology.
- GIBSON, J., BEAZA, I. and WILLUMSEN, L. (1989), Bus-stops, congestion and congested bus-stops. *Traffic Engineering and Control*, Vol. 30,(6), pp291-296.
- GLAD, (1986), *All Change: a consumer study of public transport handicap in Greater London*. Greater London Association For Disabled People. London.
- GLAISTER, S. (1985), Competition on an urban bus route. *Journal of Transport Economics and Policy*, Vol. 19,(1), pp65-81.
- GLAISTER, S. (1986), Bus deregulation competition and vehicle size. *Journal of Transport Economics and Policy*, Vol. 20,(2), pp217-244.
- GOLANT, S. M. (1972), *The Residential Location and Spatial Behaviour of The Elderly; A Canadian example*. University of Chicago, Department of Geography, Research Paper 143.

- GOLOB, T. F. and RECKER, W. W. (1977), Mode choice prediction using attitudinal data: a procedure and some results. *Transportation*, Vol. 6, pp265-286.
- GOMEZ-IBANEZ, J. A. and MEYER, J. R. (1987), *Deregulation of Urban Bus Service: Britains Early Experience and The Lessons for The United State*. Urban Mass Transportation Administration, U.S. Department of Transportation, Grant UMTA-MA-11-0046.
- GONDA, J. (1982), Transportation perceived control, and well-being in the elderly. *Spec. Trans. Plan. and Pract.*, U.S.A., Vol. 1, pp61-72.
- GOODWIN, P.B. (1986), A panel analysis of changes in car ownership and bus use. *Traffic Engineering and Control*, Vol. 27,(10), pp519-525.
- GOODWIN, P.B. (1989), Family changes and public transport use 1984-1987: A dynamic analysis using panel data. *Transportation*, Vol. 16,(2), pp121-154.
- GOODWIN, P. B., BAILEY, J. M., BRISBOURNE, R. H., CLARKE, M. I., DONNISON, J. R., RENDER, T. E. and WHITELY, G. K. (1983), *Subsidised Public Transport and The Demand For Travel*. The South Yorkshire Example (Aldershot, Gower), pp34, 190.
- GRAYSON, G. B. (1975), *Observations of Pedestrian Behaviour at Four sites*. Transport and Road Research Laboratory, Report LR 670, Crowthorne, Berkshire.
- GREEN, A. and POPE, J. (1987), *User Attitudes to Bus Competition in Plymouth*. Proceedings of PTRC Summer Annual Meeting, Seminar B, pp53-60.
- GUIVER, J. and TURNER, R. (1987), *Buswatch; The Passenger's Viewpoint on deregulation*. Proceedings of PTRC Summer Annual Meeting, Seminar A, pp179-190.
- GUNN, H. F. (1981), Travel budget; a review of evidence and modelling implication. *Transportation Research, A*, Vol. 15, pp7-23.
- GWILLIAM, K. M., NASH, C. A. and PRESTON, J. M. (1988), *The Impact of Stage Bus Deregulation In Urban Areas*. Final Report to ESRC, University of Leeds.
- HAGERSTRAND, T. (1974), *Transport in The 1980-1990 Decade - The Impact of Transport on The Quality of Life*. Fifth International Symposium on the Theory and Practice of Transport Economics, Athens, October 1973.

- HALL, D. R. (1988), *The Changing Nature of Minibus In U.K. Public Transport Strategies, With Particular Reference to The Tyne and Wear*. In *Transport Technology and Spatial Change*, edited by R. S. Tolley. (Stoke on Trent: Institute of British Geography).
- HALL, D. and ROBSON, D. (1988), *The Social Impact of Minibuses In A Peripheral Low Status Housing Area of Sunderland*. Final Report to ESRC. Sunderland Polytechnic.
- HALLIDAY, M. (1991), *Our City Our Health; idea for improving public health in Sheffield*. Health Sheffield Planning Team. Sheffield, UK, pp24, 88, 138-143.
- HARRINGTON, A. and PAROLIN, B. (1991), Factors affecting the use of bus and rail services in a deregulated environment. *Transportation*, Vol. 18,(2), pp175-193.
- HARTGEN, D. T., PASKO, M. and HOWE, S. M. (1976), *Forecasting non-work public transit demand by the elderly and handicapped*. Preliminary Research Report 108. New York, State Dept. of Transportation.
- HASLEGRAVE, C. (1986), *Car Control Conversions for Disabled Drivers*. Transport and Road Research Laboratory, Report RR 29, Crowthorne, Berkshire.
- HAUER, E. (1971), Fleet selection for public transportation routes. *Transportation Science*, Vol. 5,(1), pp1-21.
- HAY, A. (1986), The impact of subsidised low-fare public transport on travel behaviour. *Environment and Planning C: Government and Policy*, Vol. 4, pp233-246.
- HAWKINS, R. (1986), Development in small bus operation in Britain. Paper C210/86 at the conference 'The bus 86', *Institution of Mechanical Engineering*, London, September 1986, pp153-160.
- HAWTHORNE, I. H. and WALMSLEY, D. A. (1987), *Municipal Bus Operation: The Effect of 1985 Transport Act in Three Cities*. Transport and Road Research Laboratory, Report RR 117, Crowthorne, Berkshire.
- HEADICAR, P. G., FISHER, R. M. and LARNER, T. C. (1987), *The Initial Effects of Bus Deregulation in West Yorkshire*. Proceedings of PTRC Summer Annual Meeting, Seminar B, pp1-16.
- HEALTH CARE AND DISEASE (1986), *A Profile of Sheffield*. Sheffield Health Authority.

- HENDERSON, H. M. and WHALLEY, A. (1976), *Transport Realities and Planning Policy*. PEP, Broadsheet 567, (Political and Economic Planning), London,
- HENSEN, M.H., HURWITZ, W.N. and MADOW, G.W. (1956), *Sample Survey Methods and Theory, Volume I, Methods and Applications*. Published by John Willey and Sons, New York and London. Chapman and Hall limited., 2nd ed.
- HENSEN, M.H., HURWITZ, W.N. and MADOW, G.W. (1956), *Sample Survey Methods and Theory, Volume II, Theory*. Published by John Willey and Sons, New York and London, Chapman and Hall limited, 2nd ed.
- HENSHER, D. A. (1987), Productive efficiency and ownership of urban bus services. *Transportation*, Vol. 14, pp209-225.
- HERATY, M. J. (1984), *Monitoring Demand-responsive Transport for Disabled People: The readibus Example*. Transport and Road Research Laboratory, Report SR 828, Crowthorne, Berkshire.
- HERON, R. M., SMITH, B. A., SUEN, L. and ALFIERI, F. A. (1983), Canadian overview of technological and systems research and development on transportation for disabled persons. *Transportation Research Record 994*, Washington, D. C. pp31-38.
- HILLMAN, M. (1976), *Personal Mobility and Transport Policy*. Political and Economic Planning, Broadsheet, 542, London.
- HILLMAN, M. and WHALLEY, A. (1979), *Walking is Transport*. Policy Studies Institute, Broadsheet 583, London.
- HILLS, P. J. and TALLEY, W. (1991), Experiences from different countries. *Transportation Planning and Technology*, Vol. 15,(4/5), pp125-133.
- HITCHCOCK, A. (1980), *Social Service Transport: Transport For Elderly and Handicapped Persons: Report of Fifty-First Round Table on transport Economics*. European Conference of Ministers of Transport, Paris, 20th - 21st march 1980.
- HITCHCOCK, A. (1982), *Social Aspects of Transport: how to use social research in transport policy marking*. Transport and Road Research Laboratory, Report SR 689, Crowthorne, Berkshire.
- HITCHCOCK, A. and MITCHELL, C. G. B. (1984), Man and his transport behaviour, Part 2a, Walking as a means of Transport. *Transport Reviews*, Vol. 4,(2), pp177-187.

- HOOD, T. C., BELL, T. L., SOVCHEN, C. A. and KEATHINGTON, K. W. (1979), *Market Opportunity Analysis for Short-Range Public Transportation Planning, Transportation Services for the Transportation disadvantaged*. National Cooperative Highway research Program Report 209. Transportation Research Board, Washington, D. C.
- HOPKIN, J. M. (1981) *The Ownership and Use of Cars By Elderly People*. Transport and Road Research Laboratory, Report LR 969, Crowthorne, Berkshire.
- HOPKIN, J. M., ROBSON, P. and TOWN, S. W. (1978), *The Mobility of Old People; a study in Guildford*. Transport and Road Research Laboratory, Report LR 850, Crowthorne, Berkshire.
- HOPKIN, J. M., ROBSON, P. and TOWN, S. W. (1978), *Transport and The Elderly People; requirements, problems and possible solutions*. Transport and Road Research Laboratory, Report SR 419, Crowthorne, Berkshire.
- HUGO, G., RUDD, D. M. and DOWNIE, M. C. (1984), Adelaide's aged population: changing spatial patterns and their policy implications. *Urban Policy and Research*, Vol. 2,(2), pp17-25.
- HUNT, A. (1978), *The Elderly at Home*. Office of Population Censuses and Surveys, Social Survey Division, London, Her Majesty's Stationary Office (HMSO).
- HUTCHINSON, B. G. and SAID, G. M. (1990), Spatial differentiation, transport demands and transport model design in Kuwait. *Transport Reviews*, Vol. 10,(2), pp91-110.
- INSTITUTE OF CONSUMER ERGONOMICS (1985), *Problems Experienced By Disabled and Elderly People Entering and Leaving Cars*. Transport and Road Research Laboratory, Report RR 2, Crothorne, Berkshire.
- JANSSON, J. O. (1980), A simple bus line model for optimisation of service frequency and bus size. *Journal of transport Economics and Policy*, Vol. 14,(1), pp53-80.
- JEFFS, V. and HILLS, P. J. (1990), Determinants of modal choice in freight transport. *Transportation*, Vol. 17,(1), pp29-47.
- JONES, S. R. and TANNER, J. C. (1979), *Car Ownership and Public Transport*. Transport and Road Research Laboratory, Report SR 464, Crothorne, Berkshire.

- JOHNSTON, R. H. (1983), *Travel Characteristics of Seven French Cities*. Transport and Road Research Laboratory, Report LR 1106, Crothorne, Berkshire.
- KEEFER, L. E. (1962), *Characteristics of Captive and Choice Transit Trips In The Pittsburgh Metropolitan Area*. Bulletin No. 347, Highway Research Board Washington, D. C.
- KENDALL, D. (1980), Comparison of findings from projects that employ user-side subsidies for taxi and bus travel. *Transportation Research Record 784*, Washington, D. C. pp45-52.
- KNAPP, S. F. and LAGO, A. M. (1983), Results of a parametric cost analysis of differences between urban and rural transportation services for transportation disadvantaged persons. *Transportation Research Record 934*, Washington, D. C. pp1-8.
- KNAPP, S. F., WOZNY, M. C. and BURKHARDT, J. E. (1985), Estimating the cost of providing transportation services to elderly clients. *Transportation Research Record 1018*, Washington, D. C. pp22-33.
- KOFFMAN, D. (1978), Mobility Impacts of transportation improvements for the elderly and handicapped. *Transportation Research Record 850*, Washington, D. C. pp11-17.
- KOUTSOPOULOS, K. O. (1980), Determining transport needs, *Traffic Quarterly*, Vol. 34,(3), pp397-412.
- LAGO, A. M. and BURKHARDT, J. E. (1978), Rural Transportation Needs and Demands: Definition and Measurement In The Case of Rural Elderly. *Mobility For Elderly and The Handicapped*. (Proceedings of the international conference on transport for the elderly and handicapped), edited by Norman Ashford and William G. Bell, Loughborough University, pp 269-279.
- LAGO, A. M. and BURKHARDT, J. E. (1980), Predictive models of the demand for public transportation services among the elderly. *Transportation Research Record 784*, Washington, D. C. pp21-27.
- LARNER, T. C. (1984), The distributional effect of bus subsidies in West Yorkshire. *Traffic Engineering and Control*, Vol. 25, pp429-433.
- Le FEVRE, J. (1981), Urban buses: wind of change blows at home and abroad. *Transport*, Vol. 2,(2), pp15-19.

- Le GRAND, J. (1982), *The Strategy of Equality*. London, Allen and Unwin.
- LICHTER, D. T., FUGUITT, G. V., HEATON, T. B. and CLIFFORD, W. B. (1981), Components of change in the residential concentration of the elderly population: 1950-1975. *Journal of Gerontology*, Vol. 36,(4), pp480-489.
- LONDON BOROUGH OF HILLINGDON (1973), *Transport : A Review of Services to Clients*. Social Services Department.
- LONGINO, C. F. Jr., BIGGAR, J. C., FLYNN, C. B. and WISEMAN, R. F. (1984), *The Retirement Migration Project (Final Report to the National Institute on Aging)*. Coral Gables, Fl: Center for Social Research on Aging, University of Miami.
- LOVELY, M. E. (1983), Case study of user-side subsidies for the handicapped in Milwaukee County. *Transportation Research Record 994*, Washington, D. C. pp9-13.
- LEYLAND VEHICLES LTD AND MOTOR INDUSTRY RESEARCH ASSOCIATION (1980), *Passenger Problems On Moving Buses*. Transport and Road Research Laboratory, Report SR 520, Crothorne, Berkshire.
- MACKETT, R.L. (1991), LILT and MEPLAN: a comparative analysis of land-use and transport policies for Leeds. *Transport Reviews*, Vol. 11,(2), pp131-154.
- MARKOVITZ, J. K. (1971), Transportation Needs of The Elderly. *Traffic Quarterly*, vol. 25. April. pp237-253.
- MARKSTEDT, P.A. and HIRSCHMAN, I. (1983), Impacts of subsidies on the costs of urban public transport, *Journal of Transport Economics and Policy*, Vol. 17,(2), pp155-176.
- Mc-FARIAND, R.A., TUNE, G.S. and WELFORD, A.J. (1964), On the driving of automobiles by older people. *Journal of Geography*, Vol.19, pp190-197.
- MEADOWS, J. (1993), Community transport association. *ANU Seminar - Bus To People*. Manchester, 23rd November 1993.
- MEYER, J. W. and SPEARE, A. (1975), Distinctively elderly mobility: types and determinants. *Economic Geography*, Vol. 61,(1), pp75-88.
- MILLER, J. A. (1976), Latent Demand of The Handicapped and Elderly. *Transportation Research Record 618*, Washington, D.C., pp7-12.
- MITCHELL, C.G.B. (1973), *Pedestrian and Cycle Journeys In English Urban Areas*. Transport and Road Research Laboratory, Report LR 497, Crowthorne, Berkshire.

- MITCHELL, C. G. B. (1979), *Concepts and definitions of accessibility. Proceedings of A Conference on Mobility in Rural Areas*. Cranfield Institute of Technology, March.
- MITCHELL, C.G.B. and STOKES, R.G.F. (1982), *Walking As A Mode of Transport*. Transport and Road Research Laboratory, Report LR 1064, Crowthorne, Berkshire.
- MITCHELL, C.G.B. and FRYE, A. (1985), *Public Transport For Disabled People - The Role of The British Department of Transport*. Transport and Road Research Laboratory, Report RR 23, Crowthorne, Berkshire.
- MITCHELL, C.G.B. (1988), *Features on Buses to Assist Passengers With Mobility Handicaps*. Transport and Road Research Laboratory, Report RR 137, Crowthorne, Berkshire.
- MOSER, C. A. (1968), *Survey Methods in Social Investigation*. London, U.K., Melbourne.
- MOSELEY, M. J., HARMAN, R. G., COLES, O. B. and SPENCER, M. B. (1977), *Rural Transport and Accessibility, Vol. I and II*. Centre for East Anglian Studies, University of East Anglia.
- MOSELEY, M. (1979), *Accessibility: The Rural Challenge*. Methuen, London.
- NASH, C.A. (1985), Competition on an urban bus route: a comment. *Journal of Transport Economics and Policy*, Vol 19,(3), pp313-317.
- NATIONAL COUNCIL FOR THE AGED (1984), *Incomes of The Elderly*. National Council for the Aged, Corrigan House, Fenian Street, Dublin.
- NATIONAL COUNCIL FOR THE AGED (1986), *The Elderly in The Community: Transport and Access to Services in Rural Areas*. National Council for the Aged, Corrigan House, Fenian Street, Dublin.
- OHTA, K. (1984), Present status and approach of transport for the elderly in Japan. *IATSS Research*, Tokyo, Vol. 8, pp92-101.
- OLDFIELD, R.H. (1981), *The Effect of Income on Bus Travel*. Transport and Road Research Laboratory, Report SR 644, Crowthorne, Berkshire.
- OLDFIELD, R.H. and BLY, P.H. (1988), An analytical investigation of optimal bus size. *Transportation Research B*, Vol 22,(5), pp319-337.

- OPPENHEIM, A. N. (1984), *Questionnaire Design and Attitude Measurement*. 2nd edition, London.
- OPPENHEIM, A. N. (1992), *Questionnaire Design Interviewing and Attitude Measurement*. New edition, London.
- OXLEY, P.R. and BENWELL, M. (1983), *The Use of Buses in Sheffield By Elderly and Handicapped People*. Transport and Road Research Laboratory, Report SR 779, Crowthorne, Berkshire.
- OXLEY, P.R. and BENWELL, M. (1985), *An Experimental Study of The Use of Buses By Elderly and Disabled People*. Transport and Road Research Laboratory, RR 33, Crowthorne, Berkshire.
- PAASWELL, R. (1977), Estimation of Demand For Transit Service Amongst The Transportation Disadvantaged. *Transportation Research Record 660*, Washington, D.C. pp38-49.
- PAASWELL, R. E. and RECKER, W. W. (1978), *Problems of The Carless*. Praeger Publishers, New York, London.
- PAGANO, A.M. and McKNIGHT, C.E. (1983), Quality of Service in Special Service Paratransit: The Users Perspective. *Transportation Research Record 994*, Washington, D.C. pp 14-23.
- PAULLEY, N.J. and WEBSTER, F.V. (1991), Overview of an international study to compare models and evaluate land-use and transport policies. *Transport Reviews*, Vol. 11,(3), pp197-222.
- PICKRELL, D. (1985), Rising deficits and the uses of transport subsidies in the United States. *Journal of Transport Economics and Policy*, Vol. 24, no 3, pp281-298.
- PIO, A. (1980), Cost and Productivity of transportation for the elderly and handicapped: A comparison of alternative provision systems. *Transportation Research Record 784*, Washington, D.C., pp27-34.
- POLONSKY, Jr. S. I. (1978), Serving transportation needs of the elderly. An overview. *Traffic Quarterly*, October, pp621-633.
- PRENTICE, R. (1987), Minibuses or Conventional buses,? *Buses*, Vol. 39,(391), pp441-443.

- PUCHER, J., MARKSTEDT, A. and HIRSCHMAN, I. (1983), Impacts of subsidies on the cost of urban public transport. *Journal of Transport Economics and Policy*, Vol. 17,(2), pp156-176.
- PUCHER, J. (1990), A comparative analysis of policies and travel behaviour in the Soviet Union, Eastern and Western Europe and North America. *Transportation Quarterly*, Vol. XLIV,(3), pp441-465.
- REILLY, J. (1978), Efficiency of Transit subsidies to the elderly. *Transportation Research Record 850*, Washington, D.C. pp 6-10.
- REVIS, J.R. (1978), Transportation Problems of The Elderly and Handicapped, An Overview of United State Experience. *Mobility For Elderly and The Handicapped*. (Proceedings of the international conference on transport for the elderly and handicapped), edited by Norman Ashford and William G. Bell, Loughborough University, pp 10-19.
- RIHANI, S. (1982), *The Disabled and Elderly: A passenger Transport Perspective*. Merseyside Passenger Transport Executive, (MPTE), Jul. 1982, 48 pp.
- ROGERS, A. and WATKINS, J. F. (1987), General versus elderly interstate migration and population redistribution in the United States. *Research on Aging*, Vol. 9,(4), pp483-529.
- ROGERS, A. and WOODWARD, J. (1988), The sources of regional elderly population growth: migration and aging in place. *Professional Geography*, Vol. 40,(4), pp450-459.
- ROSENBLOOM, S. (1980), Local Responses to meeting the transportation needs of the handicapped: The experiences of six Texas cities. *Transportation Research Record 784*, Washington, D.C. pp39-45.
- ROTH, G.J. and ZAHAVALI, Y. (1981), Travel time "budgets" in developing countries. *Transportation Research*, Vol. 15, pp87-95.
- SAID, G.M. (1982), An overview of Transport in Kuwait. *Transport Reviews*, Vol. 2, pp321-348.
- SALTZMAN, A. and AMEDEE, G. (1976), Serving the transportation disadvantaged with demand-responsive transportation. *Transportation Research Record 559*, Washington, D.C. pp1-10.

- SEN, L., WALTHER, E., BENJAMIN, J. and WATT, R.S. (1982), Methodological issues in collection of primary data on the transportation - Handicapped. *Transportation Research Record 850*, Washington, D.C. pp7-12.
- SERTA, R. (1988), Fare system proposed for the Rio De Janeiro Metro. *Transportation Planning and Technology*, Gordon and Breach Science Publishers, New York, London, Paris, Montreux, Tokyo and Melbourne, Vol. 12,(2), pp121-134.
- SHEFFIELD HEALTH AUTHORITY (1989), *Report of The Director of Public Health*. Department of Public Health, Sheffield, UK, pp45-54.
- SHEFFIELD HEALTH AUTHORITY (1990), *Report of The Director of Public Health*. Department of Public Health, Sheffield, UK, pp12-18, 78-79.
- SIMPSON, B.J. (1987), *Planning and public transport in Great Britain, France and West Germany*. Longman Scientific and Technical, England, pp33-38, 92-99.
- SIMPSON, B.J. (1988), Local public transport system in Britain, France and West Germany. *Traffic Engineering and Control*, Vol. 29,(51), pp288-294.
- SKELTON, N. G. (1978), *An Investigation Into The Travel of Elderly People in Urban Areas*. Ph.D. Thesis, University of Newcastle Upon Tyne.
- SKELTON, N. G. (1979), The investigation of travel. *Transportation Planning and Technology*, vol. 5,(2), pp115-122.
- SMITH, G. D., BARTLEY, M. and BLAINE, D. (1990), *The Black Report on Socio-economic Inequalities in Health Ten Years on*. Br Med. J. 1990, pp301, 373-377.
- SOCIAL TRENDS 19, (1989), Central Statistical Office, *A publication of the Government Statistical Service*. London: HMSO. Editor Tom Griffin. pp23-33, 96-100, 149-160.
- SOCIAL TRENDS 20, (1990), Central Statistical Office. *A publication of the Government Statistical Service*. London: HMSO. Editor Tom Griffin. pp23-34, 94-96, 139-150.
- SOCIAL TRENDS 21,(1991), Central Statistical Office. *A publication of the Government Statistical Service*. London: HMSO. Editor Tom Griffin. pp23-34, 93-97, 145-149.

- SPEAR, B. (1982), User side subsidies: Delivering special needs transportation through private providers. *Transportation Research Record 850*, Washington, D.C. pp 13-18.
- STAMATIADIS, N., TAYLOR, W.C. and McKELVEY, F.X. (1991), Elderly drivers and intersection accidents. *Transportation Quarterly*, Vol. 45,(3), pp377-390.
- STARKS, J.K. (1982), Two options for travel needs of mentally retarded: Implication for productivity and cost effectiveness. *Transportation Research Record 850*, Washington, D.C. pp25-31.
- STARRS, M. and PERRINS, C. (1989), The markets for public transport: the poor and the transport disadvantaged. *Transport Reviews*, Vol. 9,(1), pp59-74.
- STEWART, J.R. (1979), *Pedestrian User Response Study*. Centre for Urban and Regional Studies, University of Birmingham.
- TANNER, J.C. (1975), *Forecasts of Vehicles and Traffic in Great Britain: 1974 Revision*. Transport and Road Research Laboratory. Report LR 650, Crowthorne, Berkshire.
- TANNER, J.C. (1977), *Car Ownership Trends and Forecasts*. Transport and Road Research Laboratory. Report 799, Crowthorne, Berkshire.
- TEAL, R., ROONEY, S., MORTAZAVI, K. and GOODHUE, R. (1983), *Taxi-based Special Transit Services*. Report no, DOT-J-83-24 for the U.S. Department of Transportation, University of California, Irvine.
- TEAL, R. (1991), Issues raised by competitive contracting of bus transit service in the U.S.A. *Transportation Planning and Technology*, Vol. 15,(4/5), pp391-403.
- THAYER, R. (1973), Measuring need in the social services. *Social and Economic Administration*, Vol. 7,(2), pp91-105.
- THOMPSON, K.N. and CUNNINGHAM, L.F. (1987), Marketing research applications in interstate tour bus markets. *Transportation Quarterly*, Vol. 41, pp601-618.
- TODD, J.E. and WALKER, A.(1980), *People as Pedestrians*. Office of Population Censuses and Surveys. London (H.M. Stationery Office).
- TREVELLYAN, P. (1973), *The Characteristics of The Walk Trip*. Paper to the PTRC Summer Annual Meeting 1973, Planning and Transport Research and Computation.

- TURNER, R.P. and WHITE, P.R. (1987),** *NBC's Urban Minibuses. A Review and Financial Appraisal.* Transport and Road Research Laboratory, Report CR 42, Crowthorne, Berkshire.
- UPTON, G.J.G. and FINGLETON, B. (1985),** *Spatial Data Analysis By Example, Volume I.* Published by John Willey and Sons, Toronto, New York, Chichester, Brisbane, Singapore.
- UPTON, G.J.G. and FINGLETON, B. (1989),** *Spatial Data Analysis By Example, Volume II.* Published by John Willey and Sons, Toronto, New York, Chichester, Brisbane, Singapore.
- U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON WAYS AND MEANS (1985),** *Medicare, Health Care Expenditures and the Elderly.* Washington, D.C.; U.S. Government Printing Office.
- VOLET, P. and HUTCHINSON, B.G. (1986),** Explanatory and forecasting capabilities of trip distribution models. *Canadian Journal of Civil Engineering*, Vol. 13, pp666-673.
- WACHS, M. (1979),** *Transportation For The Elderly.* University of California Press. California, U.S.A.
- WACHS, M. (1989),** U.S. transit subsidy policy: in need of reform. *Science*, Vol. 244, pp1544-49. June 30 1989.
- WALTERS, A.A. (1982),** Externalities in urban buses. *Journal of Urban Economics*, Vol. 11, pp60-72.
- WEBSTER, F.V. and OLDFIELD, R.H. (1972),** *A Theoretical Study of Bus and Car Travel in Central London.* Transport and Road Research Laboratory, Report LR 451, Crowthorne, Berkshire.
- WEBSTER, F.V. and BLY, P.H. (1980),** *The Demand For Public Transport.* Report of the International Collaborative Study on the Factors Affecting Public Transport patronage. Transport and Road Research Laboratory.
- WEBSTER, F.V. and BLY, P.H. (1981),** The demand for public transport Part I. The changing environment in which public transport operates. *Transport Reviews*, Vol. 1,(4), pp323-351.

- WEBSTER, F.V. and BLY, P.H. (1982), The demand for public transport Part II. Supply and demand factors of public transport. *Transport Reviews*, Vol. 2,(1), pp23-46.
- WEBSTER, F.V. and BLY, P.H., JOHNSTON, R.H., PAULLEY, N. and DASGUPTA, M. (1986), Changing patterns of urban travel Part I. Urbanization, household travel and car ownership. *Transport Reviews*, Vol. 6,(1), pp49-86.
- WENGER, G.C. (1981), *The Elderly in The Community: Mobility and Access to Services*. Working paper No 6. University of North Wales, Bangor.
- WEGENER, M., MACKETT, R.L. and SIMMONDS, D.C. (1991), One city, three models: comparison of land-use/transport policy simulation models for Dortmund. *Transport Reviews*, Vol. 11,(2), pp107-129.
- WHELAN, B.J. and VAUGHAN, R.N. (1982), *The Economic and Social Circumstances of The Elderly in Ireland*. The Economic and Social Research Institute, Dublin.
- WHITE, P.R. and TURNER, R.P. (1987), Development of intensive urban minibus services in Britain. *Logistics and Transportation Review*, Vol. 23,(4), pp385-400.
- WILLIAMS, M.C. (1989), Injury, accidents to pedal-cyclists on roads with converted footways. *Traffic Engineering and Control*, Vol. 30,(2), pp63-69.
- WILLIAMS, M.C. (1990), Monitoring tactile markings on shared pedestrian/cycle routes. *Traffic Engineering and Control*, Vol. 31,(12), pp655-659.
- WILSON, D.G. and GRAYSON, G.B. (1980), *Age-related Differences in Road Crossing Behaviour of Adult Pedestrians*. Transport and Road Research Laboratory, Report LR 933, Crowthorne, Berkshire.
- WISEMAN, R. F. (1979), Regional patterns of elderly concentration and migration. *Location and Environment of Elderly Population*, ed S. M. Golant, 21-54, Washington D.C.; V.H. Winston and Sons.
- WISEMAN, R. F. (1980), Why older people move? Theoretical issues. *Research on Aging*, Vol. 2,(2), pp141-154.
- WITKOWSKI, J.M. and BUICK, T.R. (1985), Travel behaviour of residents of retirement communities. *Transportation Research Record 1018*, Washington, D.C. pp13-22.

WOLFE, R.A. and MILLER, E.J. (1983), Long-range transportation planning for the elderly in Ontario. *Transportation Research Record 934*, Washington, D.C., pp44-51

Appendix A

Questionnaire for organisers

In this first part of this interview I want to find out what problems your group/activity has in the transport field.

- (1-) Are any of your members/potential members unable to attend regular events because of transport difficulties?

Yes

No

- if yes, how many are affected in this way?

..... < 10% very few.

..... 10 – 39% some.

..... 40 – 59%

..... 60 – 89% most.

..... 90 – 100% almost all.

- (2) What proportion % require at least the following help.

..... Depend on special transport connected with club.

..... Depend on lift from volunteer driver.

..... Depend on lift from friend/relative.

..... Depend on Taxi.

..... Depend on public transport only.

.

..... None

In the second part I want to find out what you think are the main problems caused by transport for your members in general.

(3) Tick one box in each part of the table for each of the activities in which your group members participate or would like to be able to do so:

PART ONE

Activities	number of members affected by transport problems				type of effect		
	very few	some	nearly half	most	never able to take part	take part less often	take part at a different location
Shopping							
Personal business (e.g. bank, post office, building society)							
Betting shop							

PART TWO

Social (e.g. pub, etc.)							
Regular social meeting (e.g. social club, lunch club, whist drive)							
Visiting friend/relative at home							
Visiting friend/relative in hospital							
Medical (e.g. visiting doctor, day centre, clinic)							
Visiting hospital as an outpatient							
Visiting Dentist							
Visiting Chiropodist							
Hairdresser							
Religious services (e.g. Church)							
* Other (please give details in the space immediately below)							

Appendix B

Questionnaire for participant

Dear Sir/Madam

Following upon my letter sent to you via the Family Health Service Authority you kindly agreed to help me in this study. Please find enclosed a questionnaire on the transport problems that you may encounter as an elderly person in your part of Sheffield.

I would be grateful if you would fill in this questionnaire and return it as soon as possible.

All your answers will be treated as confidential: if there is any question which you would prefer not to answer please do not feel obliged to do so.

Please find a stamped addressed envelope for your reply.

Thank you for your help

your sincerely

Jebril El-Telbani

Please tick the box(s) for your answer.

- (1) How many cars or vans are available in the household where you live?

none 1 car/vans 2 cars/vans 3 or more cars/vans

- (2) Are you licensed, insured, and able to drive a car(s)?

Yes

No

If you have answered no go to question 4.

- (3) How often do you use the household car as driver?

daily.

more than once a week.

once a week.

at least once a month.

less than once a month.

never.

don't know/no answer.

Go to question 7.

- (4) (If you answer no to question 2) have you ever been a car driver?

Yes

No

- (5) How long ago did you cease to drive on a regular basis?

Within last year.

Within last 1 - 5 years.

Within last 6 - 10 years.

Over 10 years.

- (6) Why did you give up being a car driver?

Reasons of health (disability, eyesight, fear accident, etc.)

Could not afford it (cost of car, petrol, insurance, etc.)

No longer needed, interested.

Other (write in).....

• (7) How often do you travel in a household car as a passenger?

- daily.
- more than once a week.
- once a week.
- at least once a month.
- less than once a month.
- never/no car in household.
- don't know/no answer.

• (8) Who mostly drives on these occasions?

- other household member who lives in the same house.
- friend/relative who lives somewhere else.
- neighbour.
- driver supplied by someone else.
- don't know/no answer/never do so.
- other (write in)

• (9) How often do you travel in some other car as a passenger? (not taxi trips)

- daily.
- more than once a week.
- once a week.
- at least once a month.
- less than once a month.
- never.
- don't know/no answer.

- (10) Who mostly drives on these occasions?
 - other household member who lives in the same house.
 - friend/relative who lives somewhere else.
 - neighbour.
 - driver supplied by someone else.
 - don't know/no answer/never do so.
 - other (write in)

- (11) How often do you travel by each of the following forms of public transport?

Method			
	Bus or Coach	Minibus	Taxi
daily			
more than once a week			
<i>once a week</i>			
at least once a month			
less than once a month			
never			
don't know/no answer			

The study is trying to discover how transport problems affect the activities in which you take part. Please....

(12) Tick the box(es) for the activities in which you take part?

Activities	How often do you do this				
	daily	weekly	at least once amonth	less than once amonth	never
Shopping					
Personal business (e.g. bank, post office, building society)					
Betting shop					
Social (e.g. pub, etc.)					
Regular social meeting (e.g. social club, lunch club, whist drive)					
Visiting friend/relative at home					
Medical (e.g. visiting doctor, day centre, clinic)					
Visiting hospital as an outpatient					
Visiting friend/relative in hospital					
Visiting Dentist					
Visiting Chiropodist					
Visiting Hairdresser					
Religious services (e.g. go to Church)					
* Other please give details in the space immediately below					

I want to focus on activities that you would like to undertake but do not do at the present time.

(13) Tick the box(es) for the activities you would like to take part in.

Activities	How often would you like to do it if transport circumstances were not on obstacle					
	daily	weekly	at least once amonth	less than once amonth	yearly	never
Shopping						
Personal business (e.g. bank, post office, building society)						
Betting shop						
Social (e.g. pub, etc.)						
Regular social meeting (e.g. social club, lunch club, whist drive)						
Visiting friend/relative at home						
Medical (e.g. visiting doctor, day centre, clinic)						
Visiting hospital as an outpatient						
Visiting friend/relative in hospital						
Visiting Dentist						
Visiting Chiropodist						
Hairdresser						
Religious services (e.g. go to Church)						
* Other please give details in the space immediately below						

(14a) For each of the activities listed tick the box(es) for the main method of transport you use and the transport difficulties you encounter

(14b) For each of the activities listed identify the difficulties that you encounter in using the personal method of transport which you use?

Activities	Main Transport method used							Travel difficulties for this activity				
	bus or coach	mini -bus	taxi	car as driver	car as passenger	walk	other	home visit	cost of transport	time taken delays or waiting, etc	physical problems in vehicle use	walking to or from the bus, taxi, or car
Shopping												
Personal business (e.g. bank, post office, building society)												
Betting shop												
Social (e.g. pub, etc.)												
Regular social meeting (e.g. social club, lunch club, whist drive)												
Visiting friend/relative at home												
Visiting friend/relative in hospital												
Medical (e.g. visiting doctor, day centre, clinic)												
Visiting hospital as an out patient												
Visiting Dentist												
Visiting Chiroprapist												
Hairdresser												
Religious services (e.g. Church)												
* Other please give details in the space immediately below												

Now we move on to some other personal details

- (15) We know that some people have problems arising from physical disabilities:

Please tick if you have such a problem.

- | | | |
|--------------------------------------------------|--------------------------------|---------------------------------|
| <input type="checkbox"/> in walking: | minor <input type="checkbox"/> | severe <input type="checkbox"/> |
| <input type="checkbox"/> in vision: | minor <input type="checkbox"/> | severe <input type="checkbox"/> |
| <input type="checkbox"/> other (please specify): | minor <input type="checkbox"/> | severe <input type="checkbox"/> |

- (16) Are you

- male
- female

- (17) Which age group do you belong to?

- 65 - 69
- 70 - 74
- 75 - 79
- 80 and over.

- (18) Do you live

- On your own?
- with an elderly friend/relative (65 or over)?
- with non-elderly friend/relative (64 or under)?
- In a residential home for elderly?
- Other (please specify).

• (19) Do you live

- On State pension and benefits only (including DHSS)?
- On state pension plus other income up to £50/Week?
- On state pension plus other income £50 to £99/Week?
- On state pension plus other income over £100/Week?
- Other / don't know.

Let us now look at your accommodation

•(20) type of accommodation which you occupy or live in? please tick one box

- 1 A caravan or other mobile or temporary structure.
- 2 A whole house or bungalow that is:
 - detached
 - semi-detached
 - terraced (include end of terrace).
- 3 The whole of a purpose built flat or maisonette.
 - in a commercial building (for example in an office building or hotel or over shop).
 - in a block of flats.
- 4 Part of a converted or shared house, bungalow or flat.
 - separate entrance into the building.
 - shared entrance into the building

•(21) How do you and your household occupy your accommodation: .

- As an owner-occupier.
- By renting the property furnished.
- By renting the property unfurnished.
- As resident in residential home.
- In home of friend or relative.
- other (pleas explan)

•(22) Finally if there is any other problem which you encounter in travelling about the city please write about it in the space bellow.

•(23) and if there is any thing you believe should be done to improve public transport in the city for you please write about in the space bellow.

Thank you very much for you help

Appendix C

Main tabulations of the questionnaire data

(from the organisers)

- C1- Proportion of organisations having members unable to attend regular events because of transport difficulties (see Table 7.1).
- C2- Proportion of the elderly people whose attendance at events is affected by transport problems (see Table 7.2).
- C3- Dependence on transport mode for attendance at the club activities (see table 7.3).
- C4- The proportion of organisers whose members required help by each type of transport available to them: Walkley area (see Table 7.4).
- C5- The proportion of organisers whose members required help by each type of transport available to them: Manor area (see Table 7.5).
- C6- The proportion of organisers whose members required help by each type of transport available to them: Birley area (see Table 7.6).

- C7- The proportion of organisers whose members required help by each type of transport available to them: Chapel Green area (see Table 7.7).
- C8- Proportion of clubs members affected by transport problems on economic activities (see Table 7.8).
- C9- Proportion of clubs members affected by transport problems on social activities (see Table 7.9).
- C10- Proportion of clubs members affected by transport problems on medical activities (see Table 7.10).
- C11- Proportion of clubs members affected by transport problems on other activities (see Table 7.11).
- C12- Proportion of type of effect for each of the activities on economic activities (see Table 7.12).
- C13- Proportion of type of effect for each of the activities on social activities (see Table 7.13).
- C14- Proportion of type of effect for each of the activities on medical activities (see Table 7.14).
- C15- Proportion of type of effect for each of the activities on other activities (see Table 7.15).

Main tabulations of the questionnaire data (from the participant)

- C16- Cars and vans available in the respondent's household, by age group (figures give % of all respondents).

Age Groups	Walkley			Manor			Birley			Chapel Green		
	No 0	Yes 1	2	No 0	Yes 1	2	No 0	Yes 1	2	No 0	Yes 1	2
65 - 69	20.4	18.5	0.0	22.8	2.2	3.3	16.3	20.2	0.0	21.4	28.6	1.0
70 - 74	11.1	5.6	0.0	34.8	5.4	2.2	29.8	12.5	0.0	12.2	21.4	1.0
75 - 79	14.8	1.9	0.0	6.5	0.0	0.0	9.6	3.8	0.0	4.1	5.1	1.0
80+	16.7	9.3	0.0	22.8	0.0	0.0	7.7	0.0	0.0	4.1	0.0	0.0
Total	64.8	35.2	0.0	87.0	7.6	5.4	63.5	36.5	0.0	41.8	55.1	3.1

- C17- Cars or vans available in the respondent's household by gender (figures give % of all respondents).

	% Males		% Females		Total	
	No 0	Yes 1+	No 0	Yes 1+	No 0	Yes 1+
Walkley	60.0	40.0	66.7	33.3	64.8	35.2
Manor	78.4	21.6	92.7	7.3	87.0	12.7
Birley	63.0	37.0	63.8	36.2	63.5	36.5
Chapel Green	34.9	65.2	47.3	52.7	41.8	58.2

- C18- The % of the elderly who are licensed, insured and able to drive a car, by gender.

	% Males		% Females		Total	
	Yes	No	Yes	No	Yes	No
Walkley	75.0	25.0	27.3	72.7	44.4	55.6
Manor	27.0	73.0	9.1	90.0	16.3	83.7
Birley	37.0	63.0	17.2	82.8	26.0	74.0
Chapel Green	60.5	39.5	34.5	65.5	45.9	54.1

- C19- The frequency of use of a household car as driver (see Table 8.1).
- C20- Car driving characteristics of respondents (see Table 10.4).
- C21- The relationship between having been a car driver and the income of the elderly.

Income categories					
	1	2	3	4	N/A
Walkley: current	3.7	14.8	9.3	1.9	1.9
formerly	3.7	1.9	11.1	1.9	*
never	18.5	13.0	18.5	*	*
Manor: current	3.3	4.3	3.3	3.3	*
formerly	4.3	8.7	1.1	*	2.2
never	33.7	21.7	10.9	3.3	*
Birley: current	2.9	4.8	6.7	5.8	*
formerly	4.8	4.8	7.7	*	1.9
never	38.5	18.3	1.9	1.9	*
Chapel Green: current	6.1	12.2	8.2	6.1	3.0
formerly	9.2	2.0	3.1	1.0	*
never	20.4	19.4	3.1	3.1	3.1

- Where categories:

1= On state pension and benefits only (including DHSS). 2= On state pension plus other income up to £50 p.w 3= On state pension plus other income £50 to £99 p.w. 4= On state pension plus other income over £100+ p.w. N/A= Not applicable (including some no answers by the respondents).

- C22- How long ago did the respondent cease to drive on a regular basis, (figure give % of all respondents).

	Wakley	Manor	Birley	Chapel Green
Within last year	0.0	2.2	1.0	10.2
Within last 1-5 years	5.6	9.8	11.5	5.1
Within last 6-10 years	5.6	1.1	3.8	3.1
Over 10 years	18.5	13.0	6.7	13.3
not applicable	70.4	73.9	76.9	68.4

– Note: inconsistencies between this table and Table 12, are due to inconsistent responses to the question.

- C23- The reasons for ceasing to drive on a regular basis (see Table 10.6).
- C24- The proportion of elderly people who travel in a household car as a passenger (see Table 10.7).
- C25- Who mostly drives the car when the elderly travel in a household car as a passenger.

	Wakley	Manor	Birley	Chapel Green
Other household members who lives in the same house	20.4	7.6	20.2	30.6
Friend/relative who lives somewhere else	22.2	22.8	29.8	13.3
Neighbour	0.0	5.4	1.0	5.1
Driver supplied by someone else	0.0	0.0	1.0	0.0
don't know/no answer/never do so	13.0	16.3	3.8	2.0
Other	0.0	0.0	0.0	4.1
N/A	44.4	47.8	44.2	44.9

- C26- The proportion of elderly people frequency of travel in some other car as a passenger (excluding Taxi trips) (see Table 10.8).

- C27- Who mostly drives the car when the elderly travel in some other cars as a passenger.

	Walkley	Manor	Birley	Chapel Green
Other household members who lives in the same house	5.6	2.2	2.9	3.1
Friend/relative who lives somewhere else	44.4	63.0	56.7	56.1
Neighbour	0.0	2.2	12.5	5.1
Driver supplied by someone else	0.0	1.1	1.0	0.0
don't know/no answer/never do so	9.3	7.6	0.0	4.1
Other	0.0	3.3	0.0	2.0
N/A	40.7	20.7	26.9	29.6

- C28- The proportion of elderly people who travel by bus or coach as a form of public transport (see Table 10.1).
- C29- The proportion of elderly people who travel by minibus as a form of public transport (see Table 10.2).
- C30- The proportion of elderly people who travel by Taxi as a form of public transport (see Table 10.3).
- C31- Proportion of elderly people who take part in economic activities (see table 8.1).
- C32- Proportion of elderly people who take part in social activities (see Table 8.2).
- C33- Proportion of elderly people attending medical services or using medical facilities (see Table 8.3).

- C34- Proportion of elderly people who take part in other activities (see Table 8.4).
- C35- Frequency at which elderly people would like to take part in economic activities if transport permitted (see Table 9.1).
- C36- Frequency at which elderly people would like to take part in social activities if transport permitted (see Table 9.2).
- C37- Frequency at which elderly people would like to attend medical services or medical facilities if transport permitted (see Table 9.3).
- C38- Frequency at which elderly people would like to take part in other activities if transport permitted (see Table 9.4).
- C39- The proportion of the elderly people according to the main transport method used to take part in economic activities (see Table 10.9).
- C40- The proportion of the elderly people according to the main transport method used to attend social activities (see Table 10.10).
- C41- The proportion of the elderly people according to the main transport method used to attend medical services or medical facilities (see Table 10.11).
- C42- The proportion of the elderly people according to the main transport method used to attend other activities (see Table 10.12).
- C43- The proportion of elderly people by type of difficulties encountered in using the transport when they take part in economic activities (see Table 11.1).
- C44- The proportion of elderly people by type of difficulties encountered in using the transport when they take part in social activities (see Table 11.2).

- C45- The proportion of elderly people by type of difficulties encountered in using the transport when they attending medical services or facilities (see Table 11.3).
- C46- The proportion of elderly people by type of difficulties encountered in using the transport when they take part in other activities (see Table 11.4).
- C47- The percentage of respondents having difficulties in using transport arising from physical disabilities (figures give % of all respondents).

	Physical disabilities						
	In walking		In vision		Other		None
	minor	severe	minor	severe	minor	severe	
Walkley	29.6	27.8	13.0	5.6	0.0	0.0	24.1
Manor	37.0	13.0	18.0	8.7	2.2	3.3	12.0
Birley	41.3	17.3	5.8	1.0	4.8	0.0	29.3
Chapel Green	45.9	15.3	12.2	4.1	5.1	0.0	17.3

- C48- Residence characteristics of respondents (figures give % of all respondents).

Respondent lives:	Walkley	Manor	Birley	Chapel Green
On his/her own	42.6	45.7	36.5	27.6
With an elderly friend/ relative (65 or over)	37.0	29.3	59.6	59.2
With friend/relative (64 or under)	14.8	25.0	3.8	9.2
In a residential home	1.9	0.0	0.0	0.0
N/A or no answer	3.7	0.0	0.0	4.1

- C49- The proportion the elderly by income category (figures give % of all respondents).

Income categorys					
	1	2	3	4	N/A
Walkley	25.9	29.6	38.9	3.7	1.9
Manor	41.3	34.8	15.2	6.5	2.2
Birley	46.2	27.9	16.3	7.7	1.9
Chapel Green	35.7	33.7	14.3	10.2	6.1

- Where category:

1= On state pension and benefits only (including DHSS). 2= On state pension plus other income up to £50 p.w 3= On state pension plus other income £50 to £99 p.w. 4= On state pension plus other income over £100+ p.w. N/A= Not applicable (including some no answers by the respondents).

- C50- The proportion of elderly by accommodation type (figures give % of all respondents).

Accommodation type	Walkley	Manor	Birley	Chapel Green
<i>A caravan or other mobile or temporary structure.</i>	0.0	0.0	0.0	0.0
<i>A whole house or bungalow:</i>				
* detached.	11.1	0.0	1.0	10.2
* semi-detached.	27.8	44.6	65.4	68.4
* terraced (includ end of terrace).	51.9	25.0	9.6	8.2
<i>The whole of a purpose built flat or maisonette:</i>				
* in a commercial building.	0.0	0.0	0.0	0.0
* in a block of flats.	5.6	18.4	15.3	9.2
<i>Part of a converted or shared house, bungalow, or flat:</i>				
* separate entrance into the building.	3.7	0.0	1.0	2.0
* shared entrance into the building.	0.0	12.0	7.7	2.0

- C51- Tenure by which the elderly occupy their accommodation (figures give % of all respondents).

	Walkley	Manor	Birley	Chapel Green
As an owner occupier.	74.1	20.7	57.7	63.3
By renting the property furnished.	0.0	1.1	0.0	0.0
By renting the property unfurnished.	22.2	73.9	38.5	22.4
As resident in residential home.	1.9	0.0	0.0	0.0
In home of friend or relative.	0.0	0.0	1.9	13.3
N/A no answer	1.9	4.3	1.9	1.0

Appendix D

Open questionnaire for individuals

Question 22

Finally if there is any other problem with you encounter in travelling about the city please write about it in the space below.

(Manor)

- "Lack of parking places in city centre, and less crowding with the buses."
- "Buses never come to time. Then 3 come at once."
- "Crossing roads - I don't walk very fast. When I have shopping done I have to ask anybody if they will lift it up the steps of the bus."
- "If I have to keep an appointment at a certain time I have to leave home a lot earlier, because of the delays due to road works, also the traffic hold ups in the city centre. These make the journey twice as long and sometimes miss your appointment because of the delay."
- "Too many bus companies. With some companies no timetables. Bad timing of buses whereby at some stops there are sometimes 3 or 4 buses going to the same destination."

- "My granddaughter does my shopping monthly and I also have a good neighbour."
- "Yes, I'm writing to say we get three buses all following one another, they could space them out so as not to do just that and time them so they don't do that."
- "Busses going the same journey running in convoy instead of at intervals, miss one bus then wait twenty minutes for the next."
- "I can't understand why some routes are starved of buses whilst other routes have buses at 3 minute intervals and travel empty."
- "Too many buses in the city area."
- "Buses do not keep to a relative time schedule - presently construction of supertram - lack of parking in city centre."
- "Going to Darnall I generally walk down and ride back. I've a long walk to the bus to Prince of Wales Road. Unless I take 2 buses, the first from Manor Park Centre to Prince of Wales Road."
- "Need a bus from Manor Park Centre up to Manor Top."
- "Find crossing the High Street and surrounding roads very frightening since deregulation of buses."
- "Have on numerous occasions tried to get transport from disabled transport to enable me to get to my Wednesday day centre which is quite a way from my home. I have difficulty with the public transport. 4 bus journeys in all. My eyesight is deteriorating and I have problems crossing the roads on these occasions."
- "No problems. I am satisfied."
- "Too many buses in city centre which only aggravates delays."
- "I find steps on some buses are far too high and the driver doesn't pull up to the pavement making it more difficult to step up."
- "Apart from the difficulty of boarding some buses (I am 80 years old, not as capable as I used to be and am partially sighted) and the fact that public transport seems to run in convoy with a long pause. I have no further quibble."
- "At the present time there is no bus service to the Manor Top Shopping Area, (along Castlebent Avenue) a facility, in my opinion, long overdue. Have appealed to SYT but with no result."

- "I find the timing of the services pretty poor. We have five different services, running through this estate, where before there were two. Where as before the two services run at intervals, now all services run together, it is not unusual to see three different services following one another. Of course the outcome of that is, if you miss one, you miss the lot."
- "The main problem is that some of the buses have a high step to get on and if they don't pull right in to the curb many elderly people, including myself, find it difficult to lift your legs high enough to get on, without help, especially when carrying shopping."
- "Bus stops nearer old peoples flats."
- "We have quite a walk to the buses from where we live and this is one of the reasons why we do not use them. As we live at the top of a hill it is quite a struggle. There are three buses which go up Harborough Avenue and one on Beaumont Road by-passing us altogether. The bus stops are quite a distance, also there is quite a walk if we want to get to Prince of Wales Road. I myself suffer arthritis and my husband has heart trouble."
- "I live at Lower Walkley on the 31 bus route. The buses used to pick passengers up at the back of the market, now that has stopped and the bus stop is in Snig Hill which means walking from the markets along Castle Street to get on the bus, which is not very convenient if one is not very good at walking. I think Sheffield Transport did not consider elderly or disabled people when they made these alterations. I do not go into town very often now for this reason."
- "I would like intermediate request stops on the major routes."

(Chapel Green)

- "We reside 6 miles outside the city centre, and there seems to be a line following the old Sheffield boundary which seems to leave us on the outskirts like second class citizens in everything. ie more buses turning round at the bus station at Sheffield Lane Top which is within the old Sheffield boundary. You only have to look at the bus timetable for a Sunday morning. Also disabled parking is certainly lacking near the shops in the town centre and also in our village."
- "I gave up visiting Sheffield centre 4 years ago. The journey by public transport takes far too long. The air is far too polluted (ie buses), no easy parking therefore I visit Barnsley for weekly shopping and Meadowhall once a month."

- “There is only one bus per hour on *weekdays and none Sundays* on this road. The only other service is ten minutes walk away not good for elderly or disabled. At the moment this does not affect me as I am fit at present.”
- “I live at High Green and the problem is too many buses within 5 minutes of each other resulting in up to 20 minutes to wait. In winter this is not very nice.”
- “I haven’t been into town since all the disruption caused by supertram and road alterations by the Council. The provisions for parking have long been inadequate for disabled. I would use buses if they made services and destinations and routes more clear to the occasional user.”
- “Alterations to bus times, bus stops etc with insufficient public advance notice.”
- “The time it takes to go anywhere, as buses do not always run to time and then having to wait in the cold for connections to visit friends.”
- “There is a severe shortage of parking areas. I am unable to walk far so don’t go to town. Bus services and destination indicators are unclear since deregulation.”
- “Lack of toilet facilities as a 73 year old diabetic with mild incontinence.”
- “Numbers on the back of buses as well as front would be helpful.”
- “Bus steps are too high. Bus jolts you around too much. Bus drivers don’t allow enough time for getting on and off bus.”
- “Not safe to go about town these days on your own waiting for buses. Busy roads with buses in centre of town. Afraid to cross the roads.”
- “Avoid town centre for parking and traffic system. Shop in Barnsley.”
- “The main complaint I come across is that there is not enough toilets which people of my age and above can use.”
- “Our safety from immigrants (I have been set upon by two blacks). We prefer Barnsley. The answer to this is stop them coming in and start a reversal system. After all how can a cash shortage city be able to afford them. The bonus being everyone such as myself would benefit in many ways.”
- “Parking even on my own road, Station Road, Chapeltown, parking at the Hospitals and the long walk from the Northern General Hospital car parks..”
- “Too busy. Too many diesel and petrol fumes, too much rubbish everywhere.”

- "Parking facilities."
- "There is a frequent bus service from Chapelton to the city and vice versa! The thing I find a bit difficult to get used to is the fairly frequent reorganisation of buses and different routes and picking up stops in the City."
- "Parking facilities far too few and much more expensive than necessary."
- "I have arthritis and have had a hip replacement so my problem is the bus not stopping near the curb."
- "A pity the 165 no longer stops in Castlegate."
- "Apprehension when using underpasses even in daylight."
- "Buses should have their destination numbers on the back as well as the front, this would be a great help."
- "Other than answers already written no other problems as I don't really leave the house."
- "The current bus service is unreliable, they do not run to time, they are mechanically unreliable. In this area they seem to run in groups of four at about forty minute intervals, the driver seem more interested in overtaking the bus in front than picking up passengers."
- "Crossing the road is about the worst thing an elderly person can be asked to do these days. Next is the state of the pavements - and the height of curbs. Next is finding toilets with few or no steps. Again it's not for nothing that the big Stores have fled to Meadowhall. It let's shoppers be put down quite near to the points of sale. And the killing off of the 'little' shop has made matters all the worse. The way things are going with more and more snags to personal shopping by elderly people shops are going to have to go back to the old practice of delivering groceries to the door. Mail Order is doing a good deal already in non-food products."

(Walkley)

- "Through introducing a new one way traffic system to keep the city centre from private cars, and to allow buses to move about more freely, but that meant moving bus stops to other parts of the city, one example 31 bus route was moved from Sheaf Street lower fruit market to Angel Street, causing passengers using it to have nearly a quarter of a mile to carry their shopping."

- “The buses do not draw into the pavement making it difficult to get on the bus with the depth of the steps.”
- “Would benefit greatly if buses pulled in nearer the pavement which would make dismounting easier. Lower steps on buses.”
- “Wet leaves on roads and causeway. Ice on causeway in winter.”
- “There are far too many different bus companies which causes too much congestion. This causes problems for the elderly to cross roads etc.”
- “Waiting for buses.”
- “There is no parking facilities in the city centre near enough to take my disabled wife and mother in law.”
- “There is no facilities for parking in the city centre for disabled people when wanting to go shopping in the market area.”
- “I am only able to walk a few yards with a frame and cannot do personal shopping in the city centre owing to lack of parking due to the new traffic regulations as I was *able to do prior to this and it is impossible* for me to travel by public transport.”
- “Excellent concept of regular minibuses made useless when they travel in convoy 3’s and 4’s, instead of spread singly.”
- “Late buses not travelling to destination stated on timetable. e.g. Bus from Handsworth to Crookes, late bus only travelling to Darnall when timetable states going through to Crookes.”
- “Closure of public toilets.”
- “I am registered physically handicapped owing to a pelvic misalignment and a hip replacement on one side and later a knee operation, later that went wrong leaving me with a permanently stiff leg on the other side, I have great difficulty getting on and off public transport and must have an aisle seat for my stiff leg.”
- “If we had a single decker bus we would use regularly but we live in lower Walkley area where there are mostly hills.”
- “When using bus I have to walk up hill to my home.”

- “As my wife and I both have mobility problems in regard to walking difficulties, public transport is far from ideal for getting to and from places we need to visit. If we were without our own means of transport we would have to limit our journeys around and about as we would then be relying on friends/relatives and, occasionally taxis for transport.”
- “Waiting for buses ie 10mins/15mins.”
- “Lack of public toilets. Not able to travel at night because of attacks etc. Since deregulation of transport not having a comprehensive timetable printed (e.g. having to ring for times every time you go somewhere different).”
- “As a walker, I find my greatest problem is with the number of cars on the road, especially with only the driver (which is the majority). They seem completely oblivious of other travellers.”

(Birley)

- “The reason I don’t go out is because it is too far to walk to the nearest bus stop and to have to cross a busy main road.”
- “Insufficient parking at reasonable cost. We travel to Chesterfield and Worksop to shop for 90free. We also visit Crystal Peaks for the same reason.”
- “Atmosphere less than acceptable in city centre.”
- “Waiting time and congestion of buses.”
- “I am unable to travel to town by car because of parking problems and the cost of parking.”
- “Road works.”
- “I do not go into the city. The shopping centre I use is Crystal Peaks which is not in the city and is served by a very good bus service. My personal problem is from house to bus stop, and shopping centre to bus stop, because I suffer from chest trouble and cannot walk very far without stopping for breath. Otherwise it is a good service.”
- “At 86 years old bus driver’s could help by waiting for us. Having to walk up the hills from the 95 bus stop.”
- “Excessive roadworks (supertram).”

- “Pollution from private buses, e.g.. Yorkshire Terrier in town and South Riding which passes our house Monday to Saturday.”
- “If I need to cross town in the evening after swimming or visiting friends/relatives, I feel very vulnerable as our Birley (63) bus starts in Pond Street. Also if I visit theatres in the evening or concerts it is frightening on ones own.”
- “When visiting Dr and Dentist the bus stops at Crystal Peaks this means walking up the hill. I have written to transport about 2 years ago and did not receive an answer. This is a very difficult situation when people like me have angina or other problems.”
- “I live at Birley and a lot of my time is wasted when visiting relatives living at Woodseats and Dronfield because the bus goes first into Sheffield City Centre to come right out again, no wonder we can’t move for buses in town. Couldn’t we have more buses running round the outskirts?”
- “Too much traffic in town. Too many buses all stopping at the same bus stop.”
- “Too many different buses at one stop.”
- “Now virtually unable to walk due to severe back/hip war injury.”
- “Due to arthritis and disabilities, nearest bus stop approximately quarter of a mile away from home and would also involve climbing hills.”
- “Too many buses.”
- “I am fortunate that I am reasonably active and also that the bus service through Hackenthorpe village is pretty frequent to and from the City and to Crystal Peaks, we also have a good range of shops nearby and a post office. Until the new bus stop signs were introduced in the city centre I found it very difficult to know where to wait for a bus to a particular place - it is much easier now as each stop has a proper indication pole but I am sure its very confusing knowing just where to go when you’re a stranger in the city.”
- “The distance from the City to the bus station and the inconvenience of underpasses and steps.”

Question 23

and if there is any thing you believe should be done to improve public transport in the city for you please write about it in the space below.

(Manor)

- "A better and more thoughtful attitude from the ruling council to the private motorist, in my opinion they are anti car."
- "Provide a no. 94 bus to DHSS and housing office and to ? at Handsworth every day from down Treeton Road, Manor."
- "Don't know."
- "A better Sunday Service would be appreciated to enable people without cars to visit relatives. Poor service on 70 and 71 route."
- "Buses to start running earlier on Sundays to enable people who wish to get to church. I am referring to Prince of Wales Road down to Darnall."
- "Deregulation be scrapped, and let us go back to the old system when you knew what time a bus was due and could rely on it. There is too much emphasis placed on profit than on good service."
- "Change the system at bus stops where 4 or 5 buses stop and only 1 place to queue."
- "It will never happen but I would like to see the behaviour of young people improve and the bad language disappear."
- "A better bus service after 6.00 pm on weekdays and all day on Sundays."
- "I run a metro car - 50 mpg - cost by bus (3 miles) to city centre myself and wife - approx: ø1.30 return. Cheaper to run car. Weekends - Meadowhall Centre via M1 - nightmare."
- "I moved to this house to be nearer transport when my walking problems started, before I live on Raynald Road, Manor Park which is quite a way from transport and also very steep hill, I would never have got out if I had stayed there. The people in that area need help with transport."
- "More buses available for the disabled. I would be willing to pay a small fee for this service."
- "More restriction of cars. More zebra crossing areas or similar. Don't like subways."

- "More courteous drivers on the SY Transport. They believe that senior citizens should stay at home, especially at times when the time arrives when you are allowed to use your pass. Thank you for enquiring about our travel problems. The drivers delight in telling you with only one minute to go - not time yet."
- "We need a bus from Manor Park Centre to Fairleigh Offices (Corporation) we used to have one but it was taken off. Having emphysema I find it difficult."
- "An improved bus service from city centre (93 service) to Woodhouse. This service has to cover a very wide area and there's always a queue at the bus stop in the market area."
- "As pointed out above, to run services to a proper timetable, not in convoy. I would also like to see all single deck buses, completely ban smoking, the SYT do this, but the private companies do not."
- "I think buses should pull into the right stopping place instead of sometimes yards below or above causing confusion and pushing. This is only on busy stops."
- "We have to have minibuses which we run daily to pensioner lunch clubs, elderly mentally handicapped people, disabled children, disabled elderly, we have to have a driver who's wages are paid for by SYPTE."
- "Bring back the bus stops to nearer the markets."

(Chapel Green)

- "If Sheffield didn't let the private motorist have the almost unrestricted run of its roads we wouldn't be in nearly the mess we are. One simple step towards this end would be to ordain that no private car enters the City limits without a full load. A rule that a four-seater car with fewer than four passengers is turned back. An alternative would be to let private drivers use the roads by turn. Say a month when you may and one when you must not. In short since it is private traffic that has given us the problem let's tackle that. public transport could then get on with its job. In the broad sense Sheffield like so many other places has to be either car-less or shop-less if we want sense in our traffic."
- "Cheaper bus fares."
- "Revert back to regulated bus services. Co-ordinate bus and train services from Chapeltown, ie terminate more buses at Chapeltown and get people to use the train to go into Sheffield - Barnsley."

- “Re-regulation of buses would bring back time tables that could be followed by the public, and adhered to by the operators. Thus eliminating 20 to 30 minutes waiting time between buses that run in fours consecutively. I would use public transport more often if it would be made more convenient.”
- “Too many buses in town.”
- “A lot of people say there are too many buses in the town, but only going perhaps twice a week, I don’t find any difficulty. I am quite satisfied with the bus services.”
- “I think a better design at the entrance for boarding buses would help the elderly and disabled. Also I have noted only a few considerate drivers wait until disabled are seated before moving off.”
- “SYT drivers should be given courtesy lessons and be more helpful. Also all bus companies should plan timetables to connect and suit passengers, especially on out of town routes.”
- “Can’t see out of windows in buses in bad weather. Very good bus service.”
- “Please try to keep 88 bus running we keep hearing it is to be taken off. Otherwise OK but if taken off myself and many more would be housebound.”
- “More buses for the Burncross Chapletown area.”
- “Times of buses should be spaced out not travelling in twos and threes. Keeping to a strict timetable.”
- “When people like me go on buses, I find the high step to get on a bus is a big problem.”
- “More car parking space on outskirts of city with ‘park and ride’ facilities provided.”
- “Not being in the drivers seat so to speak I can only state what I see the ideal situation would be transport when needed. As this is not possible for obvious reasons I suggest all the transport should be used as one when working out a time table (equal share) a reliable commonsense schedule worked out, with a view to duplicates used if required.”
- “On the whole I think we have a fairly good transport system.”
- “Stop private bus companies.”
- “Better system needed, too many buses and traffic on the roads.”

- "Run buses every 10 minutes like other routes. Clear markings on bus stops. (To explain about clear markings on bus stops - in high green and Sheffield some buses do not stop at request stops that have no bus numbers on the bus stops. This causes me a lot of confusion."
- "If all buses start from one main station (ie Pond Street) it would help a lot of elderly people, as believe me you take 'your life in your hands' dodging between the different buses which all stop in the same place, and this stops older people being mobile by themselves."
- "A comprehensive bus guide covering all services, as was the case before deregulation, would be helpful. Reinstatement of the city clipper. Before its removal the clipper (501) could be boarded in the market area, and also at the railway station, but now the 501 service goes into the interchange. Improvement in the attitude of certain drivers."
- "In comparison, the services run before deregulation were far better. Route indicators and numbers should be clearer, and there should be less companies running buses especially the old smelly ones."
- "Spread out the time so people do not have long to wait. And specially on mainline buses a little more civility would be nice, because most of them do not know what civility is."
- "Sort out the terrible congestion in the town centre, never seen so many buses in my life. In the evening stick to timetables, so many times after walking to the stop the bus fails to appear. More inspectors needed on routes after 8.00 pm then probably buses will run to time."
- "There should be more co-operation between bus operators to get some kind of decent bus timetable in operation and spread out the buses arriving at the bus stop in threes and fours and then no buses for half an hour or more. Also a proper bus timetable covering all bus companies and posted at bus stops as they used to be before the unions took over running SYPTE in the early 1970's."

(Walkley)

- "Get rid of the cowboy buses. We were quite happy with SY transport as it was before deregulation."

- "You should be able to buy a timetable of all the public transport in the city, together in one book. Revert to system as it was before deregulation. (Too many buses now on roads)."
- "No 52 is a good bus route but why do we have to wait 10-15 minutes for a bus and then 3 buses arrive together, this always happens, why cannot they be spaced more, it is such a waste."
- "After 10/15 minutes along comes 3 big buses (2 SYT/1 Terrier) - Why can't they be spaced out at 3 minute intervals and not fighting for fares."
- "More pedestrian crossings."
- "Fortunately, the residents of Crookes, Walkley areas are well catered for from the public transport point of view and obviously these services should be maintained at the present level at least."
- "Need bus to come up Daniel Hill Street."
- "Require a bus to come up Daniel Hill Street. We used to have a bus on these hills but was taken off for some reason. We are both now going on for 70 years of age and I shall no longer need a car."
- "Make bus stops a little further apart so that the buses can draw right up to the pavement instead of passengers having to step down and walk into the road to alight."
- "Services to the area require improving to correspond with start and finish of shows."
- "No 52 buses to run regularly, that is with a space of say 3 minutes between instead of 3 or 4 together then about 8 to 10 minutes wait."
- "Enclosed bus stops and/or shelter against generally prevailing winds."
- "Less congestion of buses in the city centre."
- "Go back to the old SYPT which was one of the best in England."
- "Better when there were conductors to help us on and off and certainly before deregulation. Would prefer a door to door service."
- "My flat is a considerable distance from public transport. If I come from town on a 95 bus I have a steep hill to climb and with shopping it is proving very difficult, however if I come on a 52 I have the length of Heavygate Road to walk (sorry I cannot give you measurements) it is on a level."

- “Drivers could be more patient and considerate to elderly passengers who are not very mobile.”
- “On buses, lower the bottom step as many people have trouble reaching this step if the bus doesn’t stop at the curb.”
- “The crossing at top of Commercial Street does not allow enough time to cross for anyone disabled.”

(Birley)

- “It should be made safer to get from your seat to the bus exit especially if you have shopping bags as drivers tend to be in a hurry to keep to timetables, not enough straps/handles.”
- “Bus stops should have covered shelters especially in the high parts of Sheffield as you get cold winds and more snow than in the lower areas of the city.”
- “Bus timetables at bus stops which was once done but has now ceased.”
- “Private bus companies tend to have older buses and the suspensions bad which means if the road is uneven it jars your back, also exhaust emission tends to be more than on the SYT buses.”
- “I have to attend the doctors regularly, there is no direct bus service and it is difficult to walk and get there. So I have to get a taxi which costs ø2.40 approx. The route to the doctor’s is Wingfield Crescent to the end of Gold Course near Base Green.”
- “Go back to South Yorkshire Transport. We always had a bus service at Christmas, New Year and holidays.”
- “There are far too many buses in Sheffield, but where we live, everywhere you go you have to walk up a hill. The only bus down our end is every half an hour and it only goes up the road, you can’t get one back. They have taken it off once, but put it back on again because the doctor moved and it is such a long way to go if you have no transport.”
- “I think we at Hackenthorpe have a good service of buses to and from the city.”
- “Re-routing of bus 64 to stop nearer to home.”
- “We have to get a taxi every time we attend the doctors as there is no bus which passes anywhere near us, a taxi costs me ø2.40. This I am forced touse I am unable to walk as it is too far. I suffer from angina.”

- "It is definitely a necessity that names of destinations and whether into City or out of city should be shown on bus stops (just a number is no help unless you are familiar with the route) and in places where buses stop inwards and outwards of city on the same street, Cumberland Gate for instance. I am pleased to note this is mostly being done now. The worst thing for me personally is that my homeward bus does not now stop outside the railway station - you have to struggle with your case as far as Dyson House and the room there for buses to stop is so small that if another bus is at the stop yours goes round the back of it and off its gone before you can indicate to the driver to stop - I think all buses to and from the Interchange should pass the Railway station to pick up passengers using trains - some of us have to if we want to visit relatives and friends in other towns."
- "Alter bus stops so there is only one bus at each stop at one time. Buses more often in outer city areas not one every half hour or hourly."
- "The bus used to come on Main Street, Hackenthorpe which was very handy when bringing shopping home now that has been stopped. This means we have to drag it along the road. Thank you for giving me this opportunity."
- "Get rid of old smelly buses!! There is a good supply of buses on our route, mostly because of Crystal Peaks, but they nearly all stop after tea, and there is no way of getting direct to High Street."
- "In my circumstances I find public transport satisfactory."
- "A better service to Birley Health Centre."
- "We have a very good bus service."
- "Needs more transport for Birley Moor Health Centre."
- "I only go to down once a week, because of fumes from buses."
- "More easy connections from Pond Street to Fargate and Sheffield Moor. Although the new 46 service has just been introduced and this is more helpful to cover "uptown Sheffield". Let's hope this service will be permanent."
- "Buses (except through buses) to start only from Pond Street Terminal. Pedestrian only connection to Railway Station from bus terminal. q Minibus service to extend through Bowman Drive to ring road. Parking near football ground is poor. Travelling from Gleadless to Hillsboro' by public transport difficult and time consuming through

bus on match days would be a great benefit to supporters and residents within a mile of the ground.”

- “Less buses through city centre. More use of bus terminal. Improvement of atmosphere.”