

World Transport Policy & Practice

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Compromise & constraint: Examining the nature of transport disability in the context of local travel*Alison Porter*

This paper examines the question of 'what is transport disability?' It argues that research on transport disability gains depth and value by making stronger links with the major developments in theoretical understandings of disability from the last twenty-five years. Priestley's (1998) four-fold typology of disability theory provides a framework for exploring the complex and contingent nature of transport disability, using qualitative research into disabled people's experience of local transport in Swansea, UK.

Keywords

Access, disability, local transport, mobility, Swansea, transport, travel.

Older people & road safety: Dispelling the myths*Kit Mitchell*

This paper attempts to look objectively at accidents to elderly travellers and the resultant casualties. It will show that while older travellers have fewer slight accidents than younger travellers, a disproportionate number of older travellers are killed in road accidents.

Keywords

Bus users, car occupants, cyclists, elderly, drivers, pedestrians, transport, travel.

'Enabling' transport for mobility-impaired people: the role of *Shopmobility**Robert Gant*

Shopmobility provides a vital link in the community transport chain in the United Kingdom. It has been designed to secure for mobility-impaired people equality of access to shopping facilities and 'barrier-free' movement within town centres. This report introduces key findings from a nationwide audit of *Shopmobility* services within the context of a U.K. government commitment to an 'inclusionary' and integrated transport policy.

Key words

Shopmobility, mobility-impairment, 'enabling environments', transport policy, U.K.

Concessionary fares in Britain: what we need to know*Tom Rye, David Seaman, David McGuigan & David Siddle*

Concessionary travel on public transport is available in the U.K. to pensioners and people with disabilities. The concession varies geographically. There are free travel or reduced fare schemes while other local authorities provided tokens; some schemes are limited to one's home local authority, others allow use in neighbouring authorities. On this hotchpotch, the Government has legislated for new national minima of a minimum half fare within existing scheme

boundaries. However, Scotland and Wales have their own ideas.

This paper will first consider how much the UK taxpayer currently pays for concessionary travel schemes, and what this buys in terms of discounts. It will then review the data that are available about existing levels of travel by people who are eligible for a concession. Finally, it will consider how the concession is changing and some of the effects that this might have, and the research that is needed to find out whether this use of money represents best value.

Keywords

Buses, concessionary fares, pensioners, travel.

The Disability Discrimination Act & developments in accessible public transport in the U.K.*Bryan Matthews*

This paper outlines some of the background to the Disability Discrimination Act and its transport provisions and sets out some of the expected future developments. The paper reviews the major developments in the implementation of the transport components of the Act; it highlights its key implications for future provision and seeks to identify salient lessons for the international community.

Keywords

Accessibility, disability, discrimination, Disability Discrimination Act, mobility, Public transport, Transport.

Evaluating Transportation Equity*Todd Litman*

Transportation gives people the opportunity to access goods, services and activities that provide benefits. Transportation helps determine where people can live, shop, work, go to school, and recreate. Transportation is therefore about opportunity and equity.

This paper explores the concept of transportation equity and suggests better ways to incorporate fairness into transportation decisions. It describes three major types of equity: horizontal equity, vertical equity with respect to income, and vertical equity with respect to need and ability. How transportation is defined and measured often determines how equity is evaluated. Current transportation equity issues are discussed, and examples are used to explore the equity implications of specific decisions. Case studies include automobile user charges, transit funding, and traffic management.

Keywords

Efficiency, equity, fairness, funding, transport.

Louise Darracott Britton (1916-2000)

This is a rather unusual and special issue of this journal. It is dedicated to the memory of Louise Darracott Britton who died in Amory, Mississippi (USA) in October, 2000. Louise was the mother of one of our editors, Eric Britton, and led a long, active and healthy life until Parkinson's Disease slowly deprived her of independence and the means to live a full life.

This journal has always taken a clear line on the need for a human-centred conceptualisation of transport. One of the key trends that has grown in strength during the long period of Louise's life is the development of motorisation and high levels of mobility. Whilst for some people this has produced a dazzling array of destinations and travel opportunities within a couple of hours driving time, for others it has produced a sterile and machine dominated world that reduces travel opportunities and accentuates isolation. A child in the 1950s had far more freedom and independent mobility than a child has in 2002. For the elderly and those with mobility problems the situation is much worse than it is for children. A child is deprived of independent mobility and freedom (see M. Hillman, J. Adams & J. Whitelegg, (1990) *One False Move: a study of children's independent mobility* Policy Studies Institute, London) but still has one or two parents who will go to quite extraordinary lengths to ferry them around, arrange visits and ensure that social networks are as rich as geography, time and cash can permit.

Many elderly people, people with mobility problems, people with low income and people with long term serious and debilitating illnesses do not have this parental support system. The results can be devastating. Modern life is predicated on the assumption of high levels of mobility and 'in your face' celebration of the delights that await us all at the end of the car trip. This encapsulates one of the fundamental failures of our transport and planning systems. We have lost the plot in terms of human-centred, supportive and modest transport services that take a kind and nurturing view of the travel needs of everyone within a well planned local environment.

Personal stories are important if we are to regain this lost ground. Louise found life increasingly difficult as her Parkinson's disease developed. This included very real difficulties in getting around. We have to try and understand how to provide transport services through the eyes of Louise and others like her who because of Parkinson's, Alzheimer's, MS, psychological problems, injury or whatever find themselves in an unforgiving world that is dedicated to speed, cars, poor quality public transport, poor quality pedestrian pavements/sidewalks and

impossible crossing facilities. Crossing a very wide road in Paris, Copenhagen, Lancaster or Brisbane requires athletic skills of Olympic standards. This penalises the slow, the ill and those in pain. The planning of crossing times for pedestrians is only one small example of this lost ground but it shows clearly that our transport systems are not caring, kind or human centred.

Another personal story. In 1977 and 1978 I had the enormous pleasure of walking around Lancaster with my small children. We walked everywhere and enjoyed it. There were problems but in the main an adult could walk around with a 10 month old child in a pushchair/buggy on a reasonable sidewalk and at the same time hold the hand of a 3 year old child. I am now repeating this experience with a 10 month old grandson and it is dreadful. The sidewalks are broken, cracked and uneven, the cars go too fast and are driven too aggressively (turning across my path when I am crossing a side road), the timing on the signalised crossings are not long enough for me to get the buggy across within the allotted time. It is very unpleasant.

These same conditions make life difficult for the elderly and for those with mobility problems. We have allowed our local environment to become child unfriendly and to be shaped only by the desire to reward car drivers. They can now drive faster and metal railings have been erected on some streets to make sure that the elderly and the ill have to walk even further so that drivers can be given even greater opportunity to drive faster and ignore vulnerable road users. Why should the journeys on foot of the elderly, the ill and young children be made more difficult and circuitous to enhance the ease and joy of the motorist?

This special issue can only scratch the surface of this subject area. We have put together a collection of papers that share an interest in those groups that have been ignored and have carried the burden of our inhumane and unkind transport systems. We want to continue to represent the views of those who have been ignored. We want to restore the importance and the dignity of those who have been forgotten. Louise Darracott Britton will not be forgotten and her struggle with Parkinson's Disease will be an inspiration for us to do better in this area and to act as a focus for a new paradigm in transport based on inclusivity, social justice, kindness, humanity and respect for all ages and all abilities. (She would have liked that very much.)

John Whitelegg
Editor

World Transport Policy & Practice

Toward a New World of Fair Mobility? Or ... is it true that you can't get there, until you have been there?

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Preamble

'Elderly & handicapped', 'mobility impaired', 'disabled', 'feeble' ... these and other similar phrases will of course be found in the transport planning and policy lexicon. But invariably you have to sift your way through a very long list of other categories and targets before you get there in most of the places in which we spend our day to day lives. That makes perfect sense of course in a world populated exclusively by vigorous and healthy automobilists, say the world of most of those of us who have traditionally made the key decisions underlying our transport policy in most places over all these years.

But hey, it's already the twenty first century, and if only you would roll down that heavily smoked window of your fine new car and have a look, you will see that there's a real and rather different world out there. And when it comes to the concept of 'fair access for all' there are a few remarkable things that jump out at us as we settle back into the plush comfort of our driver's seat.

The first and most blatant of these is the extent to which our present transportation arrangements— in most places consisting of a preposterous combination of hugely subsidised private cars and after-thought (if any) soviet-style bureaucratic 'public transport' – are doing such an unacceptably poor job of serving a very large proportion of our populations.

The second is far less obvious, since it has more to do with a *future state* for most of us: namely the fact that the 'mobility impaired' of tomorrow should be very close to our hearts and minds indeed – since they are, not to put too fine a point to it, thee and me. And this is a dynamic reality which we would do well to get across to all those involved in the world of transport policy, practice and decision making: our universal, implacable, personal voyage toward ever more troubled mobility and access. (You will see quite a bit about that in the pieces that have been collected in this special number so kindly been put together by John Whitelegg in memory of my dear mother.)

Against this general background, what I would like to do here, with your indulgence, would be to tell you in a few words about her voyage toward a life of ever

reduced mobility, knowing that with a few minute wrinkles this is the passage that you and I too are going to make in the years to come. My thought, my hope in doing this is that perhaps, if we can find ways to personalise the issues of transport planning, decision making and entrepreneurship in these universal ways, a world of better, fairer transportation policy and practice could begin to open up. A better place, not only for all those out there today who deserve to be able to live fuller and more rewarding lives, but soon enough too for you and me.

Amory Mississippi, Autumn 1988

It was an early Autumn morning of 1988 in a small town in my native Mississippi when I, your averagely thoughtful and considerate 50 year old male who starts each day with a six kilometre run, opened the door of the apartment of my loving, lively 72 year old mother and bounced down the hall, talking to her energetically as we went. But when I heard nothing from her, I turned around to find her ten full steps back, not moving. Stuck to the spot, as it were.

Thus began one of the most striking and formative periods of my life, though at the moment all I felt, I am afraid to say, was some exasperation. Which to this day I hope I was able to conceal as I walked back to her and asked her if anything was wrong. 'My leg seems to be stuck', she replied, and then a few seconds later she unstuck it and we continued to move down the hall, albeit rather gingerly. After this happened several times again, we went to see her doctor, who performed the usual tests, and a few weeks later presented the results. My dear mother apparently – these things are never so clear with this disease – was in the early stages of Parkinson's disease.

We the 'thoroughly mobile'

What's the figure? In our by and large reasonably well off and, less reasonably perhaps, complacent world of 2002, some very large proportion of us – 90%, 80%, X0%¹ – manage to get around in our daily lives well enough to be considered 'thoroughly mobile'. And when you are this thing, that is not only thoroughly mobile but also living your busy life with no particular

¹ This is a number that will vary according to context and country, but it is a very real number.

mobility impairments in view, the idea that there are 'some people' who are for various reasons not able to get around with much facility is for most of us a truly distant thought. And when we are confronted with this reality from time to time, seeing a person in a wheelchair or someone having difficulty getting up stairs, most of us have a feeling of compassion, a certain sadness, which, as we whisk along our way, becomes just one more of those passing thoughts in an otherwise busy day.

We, the 'thoroughly mobile', have in recent years begun gradually to be more aware of the fact that our present transportation arrangements serve a certain portion of our societies, those with mobility limitations, rather poorly – and that this is patently unfair. But noble as that may be as a human sentiment, at the end of the day it does not appear to suffice to create the sort of very strong and vocal – and effective! – constituency for the major changes that are required if we were to move into a new era of, might we call it, 'fair mobility for all'.

Amory Mississippi, 1995

Louise and I were getting pretty good at handling the myriad of problems and challenges that all those with reduced mobility have to face each day. The real problem in our case was that each time we got better at handling the latest set of circumstances, the disease clock kept ticking and in the process presented us with a new set of circumstances and options. Each time reduced, of course.

Through all this my mother was stoic, smiling (though not always without a sign of panic in her eyes), and ever uncomplaining as she learned to adjust to her new and ever smaller world. I on the other hand was struggling. The most difficult stage for me was undoubtedly the first, since it was so strange and had hit us entirely without forewarning. The key to this stage, it turned out, was learning how to adjust my own natural impatience and life rhythm, and to learn simply how to wait. First, with a certain amount of accompanying anxiety and at times even irritation (which I desperately hope to this day I was able to veil). And later, with growing calm, patience, and, let's call it, ever greater accessibility.

We learned all this together, her way ahead and me at a considerable lag but finally too making my way to our new stage of dialogue and collaboration. We would walk slowly, halting whenever she tired or in her words 'got stuck', with my dear mother each month, each visit leaning ever more heavily on her son's arm.

From then we went through a steady progression of stages: a pretty cane, a less pretty walker, and then her first wheelchair. As you can well imagine, one of the things that happened at the very beginning of our

cycle was that we had to give up her driver's license. In unequipped, unthinking America, that equates to losing your legs. A first time.

Getting By

This was America, and at the end of the day the choice for almost everyone is getting there by car or not getting there at all. There are, thanks to various permutations of new laws, a bit of technology, more thoughtful physical planning, and a growing number of concerned volunteer and other groups, a certain number of improvements available here and there. But in America at least two things immediately strike the eye about them. The first is their extreme rareness when we look at the nation as a whole. And the second is that even at best they leave a huge amount to be desired, if our point of comparison is the opportunities and quality of life of those on the 'other side' of disability.

In the case of my dear mother in late 20th century small town America, there was not even the shadow of a public transport option. A part time local volunteer service was well intentioned but far too awkward to use on a regular basis, and so under-equipped and under-staffed as to be a non-option. Taxis? Very hard to come by, inconvenient, unreliable, and not trained for the job. The friendliest, best, and most efficient services were for church transport, but, to talk transport for a moment, the origin-destination matrix was a bit limited. The bottom-line: quite close to zero mobility options, this side of begging for a ride from friends and neighbours. Not exactly the sort of thing that my dear mother was geared to do.

We were lucky to be able to find a kind lady in our small town who both had a car and the skill levels, background, and disposition that such a very special kind of job entails. So we were lucky enough to have Elizabeth Bell to be on hand whenever needed, and she was lucky in turn to have the additional income. For several years Elizabeth served to parry the problems associated with my mother's clipped wings, but this happier personal outcome is hardly a foundation for public policy.

Amory Mississippi, 2001

In any event, life moved on and the circle of immobility tightened, and one lovely Autumn day Louise left us, with all those years of mobility problems only a memory. But also, I would like to think, a clear reminder to us all about the world we live in and the obligations that we have to others '*less fortunate than ourselves*', (please read the quotation marks), and, while we're at it, to ourselves.

Seven Lessons & Recommendations

Based on this experience, which is at once very personal but also universal, and having some

background in the world of transport policy and practice I have come up with a small list of observations and recommendations for the future of the fair mobility debate and process that I would now like to put before you for your consideration – and eventually for your reactions.

1. Consensus Building:

If the issues of fair mobility are not squarely in the mainstream of transport policy and practice today, it is because someone somewhere is not taking full advantage of the tools now available to create a much larger public consensus for change. This special issue of *World Transport Policy & Practice* provides an example of consensus building in which a small group of colleagues have come together to build on the results of one personal experience and then bringing to bear on it information and research skills in an attempt to reach out and extend the consensus for change in this area. But there are many other tools available for doing this too, involving new as well as older media. One of these is the Internet, and for that we have a small 'learner' proposal that follows. But there are others as well, and one possibly smart use of the web should not be taken as a signal to close down our minds for the rest.

2. Ethical Benchmark for Public Investments:

Might we give some collective thought to the creation of some kind of Ethical Benchmark for Transportation Investments in situations in which public policy and public expenditure are concerned: a specific percent of expenditure which must be given over to providing first call access for those with mobility limitations? To do the needed job, this must be a very big number indeed – ideally one that will raise a lot of fuss and objections – but not out of line with the necessary broad public support program that now needs to be engaged.

3. Radically Increase Private Sector Involvement:

If you scratch both the law and practice in many places around the world, you will find that there are a considerable number of barriers which are holding back private enterprise in this area in which more and better is desperately needed. The private sector at its best is well equipped to respond to a wide range of market demands – assuming of course that the market is there and organised in such a way that its signals are getting through. This is not to say that the private sector unabated is going to be able to come in and solve all these problems on their own. There will still be a large role and job to do by more traditional public transporters and by the volunteer groups and associations. But the potential for huge improvements through this avenue of enterprise is

enormous. One example is the taxi industry, which becomes all the more interesting when we think of it in the context of what can be done with new technology to make it more fully demand responsive and economically viable.

4. Information Society Technologies:

It's already 2002 and technology has not been standing still for the last twenty years. You may not know it, but there are low cost technologies that are available now which can be put into the homes of those with mobility limitations that can permit them to have far greater access to the outside world and its opportunities than ever before. One of these is a combination of IP videoconferencing with an integrated 'distance work toolkit' which could and should be put into thousands of homes on a publicly monitored high profile basis, to show what they can do.² This, I can tell you with confidence, is a huge, life transforming event in the life of someone who is otherwise irrevocably bound to the walls of one room or dwelling.

5. Job Creation 1:

There is no way to move toward fair mobility without creating a lot of jobs. In the transport sector, where for the last half century the main thrust of innovation and change has precisely been to take people out of the system, this is going to require new thinking. But in a world of growing structural unemployment, the idea of good jobs in the 'people caring' sector begins to make a lot of sense.

6. Job Creation 2:

Let us not forget the large number of people who today are not able to participate in the experience of work and income generation, simply because they are not able to 'get to work'. However, the new technologies mentioned briefly here can provide excellent ways for getting the work to *them*. And when this is done cleverly enough, it becomes possible to move away from response strategies which dole out 'benign public assistance' – opening up instead a new world with possibilities for income-generating 'personal enterprise' for people who are able in many more ways than the present limited arrangements permit them to give proof of. (The biblical parable for this might be that of teaching to fish, instead of giving fish.)

7. Cross Finance:

The new arrangements needed to create this new world of mobility and access are going to require that we get a lot better at 'cross-financing': creating innovative, pattern-breaking, barrier-breaching, cross-agency programs and support for both pilot projects and longer term programs. If we see this as a challenge and not a problem, then there is much

² Internet Protocol videoconferencing using ISDN technology

that can be done, and plenty of opportunities to create useful precedents and new patterns.

Such a list can of course go on and on, but the point here is that we are beginning to have a basis for very different kinds of approaches to these issues than have traditionally been considered. This new world of fair mobility is beginning to take shape, and this is a process in which the several thousand talented readers of this small journal can participate most usefully. Thus, as a first step we would like to invite public discussion of the ideas that are set out throughout this issue, and if you go to the Journal's web site at <http://www.wTransport.org>, you will see that provision has been made for this.

Perhaps by putting our heads together on this, we can do our bit to make a world that will be a better

place for us too as our own personal mobility radius shrinks, as surely it will. But this does not have to be a sad ending. Not, that is, if thee and me are willing to make it otherwise.

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Compromise & constraint: Examining the nature of transport disability in the context of local travel

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Abstract

This paper examines the question of ‘what is transport disability?’ It argues that research on transport disability gains depth and value by making stronger links with the major developments in theoretical understandings of disability from the last twenty-five years. Priestley’s (1998) four-fold typology of disability theory provides a framework for exploring the complex and contingent nature of transport disability, using qualitative research into disabled people’s experience of local transport in Swansea, UK.

Keywords

Access, disability, local transport, mobility, Swansea, transport, travel.

Introduction

While major advances have been made over the last twenty years in the planning and provision of transport that is accessible to all, the links have not yet been effectively made between applied work on transport planning and the major developments in theoretical understandings of disability which have been taking place during a similar period. Existing studies have attempted to measure transport

disability, but have generally failed to link it to wider theoretical or structural concerns, or to explore disabled people’s responses to transport disability.

This paper seeks to fill that gap by considering the question of ‘what is transport disability?’. Those who are involved in the planning and provision of transport services which are accessible to disabled people need to have a clear working definition of what transport disability is, and by extension who is transport disabled, for two reasons. Firstly, those planning new accessible transport services, or modifications to new transport services to improve their accessibility, are generally looking for an indication of the size and nature of the potential new market for those services. Secondly, despite a general shift towards accessible mainstream services, the process of defining who is or is not transport disabled is a way of determining the eligibility of individuals to a range of transport-related benefits and specialist services.

This paper places the concept of transport disability in the context of theoretical developments in disability. It presents and evaluates five possible ways of understanding transport disability. By drawing on original research into the local travel experiences of disabled people in Swansea, it reveals

Table 1. Priestley’s four approaches to disability theory

	<i>Materialist</i>	<i>Idealist</i>
<i>Individual</i>	Position 1	Position 2
	Individual materialist models	Individual idealist models
	Disability is the physical product of biology acting upon the functioning of material individuals (bodies)	Disability is the product of voluntaristic individuals (disabled and non-disabled)
	The units of analysis are impaired bodies	
<i>Social</i>	Position 3	Position 4
	Social creationist models	Social constructionist models
	Disability is the material product of socio-economic relations developing within a specific historical	Disability is the idealist product of societal development within a specific cultural context
	The units of analysis are disabling barriers and the material relations of power	The units of analysis are cultural values and representations

Source: Priestley, 1998, p. 78

the complexity of the overlapping processes involved in transport disability.

Theoretical understandings of disability

Although definition of disability is crucial to any theoretical or applied work in the field of transport and disability, it is not a straightforward or unambiguous process. Over the last twenty years or so, there has been a fundamental change in the way in which disability has been perceived in academic circles (Morris, 1991; Oliver, 1996). The perception of disability as merely a collection of medical symptoms, a list of 'what's wrong' with an individual, has been challenged by social perspectives which are more interested in the barriers raised to the integration of disabled people in society, and which identify disability with these barriers. Although the debate is sometimes presented as simple opposition of two rival explanatory models of the nature of disability, it is more complex than this (Oliver, 1993, 1996), as Priestley (1998) showed by introducing a fourfold matrix of theoretical positions. This added to the distinction between individual and social perspectives an additional divergence between idealist and materialist modes of explanation. Though distinct, the four positions are not absolutely mutually exclusive, and linkages can be found between them.

Priestley's (1998) *Position 1* is the Individual-Materialist position which equates disability with, for example, an individual's arthritic knees or missing arm. This perspective dominated academic and policy responses to disability through most of the twentieth century (Drake, 1999; Gleeson, 1999). It has three main characteristics:

- it identifies disability as a problem of the individual;
- it conflates impairment (that is, a physical characteristic of the body) with disability; and
- it gives great value to medical definitions of and responses to disability (Oliver, 1996).

This influence of medicine is so strong that the shorthand expression 'medical model' has often been used (e.g. Drake, 1999; Priestley, 1998). The 'medical model' has come to be identified and defined only by default, presented as a contrast to the social perspectives on disability whose development and growth has been more consciously articulated.

Position 2 is Individual-Idealist, and focuses on people's experiences and interactions with others, disability being the sum of these experiences. Such ideas were put forward most influentially by Goffman who explored the ways in which people with physical impairments carry a stigma which shapes the response of other people to them (Goffman, 1963; Burns, 1972). Although the idea of stigma and its concomitant, prejudice, still sometimes appear in

research (e.g. Knight & Brent, 1998), more recent work looking at disability from the Individual-Idealist position has developed in other ways as well. Themes in recent research include more general issues of meaning (e.g. Williams, 1998) and of identity (e.g. Finkelstein, 1993; Watson, 1998) and the application of feminist perspectives (e.g. French, 1993; Crow, 1995).

Position 3 is Social-Materialist, identifying disability with the disabling barriers resulting from the playing out of power relations within contemporary society (Abberley, 1987; Oliver, 1996). Fundamental to this position is the distinction drawn between impairment as a function of the body, and disability as a process of exclusion of people with impairments, which is neither inevitable nor acceptable. From the time that disability was first coherently theorised in this way some twenty-five years ago (UPIAS, 1976), disability rights campaigners, at least in the UK, have used ideas about social creation both as a tool to understanding and an argument for change.

In contrast to this social creationism is the Social-Constructionist (or Social-Idealist) view of *Position 4*. This identifies disability as a collective idea, a label devised and ascribed by a particular society. From this perspective, the very nature of disability lies in the categorisation. What is of interest is the way in which the category, or series of categories, are defined, how individuals are found to fill them, and the reasons for their use, which are primarily concerned with controlling access to benefits (Stone, 1984). As Liggett (1988) has argued, drawing on the work of Foucault (1977), the process of categorisation places certain expectations of behaviour on those classed as 'disabled' as well as those classed as 'normal'.

Exploring transport disability

Research into transport and disability has traditionally been overwhelmingly positivist and applied in nature. It has been concerned with such issues as establishing basic needs and planning and evaluating ways to meet those needs (Sutton, 1988). Work in this field has tended to be based on an assumption of need quite different from the economic ideas of demand in the marketplace which have dominated the mainstream of transport studies. While researchers such as Hay (1995) and Hay and Trinder (1991) have analysed the underlying principles of equity, fairness and justice which are used by transport planners, they have not been able to solve the conundrum of how to define the slippery concept of need.

Within transport geography, only a few researchers have broken the prevailing silence on disability. Gant (1992, 1994) and Smith (1994) have both explored constraints on transport and discussed

Table 2. Five possible ways to look at transport disability

An aspect of the body – for example, someone may be considered transport disabled if they have no legs or are blind.

Something which affects and modifies personal relationships

One aspect of the various social or material barriers which an individual may experience

Relative disadvantage, compared to the norm.

An administrative category or label which the transport disabled person wears

possible solutions, again with a primarily applied perspective. Within the expanding field of the geography of disability, interesting work has been done on the use of space and the built environment (e.g. Imrie, 1996, 1998; Gleeson, 1999). However, equivalent work informed by theoretical developments in the study of disability has been lacking in relation to transport.

By drawing on the discussion in the previous section about the theorisation of disability, which listed a range of possible understandings, it is possible to develop a range of ideas about the nature of transport disability. Five ways of understanding disability are listed in Table 2.

This categorisation of definitions represents a basis for discussion and highlights future areas for research, rather than being an authoritative and exhaustive list of possibilities. They are tools to understanding rather than a full explanation. Later in the paper, empirical material from a study of the travel experiences of disabled people in Swansea will be used in the discussion and evaluation of these various ideas. First, though, some background information on the research will provide the context for the discussion.

How the Swansea research was carried out

The empirical material presented in the rest of this paper is drawn from research which aimed to explore the extent and nature of transport disability. It looked at the experience of disabled people between the ages of 16 and 69, with a range of physical and sensory impairments, living in the city of Swansea. The study looked at local travel, within and around the city. It explored the full range of transport options, both public and private, from walking and wheeling, to driving, being a passenger in a private car, and using public bus services, taxis, statutory provision such as Social Services minibuses, and community transport services.

The research had two distinct areas of interest: one was descriptive and explored the nature and extent of disabled people's difficulties with transport, and the other was interpretative and looked into the ways in

which people responded to limitations on travel and transport. After the work on the background and context, the core of the research was carried out in two stages, the first quantitative and the second qualitative, each broadly corresponding to one of these two areas of interest. The value of this type of mixed method approach is one which is well acknowledged in the literature on methodology (Brannen, 1992; Bryman, 1988, Bryman & Carter, 1990; Rossman & Wilson, 1984, 1991), so it is surprising that mixed method studies have been largely absent from work on disability.

The first stage of research was a survey of 114 disabled people. A questionnaire collected information on the number of journeys people made, the types of destination, mode of transport and need for assistance. It also asked respondents about what problems they had experienced in relation to travel and about limitations they felt they had on their opportunities for travel. The information was explored with the help of the SPSS computer program, to get a picture of the travel habits of the group, and the role of various influential factors.

The second stage of research consisted of in-depth interviews, participant observation and focus group work with eleven of the people interviewed during the first stage of research. The selection was designed to provide diversity of experience, and so included a range of ages, lifestyles, family structures, socio-economic groups, place of residence, and outlook on life. The interviews and focus group discussions were tape-recorded, and along with the notes made on participant observation during trips around town, analysed using the NUD*IST computer program.

Examining five possible ways of looking at transport disability

Transport disability as an aspect of the body

The idea of transport disability as an aspect of the body – the inability to walk, for example, inevitably leading to problems with travelling at all – belongs with the individual-material understandings of Priestley's (1998) *Position 1* – Individual-Materialist.

Although the Swansea study was deliberately sceptical about this position, and did not delve into people's impairments, some information was gathered in the course of the quantitative research about participants' use of mobility equipment, such as walking frames and wheelchairs. The use of mobility equipment is sometimes used in research as a surrogate for bodily impairment.

Just over half of the Swansea group used a wheelchair at least some of the time, and this group made fewer journeys than the non-wheelchair users. However, the difference between the groups was not statistically significant, and far stronger associations were found between level of activity and other factors such as age and car ownership. The significant role of these other factors in creating transport disability provides empirical support for the theoretical arguments against equating bodily impairment with disability.

The qualitative stage of the Swansea research produced supportive illustration. One young man, for example, had greater physical impairments than most participants in the study. However, he travelled around a great deal more, and more independently, than did many of the other participants, by using technology in the form of an electric wheelchair and his own fully-accessible van, leased with the help of state benefits. Another research participant was blind; her main problem with getting around was being a non-driver, a condition which inevitably followed from her impairment but is not exclusively associated with it.

The challenge presented here to the simplistic equation of impairment with disability is a clear one, but it is no longer radical. The theorisation of disability and the body has moved on, to look at new ways of taking account of the experience of impairment and its very real effects (e.g Butler & Parr, 1999).

Transport disability as something which is experienced in personal relationships

In the course of daily travel, most people are constantly encountering, influencing and responding to other people, so there is plenty of opportunity to look for examples of disability being played out in relationships with others. However, the Individual-Idealist *Position 2* which has produced useful insights into other aspects of disability seems to have limitations when it comes to transport disability.

The qualitative stage of the Swansea study produced some descriptions of the ways in which perceptions or understandings of others acted to limit or alter people's mobility. There were descriptions of the power of strangers to humiliate through their looks and mutterings, and of less malevolent but blundering lack of understanding and accommodation.

But, among the Swansea group, such experiences were not hugely significant in either quantity or tone.

The one area in which the Individual-Idealist perspective did provide a useful tool of explanation was not in interaction with strangers, but with the friends and family who provided assistance to help people to travel. All the participants in the qualitative stage of the research relied at some time on others to provide unpaid help with driving, with practical assistance such as handling a wheelchair, with gathering information about the accessibility of routes, or with simply providing a back-up in case of problems. Many problematical issues were identified: the practical limitations of relying on another, the need for reciprocity to avoid indebtedness, and the way in which the help received could distort a close relationship. These themes are familiar ones in the literature on carers and care-giving (e.g. Atkin, 1992; Keith, 1992; Twigg & Atkin, 1992), though research in that field has not up to now paid attention to the caring relationship in travel.

As well as telling us about the key role of family and friends in travel, looking at the experience of the Swansea group from the Individual-Idealist perspective also allowed an exploration of two important themes, both with policy implications: people's expectations of and feelings about independence, and the way in which disability can be experienced as a constantly changing and developing process, rather than a static situation.

Transport disability as one aspect of the various social and material barriers which an individual may experience

The idea of transport disability being experienced as a set of barriers to travel is one which sits very clearly with the Social-Materialist *Position 3*, where disability is a social creation. Barriers to travel may be physical ones, such as steps at vehicle entrances, or they may be social or structural barriers, such as lack of money or lack of information. The idea is a powerful one, and can be extended to include a discussion of processes of exclusion and so provide a politicised agenda for change. While other researchers such as Zarb *et al.* (1998) have kept strictly to the logic of social understandings of disability, and studied and measured the barriers in isolation, the Swansea study concentrated more on peoples' experience in relation to barriers, in order to understand the processes involved. Both the quantitative and qualitative stages of the research showed the value of a barriers-based model of transport disability, but also revealed its complexities and ambiguities.

The quantitative stage of the research explored the relationship between how much people travelled about and how contented – or otherwise – they were

with their travel habits. People who travelled little might be expected to report high levels of frustration with disabling barriers. Indices for activity and contentment were derived from the data and plotted against each other, and the slightly surprising result appeared that there was no direct association between the two. In other words, disabled people in the sample who travelled around more were not necessarily more content than those who travelled less, and low levels of activity did not always reflect frustrated desires to travel. This suggests that not everyone experiences and encounters the frustrations of disabling barriers in the same ways, but the implications are more complex.

When the influence of other factors on how much people travel around was explored, the most significant influence was age, people in the age group 45-69 tending to travel far less than the younger group. This was not the expected fall-off activity usually expected with old age, but a big difference within a group of working age.

Of course, people vary in what they want to do, and in what their expectations are, but more interesting questions are raised by these findings. For example, why did people in the middle-aged group apparently expect less of travel? Was there a fall-off in expectations, after years of frustration, or was there a generational influence, meaning the younger age group will maintain higher expectations as they move into middle age?

Secondly, the observations highlight some interesting conceptual issues about a model of disability based on barriers. Put crudely, if disability is a series of barriers preventing people from doing things, do the barriers – and therefore the disability – only exist when you bump up against them? If a barrier prevents you from doing something which you wouldn't want to do anyway, is it relevant? Answering a simple 'yes' to these questions undermines a barriers-based model of disability, but the evidence from the qualitative stage of the Swansea study suggests that the answer is far from simple. The research showed that barriers were a range of ways in which barriers were experienced, from simple denial of entry or passage, to entry with certain qualifying conditions or restrictions. The participants in the study developed complex and multi-layered maps in their heads of their own set of 'friendly places', destinations and routes where the level of access was acceptable to them. Along with these went sophisticated rationalisations of the barriers acting on them; they had a very clear awareness of the extent of barriers limiting their freedom, but chose to suppress, or at least to ignore, this knowledge in the course of their everyday lives. They simply wrote off whole areas as 'non-places'.

Transport disability as relative disadvantage

In theoretical terms, the notion of transport disability as relative disadvantage – the difference between the travel habits of two otherwise similar groups of people – fits most closely with the Social-Idealist *Position 4*, in which disability functions as a series of socially created barriers; however, it is not normally conceptualised in this way. The idea has been well used in studies of transport and disability for many years (Rosenbloom, 1983; Yukubousky & Politano, 1974). The concept is appealing because it appears to be something which is fairly easy to measure. It also offers a straightforward route into debates about needs and equity, since it can be used as a way of expressing a normative need. By this route, the idea can be linked to work on other disadvantaged travellers, such as older people or parents travelling with small children (e.g. Bruce, 1986)

The Swansea study offered material for this kind of analysis. Data about individuals travel patterns were used to produce an average of 351 journeys per person per year. This compares the National Travel Survey figure for the average annual number of journeys for the population as a whole of 1052 (DoT, 1996), that is, the Swansea group were making only about a third as many journeys as their non-disabled peers. Because a non-probability sampling method was used, this figure tells us about the characteristics of the Swansea group, but cannot be extrapolated to a wider population; however, the figure is roughly in line with equivalent studies carried out elsewhere (DoT, 1994; Bruce, 1986; AA, 1992).

One of these equivalent studies, the National Travel Survey's own research in the early 1990s into the experience of disabled travellers, reveals in its methodology one of the problems with such an approach. Disabled travellers were identified to become the subject of research by the difficulties they had walking or boarding the bus (DoT, 1994). With curious circularity, people's transport disability was both the starting point and the outcome of the research.

The second problem with this approach is that, like any measure based on normative standards, it entails defining what the norm is. While the National Travel Survey presents one way of defining the norm, the figures contained are misleading in their clarity. This is because the average figure conceals a wide range of individual experience, each of which is equally valid. Transport disabled people will vary in terms of how much they want or need to travel, just as the rest of the population does.

Transport disability as an administrative category or label which the transport disabled person wears

The idea of transport disability as an administrative category is one which fits the Social-Idealist *Position 4* on disability, in which disability is a social construction. The label 'disabled' is ascribed to confirm the bearer's entitlement to transport related benefits or services which assist them to travel. Earlier in the paper, I argued that being able to identify who is eligible to be classed 'transport disabled' as a passport to services was one of the useful outcomes of research into transport disability. In fact, what the Swansea research showed was that the category of transport disabled was not absolute, fixed or necessarily fairly applied, and could have effects other than those expected or intended.

The Swansea study found a surprising range of examples of disability as an administrative category affecting people's travel experiences. Most of these were in relation to private sector transport, for example, being issued with a badge allowing parking concessions. There were also a couple of examples from public sector transport (getting a concessionary bus pass) and community transport (claiming eligibility for a voluntary car scheme).

Disabled people going through the process of claiming transport disabled status found that they could be dealing with authorities operating different rules. Those rules, in turn, could be subject to interpretation by what Lipsky (1980) has called 'street level bureaucrats', the doctors and officials who put policy into action. The process of claiming can be very emotionally stressful, not just because it involved declaring and acknowledging a state of neediness, but because it can become what one participant called 'a fight'. Once the status of transport disabled has been achieved, the solutions made possible through it may be inadequate. The whole process has a paradoxical dual effect, reducing transport disability but confirming 'disabled' as a status.

Looking at transport disability as an administrative category is a very useful way of discovering more about the experience of being disabled, but it is questionable how useful it is as an indicator of the extent of transport disability. A category such as the number of people claiming the mobility component of Disability Living Allowance offers an easy shorthand measure for the number of people who are transport disabled, since the work of checking people against eligibility criteria has already been done. However, underclaiming is likely to undermine the accuracy of the figures (Berthoud, 1998), and since the names of claimants are kept confidential, further research on their experience is difficult.

More fundamentally, using a socially constructed administrative category to give an indicator of need gives too simplistic a picture, ignoring the complexities and ambiguities of the process of 'playing the disabled role', which I have discussed elsewhere (Porter, 2000).

Conclusions

This paper has not aimed to give an absolute answer to the question of 'what is transport disability?' but to show that it is many things. Of the four theoretical positions presented, the Social-Materialist conception seemed the single most powerful and effective one, a fundamental underpinning of other interpretations of disability. The empirical evidence gathered in the Swansea study, in particular during the qualitative stage of the core research, showed the connections between the four positions.

The existence of disabling barriers cannot be understood without understanding the Individual-Materialist conception of disability, that is, disability as simply a problem of the body, which has led to their existence. The Individual-Materialist position also underlies and makes legitimate the Social-Idealist position, which treats disability as an administrative category. In turn, the 'disabled role' which people act out, after being put in that category, goes to reinforce, through 'special treatment', the process of exclusion, as articulated in the Social-Materialist model of disability. Finally, the Individual-Idealist position guides us through disabled people's experience of interaction with other people and the environment as they negotiate disabling barriers. Individuals' perspectives on disability shaped their behaviour and their activities; individuals' perspectives were themselves formed and played their part in the context of broader social constructions and processes.

There are two other points worth making. Both the quantitative and qualitative findings showed how disability can be best understood as a continual process of interaction, adjustment and review, rather than as a series of fixed barriers, constant through time. The research participants' experience of disability was shaped by their expectations and ambitions, as well as by the services available. Some took steps themselves to change the services available to them, either through changes in their personal circumstances or through campaigning.

Finally, the research, particularly in its qualitative stage, showed that there is a lot more to travel than vehicles and movement. Someone may decide not to undertake a journey, not because the vehicle is inaccessible to her wheelchair, but because there is no accessible toilet in the shopping centre she

would like to visit. Those involved in policy and research into transport disability always have to place transport in the bigger picture.

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Older people & road safety: Dispelling the myths

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Abstract

This paper attempts to look objectively at accidents to elderly travellers and the resultant casualties. It will show that while older travellers have fewer slight accidents than younger travellers, a disproportionate number of older travellers are killed in road accidents.

Keywords

Bus users, car occupants, cyclists, elderly, drivers, pedestrians, transport, travel.

Introduction

When the topic of road safety and elderly people is raised, a common reaction is that the issue concerns car drivers becoming less safe as they get older, and that the policy challenges are how to identify less safe older drivers and stop them driving. When the statistics for road accident casualties among older travellers are examined, this reaction is found to be very far from the whole story.

This paper attempts to look objectively at accidents to elderly travellers and the resultant casualties. It will show that while older travellers have fewer slight accidents than younger travellers, a disproportionate number of older travellers are killed

in road accidents. This applies to pedestrians, car occupants and bus passengers. Over a quarter of all traffic fatalities are people aged 60 and over.

It is important to understand the reality of road safety issues for elderly people, if policies to reduce casualties are to be effective. The number of elderly people is increasing, and of older drivers even more so. Road safety policies need to reflect the issues that are important for older travellers, and not the misperceptions that are unfortunately all too prevalent. Independent mobility is very important to older people, and to them may be worth the higher risk of injury as a result of greater fragility. There is no evidence that older people pose a greater threat to other road users. Finally, road traffic accidents are the cause of death of less than 0.2% of people aged 60 and over.

Casualties to older travellers

Accidents to elderly people aged 60 years and over (who form 20.5% of the total population of Britain) show a below-average involvement as casualties of all severities, most of which have only slight injuries; a greater proportion of casualties killed or seriously injured (KSI); and an above average risk of being

Table 1. Representation of elderly people as road accident casualties 1998

Percent of casualties who are elderly

Severity	All road users	Pedestrians	Bus passengers	Pedal cyclists	Car drivers	Car passengers
<i>People aged 60+ 20.5% of the population</i>						
Killed	25.4	46.6	52.9	19.6	20.6	24.4
KSI	14.1	21.8	50.3	7.8	13.8	15.3
All severities	9.8	14.6	33.8	5	8.8	10.4
<i>People aged 80+ 4.6% of the population</i>						
Killed	8.2	19	23.5	1.3	5.6	6.2
KSI	3.3	7.1	16	0.6	2.5	3.1
All severities	1.6	4.1	6.7	0.5	1.1	1.6

KSI = Killed or Seriously Injured

Sources: (DETR, 1999a) Road Accidents Great Britain 1998, Table 29a

(ONS, 1999a) Population Trends No. 98, Winter 1999, Table 1.5

killed in a traffic accident (Table 1) (DETR 1999a). The same pattern applies for people aged 80 years and over (who form an estimated 4.6% of the population). Situations where elderly people are over-represented in road accident casualties are shown in bold in Table 1. Older people are over-represented in bus passenger accidents of all severities, and under-represented in fatalities as pedal cyclists.

So elderly people are less likely than the rest of the population to be involved in a road accident that causes them to suffer a slight injury. But they are more likely than the rest of the population to be killed by a road accident, particularly as a pedestrian or bus passenger.

Table 2 shows the number of fatal casualties for different categories of road user in different age bands. From the age of 50, the number of pedestrian fatalities increases with increasing age. For ages 60–69, there are more pedestrian than car driver fatalities, and for ages 70–79, more pedestrian fatalities than all car occupants. For ages over 80 years, 61% of all traffic fatalities are pedestrians.

Table 3 shows the number of casualties of all severities, mainly slight injuries, for different categories of road user in different age bands, and is the best indication available of the relative number of accidents, other than minor 'damage-only' incidents. The pattern is quite different to that for fatalities. Up

to the age of 80, car drivers outnumber pedestrian casualties. It is worth noting the way that car driver casualties reduce steadily with increasing age. Drivers aged 60 and over represent only 8.8% of all car driver casualties; those over 70 years, who make up 11.5% of the population, only 4%.

The results given in this section show that the dominant road accident issues for elderly people are:

1. Despite under-involvement of elderly people in traffic accidents that cause slight casualties, elderly people are more likely than other age groups to be killed in traffic accidents; and
2. The category of older road user most likely to be killed is pedestrians. From the age of 70, pedestrian fatalities out-number car occupant (driver and passenger) fatalities.

The fragility of elderly people

The under-representation of elderly people in casualties of all severities, for all means of transport except buses, suggests strongly that elderly people have fewer accidents than do other age groups. This may be a result of reduced exposure (elderly people travel less) and possibly of safer behaviour. The increase in risk of serious and fatal injury with age is almost certainly a result of the greater fragility of elderly people. Figure 1 shows the variation with age in the percentage of road traffic injuries that are fatal

Table 2. Numbers of fatal casualties, 1998

Age group	20—29	30—39	40—49	50—59	60—69	70—79	80+	All 60+
Pedestrians	122	77	67	73	100	150	172	422
Car drivers	295	197	148	124	86	85	63	234
Car passengers	118	39	33	47	39	63	35	137
All car users	413	236	181	171	125	148	98	371
Bus passengers	3	2	0	0	1	4	4	9
All road users	747	552	354	334	270	320	280	870

Source: Road Accidents Great Britain, 1998, Table 29a (DETR, 1999a).

Table 3. Numbers of casualties, all severities, 1998

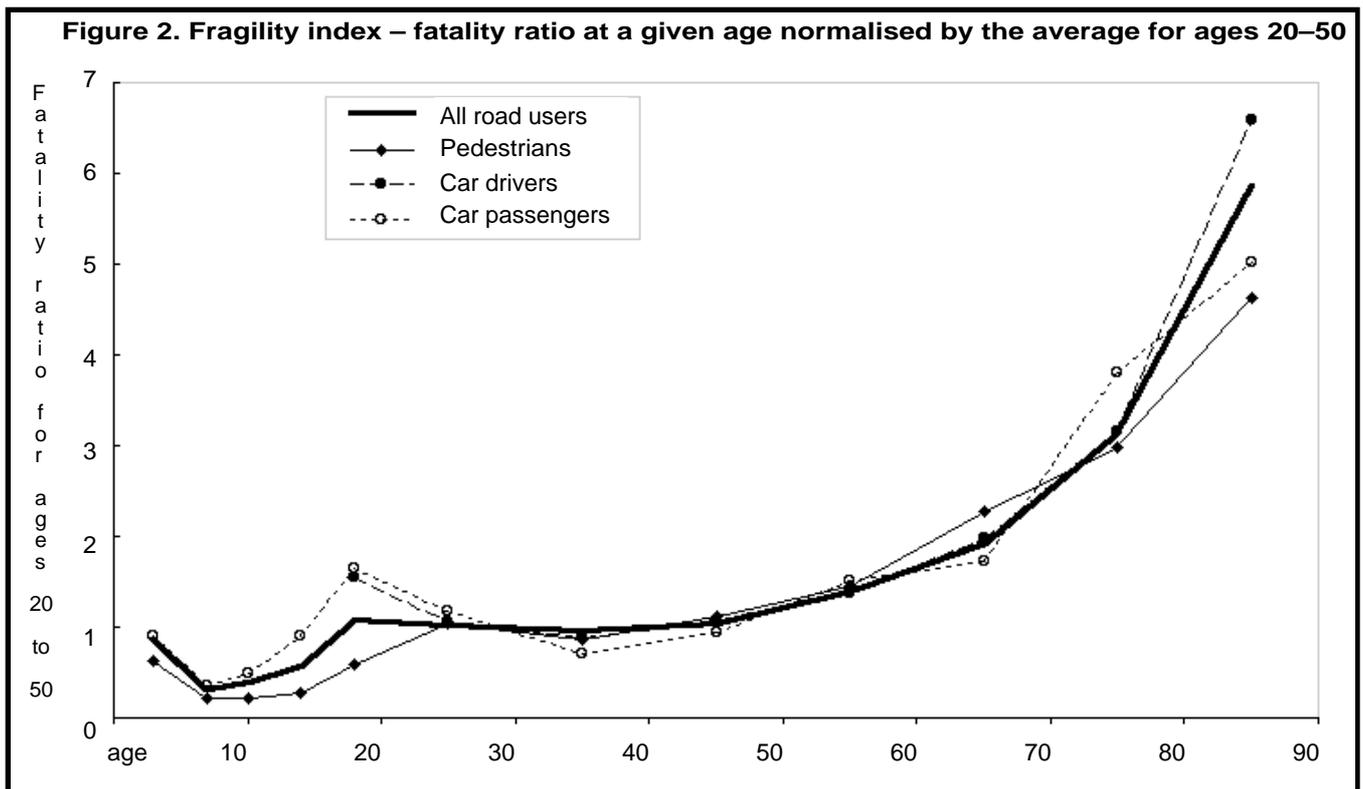
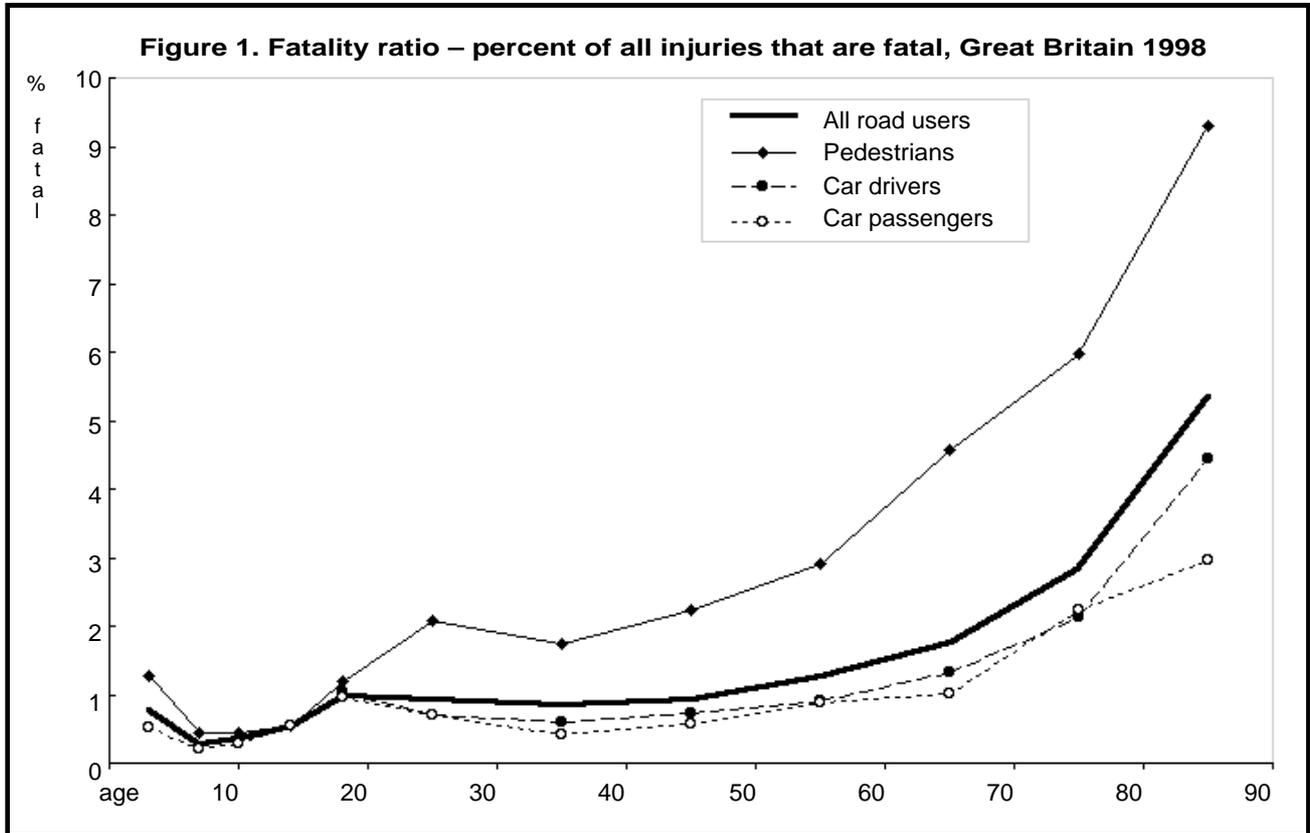
Age group	20—29	30—39	40—49	50—59	60—69	70—79	80+	All 60+
Pedestrians	5,855	4,412	2,995	2,508	2,190	2,514	1,850	6,554
Car drivers	41,368	33,565	20,444	13,445	6,488	4,014	1,423	11,925
Car passengers	16,896	9,389	5,920	5,302	3,850	2,808	1,180	7,838
All car users	58,264	42,954	26,364	18,747	10,338	6,822	2,603	19,763
Bus passengers	704	772	741	820	1,205	1,212	602	3,019

Source: Road Accidents Great Britain, 1998, Table 29a (DETR, 1999a)

(DETR, 1999a). The percentage differs between types of road user, but the increase with age is similar for all. For people aged 20–50, about 2% of those injured as pedestrians are killed. This increases steadily with age, so that for people aged 80 and over, more than 9% of all pedestrian injury accidents are fatal. For the other types of transport the percentages are lower, but

the increase with age is similar.

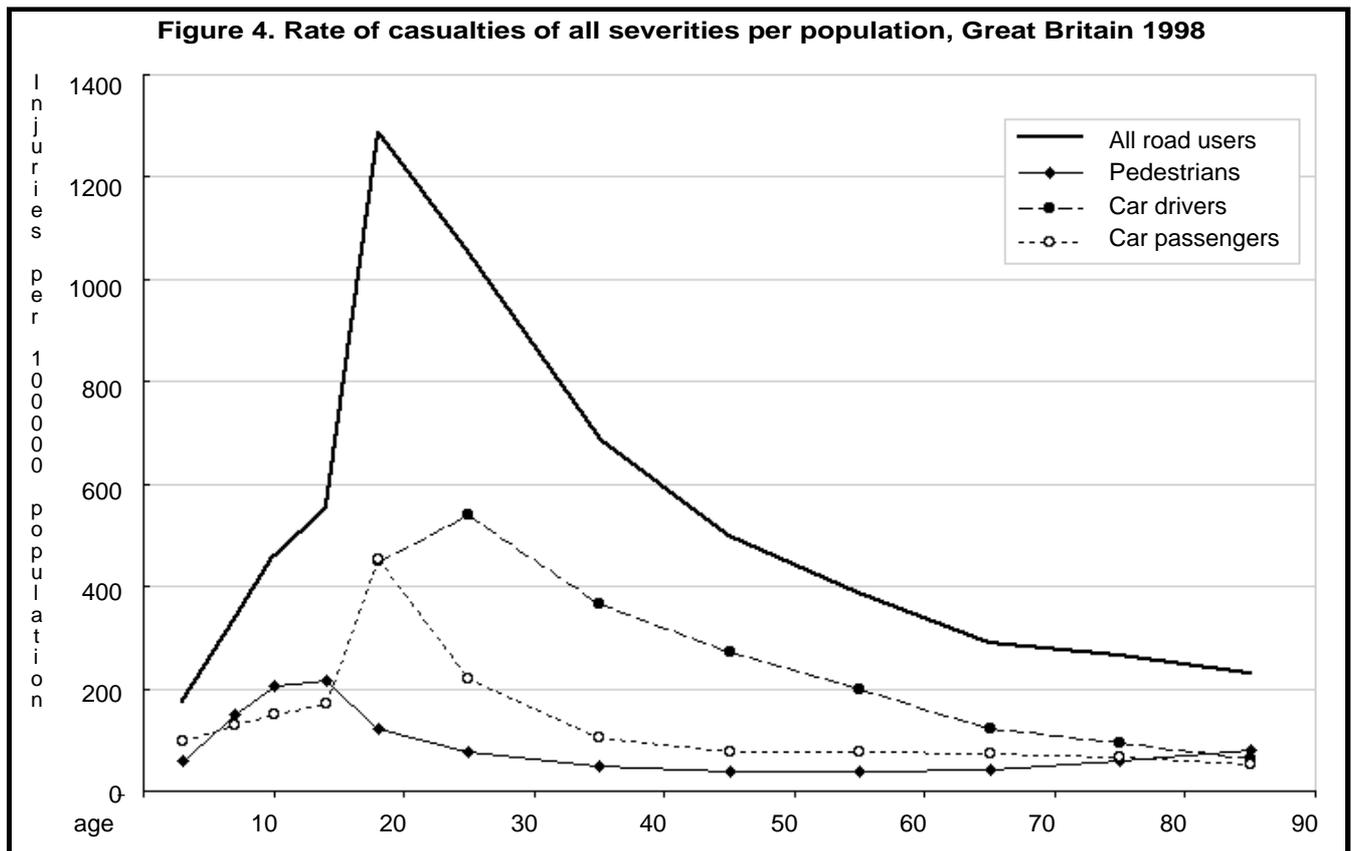
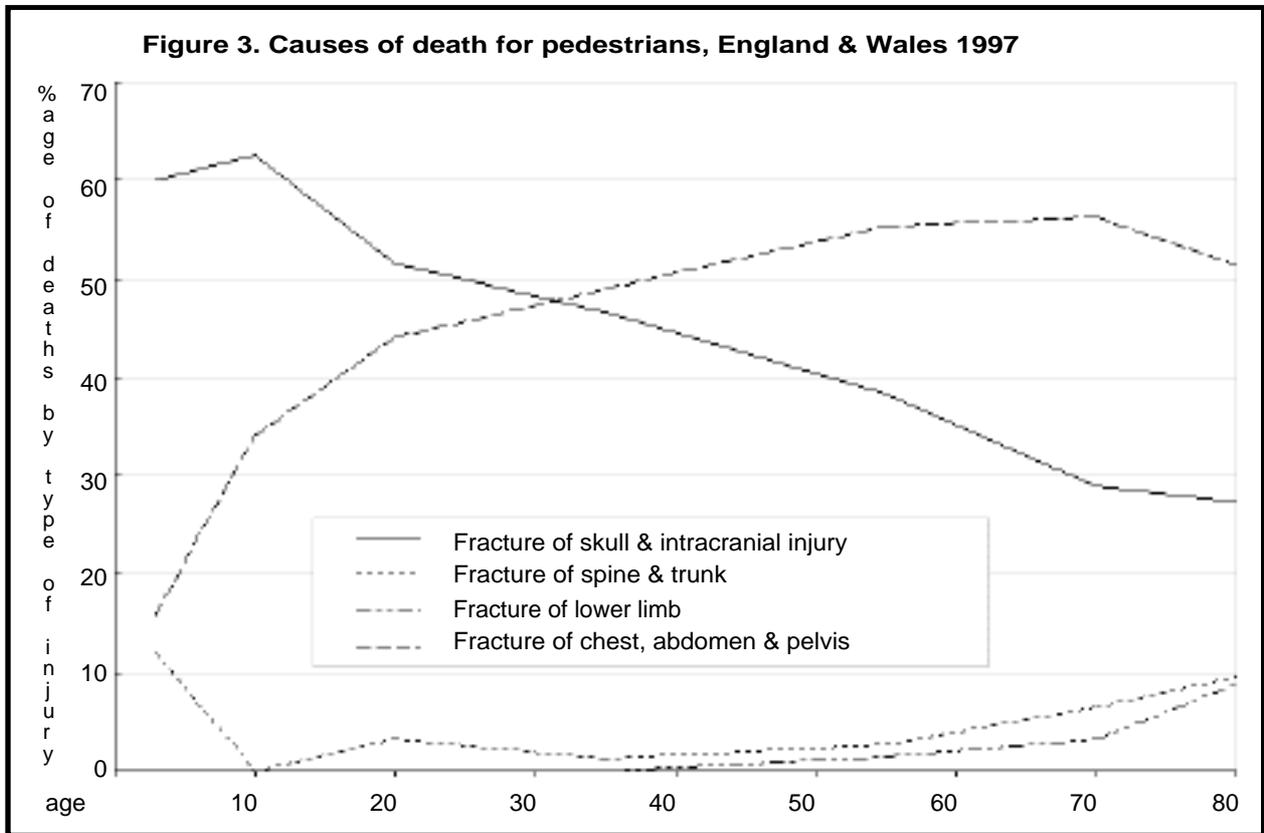
Figure 2 shows the increasing fragility with age, by normalising the percentage of accidents that are fatal – the fatality ratio – to be 1.0 for the age group 20–50. This ‘fragility index’ is the same for car drivers, car passengers and pedestrians, rising from a defined 1.0 for ages 20–50 to 1.75 at 60, 2.6 at 70 and 5.9 for



people aged 80 and over. These results are fairly similar to those given by Evans (1991) from U.S. data for car occupants.

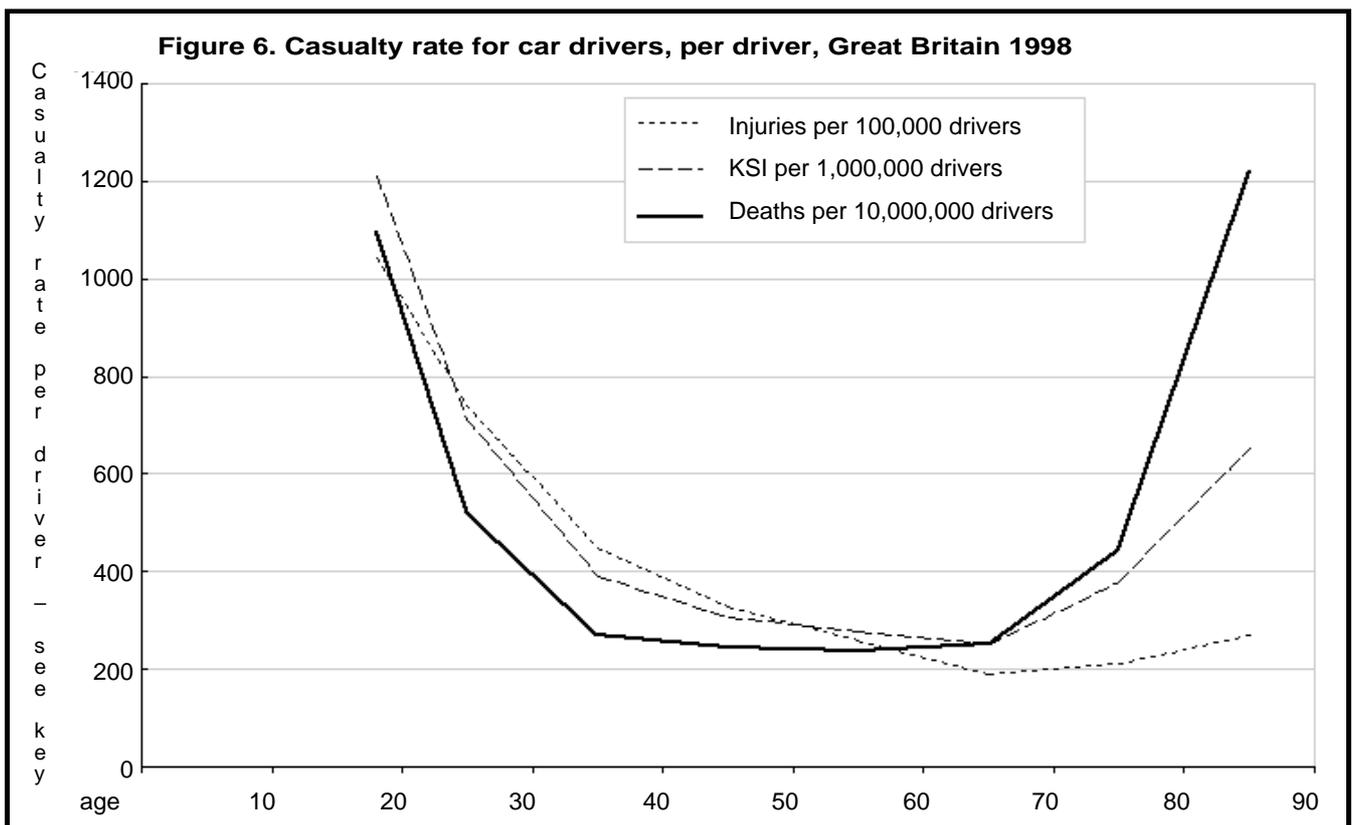
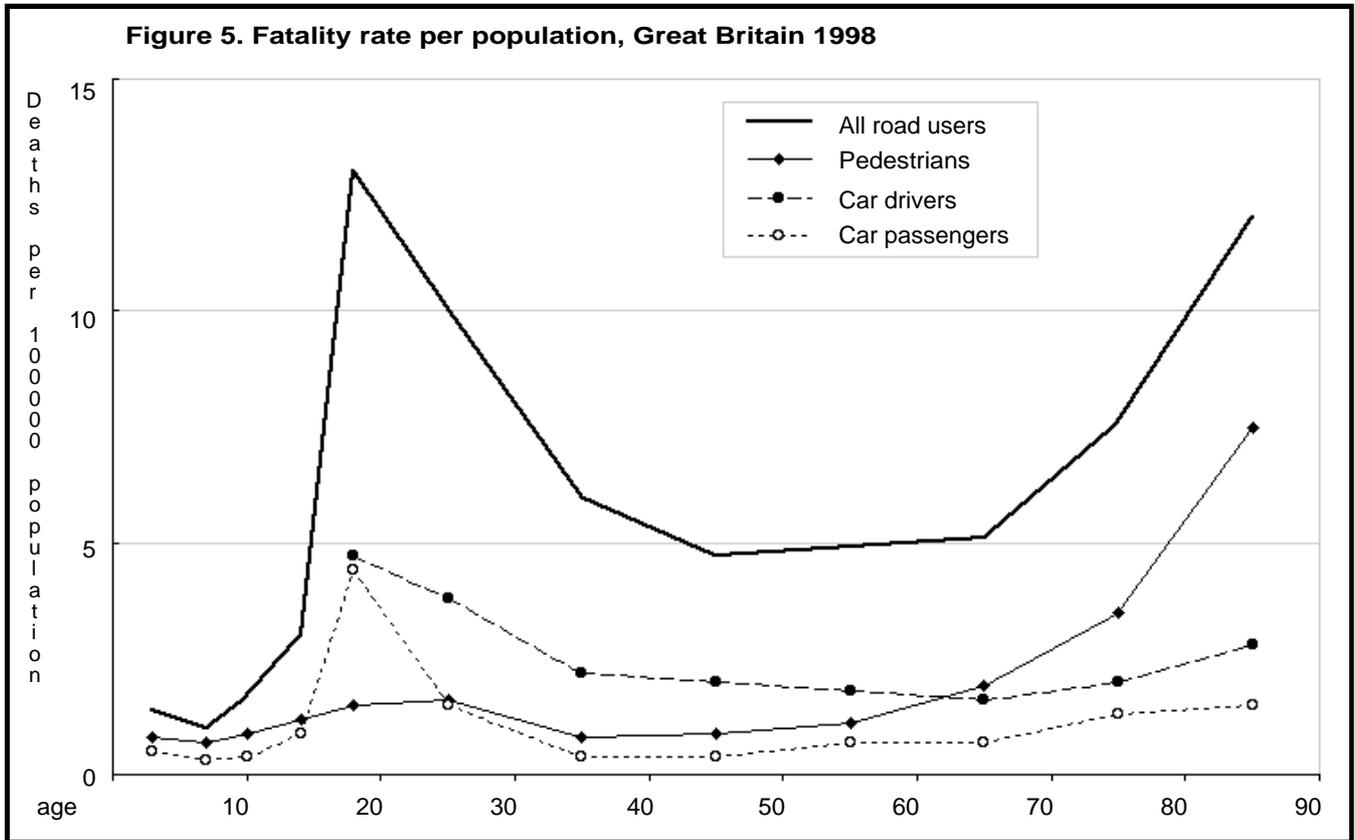
The detailed reasons for peoples' increasing fragility with age deserve investigation, to identify

aspects of the protection for road users and vehicle occupants that should be improved to better match the characteristics of elderly people. Mortality statistics for England and Wales tabulate the medical causes of death for various classes of road user (ONS, 1999b).



As an example, Figure 3 shows how these vary with age for pedestrians. The percentage of deaths caused by head injuries falls as age increases, and the percentage caused by internal injuries increases. Head injuries are a more frequent cause of death for pedestrians than car drivers. Data on the cause of

death should be treated with some caution, as there are substantial differences between the figures for 1990 and 1997. The general variation with age remains the same, but in 1990 for both drivers and pedestrians, more fatalities were caused by head injuries and fewer by internal injuries than in 1997.



Casualty rates

Rate per population

All forms of road transport show a high casualty rate per population for people in their late teens and early twenties. For car user casualties of all severities, this rate drops steadily with increasing age, Figure 4 (DETR, 1999a). For pedestrians the casualty rate rises from the fifties, doubling for those aged 80 and over.

Figure 5 shows that because of elderly peoples' fragility, the fatality rate for all road users more than doubles from 40 year olds to people aged 80 and over. The increase in fatality rate for pedestrians is even greater, by a factor of almost ten for people aged 80 and over.

There has been concern over the safety of older car drivers, because the physiological changes associated with ageing make driving more difficult. But most older drivers are well aware of these changes and problems, and modify their driving to accommodate them (Simms, 1993; Hakamies-Blomqvist, 1996). Figure 6 shows the effect of age on the casualty rate per licenced driver. The number of licenced drivers of different ages has been obtained from the National Travel Survey 1996-98 (DETR, 1999b). Unlike Figure 4, Figure 6 (based on drivers rather than the whole population) shows an increase in the rate of casualties of all severities for car drivers aged 70 and over. This increase is modest, and the rate for those aged 80 and over is less than that for those aged 40-49. The increase with age in the fatality rate for older drivers in Figure 6 is a result of increasing fragility with age.

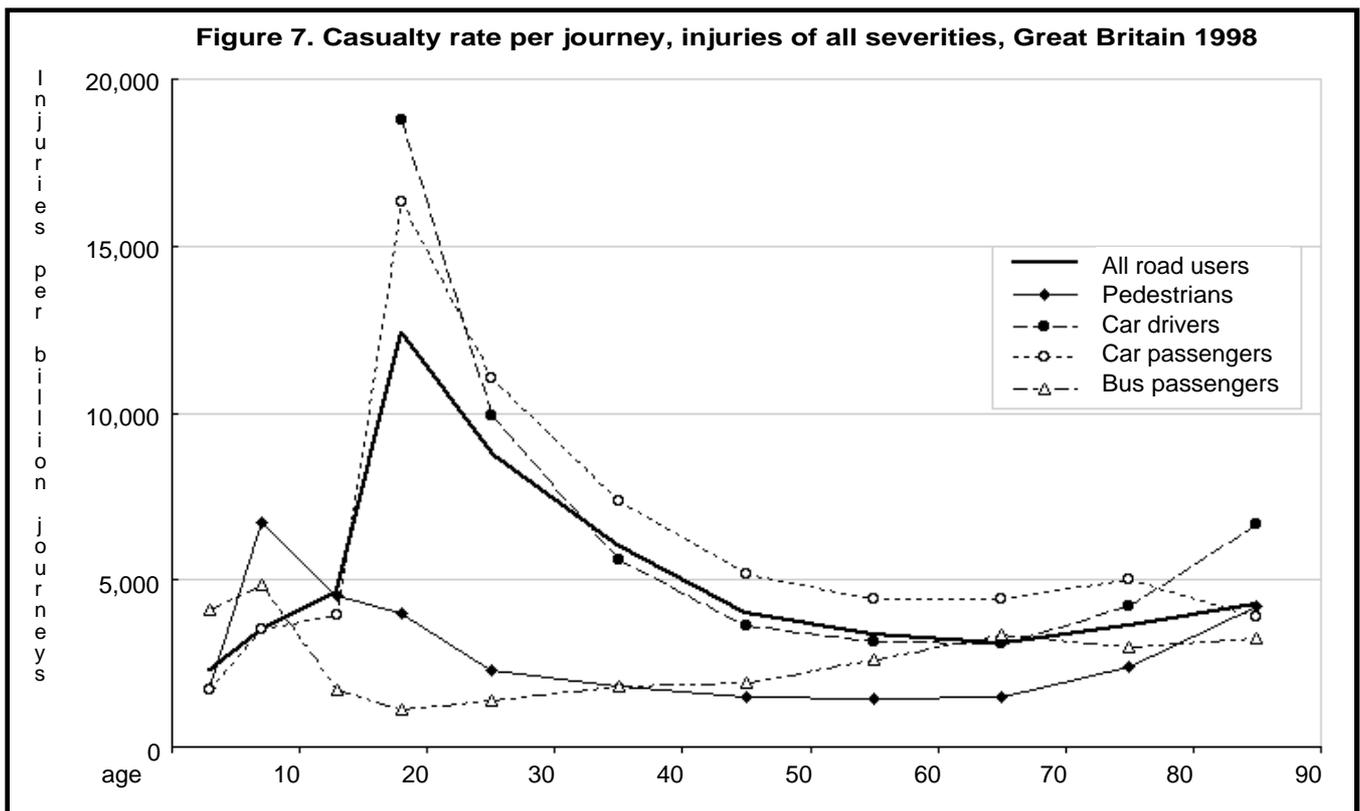
Rate per journey

The casualty rate per journey is a way of comparing the safety of different means of transport, recognising that journeys by one mode can be different in length, timing and destination from journeys by another mode. The number of journeys made by the various means of transport and by people of different ages have been obtained from the National Travel Survey 1996-98 (DETR, 1999b).

The number of person journeys per year is used as a measure of exposure for that means of transport. Casualty numbers for 1998 are combined with travel data averaged over 1996 to 1998 and population numbers estimated for 1998. The variations in the casualty rate per journey between types of transport and age groups are so striking that it is unlikely that this approximation will have more than a minor effect on the results.

Figure 7 shows the casualty rate for all severities per journey by age group. For all road users and for pedestrians and car users, the rates drop with increasing age to a minimum for people in their sixties, then rise with age for people aged 70 and over. Over most of the age range the rate is highest for pedal cyclists (not shown) followed by car passengers and car drivers, with pedestrians and bus passengers lowest of all.

Figure 8 shows the fatality rate per journey. The rates drop to minima for people in their thirties and forties and then rise with increasing age. Over the age range 30 to 55, the rates per journey are similar for car



drivers, passengers and pedestrians. The rate for pedestrians increases by a factor of 12 between people in their thirties and those over 80, and that for car drivers by a factor of 11 from the forties to the over 80s. At every age over 30, the rate for pedestrians is higher than for car users, drivers or passengers. The rate for bus passengers is very low, and for pedal cyclists (not shown) very high.

Policies that cause older car drivers to become pedestrians or pedal cyclists would, with existing fatality rates per journey, increase the total number of road accident fatalities. This is because travel as a

pedestrian or cyclist is more dangerous per journey than travel as a car driver. Finland, which has a policy of testing older drivers, has a larger total of fatalities for older road users than does Sweden, with no such policy. A high proportion of the Finnish elderly traffic fatalities are pedestrians and pedal cyclists (Hakamies-Blomqvist *et al.*, 1999).

To date there are no figures for accidents involving elderly people travelling in powered wheelchairs or on scooters. The use of this class of vehicle is increasing, and unless steps are taken to provide safe paths for them (quite possibly on pedestrian

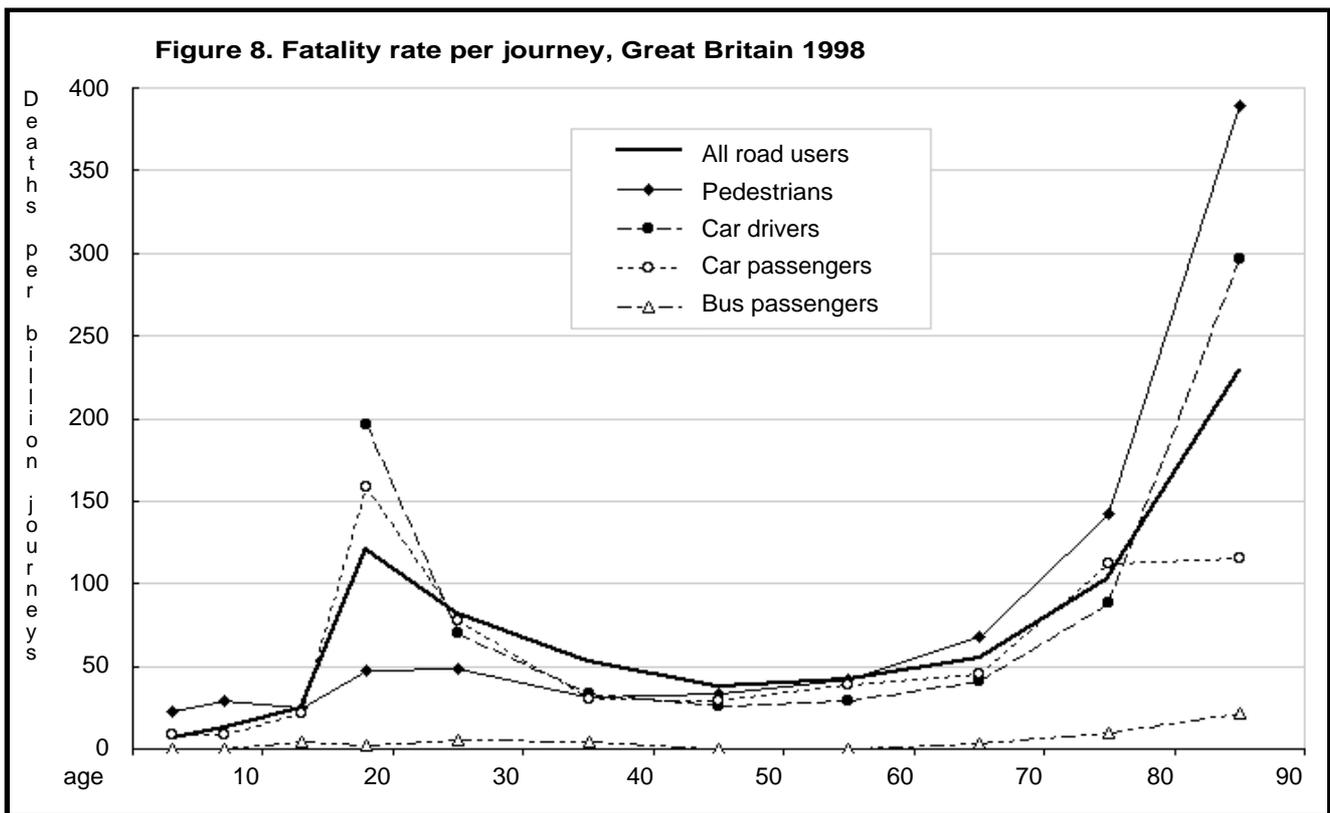


Table 4. Travel by car drivers, 1996 - 98

Age group	Car driver journeys per year		Average length of driver journeys, miles		Distance driven per year, miles	
	Men	Women	Men	Women	Men	Women
25 — 49	878	827	11.3	6.1	9899	5016
50 — 54	942	752	10.8	5.8	10209	4356
55 — 59	900	512	9.2	7.1	8315	3632
60 — 64	791	432	8.6	5.6	6800	2419
65 — 69	706	419	8	6.1	5671	2533
70 — 74	620	344	6.7	5.4	4131	1850
75 — 79	530	345	5.5	4	2907	1380
80+	430	356	5.7	3.1	2453	1100

Sources: Special tabulations from (DETR, 1999b) National Travel Survey: 1996/98 Update, Transport Statistics Bulletin

pavements), it is inevitable that they will begin to be involved in accidents either with road vehicles or with pedestrians. Intuitively, it would appear that cycle paths should provide ideal safe paths for powered wheelchairs and scooters.

Rate per mile

The casualty rate, all severities, per mile does increase for car drivers aged over about 65, and the fatality rate increases very significantly. This is mainly a result of the increasing fragility of older people, but has been widely misinterpreted as showing that drivers have more accidents as they age. Most drivers reduce the number of car driver journeys they make as they age, and also reduce the lengths of those journeys, so that the distance they drive per year decreases steadily with increasing age (Table 4). This is why any increase in the number of accidents per mile for older drivers does not result in them having more accidents per year.

Where elderly people have accidents

Pedestrians

Pedestrians aged over 60 are more likely than younger people to be injured on a pedestrian crossing, and less likely to be injured while walking on a footway or verge (Table 31, DETR, 1999a).

Car drivers

There have been many studies of the pattern of accidents for older drivers. Hakamies-Blomqvist, (1996) provides a summary of typical accidents for older drivers. Compared to younger drivers, a larger share of older drivers' accidents are collisions between vehicles as opposed to single vehicle accidents. Of older drivers' collisions, a high proportion occur at intersections, and the older driver is likely to be at fault. The typical situation is one where the older driver turns across the oncoming traffic on the main road and is hit by a vehicle having right-of-way.

Older drivers are less likely than younger drivers to have single-vehicle accidents and accidents in which excessive speed is a causative factor, and they are less likely to have drunk alcohol before driving. They are over-represented in accidents at intersections and in complex traffic situations; their fault is likely to have been to fail to yield right-of-way or to respond to a traffic sign or signal. Most accidents to older drivers happen in daylight (Hakamies-Blomqvist, 1996).

Bus passengers

A study of accidents to bus passengers was made in 1976. Although now very old, it provides the best picture available of the types of accidents that injure bus passengers. Table 5 shows that for both older and younger passengers, accidents in which the bus was involved in a collision, or manoeuvred violently to

Table 5. Age & accident type for bus passengers

Estimated age	Under 60 years	60 years & over
Collision casualties	276 (25%)	83 (12%)
Non-collision casualties	842 (75%)	634 (88%)
All casualties	1118 (100%)	717 (100%)

Source: Leyland Vehicles Ltd, 1980

avoid a collision, caused a minority of casualties. 69% of the non-collision accidents to people aged over 60 involved falls within the bus.

Casualties in collisions are distributed between older and younger passengers approximately in proportion to their numbers among the bus passengers. Older passengers are greatly over-represented among non-collision casualties, in that 43% of the casualties come from about 27% of the passengers.

Policy issues

Perhaps the most important effect of ageing for older travellers is the increase in fragility that occurs at ages beyond about 40 years. This means that for older people, a given accident is more likely to cause injury, recovery from a given injury will take longer and a given injury is more likely to cause death. A person aged 80+ is about six times as likely to die in a given accident as someone aged 40. This leads to the over-representation of older people in traffic fatalities, despite their lower than average risk of accident involvement. It also leads to the misperception that older drivers are more dangerous than middle-aged drivers, which is not supported by statistical accident data. Because the medical causes of death in road accidents vary with the age of the casualty, it is possible that occupant and road user protection systems do not serve older people as well as younger people. This needs to be investigated, and improvements made where they are needed.

Mobility is essential for independent living and contributes to older people remaining healthy and avoiding isolation and depression. The balance between the benefits of mobility and the risk of travelling, increased by the fragility of older age, should be a matter for individual older people.

In Britain, more elderly people are killed as pedestrians than as car occupants. Almost half of all pedestrian fatalities are from the 20% of the population aged 60 years and over. There is a need to improve the safety of all pedestrians, and particularly of elderly pedestrians.

There is no evidence that older drivers are any greater threat to other road users than are middle-aged drivers, but they are at greater risk themselves

because of their fragility. Some older drivers with various diseases, such as early dementia, are at increased risk of accident. If they can be detected, they may be helped by retraining and by counselling on alternative ways to remain mobile and live independent lives. Techniques for assessing drivers are still far from reliable.

Older drivers, except for some of those in the early stages of dementia, avoid driving situations that are stressful and dangerous. All drivers reduce the number of journeys and distance driven as they age. There is a need for improved mobility alternatives to the car to help older drivers avoid driving in difficult conditions (darkness, congestion, unfamiliar areas, bad weather, motorways), and to substitute for the car when the driver decides to stop driving.

Policies on older drivers should distinguish between the risks to themselves that result from increasing fragility in old age, and any increased threat that they may pose to other road users. The former is arguably a matter for informed decision by the older driver, the latter undoubtedly a matter for public concern and policy. Any policy must be based on the real situation and not on public perceptions, some of which are probably mistaken.

Age based screening programmes for elderly drivers cannot be justified on experience to date. They may well frighten some people, particularly elderly women, into stopping driving unnecessarily early. If these people then satisfy their mobility requirements by walking, this will increase the total road accident fatalities, because walking is more dangerous per journey than is driving.

It is about 50% more dangerous for older people to make a journey on foot than to make a journey by car (the journeys being of the lengths appropriate to the different modes and the age of the traveller). Any policies that cause older people to travel on foot instead of by car will increase the total number of road accident fatalities. There are indications that this has happened in Finland, in contrast to Sweden.

Conclusions

Of all traffic fatalities, 25.4% are people aged 60 and over, who form 20.5% of the total population. 46.6% of all pedestrian fatalities, and 53% of bus passenger fatalities, are people aged 60 and over.

For all travellers except bus passengers, people aged 60 and over are under-represented among road accident casualties of all severities (mainly slight). For all travellers except pedal cyclists, people aged 60+ are over-represented among road accident fatalities. The same statements apply to people aged 80 and over. The reason for this difference is the increasing fragility of people as they age. People aged over 80 are about six times as likely to be killed in a

given accident as someone aged 20–50. The traumas that kill older traffic casualties are different from those that kill younger casualties, so attention needs to be given to whether the design of occupant and road user protection systems is properly serving elderly people.

For elderly people, road accident fatalities are primarily pedestrians. For everyone aged 60 and over, 49% of all fatalities are pedestrians, and outnumber car occupants, who are 43% of all fatalities. For people aged 80 and over, 61% of all fatalities are pedestrians. To reduce the total number of fatal casualties, at least as much attention must be given to pedestrians as to car drivers.

Older drivers have different types of accidents to younger drivers, often involving collisions at intersections and failure to yield right-of-way. A slightly higher proportion of accidents to older than younger pedestrians are on a pedestrian crossing. Older bus passengers are most likely to be injured in accidents that do not involve collisions or violent manoeuvres. Their injury is most likely to be caused by a fall within the bus.

Acknowledgements

The section on where elderly drivers have accidents reproduces material from Hakamies-Blomqvist (1996).

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'Enabling' transport for mobility-impaired people: the role of *Shopmobility*

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Abstract

Shopmobility provides a vital link in the community transport chain in the United Kingdom. It has been designed to secure for mobility-impaired people equality of access to shopping facilities and 'barrier-free' movement within town centres. This report introduces key findings from a nationwide audit of *Shopmobility* services within the context of a U.K. government commitment to an 'inclusionary' and integrated transport policy.

Key words

Shopmobility, mobility-impairment, 'enabling environments', transport policy, U.K.

Mobility-impairment & the urban environment

The redesign of shopping centres throughout the United Kingdom in the post-war period has produced major changes in land use, transportation systems, the choice of materials for paved surfaces and repositioning of street furniture. These developments have presented a further challenge to the lifestyles and movements of mobility-impaired people (Imrie, 1996, 2001; Gant, 1997). This agenda will remain in focus given:

- the spread of pedestrianisation to smaller shopping centres (Ford, 1996);

- publicised developments in way-finding technology to assist personal mobility (Hine *et al.*, 2000); and
- a government commitment to 'inclusionary' and integrated transport policies (DETR, 1998, 2000a).

Furthermore, of the 6.2 million disabled people identified in an OPCS survey in 1988, 4.3 million experienced some difficulty with locomotion (OPCS, 1989). These restrictions on personal movement and increasing dependence on mobility aids (including wheelchairs) are closely associated with an ageing population (Table 1).

Transport planners have responded to this challenge. In large towns, for example, disabled people benefit from dial-a-ride and mobility bus services, specially-designed low-floor buses scheduled on priority bus routes, and customised community transport services. Well sign posted private and municipal car parks make provision for disabled drivers and on-street parking spaces are available for orange badge holders. Notwithstanding these widespread developments, for most mobility-impaired people the final stage in the journey from a car park or transport terminus to destinations in the shopping centre still has to be made as a pedestrian. Here, *Shopmobility* can play a vital role in providing the

Table 1. Degree of personal mobility: disabled adults living in private households (%)

Mobility status	Age group (years)				Overall
	16-49	50-64	65-74	75+	
Usually goes out unassisted	91%	88%	82%	60%	78%
Usually goes out with assistance	7%	9%	12%	22%	14%
Housebound	1%	3%	6%	18%	8%
Use wheelchair	6%	6%	7%	9%	7%
Use walking aid	13%	27%	36%	50%	33%
100% =	1,869	2,416	2,533	3,181	10,000

Source: OPCS, 1989.

final link in a completely accessible transport service, securing equality of access to shopping facilities and 'barrier-free' movement within town centres. (Swain *et al.*, 1993).

Shopmobility: role & context

Shopmobility schemes have common features: they provide well-maintained electrically-powered scooters and wheelchairs, and manual wheelchairs, to help people who have limited mobility – through permanent or temporary disablement, illness, accident or age – to shop and use other facilities within the shopping centre. All schemes offer appropriate tuition in the use of equipment, and operate a telephone (and, sometimes, e-mail) booking service. Some, in addition, provide a personal escort service for vision-impaired members while many advertise free car parking in reserved spaces. Although charging practices vary for registration/membership and the use of equipment, all schemes welcome a voluntary donation from clients towards operating costs.

There are *Shopmobility* schemes throughout the United Kingdom. The first scheme to operate under the *Shopmobility* banner was launched in Milton Keynes in 1981. By July 1990, 21 services were fully operational, mainly in the Midlands, London and the South East. Modelled on successful practice and local initiative, a further 79 schemes had opened by the Spring of 1996, with marked concentrations in Central Scotland, the North East, Central and Southern England, Merseyside and Greater Manchester. This total reached 234 (including 12 satellite branches of

larger schemes) in August 2000. Early schemes were run without central support. In 1988, however, the National Federation of Shopmobility (NFS) was founded. It continues to provide support for existing schemes, negotiates discounts on the purchases of equipment and insurance, publishes a directory of local services and facilities, and offers practical advice and support to voluntary groups, local authorities and commercial developers intending to establish new schemes.

This study draws on a millennium audit of *Shopmobility* and focuses on its 'enabling' role as a specialised component of voluntary sector transport provision. Firstly, it identifies the role of the service and its setting in transport legislation and policy formulation. This leads to a discussion of local operating practices and service delivery. Finally, it summarises the attitudes of *Shopmobility* users in Kingston town centre towards the 'enabling' qualities of a pedestrianised environment.

Transport policies for disabled people

Throughout the 1980s and 1990s, privatisation, deregulation and competition have worked against the development of an integrated transport system in the United Kingdom (DETR, 1998). This has had serious consequences for mobility-impaired people whose travel needs have not been satisfactorily addressed (Porter, 2000). Government is now responding to this challenge in three ways: firstly, by progressive implementation of the transport provisions under Part V of the Disability Discrimination Act (1995);

Table 2. Stockholding of equipment

Type of vehicle	Average stockholding per scheme			
	City/Town	London	Metropolitan	All schemes*
Manual wheelchairs	11	15	31	18
Electric scooters	16	12	18	15
Electric wheelchairs	4	4	4	4
Children's	1.5	0	4	2

* Based on a total of 127 schemes.

Table 3. Annual levels of use

Trips supported	Average number of trips			
	City/Town	London	Metropolitan	All schemes*
April 1998-March 1999	2,570	5,132	4,207	3,970
April 1997-March 1998	2,003	3,510	4,109	3,207
April 1996-March 1997	2,239	3,186	4,366	3,264

*Based on a total of 65 schemes.

secondly, by promoting policies for the introduction of locally integrated transport networks, guided by the White Paper *New Deal for Transport* (DETR, 1998); and, thirdly, by supporting the innovative and complementary role of voluntary sector (community) transport initiatives mapped against the essential travel needs of disabled people.

Progress continues in introducing the provisions of Part V of the Disability Discrimination Act (1995) which legislates for improvements in accessibility to mainstream public transport (Department of Transport, 1996). As these accessibility regulations apply only to new buses, coaches, trains and newly-licensed taxis, it will take time to achieve a fully accessible transport network. Nevertheless, through industry consultation dates have been set for implementing new construction standards: incrementally, for the bus and coach industries, starting with large single-deck vehicles (1st January, 2000); and for taxis (1st January 2002). The Strategic Rail Authority (which has inherited many of the functions of the Office of the Rail Regulator) has a duty to take into account the needs of disabled travellers which is referenced to a *Code of Practice* devised in consultation with the Disabled Persons Transport Advisory Committee (SRA, 2002). Notwithstanding the policy emphasis on public transport, severely disabled private motorists continue to benefit from vehicle tax concessions and, as orange badge holders, dedicated car parking space in town centres. In parallel, the increasing attention paid to the needs of pedestrians in urban design and enforcement of access regulations to new buildings have benefited disabled people across the range of urban environments (Imrie, 2000).

The White Paper *New Deal for Transport* (DETR, 1998) marks a significant departure in government thinking. It proposes locally-integrated transport networks which extend choice and accessibility. Local authorities are required to prepare five year Local

Transport Plans which specify future investment strategies and measures to meet local transport needs. Consultation with local people, businesses, public transport operators, and voluntary sector transport providers is a fundamental requirement to reduce social exclusion (Church, Frost & Sullivan, 2000). The interests of the growing number of car-less and mobility-impaired people feature prominently on this local agenda (DETR, 1999). Likewise, the White Paper *Our Countryside: The Future* reinforces this case for social inclusion and argues for responsive, flexible, well-marketed, stable and reliable local transport services focusing on market towns in the countryside (DETR, 2000b). To deliver these policies and inform the delivery of Local Transport Plans, the government has established an independent Commission for Integrated Transport with a brief to advise Ministers, monitor implementation practices, and identify priorities for further action.

Taken together, the commitment of Government, local authorities and transport operators to consider the needs of disabled people from journey origin to destination represents a strategic shift in planning and transport provision. Transport brokering services, operating across the gamut of available transport modes and newly-commissioned services, are being developed to secure unimpeded travel for essential and discretionary needs. Equally as important, however, is the fundamental question of sustaining independent personal movement in what is, for many mobility-impaired people, a vitally important travel destination – the shopping centre.

Audit of Shopmobility services

The National Federation of Shopmobility is committed to the further development of services throughout the U.K. This important advisory role requires up-to-date knowledge of best practice and funding arrangements. The millennium audit

Table 4. Modes of transport used by clients

<i>Transport used to access the Shopmobility service</i>	Client numbers				Total *
	0	1-10	11-100	100+	Schemes
Car - private	2	12	29	5	48
- community	6	10	1	0	17
Ring-a-ride/Dial-a-ride	2	33	6	0	41
Community transport	7	19	3	0	29
Public transport – accessible	3	13	8	0	24
- non accessible	4	7	3	0	14
Taxi-card	4	8	2	0	14

* Based on a total of 63 schemes.

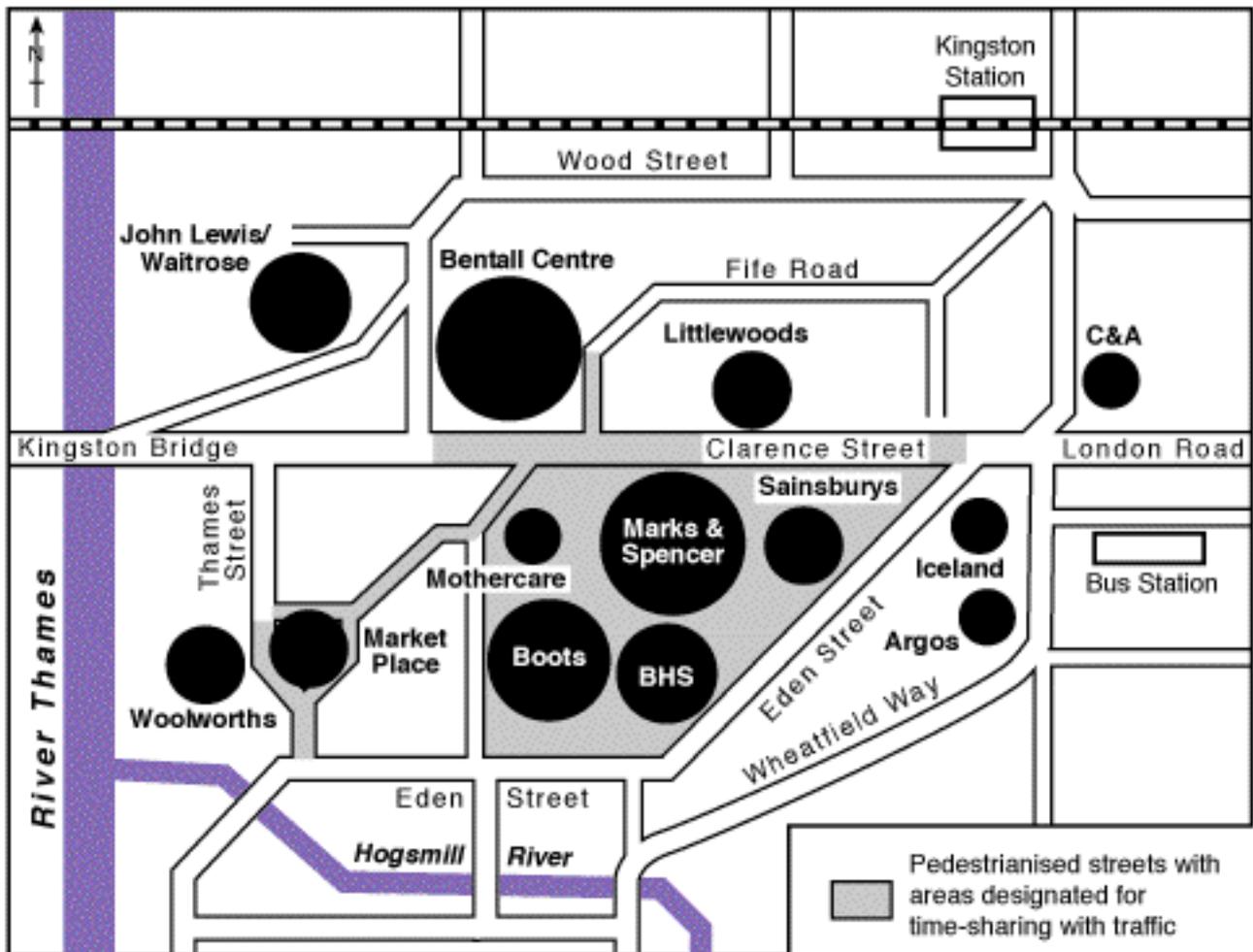
undertaken jointly by the NFS and Kingston University was designed to inform this process. In February 2000 a (large-print) questionnaire and covering letter were dispatched with the NFS Newsletter to the managers of 234 schemes (including 12 satellite operations) listed in the 1999 *Shopmobility Directory* (National Federation of Shopmobility, 1999). The pre-tested questionnaire covered issues connected with premises, local operating environment, management structure, services offered, staffing and training, stock holdings of equipment, patterns of usage, funding arrangements, relationships to community transport and intentions for the development and promotion of the service. Responses were received (following telephone calls to three-quarters of the target sample) from 127 (57%) of the

operating schemes: 9 situated 'within' the orbital M25 in the South East of England; 18 from Metropolitan Districts; and 100 in cities and smaller towns.

Characteristics of Shopmobility

The nationwide audit identified schemes founded during the period 1982-2000: 57% had been commissioned since 1995, especially in towns and cities outside the metropolitan areas. These services are delivered from a variety of premises, including units in new multi-storey car parks (26%), new shopping centres (25%), surface-level car parks (25%), converted shops in traditional High Streets (12%), and temporary buildings (including Portacabins) (12%). They are directed by Management Committees that typically include members from local authorities

Figure 1. Kingston upon Thames Shopmobility Scheme – Shops visited



Number of customers



Source: Survey of Shopmobility clients, May and November 1994 (107 Shopmobility clients interviewed)

(54%), and representatives from disabled users and groups (34%), community transport associations (25%) and property development companies (24%). In this context, the active participation of disabled members is crucially important in aligning local service provision with the differentiated needs of clients.

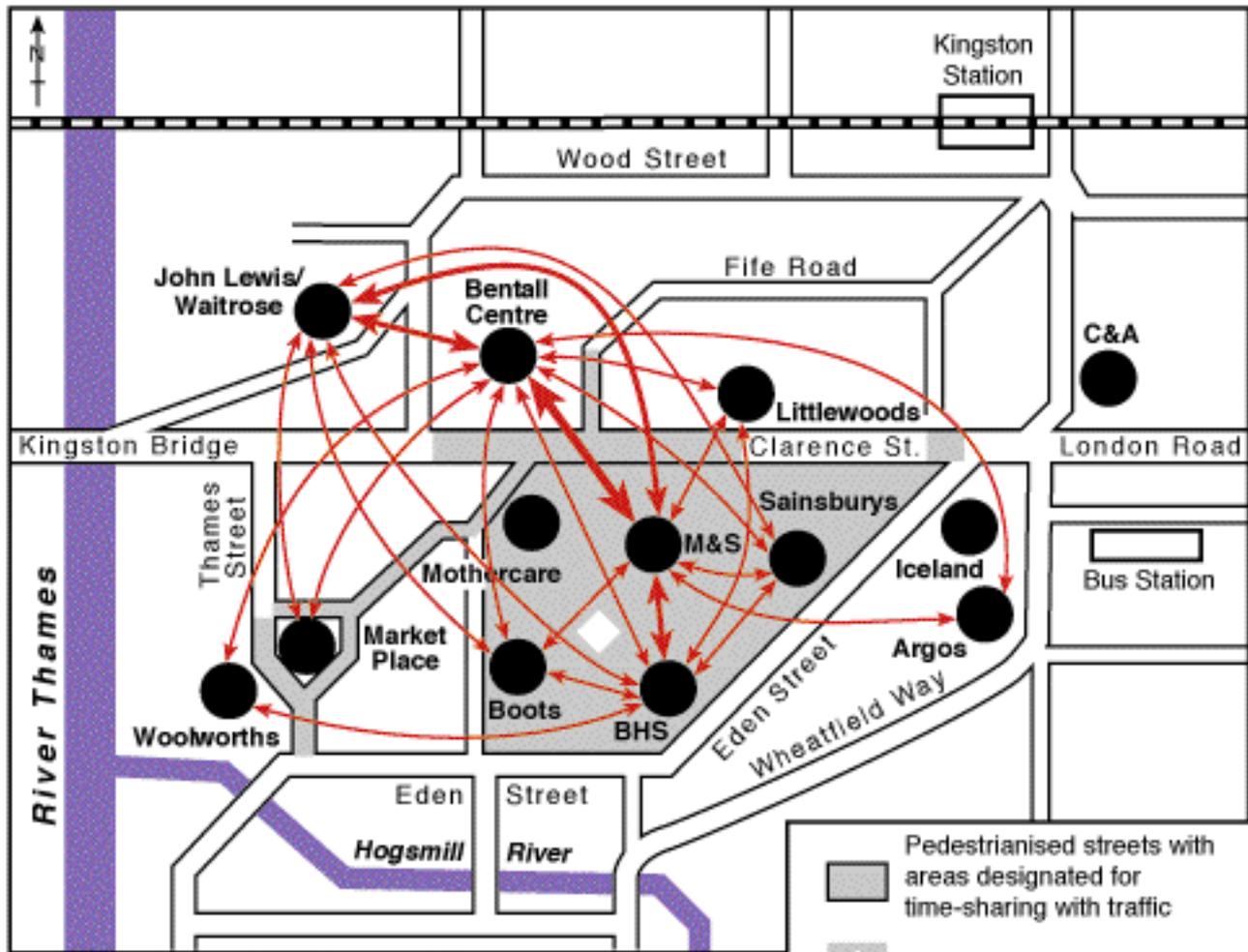
All schemes provide a full range of equipment, but mainly for adults (Table 2). Whilst the average stock of manual wheelchairs is highest in the metropolitan districts, there is a more even distribution across the country of electric scooters and electric wheelchairs.

Day-to-day staffing is critical to successful operation and depends on the services of part-time volunteers. The survey identifies a national average of two paid employees and eight volunteer workers per scheme. In London, however, the average complement

of 14 volunteers is significantly larger reflecting the volume of business and availability of ancillary help. Staff training is essential and takes many forms. Core training includes familiarisation with equipment and operating procedures. For some, it extends to disability awareness, escort training and interpersonal, management and basic I.T. skills. First Aid training is given to unqualified assistants in over one third of the schemes.

Shopmobility services take time to grow in their local environments. The audit includes mature and recently-founded schemes. Registered memberships range from under 100 in newer schemes to over 5000 in well established services operating in the metropolitan districts and London suburbs. Demand for *Shopmobility* services is growing, especially in

Figure 2. Movement of Shopmobility clients in Kingston town centre



Percentage of Group Making Linkage

(values of $\geq 10\%$ shown)

- 10-19
- 20-29
- 30-39

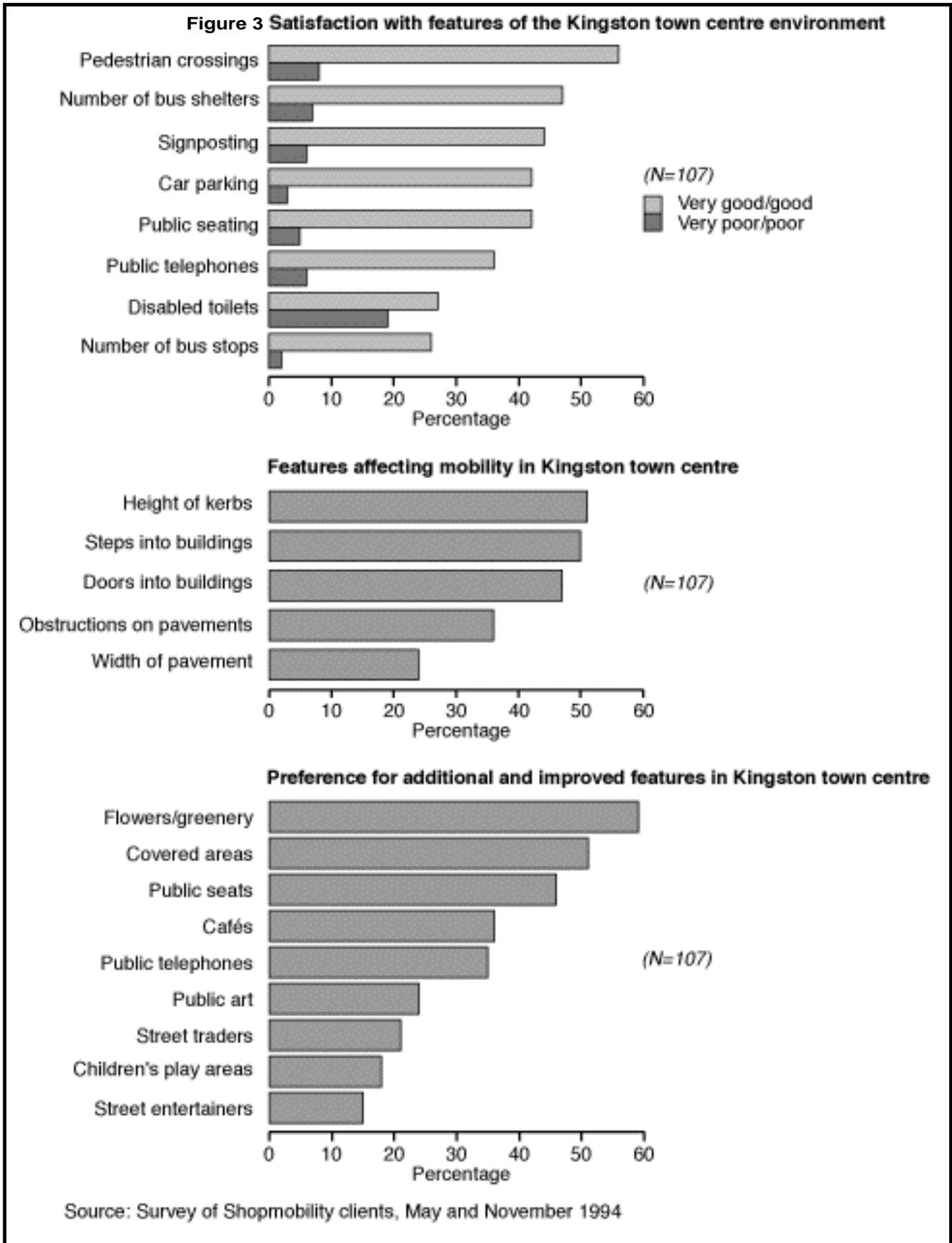
0 250 m
approx.

Source: Survey of Shopmobility clients, May and Nov. 1994 (107 Shopmobility clients interviewed)

metropolitan areas. Across the country, the average number of trips per scheme has increased from 3264 in 1996-1997, to 3970 in 1998-1999 (Table 3). *Shopmobility* provides not only for the immediate needs of mobility-impaired people, but also brings financial benefits to a

town's economy (AA, 1995).

Unimpeded access to *Shopmobility* premises is crucial for their growth and development. Table 4 is based on typical weekly patterns of travel to 63 schemes. Close links with public and community



transport, including variants of 'dial-a-ride', and dedicated car parking provision are vital ingredients for a successful operation. Private cars are the principal means of transport. Outside the metropolitan areas, a mix of transport modes, including community car and taxi-card schemes, cope with a more scattered pattern of client demand. Mid-week, late morning shopping trips, peaking on a Thursday are fairly standard, whilst the busiest months are July, August, November and December.

Management committees consistently have to juggle several (usually fairly small) streams of income to sustain their operations. Although not all schemes charge a fee for membership or for the use of equipment, donations for the use of facilities are readily accepted to generate an essential income. Two-thirds of the schemes, overall, benefited from charitable status; others were actively seeking such recognition. Some schemes are fortunate and receive a regular contribution towards their operating costs from local authorities and charitable trusts; others, in modern shopping centres, occupy premises provided by a property development company. Nevertheless, to secure a stable financial base and to cover operating costs, many management committees have to target local branches of national banks and building societies, prominent High Street stores, and local businesses for sponsorship and donations; others have set up fundraising committees which organise social events. For all schemes, the replacement of capital equipment remains a cause for constant concern.

Perspectives on pedestrianisation

Surveys of people using *Shopmobility* throughout the United Kingdom confirm that the majority were aged over 50 years, used a private car purchased under the Motability Scheme, travelled less than 16 km in

the company of a spouse or relative to a service at least monthly, and shopped mainly for clothes and household goods (e.g. Paul Beacham & Associates, 1994; AA, 1995). They greatly appreciated their enhanced personal freedom, had reduced their patronage of shopping centres which lacked an equivalent service and consistently praised the high standard of personal care.

Adequate provision of town centre facilities and sensitive urban design are factors which secure the success of a *Shopmobility* service. In 1994 107 users of *Shopmobility* in Kingston upon Thames were interviewed to evaluate, from their perspective, the 'user-friendliness' of the newly-pedestrianised town centre. This scheme (the 14th scheme established in the UK in 1988) is located on first floor of the (lift accessible) Eden Walk multi-storey car park and benefits from reserved car parking spaces, close proximity to the main public transport terminals and effective links with community transport. Figure 1 shows the distribution of shops accessed by *Shopmobility* visitors and their escorts. These are mainly concentrated in the pedestrianised core of the town. Figure 2 identifies the strength of the linkages between the main departmental stores.

Clients strongly commended most features of design and service provision throughout the pedestrianised zone, including the siting of pedestrian crossings, number of bus shelters, level of sign posting, accessible car parking, public seating and provision of telephones (Figure 3). There is one important deficiency: the inadequacy of toilet facilities for disabled people. With respect to further improvements to the town centre environment, over half the respondents requested more flowers/greenery and covered areas, whilst at least one-third wanted more seating and

Table 5. Factors in the future development of the Shopmobility service

Identified needs	London	Metropolitan	City/Town	All schemes*
Revenue	3	7	38	48
Capital	3	4	19	27
Publicity	2	5	18	25
Volunteers	3	1	19	23
Premises	3	3	14	20
Equipment	3	1	14	18
Clients	1	1	10	12
Training	0	1	5	6
Computer	0	0	4	4
Other	0	1	1	2

* Based on a total of 112 schemes.

refreshment facilities. Significantly, relatively few wanted more street traders or entertainers who inevitably attracted small crowds of onlookers, thus obstructing personal movement. Notwithstanding these improvements in the pedestrianised core, access to individual buildings remains a problem for almost half the sample, whilst the height of kerbs and the width and amount of obstruction on pavements still present some difficulty for a quarter of those using *Shopmobility* scooters and wheelchairs.

Development priorities

Shopmobility is a vibrant, community-oriented organisation. Each year, new schemes are being commissioned, others proposed. Priorities for development have been set by most management groups. The audit invited respondents to identify key requirements for successful operation, and their perceived priority, on a scale of 1-10. Table 5 highlights factors scored in the priority range 1-3. Revenue support (43%) is of paramount importance, followed by the further injection of capital (24%), publicity (22%), recruitment of volunteers (21%), improved quality of premises (18%) and the purchase of equipment (16%). Less immediate priorities were attached to increasing membership (11%), staff training (5%) and the acquisition of computers (4%).

Strategies are varied for promoting the availability and range of local services. Five methods are widely used:

- advertisements in the local (free) press;
- leaflet distribution from key points frequented by mobility-impaired people and their families (including hospitals and medical practices);
- word of mouth;
- street advertising and poster-based information displays; and
- outreach visits and promotional talks (and awareness days) to disability groups and clubs attended by elderly people.

The preferred approaches relate, in part, to local operating environment. One city scheme, for instance, has produced a promotional film and presents awareness sessions for ethnic minority people. Visibility in a town centre, moreover, is crucial to the development and delivery of an effective service. One third thought that street signage for *Shopmobility* services could be markedly improved. A similar proportion argued for the addition of the *Shopmobility* logo to existing road signs on approaches to the shopping centre.

For the medium to longer term, most schemes have plans for the development of services. Foremost amongst these is the prospect of introducing Sunday opening in new and extensively-redeveloped shopping centres. In some regions satellite services operate from

provincial centres to meet the intermittent market-day demand from smaller towns. In several cities, schemes are actively re-evaluating the centrality of their locations and quality of premises in the face of a growing demand for services and the constraints imposed by floorspace and the lay-out of premises. A few schemes propose the introduction of limited refreshment and information services for visitors. Financial planning, in various guises, remains central to all agendas.

The way forward

The creation of an 'enabling' town centre is a major achievement in urban design: not just for those with special mobility needs, but for society at large. There is evidence, too, that 'barrier-free' shopping environments benefit from increased levels of pedestrian movement and volumes of trade (Hass-Klau, 1993). Modest capital investment, driven by enthusiastic local management, has fuelled an exponential growth in the number of *Shopmobility* schemes. These services assist in sustaining the independence and rights of mobility-impaired people to 'seamless' travel, and extend the choice of town centre destinations for personal, shopping and leisure needs. The promotion of *Shopmobility* is consistent with government policy towards reducing social exclusion, integrating the various strands of transport policy, improving accessibility and creating user-friendly town centres, and delivering the provisions of the Disability Discrimination Act (1995). The introduction of 'brokering services' in Local Transport Plans presents a long-overdue opportunity to re-evaluate that equation: the audit of *Shopmobility* provides benchmark evidence to inform that process.

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Concessionary fares in Britain: what we need to know

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Abstract

Concessionary travel on public transport is available in the U.K. to pensioners and people with disabilities. The concession varies geographically. There are free travel or reduced fare schemes while other local authorities provided tokens; some schemes are limited to one's home local authority, others allow use in neighbouring authorities. On this hotchpotch, the Government has legislated for new national minima of a minimum half fare within existing scheme boundaries. However, Scotland and Wales have their own ideas.

This paper will first consider how much the UK taxpayer currently pays for concessionary travel schemes, and what this buys in terms of discounts. It will then review the data that are available about existing levels of travel by people who are eligible for a concession. Finally, it will consider how the concession is changing and some of the effects that this might have, and the research that is needed to find out whether this use of money represents best value.

Keywords

Buses, concessionary fares, pensioners, travel.

Introduction

In Great Britain, people over the age of 60 (women) and 65 (men) now qualify for a concessionary fare on, at least, local bus services. This concession is paid for by local authorities, who reimburse Britain's mainly private bus operators for the revenue that they have lost as a result of carrying passengers at a concessionary fare (net of any additional revenue generated by concessionary passengers who travel only because the concession is available). It should be noted that many local authorities also extend their concession to people with various physical and/or mental disabilities; however, this paper concentrates on travel by those who qualify on grounds of age.

Before the passage of new Transport Acts in England and Scotland in 2000 and 2001, provision of a concession was at the discretion of local authorities, and indeed, in England, some

provided none at all. Now, new national minima apply, funded with extra national government subventions: in England, a minimum half fare will apply within existing scheme boundaries (normally their home local authority area plus one or more adjacent areas); in Scotland, concessionary passengers will enjoy free travel after 0930 in their existing scheme area; and the Welsh Assembly has funded free bus travel for all concessionary travellers throughout the country, regardless of where the concessionary traveller lives (see Welsh Assembly, 1999). This Government largesse reflects in part a belief that concessionary fares will be a route to achieving a key Government objective, the reduction in social exclusion; but also the political importance of concessionary fares, which is seen at both the national and local level, and whose scale is unusual for a transport issue.

At such a time of change in concessionary fares schemes, it seems appropriate to review what is currently known about concessionary travel and to set out an agenda for further research to answer perhaps the most fundamental question about the schemes that exist: who uses them, and what value do they derive from so doing?

Current scheme costs & discounts

This section reviews the costs of schemes and the discounts available to users prior to the introduction of the new national minima referred to above. These

Table 1. Concessionary fare scheme types & costs

Type	Cost of schemes (£m)	Total population (000)	Cost per head
Free	188.65	9,961	£23.95
Flat fare	102.6	9,252	£11.09
Half fare	40.69	17,906	£2.27
Third fare	2.26	1,215	£1.86
Various	66.5	12,201	£5.45
Token schemes	19.23	5,864	£3.28

(Source: TAS Partnership, 1998)

minima will have the effect of providing a concession for all eligible people in the UK – a benefit that has not before existed. However, in some cases it may have the perverse effect of restricting an already existing concession. For example, in the County of Shropshire in England's West Midlands, concessions are funded by local (District) Councils, but their concessionary travellers then enjoy this concession throughout the County. Hence those resident in Lichfield District, for

example, have been able to travel at half fare for many years. In more conservative and rural South Shropshire, those eligible did not until now receive a half fare pass but rather a limited number of tokens for bus travel, but these could be used all over the County. Now, required by central Government to provide a half fare, South Shropshire is considering whether to permit its eligible population concessionary travel

Table 2. Concessionary Schemes, Scotland, 1999/2000

	Pass holders	Scheme type	Validity of pass (years)	Cost of pass (a)	Elderly pop. (1997)	% take-up (elderly)	Scheme cost	Ridership	Cost/ trip	Cost/ pass holder	Trips/ pass holder
Highland	18,000	Half fare	5	£3	38,281	47.02%	£329,000	1,082,681	£0.30	£18.28	60
Scottish Borders	9,300	Half fare	1	£3	21,437	43.38%	£255,000	683,000	£0.37	£27.42	73
Perth & Kinross	20,225	Half fare	Up to 5 years	£2.50 elderly	28,000	72.23%	£604,700	1,442,051	£0.42	£29.90	71
Moray	7,742	Half fare	1	£5	15,626	49.55%	£280,000	587,791	£0.48	£36.17	76
Angus	12,808	Half fare	5	Unknown	21,437	59.75%	£469,261	1,249,263	£0.38	£36.64	98
Dumfries & Galloway	17,000	Largely free	5	£2/£10 (b)	31,550	53.88%	£645,000	2,100,000	£0.31	£37.94	124
Falkirk	21,775	Quarter fare	Unknown	Unknown	25,021	87.03%	£827,504	1,857,812	£0.45	£38.00	85
Western Isles	1,400	Half fare	Unknown	Unknown	5,930	23.61%	£55,000		-	£39.29	-
East Lothian	13,973	Flat fare	4	Free	17,225	81.12%	£614,200	Included below	-	£43.96	-
Edinburgh	75,000	Flat fare	5	Free	79,678	94.13%	£3,404,641	18,000,000	£0.19	£45.40	240
Midlothian	10,048	Flat fare	4	Free	13,297	75.57%	£441,582	Included above	-	£43.95	-
Aberdeen shire	14,356	Half fare	1	£5	35,150	40.84%	£710,000	1,322,209	£0.54	£49.46	92
Strathclyde	306,897	Flat fare	Unknown	Unknown	401,026	76.53%	£16,793,700	58,237,300	£0.29	£54.72	190
Dundee	29,850	Flat fare	5	£1	29,794	100.19%	£1,650,000	5,250,000	£0.31	£55.28	176
Fife	65,000	Free	5	Free	64,125	101.36%	£4,170,000	10,698,000	£0.39	£64.15	165
Aberdeen	26,930	Quarter fare	Unknown	Unknown	37,015	72.75%	£2,500,000		-	£92.83	-
West Lothian	Unknown	Flat fare	Unknown	Unknown	20,099	-	£752,000	1,983,191	£0.38	-	-
Stirling	Unknown	Quarter fare	Unknown	Unknown	14,913	-	£500,000	1,391,543	£0.36	-	-
Shetland Islands	1,710	Half fare	Unlimited	Free	3,436	49.77%	Unknown	85,000	-	-	50
TOTAL	634,014						£34,672,588	104,887,160	£0.33	£54.69	115

Notes

(a) charge can be higher for replacement passes

(b) £2 per year for half fare concession pass, £10 per year for free concession pass

only within its boundaries, to contain scheme costs to the lowest possible level.

There is a paucity of data on the usage of concessionary fares prior to the introduction of the national minima that makes it difficult to draw conclusions about the value that the concession provides. Whilst all local authorities keep records of the costs of their concession schemes, few have accurate records of the numbers of concessionary passengers carried in their areas, since reimbursement to operators is frequently based on the total revenue collected by operators from the sales of concessionary fares, as a proxy for actual concessionary ridership. Records of numbers of passholders are also often not accurate, as in some areas, passes from previous schemes may still be valid, and passes are often issued for long periods, during which some of the passholders may die or cease to use the scheme. The key reference work in this field, *Concessionary Fares UK* (TAS Partnership, 1998) includes details for each UK local authority of the concession offered and the cost of the scheme, but not ridership, nor number of passholders.

Table 1, is taken from *Concessionary Fares UK* and simply summarises the cost of the schemes throughout Britain, based on the level of concession provided, and an average cost per head of *total* (not just eligible) population. This clearly shows the high cost of free schemes and the low cost of token schemes – that is, schemes where the elderly are given a number of free or discount tokens and so can only make that number of discounted trips each year.

Previous work for the Scottish Executive (Colin Buchanan & Partners, 2000) collected data on the usage of schemes in Scotland, and of passholder numbers, thus permitting the calculation of costs per passholder and per trip. These are shown in Table 2. Ridership is heavily concentrated in urban areas. There is a general pattern that the proportional schemes in rural areas are less heavily used, and free and flat fare schemes in urban areas are more heavily used and cost more, although there are some exceptions to this generality. It is likely that this pattern is replicated throughout Britain, but further research is required to find out whether this is indeed the case.

Table 3. Travel patterns of those eligible for a travel concession

	<i>Number of cars in household</i>			All people
	0	1	2 or more	
Bus journeys per person per year				
<i>Males age 65+</i>				
Bus pass	223	46	18	126
No pass	53	5	-	16
All	165	22	5	68
<i>Females age 60+</i>				
Bus pass	217	72	36	155
No pass	39	14	5	21
All	156	40	15	93
Bus as % of journeys				
<i>Males age 65+</i>				
Bus pass	30%	40%	20%	14%
No pass	11%	-	-	20%
All	25%	20%	-	80%
<i>Females age 60+</i>				
Bus pass	32%	80%	40%	21%
No pass	10%	20%	10%	30%
All	27%	50%	20%	13%
Percentage with bus pass				
Males age 65+	65%	41%	26%	47%
Females age 60+	66%	45%	31%	54%

Source: National Travel Survey 1997/99

The total amount spent by local authorities on supporting concessionary travel on local bus services in Great Britain in 1998/1999 was £441 m. This compares to £2,172 m in fare revenue from paying passengers (including concessionaires where they must pay some fare), £441 m in support for socially necessary bus services and £271 m in fuel duty rebate. (DTLR, 2001). Thus concessionary reimbursement constitutes the second most significant source of revenue for Britain's largely private bus operators and, it has been argued, at times an effective subsidy to these operators. In addition to these sums, the English and Scottish Governments have awarded local authorities a further £99 m per year to fund the more generous concession, although the distribution of these funds does not necessarily match the cost to each authority of providing the new minimum concession.

What all these statistics fail to tell us, of course, is anything about who is benefiting from this spending and who is making these trips. The next section starts to consider some of these issues.

Who are concessionary travellers?

Table 3 is a summary of the data about the travel patterns of those eligible for a concessionary travel pass, taken from the National Travel Survey Update 1997/99 (DETR, 2000). These data reveal a number of perhaps not wholly unsurprising relationships.

This table relates the number of journeys made by those eligible for a concessionary pass (men aged 65+, and women aged 60+) to whether they have a car, and whether they actually take up the option of having a concessionary bus pass. The first half of the table (from top to bottom) shows how many trips are made per person per year by bus; and the second half shows the percentage of total trips that are made by bus. For example, the first three rows of numbers in the table show that, among males aged 65+ who have a bus pass, those living in households with no car make an average of 223 bus trips per year, but for those in households with two or more cars, the figure falls to only 18 bus journeys per year – with an average amongst all men of this age in all households, of 126 bus trips per year. For those men in this age group with

no bus pass, the respective figures are 53, zero, and 16. The average number of bus trips made by all men in households with no car – regardless of whether they have a concessionary bus pass or not – is 165 per year, which equates to 25% of all the trips made by these men in a year.

Firstly, there is a strong relationship between car ownership and both bus pass ownership and bus use. Those with a pass make between 4.2 and 4.5 bus trips per week (though it cannot be assumed that all these would necessarily qualify for a concession). It is also clearly the case that more women than men own a bus pass, reflecting rates of driving licence ownership in these age groups.

Secondly, there is still a substantial percentage of trips made by people in non-car-owning households that also do not own a concessionary pass. Presumably this is in part accounted for by those areas where no concession is provided (and therefore the new national minimum concession will be of particular help to these people); but it may also be explained by some people who either do not know about, or choose not to take up, the concession.

Thirdly, since the majority of trips in non-car-owning households will be on foot, the data imply that the acquisition of a pass in these households leads to the substitution of walk trips by bus.

Trends in concessionary travel

Concessionary travel can be assumed to be stimulated by a number of factors:

- Levels of bus service; service elasticities apply to concessionary as well as fare paying passengers, although they would be expected to be lower for the former, due to their generally lower values of time.
- Levels of bus fare. In areas with a flat fare or free concession, bus fare rises would be expected to generate additional patronage, due to the effectively greater discount resulting. In schemes with a proportional discount, the opposite would be expected. As is well-known, bus fares in the UK have risen by 30% in real terms between 1985 and 2000; there is currently nothing to indicate that this increase will not continue, unless there is

Table 4. Numbers of bus trips per person per year, Britain

	1985/86		1996/98	
	Men	Women	Men	Women
65-69	89	121	49	88
70-74	82	121	78	114
75-79	84	94	89	105
80+	57	52	64	69

Source: National Travel Survey

widespread adoption by local authorities of the quality contract, which will give them control over fares as well as services and frequencies.

- Car ownership and ability to drive amongst the eligible population. As this increases, concessionary travel would be expected to decrease. While car ownership is forecast to increase to 425/1000 population between 2000 and 2020, but forecasts from the Department for Transport (NRTF, 2001) show that this growth is forecast to be disproportionately high among the over 60s. However, tentative estimates indicate that the 2 million driving licence holders who are aged over 70 at present may increase to some 4.5 million by 2015 (NRTF, 2001).
- Concessionary pass ownership, itself directly related to the effective concession and an inverse function of car ownership among the eligible group.
- Elderly population; more elderly people would be expected to result in more concessionary travel. The population of the UK aged 65 to 74 is forecast to grow by 25% to 6.763 million by 2021, and that portion aged 75 or more by 35% to 6.442 million over the same time. The National Travel Survey shows that those in the younger age group make about 300 total trips per year, declining to about 250 among those people aged 75-79, and less than 200 among the over 80s (Noble, 2000). Thus it is the growth in the younger cohort that can be expected to drive the majority of any increase in concessionary patronage.

While there are no national figures showing trends in concessionary ridership, several of the schemes in Scotland reported a general downward trend over the last 3 to 5 years (City of Edinburgh Council, 2001; Strathclyde Passenger Transport, 2001; Lancashire County Council, 2002). In part this is due to reductions in the generosity of the concession driven by budget constraints, but it is likely that it is also due to demographic factors related to car ownership, use and income amongst the eligible group. National Travel Survey data presented by Noble (2000) also demonstrate the drop in bus use amongst the eligible group, as summarised in Table 4.

It remains to be seen whether the additional concessions soon to be enjoyed by elderly people in Britain will reverse or simply slow this trend. Initial indications show some significant but not enormous change: for example, in Norfolk, passholder numbers have increased by 20% since the half fare concession was introduced, while the improvement in the concession in Clackmannanshire, Scotland, from quarter fare to free has led to a 7% increase in patronage, mainly from an increase in short trips.

Who uses concessionary fares & what do they gain?

National Travel Survey data show that over 80%

of trips made by people aged 65 or over are for the purposes of leisure, shopping or personal business (Noble, 2000). This includes both 'discretionary' trips, such as visiting friends, and 'essential' trips, such as those to medical services. Greater disaggregation of trip purposes is not available in this dataset.

National Travel Survey data could be disaggregated to cross-tabulate the demographics of eligible households with their (concessionary) bus use, thus demonstrating whether benefits are concentrated in particular groups of elderly people, or relatively spread geographically and across income quintiles. However, while this analysis has not yet been carried out, it is intended to use Scottish Household Survey data for this purpose as part of the Scottish Executive study on concessionary fares, mentioned in greater detail, below.

Work carried out in 1999 by CSR Partnership for CENTRO, the West Midlands Passenger Transport Executive, found that 70% of concessionary trips were made by elderly people whose only income was the state pension, and 80% of elderly concessionary passengers had a weekly income of less than £100. Some 40% of these trips would not have been made at all, had the concession not been available, indicating the vital role played by concessionary travel in extending the mobility of the elderly. If these patterns are repeated across the country, then it would appear that the many hundreds of millions that are spent on concessionary travel are indeed targeting those who are at risk of social exclusion. But no research has yet convincingly demonstrated this. Equally, if research is carried out and shows that the benefits of concessionary travel are enjoyed by elderly people who themselves have the resources to pay for their own mobility, then there would be an argument for perhaps restricting the concession and using the resources to improve the mobility of other potentially socially excluded groups in society.

A research agenda

The majority of research work up to now on concessionary fares in the UK has concentrated on attempting to measure price elasticity of demand or, as it is known in this context, 'generation' – i.e. the proportion of concessionary travellers who would not have travelled, had that concession not been available. This figure is crucial to levels of operator reimbursement and hence to scheme finances.

The much more interesting question of who uses the concession, for what purpose, and what they would do were it not available, has not been studied in a national context. The Scottish Executive has recently begun a study of the effects of the new free concession there: the purpose of this is primarily to monitor and record the quantitative changes in patronage and

vehicle utilisation/loading which occurs in the post October 2002 period. A comprehensive qualitative element of this study will attempt to find out who uses their concession, where, and for what purpose. This will include a longitudinal sample of up to 600 concessionary passholders from all over Scotland.

Ultimately, this and any other research has a very difficult question to answer: could more benefit be produced by spending the money that is currently spent on concessionary travel in a different way, or are the unquantifiable benefits (e.g. social contact, low cost mobility) so great that acceptable alternatives could only be provided at much greater cost?

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The Disability Discrimination Act & developments in accessible public transport in the U.K

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Abstract

This paper outlines some of the background to the Disability Discrimination Act and its transport provisions and sets out some of the expected future developments. The paper reviews the major developments in the implementation of the transport components of the Act; it highlights its key implications for future provision and seeks to identify salient lessons for the international community.

Keywords

Accessibility, disability, discrimination, Disability Discrimination Act, mobility, Public transport, Transport.

Introduction & background

In many of today's societies, more people are more mobile than they have ever been before. As people rely on being more mobile, and as the provision of goods, services and other facilities adapts to people's increased mobility, transport becomes even more vital for accessing key activities. However, those who are excluded from transport, or whose mobility is impaired in some way, are placed at an ever increasing disadvantage.

A recent study into social inclusion and public transport use (DETR, 2000a) identified four generic barriers:

- Affordability;
- Acceptability;
- Availability; and
- Accessibility.

The focus of this paper is on accessibility and mobility impairment as it relates, specifically, to disabled people. It is generally recognised that 10% – 14% of society has some form of mobility impairment and, of this group, the majority are disabled people.

A *Which?* survey in 1990 found that 4 out of 5 disabled people interviewed had problems with transport and two-thirds said that difficulty with using public transport was one reason for not going out more and not travelling further afield (Consumers' Association, 1990). Furthermore, a literature review concluded that there was 'a very considerable unmet need for mobility' among disabled people (Fowkes *et*

al., 1993).

There are two broad streams of arguments for removing barriers which impair mobility. Firstly, it is argued that, on principles of equity and human rights, people should expect society not to exclude them from the mainstream; not to construct barriers to their independence and, to remove barriers where they exist. Secondly, it is argued that, on social welfare grounds, the benefits of removing barriers outweigh the costs of so doing. This paper focuses on the first of these broad arguments and the increasing trend towards governments seeking to pursue these principles via legislative means.

All ECMT member countries embrace the objective of improving access to transport for people with mobility impairments. Until recently, progress has been made mostly via voluntary guidance and agreement. For example, the Disabled Persons Transport Advisory Committee (DPTAC), an advisory committee to the UK Transport Secretary, has achieved much in the way of raising awareness of disability issues throughout the transport industry and, specifically, in terms of agreeing a voluntary set of design standards for accessible transport vehicles (DPTAC, 1995, 2001). Nevertheless, this objective of improving access to transport is increasingly being supported by the introduction of legislation (ECMT, 1999).

Table 1. The Disability Discrimination Act, 1995

Part I	Defines disability
II	Employment – discrimination by employers & other persons
III	Discrimination in other areas – goods, facilities, services & premises
IV	Education of disabled persons
V	Public transport
	– Taxis
	– Public service vehicles
	– Rail vehicles
	– Supplemental
VI	The National Disability Council
VII	Supplemental
VIII	Miscellaneous

Thus, the UK Disability Discrimination Act, passed in 1995 under the stewardship of the Department for Social Security, is one of a growing number of examples of national legislation aimed at dismantling barriers to the full inclusion of disabled people within society and, in particular, transport. The Act places legal duties on service providers and other persons not to discriminate against disabled people in certain circumstances and authorises the establishment of regulations relating to enforceable standards for accessible public transport vehicles.

Whilst the legislation was passed in 1995, a number of aspects of its implementation remained unclear for some time afterwards (Matthews, 1996). However, much of the detail regarding what the legislation will require has now been clarified and timetables for its implementation, stretching across the next two decades, have been put forward. Furthermore, in late 1997, a Disability Rights Task Force was established by the then new government to review the Act's provisions and to consider what further measures may be necessary to meet the government's commitment to civil rights for disabled people. The Task Force's review has resulted in a government consultation, completed in June 2001, on how the Act might be enhanced. As a separate development, an enforcement agency, the Disability Rights Commission, has now been established.

This paper reviews the major developments in the implementation of the transport components of the Act; it highlights its key implications for future provision and seeks to identify salient lessons for the international community.

Disability & discrimination

Disability is often defined in either medical or social terms. The medical model defines disability in terms of the individual and how their impairment makes it difficult for them to do things. In contrast, the social model focuses on how society's attitudes and the way in which it organises and constructs itself disables people with impairments. Thus, a medical view of disability might contend that a person is disabled by their own inability to climb steps or read newsprint satisfactorily, whereas a social view would argue that a person with an impairment is disabled as a result of steps having been built into a design or by newspapers being unavailable in alternative formats.

Our choice of perspective influences how we view disability issues and what we do about them. Viewing disability in medical terms might suggest that we should leave things to doctors or to medical science, despite the fact that, in the case of many disabled people, medical science can offer little or nothing in the way of remedies. Viewing disability as a social issue, on the other hand, suggests that policies and

practical initiatives should be addressing society. Crucially, society is capable of adjusting so as to enable and empower disabled people. Societal adjustments would include a greater awareness of disability, greater flexibility in the ways by which services are delivered to people and physical adjustments to existing and future components of the built environment.

Oliver and Barnes (1991) identify 3 separate strands of unfair discrimination against disabled people:

- Direct discrimination – treating some individuals less favourably than others, purely because of their disability;
- Indirect discrimination – making something (such as a job, service or facility) available subject to a condition which makes it harder for disabled people to qualify than for those who are not disabled; and
- Unequal burdens – failure to take reasonable steps to remove a handicap imposed by an individual's social or physical environment.

All three types of discrimination are present in transport and their effects are to limit the mobility of disabled people and their access to the range of services and activities which contribute to quality of life. The most obvious form of discrimination within the public transport field is that of unequal burdens. The presence of steps within stations and vehicles, the unprotected horizontal and vertical gaps at the interface between bus stops and buses and between rail platforms and trains and the absence of suitable audio information are examples of these unequal burdens. In part they reflect the long-lived nature of transport infrastructure and vehicles but they also serve to illustrate how the design of public transport has become what it is today – a somewhat inadequate process of evolution rather than a systemic and systematic redesign for the demands of modern society.

Increasingly, individual systems, parts of systems and particular initiatives can be cited which demonstrate that many transport access problems are solvable. For example, many modern light rail systems such as the VAL in Lille are designed with step-free access, wide doorways and gangways and clear written, audio and tactile information. A number of accessible bus demonstration projects now also exist, e.g. in North Tyneside near Newcastle-upon-Tyne (York & Balcombe, 1998), whereby local authorities have undertaken work to improve the bus stop environment and bus operators have introduced low-floor buses; ; these initiatives often prove even more successful in terms of attracting non-disabled mobility-impaired people (e.g. parents with prams and people with shopping) in addition to disabled people.

Whilst unequal burdens might be the most obvious form of discrimination with regard to transport, the existence and impacts of direct and indirect discrimination should not be overlooked. The attitudes and awareness of staff and the practices and procedures of transport organisations towards their customers can also have a bearing on disabled people. A patronising or unhelpful bus driver can be almost as much of a barrier as a flight of stairs or a narrow doorway. Much has been achieved in this area through staff training and awareness-raising, though this often overlooks the more organisational aspects.

The Disability Discrimination Act & its public transport provisions

Firstly, the Act defines disabled people as those who have, or who have had, 'either a physical or a mental impairment which has a substantial and long-term adverse effect on a person's ability to carry out normal day-to-day activities' (DfSS, 1995). The Disability Rights Task Force estimate that this definition includes approximately 10 million people in the UK. However, there are fears that it excludes certain groups of disabled people, including those with mental health problems, asthma, diabetes or epilepsy.

Secondly, the Act defines discrimination as either 'less favourable treatment for a reason related to a person's disability which cannot be justified' under the Act or 'a failure to comply with a duty to provide reasonable adjustment' (DfSS, 1995). What is 'justified' and what is 'reasonable', however, varies between the different sections of the Act, making it difficult for a clear principle to be established. It is not clear whether this definition is equally or less comprehensive than that cited above.

The Act deals separately with, on the one hand, transport infrastructure and provision of information services, and, on the other hand, transport vehicles. Infrastructure and information services are covered by Part III of the Act which relates to access to goods, services and facilities. Examples of services covered by this part of the Act include 'access to and use of any place which members of the public are permitted to enter [and] access to and use of information services' (DfSS, 1995); the former would, therefore, include bus stations and stops, railway stations, airports and ferry terminals, whilst the latter would include fares, ticketing and route information provided by local authorities or by transport operators. However, the provisions relating to goods, services and facilities do not apply to 'any service so far as it consists of the use of any means of transport' (DfSS, 1995). This means that services associated with transport vehicles are excluded. Instead, Part V of the Act focuses solely upon access to transport vehicles.

The approaches of Part III and Part V of the Act are quite different. Part III of the Act places a series of duties on the providers of goods, services and facilities not to discriminate against disabled people in the provision of their goods, services and facilities, except in cases where they are able to justify such discrimination. In general, this part of the Act follows 'a general 'civil rights' interpretation leaving the provider or operator of a service to determine what is 'reasonable'.' (Frye, 1996). Part V does not lay down any rights as such; instead it gives power to the government to draw up technical regulations defining vehicle accessibility appropriate to each mode covered within the Act.

The provisions of Part V relate to domestic, land-based, public passenger transport, i.e. railways, Public Service Vehicles (PSVs, i.e. buses and coaches), and taxis. Aircraft and shipping are not included in the scope of the Act on the grounds that they are international modes of transport, despite there having been considerable growth in the domestic airline market over recent years and there being a number of areas within the UK, e.g. the islands of Scotland, where there is a strong reliance on ferry transport. Two further restrictions are that only scheduled or, in the case of taxis, licensed services are covered and regulations will only apply to new vehicles.

The duties on service providers and other persons which emerge from Part III of the Act are being phased in. Since December 1996, it has been unlawful for service providers to treat disabled people less favourably for a reason related to their disability. This would appear to be aiming to address 'direct' discrimination as referred to and defined above. Furthermore, from October 1999, service providers have been required to take reasonable steps to change practices, policies or procedures, which make it impossible or unreasonably difficult for disabled people to use their services. This would appear to be aimed at addressing 'indirect' discrimination as referred to and defined above. In both cases, detailed 'codes of practice' have been issued by government which seek to clarify the nature, extent and implications of the duties. The intention is that, from 2004, service providers will also have to take reasonable steps to remove, alter, or provide reasonable means of avoiding physical features that make it impossible or unreasonably difficult for disabled people to use their service. To re-enforce this third duty in the context of transport, the government have pledged themselves to making accessibility a condition of any new transport investment (DETR, 2000b). However, it should be noted that the exemption of services which consist of the use of any means of transport from this Part of the Act means that transport service providers are not subject to these duties in relation to their vehicles or drivers (or other on-board staff).

The regulations relating to taxis, railway rolling stock and PSVs have been drawn up and are now in force for PSVs and rolling stock. A timetable for implementing the PSV regulations has also been set out.

The rail section of Part V is the only example where a date was already set in the primary legislation; all rail (including tram) vehicles to come into service after 31st December 1998 must be accessible. The technical regulations essentially defining what is accessible were, after widespread consultation, published in 1998 and there are presently some 250 in-service rail vehicles which comply with the Act.

A major difficulty, difficulty, particularly given the Act's approach of treating transport infrastructure separate from vehicles, is posed by the gap between the platform and the train. The duty to bridge this gap has been placed upon the train operator, though they are free to contract this out to the station operator. Where new facilities are built, particularly in the case of underground and light rail, the aim, though not necessarily the requirement, will be to reduce the gaps so as to enable level access. However, this will not always be possible and it is highly likely that solutions to this problem will involve ramps and lifts.

In the area of public service vehicles (PSV), proposals have taken longer to develop and will be implemented over a longer time period. The government's view until very recently was that many of the technical and operational issues regarding accessible buses remained unresolved. Therefore, two working parties were set up immediately following the passage of the Act; one looking at these technical issues and the other looking into economic and use issues. Significant problems were envisaged, specifically relating to capacity and viability, when it came to addressing minibuses, double-decker buses and inter-urban coaches, e.g. low floor double-decker buses are still not fully developed. Furthermore, car-parking at bus stops continues to be a significant problem, and bus stop infrastructure is often unfriendly towards mobility-impaired people and low floor buses, particularly in rural areas. Nevertheless, the Public Service Vehicles Accessibility Regulations were published, following widespread consultation, in 1999 and from 31st December 2000 have applied to all new buses and coaches with more than 22 passengers on local and scheduled services. Minibuses and other vehicles carrying 22 passengers or less are, however, not covered by these regulations. In recognition of this, DPTAC has produced a set of voluntary guidelines so as to promote best practice in the design of 'small buses' (DPTAC, 2001).

The government viewed the regulations relating to taxis as representing 'the most radical and far reaching changes in the transport field' (Frye, 1996).

The expectation is that all licensed taxis in the UK will be required to accommodate wheel chair users; perhaps because of their more radical nature, these regulations appear to have been the most difficult to settle. During 1997 the government undertook an informal consultation exercise on their proposal that from 1st January 2002 all newly licensed taxis would have to comply with accessibility regulations, with all licensed taxis compliant by 1st January 2012. However, after considering the responses to this consultation, together with the detailed economic analysis of the draft proposal, ministers announced in 2001 that they would not be pursuing a start date of 2002, and a revised package of proposals is now being developed (DfT, 2002). It is expected that the regulations will not require all taxis to be of the traditional London type. Instead, performance requirements will be set which may be met by a number of different vehicles. Exemptions will be available, e.g. where it can be shown 'both that there is no need for [wheelchair] accessible taxis... and that to introduce them would severely jeopardise the taxi industry in that locality' (Frye 1996). Separately, regulations requiring drivers of licensed taxis to carry, free of charge, guide, hearing and certain other service animals accompanying disabled people have been in force since 31st March 2001.

Cut-off dates, by which time whole parts of the transport system will be required to be accessible, are not set in the actual legislation itself. For buses and coaches, the public service vehicle accessibility regulations specify that all single-deck buses carrying more than 22 passengers will be required to be accessible by 2016, that all double-deck buses will be required to be accessible by 2017 and that all coaches will be required to be accessible by 2020. However, the railway regulations have not set any cut-off dates and it is unclear as to whether the taxi regulations will do so.

Enforcement of Part III of the Act was, at first, left to the individual through the civil courts. The government encourages out of court settlements but beyond this, the intention was that cases will be kept to the Small Claims Court (and the Sheriff Court in Scotland). Whilst Legal Aid is not available and there is limited scope for appeal, damages and injunctions against non-complying organisations are granted. In the case of the transport regulations arising from Part V of the Act, it appears that the relevant government ministry will take responsibility for enforcement and levying fines upon organisations found not to be complying. More recently, the Disability Rights Commission was brought into being; in principle, this represents a significant step forward in terms of enforcement, though in practice it is too early to judge what impact the Commission will have in the transport sector.

Future developments

The government is committed to taking forward, as part of existing legislation, a threefold set of developments. There will be:

- the phased implementation of the accessibility regulations relating to different types of public service vehicles, culminating with those which apply to coaches;
- the consultation and introduction of the accessibility regulations relating to taxis; and
- a set of duties to be placed on providers of goods, services and facilities, whereby they will be required to make reasonable adjustments so as to remove, alter, or provide reasonable means of avoiding physical barriers to access.

Furthermore, the government has now published its response to the Disability Rights Task Force's assessment of the Disability Discrimination Act (Disability Rights Task Force, 1999). Via a consultation document (DfEE, 2001), it has indicated in what way it intends to amend or extend the existing legislation and in what ways it might seek to complement the Act's provisions. Focusing on those recommendations relating to public transport provision, the government appears to agree with the Task Force's conclusions and have committed itself to consult further on two of the Task Force's specific recommendations.

Firstly, the Task Force recommended that an 'end date' by which time all rail vehicles should comply with the rail accessibility regulations should be consulted on and then introduced. Furthermore, accessibility regulations covering the refurbishment of existing rail vehicles should be issued for consultation and then introduced. Secondly, the Task Force recommended that transport should no longer be exempt from the first two sets of duties on service providers under part iii of the Act; that is, the duty not to treat disabled people less favourably for a reason related to their disability and the duty to take reasonable steps to change practices, policies or procedures, which make it impossible or unreasonably difficult for disabled people to use their services. One year on, it is not yet clear when the Government propose to consult further on these issues.

The Disability Rights Task Force further recommended that the Disability Rights Commission and the Disabled Persons Transport Advisory Committee should consider ways of increasing the availability of accessible private hire vehicles which are currently excluded from the scope of the Act. The government has indicated that this consideration will indeed go ahead and that the industry itself should be involved.

Considering aviation, which is only covered with regard to access to airports under the Act, the government established a group to develop a Code of Practice on access for disabled people to air travel for public consultation. A draft code of practice was published for consultation in 2001, although one year later the final code has not yet been issued. Again, the Government has indicated that they agree with the Disability Rights Task Force's recommendation for them to take a reserve power to give the Code statutory backing if agreement and compliance cannot be achieved on a voluntary basis.

There are two existing sets of guidance on access for disabled people to shipping, again which is only partially covered within the scope of the Act. These are a recent set produced by the Disabled Persons Transport Advisory Committee and a more established set produced by the International Maritime Organisation. Responding to the Disability Rights Task Force's recommendation, the government has agreed to undertake a review of access arrangements.

Whilst the government itself has not yet brought forward any further legislative measures following their consultation paper, the *Disability Discrimination Bill 2002* was introduced into the House of Lords by Lord Ashley of Stoke (formerly Jack Ashley M.P.) in early 2002. This 'private member's bill' seeks to amend the existing Act in a number of ways so as to take up some of the Disability Rights Task Force's recommendations outlined above. Most notably, with regard to transport, it seeks to remove the exemption of services which consist of the use of any means of transport from the goods, services and facilities sections of Part III of the Act. It is not clear whether this bill, now re-named the *Disability Discrimination (Amendment) Bill*, will continue its passage through parliament and, if so, how quickly this might occur.

Most recently, the Disability Rights Commission (DRC) has published its first comprehensive review of how the legislation is working and where change is required for comment and consultation (DRC, 2002). The DRC's Legislative Review, firstly, urges Government to accept all of the Disability Rights Task Force's recommendations, including those relating to transport, and to put in place all of the associated proposed reforms by October 2004. Secondly, it puts forward a series of new proposals. Of these new proposals, the most relevant to transport are:

- An European Union Directive on disability discrimination in relation to goods and services should be drawn up. This would incorporate access to transport, with the aim of enabling disabled citizens throughout the EU to achieve freedom of movement and equal participation and ensuring that British citizens are socially included throughout the EU;

- The requirement that licensed taxis carry guide or assistance dogs without any extra charge (unless an exemption has been granted to the driver for medical reasons) should be extended to cover private hire vehicles;
- That service providers, when considering their response to the third set of duties under Part III (to make reasonable adjustments to their buildings), should first consider removing or altering physical barriers, and only where this is not possible think about providing their service in another way – physical alteration would discourage segregation and is likely to provide long-term and widespread benefits to all involved; and
- The legal system for planning and regulating the built environment should be used to promote equal access for disabled people.

In addition, the Review expresses concern that service providers only having to consider adjustments where the service is likely to be 'unreasonably difficult' or 'impossible' to access is inadequate and also invite comment on the issue of how less favourable treatment for a reason related to a disability can be justified. Following the consultation, the DRC intends to submit its recommendations to Government before the end of 2002.

Future developments somewhat outside the legislative process include

- the government's requirement that local authorities monitor the effectiveness of local transport plans in meeting disabled people's transport needs;
- the development of comprehensive guidance on best practice for providers of pedestrian and transport infrastructures to help them plan and design to meet the forthcoming access requirements of the Act; and
- new national minimum standard for local authority concessionary travel schemes which will ensure that certain groups of disabled people will be entitled to at least half fares on public transport in their local area.

Discussion

The 'mobility culture' makes transport a vital service for accessing goods, services and facilities. In this 'mobility culture', excluding people from mainstream transport then excludes them from accessing other goods, services and facilities. Tackling this exclusion by enabling disabled people to access goods, services and facilities with supplementary, specialist transport services or via direct provision to their homes is expensive and segregationist.

A number of recent developments have begun to foster increased access for disabled people. At a general level, increased emphasis on reducing the need to travel, via sustainable, integrated transport and land-use planning, will benefit disabled people as it reduces their dependence on a system which is

inaccessible to them. More specifically, voluntary design and service codes, such as those developed by DPTAC and others (DPTAC, 1995, 2001; IHT, 1989), can foster support, though their voluntary nature means that they are unlikely to deliver an accessible transport system on their own. Demonstration projects, such as those carried out in North Tyneside and London (York & Balcombe, 1998), can provide evidence of the benefits, not only to disabled people but also to other people with mobility impairments.

This paper has outlined some of the background to the Disability Discrimination Act and its transport provisions and has set out some of the expected future developments. The process of clarifying and giving detail to the legislation has been a prolonged one but now appears to be coming to an end. Two of the three sets of duties being placed on providers of goods, services and facilities are in force with detailed codes of practice to explain their nature and extent. Accessibility regulations for rail and public service vehicles are in force and those relating to taxis are soon to be consulted upon. In the meantime, an enforcement agency has been introduced and proposals are now being brought forward to further develop the scope of the legislation.

A number of concerns remain. In general, there are concerns with respect to whether or not all disabled people are properly included within the scope of the legislation and whether or not it outlaws all forms of unfair discrimination. More specifically, there are concerns that the legislation does not cover all modes of transport and that some of the timescales for action stretch for many years into the future. In addition, and somewhat by way of contrast, the public transport industry has expressed concerns with respect to the costs of compliance and with respect to unfair competition in the long distance travel market as the Act will place extra regulations upon UK public transport operators in comparison with European operators.

The duties being placed on providers of goods, services and facilities, as they relate to access to transport facilities, could have significant effects on local authorities and other infrastructure service providers, particularly as of 2004 when they will be required to make reasonable adjustments to remove physical barriers. Local authorities have a key role in improving access to elements of the trip chain which are often ignored: accessible information; well-maintained footways; and accessible bus stops. These aspects will be important in taking advantage of the accessible vehicles emerging out of the Act's accessibility regulations.

Action under the Act within the rail sector has started to take effect already, although impacts within the bus and coach sectors may take longer to

feed through. For licensed taxis, it is already illegal to refuse or charge extra to guide dog or other service animal users but regulations governing the access standards for licensed taxis have proven difficult to agree on. It was thought that the most sweeping impacts of the Act would perhaps relate to licensed taxis but the lack of any firm proposals for taking forward the taxi accessibility regulations at present makes this situation very unclear. One possible consequence of requiring licensed taxis to conform to accessibility regulations is that there will be a leakage from the licensed to the unlicensed, private hire, sector. This is, if anywhere, likely to be more visible in more rural areas where the requirement would involve a more radical change to the taxi fleet. Alternatively, some argue that fully-accessible taxi fleets offer taxi companies or drivers new market opportunities, particularly within the health, education, social services and traditional community transport sectors. It is increasingly recognised that efficiencies and improvements can often be made in these areas and both taxi operators and local authorities should consider these new opportunities.

Lessons from the Disability Discrimination Act & Concluding Remarks

Experience with the UK Disability Discrimination Act 1995 thus far provides a number of lessons for developing disability discrimination legislation and for ensuring that such legislation provides an effective means of fostering social inclusion. The most important lessons are:

- Legislation should consider the whole range of transport – can't exclude the vehicles;
- It is important to recognise, within the legislation, that different aspects of the transport system have different requirements for being made accessible;
- Phasing can help to make the process more manageable but phasing and end-dates should be made clear so as to manage expectations;
- All dimensions of discrimination should be addressed – direct, indirect and unequal burdens;
- Providing people with rights is necessary but not sufficient;
 - when it comes to direct and indirect discrimination, codes of practice and disability equality training will be important;
 - when it comes to unequal burdens and the physical transport infrastructure, design regulations and guidelines will be very important to assist the industry in becoming more accessible;
- The development of codes of practice, training initiatives, regulations and guidelines should involve disabled people and the transport industry together;

- An enforcement agency will help to ensure that individual cases of discrimination do not go unchallenged and will help in implementation

Effective enforcement and monitoring of impacts, with a view towards targeted development of the legislation, will be important factors in ensuring that disabled people enjoy greater access to transport and freedom of movement. The Disability Rights Commission has yet to have a major impact on enforcement. However, their Legislative Review is a major step towards securing enhancements to the existing legislation and the Government's response to the final recommendations of the Review will be eagerly awaited. Beyond this, a programme of monitoring should be conducted so as to ensure that the intended consequences occur and that there are no harmful unintended consequences – this should include impacts on disabled people's travel as well as impacts on the viability of the transport industry.

Finally, it should not be overlooked that disabled people, who in many cases have no experience of accessing mainstream services due to them having been inaccessible, are likely to require some assistance and possibly encouragement to use newly accessible services. Hence, it will be important to identify and implement targeted assistance programmes to support disabled people to take full advantage of the benefits emerging from the legislation. As a consequence of this, the role of specialist transport services requires re-examination so that it can meet the residual special needs of disabled people in the most efficient way. Further research is needed so as to inform these assistance programmes, for example research into design technologies and empowerment training, and to identify what remaining unmet needs exist.

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Note

Further reading and resources on disability issues may be found at the Disability Archive at

<http://www.leeds.ac.uk/disability-studies/archiveuk/index.html>

Evaluating Transportation Equity

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Abstract

Transportation gives people the opportunity to access goods, services and activities that provide benefits. Transportation helps determine where people can live, shop, work, go to school, and recreate. Transportation is therefore about opportunity and equity.

This paper explores the concept of transportation equity and suggests better ways to incorporate fairness into transportation decisions. It describes three major types of equity: horizontal equity, vertical equity with respect to income, and vertical equity with respect to need and ability. How transportation is defined and measured often determines how equity is evaluated. Current transportation equity issues are discussed, and examples are used to explore the equity implications of specific decisions. Case studies include automobile user charges, transit funding, and traffic management.

Keywords

Efficiency, equity, fairness, funding, transport

Defining Transportation Equity

Transportation gives people the opportunity to access goods, services and activities that provide benefits. Transportation helps determine where people can live, shop, work, go to school and recreate. Transportation is therefore about opportunity, and opportunity affects equity. There are three general types of equity as shown in Box 1.

Transportation equity is usually evaluated according to its impact on a group or individual. A somewhat different perspective is to evaluate impacts according to the value society places on different types of trips. For example, there is an equity justification to give emergency medical trips and disaster relief higher priority than most other types of trips because at that time the user (the person needing help) is in

Box 1: Three general types of equity

1. Horizontal Equity (also called 'fairness')

This is concerned with the fairness of cost and benefit allocation between individuals and groups who are considered comparable in wealth and ability. Horizontal equity implies cross subsidies (that one individual or group benefits at another's expense). It is sometimes interpreted to mean that consumers should 'get what they pay for and pay for what they get', unless there is a specific reason to do otherwise. Horizontal equity is often cited when communities compete for transportation resources, such as state or federal funding, and is the basis for cost allocation studies that compare how the costs imposed by different vehicle classes compare with their user payments. (US DOT, 1997, Federal Highway Cost Allocation Study <http://www.ota.fhwa.dot.gov/hcas/final>)

2. Vertical Equity With Regard to Income and Social Class

This focuses on the allocation of costs between income and social classes. According to this definition, transport is most equitable if it provides the greatest benefit at the least cost to disadvantaged groups, therefore compensating for overall social inequity. This definition is often used to support transport subsidies and oppose price increases.

3. Vertical Equity With Regard to Mobility Need and Ability

This is a measure of how well an individual's transportation needs are met compared with others in their community. It assumes that everyone should enjoy at least a basic level of access, even if people with special needs require extra resources (Bureau of Transportation Statistics, 1997, *Mobility and Access; Transportation Statistics Annual Report*, Washington DC, pp. 173–192, <http://www.bts.gov>). Applying this concept can be difficult because there are no universally accepted standards for transport need, nor a consistent way to measure access. Vertical equity by need/ability tends to focus on two issues: access for physically disabled people (also called 'universal access') and support for transit and special mobility services.

Table 1: Equity implications of different Transportation Evaluation Criteria

<i>Unit</i>	<i>Description</i>	<i>Equity Implications</i>
Cost Recovery	Transport investments are evaluated according to whether users will repay the costs.	Favours wealthier travellers, because they have greater ability and willingness to pay.
Benefits Provided in Proportion to Payment	Transport investments are evaluated according to the taxes or special charges paid by users.	Favours wealthier residents because they pay a greater share of taxes.
Congestion (V/C Ratio, vehicle delay)	Transport investments are evaluated according to which investment provides the greatest congestion reduction at the lowest cost.	Favours people who most often drive on congested roads over people who seldom or never use such facilities.
Vehicle Miles Travelled (VMT)	Transport investments are evaluated according to where additional vehicle travel demand can be accommodated at the lowest cost.	Favours people who drive their automobile more mileage than average.
Passenger Miles Travelled (PMT)	Transport investments are evaluated according to where increased person travel demand can be accommodated at the lowest costs.	Favours people who travel more than average.
Passenger Trips	Transport investments are evaluated according to where increased person trips be accommodated at the lowest costs.	Favours people who take more than average number of trips, by any means.
Access	Transport investments are evaluated according to where improved access can be accommodated at the lowest cost.	Favours people who 'access' more than average.
Mobility Need	Transport investments are evaluated according to where disadvantaged people's needs are greatest.	Favours people who have the greatest unmet travel needs.

Equity analysis is affected by how transportation is measured

greater need than other travellers, regardless of their income or physical ability. This is one way to explain why emergency vehicles are allowed to use sirens to give them priority over other road traffic. Similarly, sometimes freight vehicles are given priority over other traffic and commuter trips may be given greater priority in terms of project funding than other types of trips.

Below are five indicators that can be used to evaluate the transportation equity impacts of specific policies and projects:

Horizontal Equity

- Treats everybody equally. Public policies and resources are applied and distributed equally to different individuals and groups. Does not favour one group at the expense of another.
- User Pays. Individuals bear the costs they impose. Minimal cross-subsidies.

Vertical Equity

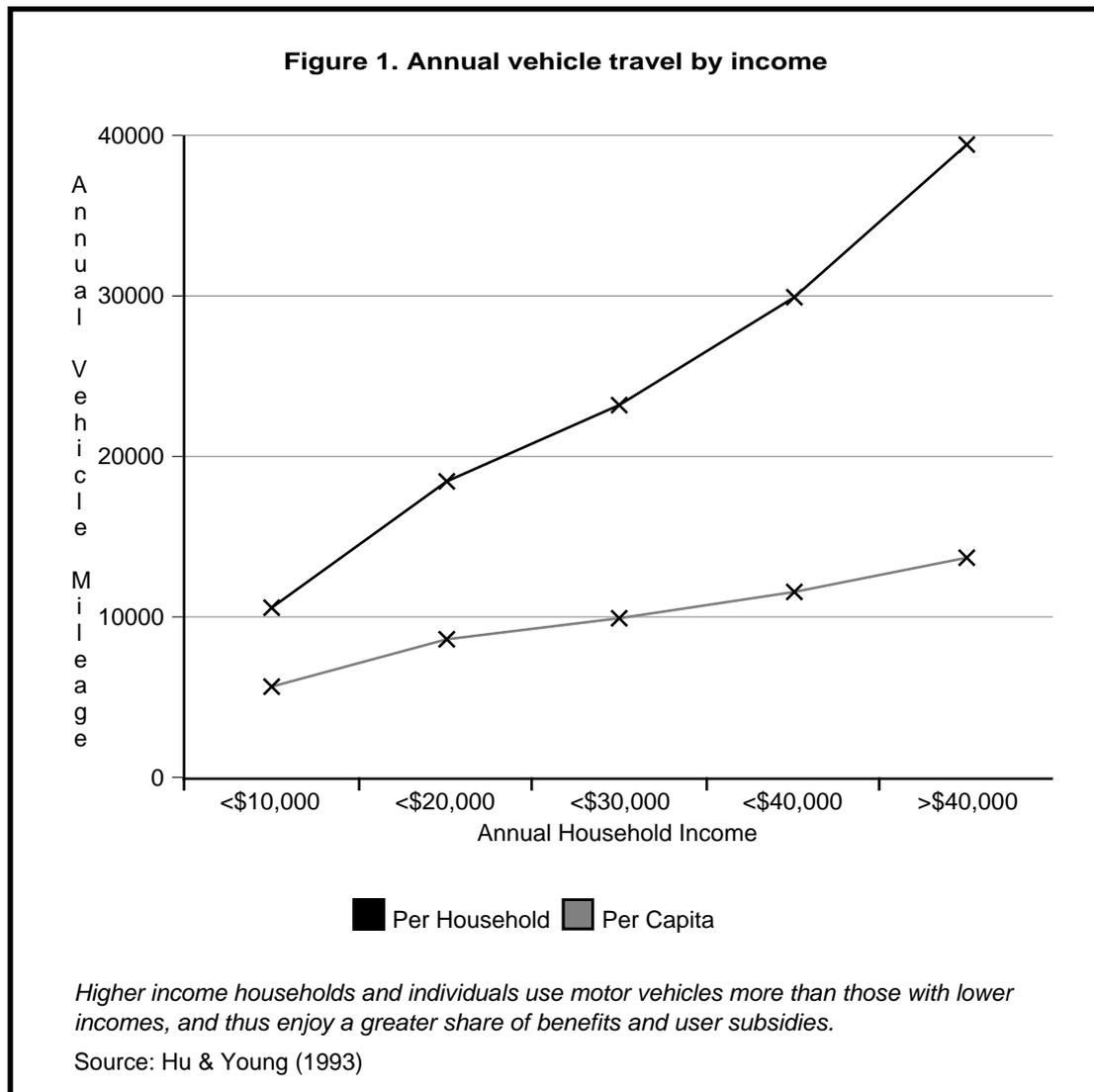
- Progressive with respect to income. Lower-income households pay a smaller share of their income, or gain a larger share of benefits, than higher income households.
- Benefits people who are transportation disadvantaged: non-drivers, disabled, children, etc.
- Improves basic mobility: favours trips considered necessities rather than luxuries.

Equity of Opportunity versus Equity of Outcome

There is an ongoing debate about how to measure vertical equity. There is general agreement that everybody deserves 'equity of opportunity', meaning that society ensures that disadvantaged people have equal access to education and employment opportunities. There is less agreement concerning 'equity of outcome', meaning that society ensures that disadvantaged people actually succeed in these activities. Transportation is often a requirement for equity of opportunity. Without transportation it would usually be impossible to access education and job opportunities.

For this reason, some transportation travel can be considered a 'merit good' (Goodwin, 1990) and even a right (Hamburg *et al.*, 1995; Hay & Trinder, 1991³). 'Basic mobility' consists of trips that are considered valuable to society (they provide external benefits) such as access to education, employment, and basic services (stores, medical care, and civic activities) and – to a lesser degree – social and recreational activities. It is these trips that are most often considered to deserve community subsidy, while other types of travel (luxury travel) are usually expected to be self-supporting.

³ Hay & Trinder also identified horizontal equity or (as they call it) 'formal equity' as a priority in transport equity



How transport is measured and users are grouped affects equity analysis

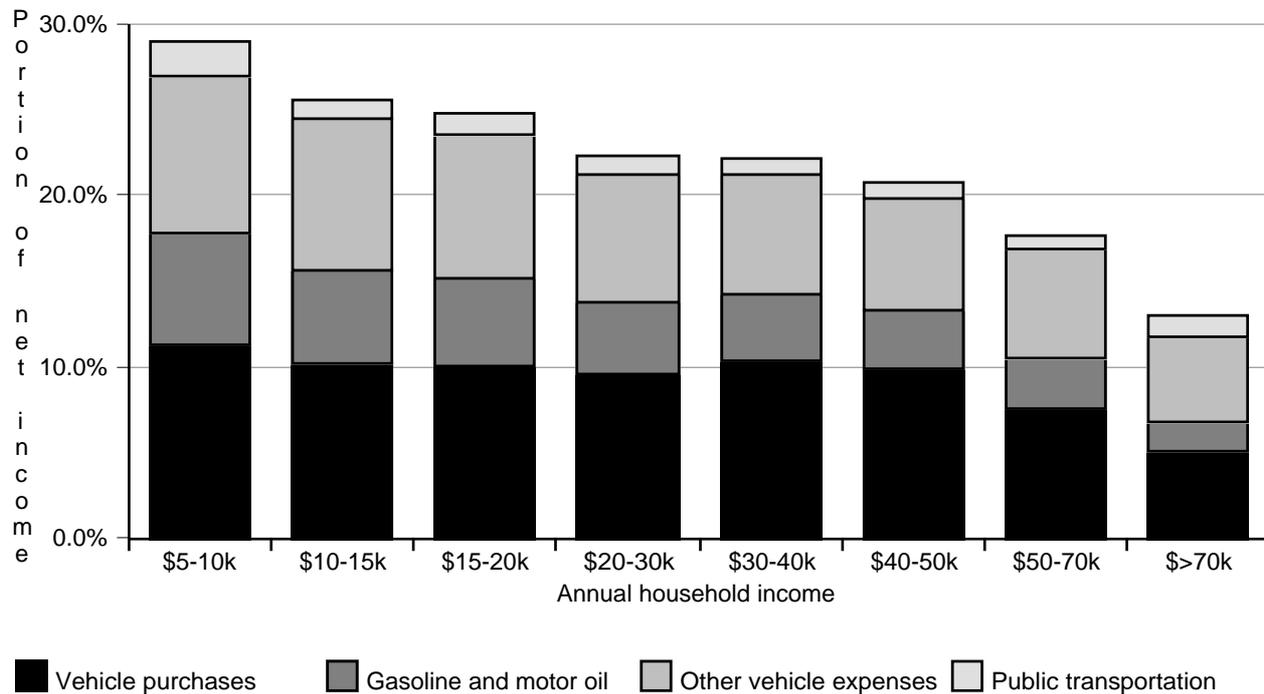
Equity analysis is usually performed at the group level, since that is how data are available and because policy decisions are based on the political interests of various groups. However, this can be rather arbitrary since it depends on how groups are defined. For example, people can be grouped for transportation equity analysis according to geography, income, age, employment status, race/ethnicity, travel behaviour, travel ability (how well they can walk, whether they can drive, etc.), and tax payments. Although a particular policy may be considered beneficial to an individual when they are classified in one way, it may be considered harmful when they are classified in another. In general, equity analysis of large groups is less accurate than if groups are disaggregated into smaller groups, or individuals.

Table 1 shows how equity analysis is affected by the units used for evaluation. Using vehicle mileage to measure travel and applying traffic congestion to measure need tends to favour automobile travel. Using passenger mileage gives greater weight to transit

expenditures. Using person trips to measure transportation gives greater weight to transit, cycling and walking. Using access to measure transportation gives greater weight to non-travel options, such as telecommuting and location efficient land use patterns.

Equity analysis also depends on how groups are defined. For example, in most regions, transit riders on more congested urban corridors receive less subsidy per trip, because their trips are short and load factors are high. However, since most suburban residents seldom ride transit, they contribute more than they receive as a group, while the small number of suburban transit riders tend to receive the greatest subsidy per capita (Hodge, 1995).

Equity analysis is sometimes defined in terms of one group against another (e.g. motorists' interest versus those of transit users) but a lifecycle analysis may often be more appropriate. For example, although motorists may not use public transit at a given time, they may when they are too young or old to drive, or when living in a large city. This increases the justification for subsidising alternative travel modes to ensure choices at the times people need them.

Figure 2. Transportation expenditures as a percentage of household income

Transportation expenditures are highest as a portion of income for lower-income households, indicating that automobile dependency is a financial burden to the poor.

Source: BLS, (1997)

This is not to imply that there is only one right way to evaluate transport improvements. A community may choose to target investments in a particular way for the sake of horizontal equity, to attract economic development, or for other strategic purposes. But it is important that decision makers consider the equity implications of their choices.

In practice, most communities tend to apply a mixture of equity criteria to transportation investments. For example, transportation resources (such as federal and state fuel tax funds) are allocated, in part, on a population basis, reflecting horizontal equity criteria. Others, such as transit, paratransit, and special mobility services, are provided in most communities based on mobility need, and a few are targeted at communities or groups that are historically disadvantaged (FTA, 1996).

Current Transportation Equity Analysis

Most current analyses of transportation equity focus on only one type of equity and consider only market effects. Examples are described below.

Horizontal Equity

Horizontal equity is often an issue in the allocation of transport funds between geographic jurisdictions because transportation projects provide short term economic stimulation (jobs and contracts) and long term

economic development (Chen, 1996). Political representatives often fight for a fair share of this money and various formulae and decision making frameworks have been developed to distribute these resources fairly. For example, the American Petroleum Institute argues that a fuel tax increase would be unfair to residents of areas that tend to spend relatively more personal income on fuel (Dougher, 1993).

Cost allocation studies have examined whether different vehicle classes (automobiles, medium trucks and heavy trucks) pay a fair share of the costs they impose on the roadway in taxes (Jones & Nix, 1995). One study compares overall automobile financial costs and revenues (Roelofs & Komanoff, 1994). A few studies have also compared the costs of road and rail transport (Transport Concepts, 1994). Highway user organisations argue that 'diversions' of fuel taxes to non-highway projects and exempting gasohol from road taxes are inequitable to motor vehicle users (Road Information Program, 1995).

An increasing concern is the inequity of transport projects that impose costs but provide few direct benefits to a neighbourhood (Leavitt, 1970; Kelley, 1971; Goddard, 1994, ch. 13). Urban neighbourhoods are negatively impacted by freeways or other road improvements that primarily benefit suburban commuters. For example, despite vigorous opposition,

freeway construction in the late 1950s destroyed much of the African American community in Nashville, Tennessee (Hodge, 1995). In addition to being unfair in terms of horizontal equity, this type of destruction is often vertically inequitable since the people who are harmed tend to be less affluent than the drivers who use the facilities. Such unfair treatment of local communities lead to 'freeway revolts' which often pit poorer urban residents against suburban development interests. This resistance has stopped many planned urban freeway projects.

Vertical Equity With Regard to Income & Social Class

Equity is often evaluated with regard to income class or social class. This reflects the assumption that lower income and socially disadvantaged people should bear a smaller share of costs or receive a greater share of public resources. As economist Adam Smith (1776) wrote, '*It is not very unreasonable that the rich should contribute to the public expense, not only in proportion to their revenue but something more than in that proportion*'.⁴ A price or tax structure that increases with wealth (rich people pay proportionally more of their income than poor people) is called 'progressive', while pricing and taxes that are borne proportionally more by lower income groups are called 'regressive'.

The economic principle of 'diminishing returns' (more properly called 'diminishing marginal utility') supports progressive pricing. This principle means that beyond some point the incremental benefits of any input (including money) start to decline. For example, an additional \$5,000 to a low-income household can increase the purchase of necessities such as food, shelter and medical care, providing significant welfare benefits. The same \$5,000 to a wealthy household may provide little welfare gain, particularly if others in their community received a similar increase in income.

An implication of this principle is that conditions facing the most disadvantaged members of society may be the best indicator of overall social and economic progress. For example, an increase in wealth or opportunity to the poorest 10% of the population may provide far greater social welfare than the same proportional increase for a richer group, all else being equal.

Applied to transportation this principle implies that the quality of access for people who are mobility

⁴ With regard to transportation policy Adam Smith also wrote: "When the toll upon carriages of luxury coaches, post chaises, etc. is made somewhat higher in proportion to their weight than upon carriages of necessary use, such as carts, waggons, &c. the indolence and vanity of the rich is made to contribute in a very easy manner to relief of the poor, by rendering cheaper the transportation of heavy goods to all the different parts of the country."

Table 2. Incidence of taxes used to support highway services

<i>Tax</i>	<i>Incidence</i>
Gasoline tax	Regressive
State use fees	Regressive
Sales taxes	Regressive
Property taxes	Regressive
Income taxes	Progressive

Most current taxes used for roadway funding are regressive

Source: Giuliano, 1994, p. 260

disadvantaged is one of the most important indicators of transportation system performance. In an automobile dependent society this may justify increasing attention to providing basic mobility and access for non-drivers.

These issues are sometimes called 'environmental justice' (DeSanto & Bailey, 1999). The book *Just Transportation* includes essays arguing that the distribution of costs and benefits is unfair in the current transport system (Bullard & Johnson, 1997). It shows, for example, how transit funding in Los Angeles provides far more subsidy for wealthier rail users than for poorer, mostly minority bus riders. Similarly, it cites cases in which lower income neighbourhoods are negatively impacted by transportation projects, while receiving little benefit.

Underpricing driving is often justified for the sake of income equity. Dougher shows that driving and fuel consumption tend to be higher in lower income states, and concludes that a fuel tax increase would be regressive⁵. French (1989) concludes that a fuel tax increase would be regressive with respect to income, although his analysis overstates this factor by assuming incorrectly that driving rates and fuel consumption are the same for all income classes. The poor, especially the very poor, own fewer automobiles, drive less and rely more on alternatives to driving (Figures 1 & 2) than wealthier households (Golob, 1989).

How regressive a fuel tax increase would be depends on the assumptions and perspective used. Poterba demonstrates that the poorest households spend a smaller portion of annual *expenditures* (which he considers a more appropriate reference than *income*) on

⁵ Dougher, 1993. Dougher cites Data Resources Inc. (1989) *The Macroeconomic Effects of an Increase in the Federal Tax on Gasoline*, Lexington, Ky; Poterba, J. (1989) 'Lifetime Incidence and the Distributional Burden of Excise Taxes' American Economic Association Papers, Nashville, TN, pp. 325-330; U.S. Congressional Budget Office (1990) *Federal Taxation of Tobacco, Alcoholic Beverages, and Motor Fuels*, Washington D.C.

Table 3. Automobile Price Increase Equity Effects

<i>User Class</i>	<i>Cost</i>	<i>Expected Effect</i>
Non-Driver	User Market	No short term change. Small long term benefits due to economies of scale in transit service.
Low Income Drivers	User Market	Higher short term costs, with mixed long term effects since drivers will sometimes shift to cheaper (but less desirable to user) modes such as bus, bicycling and walking, and other times will pay the higher cost. Whether net market costs increase or decrease depends on the availability of substitutes. If alternatives are viable, higher driving costs will motivate a shift to these modes, resulting in overall saving. If few alternatives exist, low income households will spend more overall on transport.
Middle & Upper Income Drivers	User Market	Higher costs since they will usually drive despite higher prices.
Non-Drivers	User Non-Market	No short-term change is likely. A moderate long-term benefit is likely due to improved transit, bicycling and pedestrian service.
Low Income Drivers	User Non-Market	Significant increased costs since these users will be priced out of driving for some trips, and forced to use less desirable (to the user) modes such as transit, bicycling and walking. The size of this cost increase depends on the quality of alternative modes. This cost is offset somewhat by reduced congestion delay and accident risk.
Middle & Upper Income Drivers	User Non-Market	Moderate benefit due to reduced congestion delay and accident risk.
All Road Users	External Market	Moderate benefit, including reductions in other taxes and reduced parking subsidy costs due to less driving.
All Residents	Environmental	Moderate benefit from reduced pollution, energy consumption, and urban sprawl due to less driving.
All Residents	Automobile Dependency	Various benefits, especially for non-drivers and low-income drivers who are most likely to use the increased transport choices. These benefits increase in the long term.
All Residents	Economic	Slight short-term consumer price and employment transition costs, and slight long-term benefits due to productivity gains. Automobile sector job losses may be offset by increased employment in transit and other sectors that substitute for driving.

gasoline than middle class families, and concludes that '*The gasoline tax thus appears far less regressive than conventional analyses suggest.*' (Poterba, 1991). He finds that fuel taxes have little or no regressivity relative to *lifetime* expenditures (Poterba, 1989).

Rothengatter argues that wealthier European drivers misrepresent equity concerns to justify low vehicle use taxes that are actually regressive, since wealthier households drive more than lower income households (Rothengatter, 1994). Similarly, Banister indicates that a 26% increase in British petroleum prices would be a progressive tax with respect to income since many poor households do not own a car (Banister, 1994; see also Fergusson & Skinner, 1998). Shifting fixed vehicle ownership taxes to variable vehicle use taxes would be even more progressive since poor car-owning households tend to drive less annually per automobile than wealthier households. He concludes that the overall equity impacts of increased vehicle taxes depends in part on whether automobile use is considered a necessity or a luxury, since poor households that do own cars *are* disadvantaged⁶ by

⁶ Banister's analysis of the equity impacts of urban road pricing appears to assume that automobile use is a necessity, even for city dwellers, despite evidence he presents to the contrary.

such tax changes.

Analysis of congestion pricing and other road fees conclude that equity impacts depend largely on how revenues are distributed (Small, 1995, 19-22). Giuliano summarises current research on the fairness of current road funding mechanisms, which she concludes are overall regressive (see Table 2) (Giuliano, 1994, pp. 250-279). She argues that women commuters would bear an unfair financial burden from road pricing because they tend to have fewer travel options, due to family responsibilities and inflexible employment conditions, although this would be offset for higher-income women by reduced congestion delays. Kain identifies significant potential benefits to lower income commuters and non-drivers from congestion pricing because it could improve transit and ride sharing services (Kain, 1994, pp. 502-553).

One study finds that *Pay-As-You-Drive* insurance increases income equity by eliminating the high premiums often charged in low income communities, reducing costs for low mileage drivers, and providing overall insurance savings (Allen *et al.*, 1994). Low income households would pay 30% to 80% lower premiums than under the current system, in part because low income households drive less than

Table 4. Increased automobile price equity effects summary

	Short Term			Long Term		
	Non-Drivers	Low Income Drivers	Middle-High Income Drivers	Non-Drivers	Low Income Drivers	Middle-High Income Drivers
User Market	None	Moderate Cost	Moderate Cost	Slight Benefit	Mixed	Moderate Cost
User Non-Market	Slight Benefit	Large Cost	Small Benefit	Moderate Benefit	Mixed	Small Benefit
External Market	Moderate Benefit	Moderate Benefit	Moderate Benefit	Moderate Benefit	Moderate Benefit	Moderate Benefit
Environmental	Moderate Benefit	Moderate Benefit	Moderate Benefit	Moderate Benefit	Moderate Benefit	Moderate Benefit
Auto Dependency	Large Benefit	Moderate Benefit	Slight Benefit	Large Benefit	Large Benefit	Small Benefit
Economic	Slight Cost	Slight Cost	Slight Cost	Slight Benefit	Slight Benefit	Slight Benefit

wealthier households. This analysis understates total potential benefits to the poor by considering only market costs; reduced pollution, traffic congestion and automobile dependency also benefit low income households.

Cameron concludes that a 5¢ per mile road user charge in Southern California would not necessarily be regressive, since all income quintiles benefit from reduced congestion and air pollution including the poorest residents (Environmental Defense Fund, 1994). Cameron suggests that this estimate probably understates benefits to the poor, since low income people tend to be exposed to higher than average pollution (Bullard & Johnson, pp. 11 & 18), a factor not incorporated into his model.

Johnston *et al.* consider the income equity of congestion management strategies, including HOV facilities, metering, pricing, and rationing, and conclude that pricing can be equitable if revenues are appropriately spent (Johnston *et al.*, 1995, pp. 27-39). Similarly, Small states that, '*... when central cities are the recipients of the toll revenue, the toll causes a monetary transfer from rich to poor plus a uniform time saving enjoyed by all*' (Small, 1983, pp. 90-111).

After examining equity impacts of internalising transport costs, Kågeson concludes that increasing automobile user charges, '*... will do little to change the existing differences between income groups, and the strain on low income groups can be offset by refunding a portion of revenues, in equal amounts, to all citizens*' (Kågeson, 1993, p. 185). Lee concludes that congestion pricing is probably not regressive overall since peak period drivers tend to be wealthier than average, '*... peak tolls (in the peak direction during peak hours) would be a progressive source of revenue. All existing user and non-user funding sources (such as property and sales tax) are less progressive or are regressive*' (Lee, 1989, p. 13).

Regulation is sometimes seen as more equitable than pricing to manage markets and reduce impacts, because with pricing, '*motoring will become the prerogative of the wealthy*' (Banister & Button, 1993, p. 7). This conclusion is debatable since regulations increase costs (for example, increasing the price of automobiles), and penalties for failing to comply are often fines, all of which are a greater burden to low income drivers. Deakin finds that nearly half of all vehicles owned by poor families (annual income less than \$25,000) in the San Francisco Bay area are older, high polluting models, but such households produce only 12% of mileage and 15% of trips made in these older vehicles (Deakin, E. (1993, p. 95). The majority of older vehicles are owned by wealthier families, which account for $\frac{3}{4}$ of their mileage.

Congestion is a progressive cost with respect to income because wealthier people have higher opportunity costs for their time (Mohring & Anderson, 1994). This is tempered by the fact that wealthy drivers can afford more comfortable cars, mobile communications, a greater choice of housing locations, more flexible schedules, and in some cases alternative modes.

Vertical equity with regard to mobility need & ability

Several factors can make an individual transportation disadvantaged, including limited transportation choices in their community, inability to drive, and limited availability of a vehicle. A lack of access experienced by disadvantaged groups is sometimes called 'social exclusion' (Murray, 1998).

About 13% of U.S. households do not own an automobile (BLS, 1997)⁷, and members of a household

⁷ The Nationwide Personal Transportation Survey (NPTS) indicates a lower portion of zero-vehicle households, but the sampling methodology used tends to exclude more lower-income households and so is likely to underestimate this factor. <http://www.fhwa.dot.gov/ohim/nptspage.htm>

Table 5. Transit Subsidy Equity Effects

<i>Group</i>	<i>Cost</i>	<i>Expected Effect</i>
Non-Driver	User Market	Large benefits. Transit service would not exist in most communities without subsidies. Transit is much cheaper than alternatives such as taxis. Subsidies provide financial savings to users and allow access to jobs and a wider selection of commercial services.
Low Income Drivers	User Market	Moderate benefits. Transit is used regularly by some low-income drivers, and it provides a backup when a car is unavailable.
Middle & Upper Income Drivers	User Market	Small benefit. A few affluent drivers regularly use transit such as suburban rail, and it provides a backup when a car is unavailable.
Non-Drivers	User Non-Market	Large benefit. Transit service provides many non-market benefits to non-drivers, and reduces traffic congestion and accident risk.
Low Income Drivers	User Non-Market	Moderate benefit, including reduced congestion and accident risk.
Middle & Upper Income Drivers	User Non-Market	Moderate benefit, including reduced congestion and accident risk.
All Residents	External Market	Moderate cost. Transit subsidies require additional taxes that are offset slightly by reduced automobile parking and road subsidies.
All Residents	Environmental	Moderate benefit, including reduced air pollution and urban sprawl.
All Residents	Automobile Dependency	Moderate to large benefits, including more short-term mobility choices, and less car dependent transport and land use in the long term. Non-drivers benefit most.
All Residents	Economic	Mixed overall, with significant distributional effects in some areas.

Various groups have different costs and benefits from transit subsidies.

that owns an automobile may be disadvantaged in an automobile dependent community where each individual is expected to have a personal vehicle. Approximately one-third of the U.S. population is at risk of being transportation disadvantaged, including 26 million elderly, 24 million disabled, and 25 million poor young people aged 10 to 17 (CTAA, 1995). Rural residents are especially disadvantaged because they have few travel options (Raphael, 1995, pp. 38). Some studies indicate that women tend to be transportation disadvantaged more often than men (Overton, 1995, p. 16). One recent study found that non-drivers often have trouble shopping for food, due in part, to the difficulties of carrying heavy loads on public transit (Gottlieb *et al.*, 1996).

Need based transportation equity concerns tend to focus on two issues. One is access for physically disabled people to public facilities, which has produced various handicapped access requirements including the Americans with Disabilities Act. The second area of attention is support for transit and special services to provide basic mobility. Although there is no doubt that many transport disadvantaged people rely on public transit, there is little research on the degree to which they depend on transit, and less information on how much they use other modes, such as cycling and walking.

In general, automobile dependency increases this form of transportation inequity because it increases the need to travel while reducing travel choices for non-drivers (Newman & Kenworthy, 1998; Litman, 1999a). Whether increasing vehicle costs is inequitable depends in part on whether driving is considered a necessity or a luxury. If poor people *must* drive, then an increase in user costs is an unfair burden. If usable transport alternatives exist then increased costs can be considered acceptable. However, since many disadvantaged people cannot drive, regardless of price, subsidising driving can only satisfy part of transport equity.

Comprehensive transportation equity analysis

The total cost perspective presented in this report allows a more comprehensive analysis of transport equity. Equity analysis depends on how transportation system user classes are defined. Major variables include location (urban, suburban, rural), income (low, medium, high), physical ability (disabled non-driver, able non-driver, driver), and lifecycle stage (child, adolescent, adult, parent, elderly). For this analysis users are divided into four major classes, which capture most of the variables just listed:

- *Non-drivers*. This includes people who cannot drive due to age or disability, or poverty. Non-drivers use

Table 6. Transit subsidy benefits summary

<i>Impact Category</i>	<i>Non-Drivers</i>	<i>Low Income Drivers</i>	<i>Middle–High Income Drivers</i>
User Market	Large Benefit	Moderate Benefit	Small Benefit
User Non-Market	Large Benefit	Moderate Benefit	Moderate Benefit
External Market	Moderate Cost	Moderate Cost	Moderate Cost
Environmental	Moderate Benefit	Moderate Benefit	Moderate Benefit
Auto Dependency	Large Benefit	Moderate Benefit	Moderate Benefit
Economic	Mixed	Mixed	Mixed

This table summarises benefit and cost categories of transit subsidies on three groups.

automobiles as passengers but, except for those who can afford unlimited chauffeuring, their use is typically much less than drivers.

- **Low income drivers.** This includes people who can drive and have access to an automobile but whose travel decisions are significantly affected by financial costs. Vehicle user prices have a major effect on their travel habits.
- **Middle income drivers.** This includes drivers who normally have unrestricted access to an automobile and who are only moderately burdened by their automobile financial costs. Vehicle user prices have a moderate effect on their travel habits.
- **Upper income drivers.** This includes drivers who normally have unrestricted access to an automobile and are not burdened by their automobile financial costs. Vehicle user prices have little effect on their travel habits.

Transportation costs are divided into six categories:

1. **User market.** These include vehicle ownership and operating costs, out-of-pocket parking expenses, and transit fares. These are the focus of most transportation planning and equity analysis.
2. **User non-market.** These include user travel time, accident risk and comfort. These are often recognised in planning but are frequently ignored in equity analysis. For example, few analyses formally identify how the speed, safety and comfort benefits of a transportation decision are distributed by income or user class, although this is sometimes considered informally when allocating transport resources between different geographic locations, or between automobile and transit investments.
3. **External market.** These include roadway facility costs, parking subsidies, and transit subsidies that originate as general taxes or increased consumer prices. Equity is sometimes a factor in the allocation of these costs and benefits (for example, in the allocation of road tax burdens between

different motor vehicle classes) but there is often disagreement as to how equity should be measured.

4. **External environmental.** This includes noise, air and water pollution, the barrier effect, aesthetic degradation, and habitat loss. These are sometimes considered during transportation planning but are usually ignored in equity analysis. For example, there is little research on the distribution of air pollution impacts by income or user class. Pollution costs tend to be borne most by lower income residents, but little quantitative research has been done (Forkenbrock & Schweitzer, 1997).
5. **Automobile dependency.** This includes the costs of reduced transportation choices and generated traffic that result from automobile dependent transportation system and land use patterns. These are seldom incorporated in transport planning or equity analysis, although some recent discussions of sustainable community planning consider them.
6. **Economic.** This includes changes in consumer prices, economic development, employment, and productivity. These costs are frequently cited in general discussions of transportation policy, but little quantitative research has been done. Many claimed economic benefits of transport improvements are distributional, representing gain in one community that is offset by a loss elsewhere, which is a horizontally inequitable. Except for a few studies of the employment benefits of specific transportation projects, few studies have examined how such costs and benefits are distributed by income or class. Transaction costs, such as economic changes that result in unemployment among traditional industries tend to be vertically inequitable since disadvantaged people have fewer resources to fall back on.

Examples of Comprehensive Equity Analysis

The four user classes and six major cost categories above can be used for comprehensive analyses of transport's equity impacts. Below are four examples.

*Example 1:**Equity Impacts of Automobile Dependency*

Automobile dependency is defined as high levels of automobile ownership and use, a high percentage of total travel by automobile, and inferior transport choices for non-drivers (Litman, 1999a)⁸. Automobile dependency provides benefits to users, and increases various internal and external costs, including household transportation expenditures, subsidies for road and parking facilities, congestion, land use impacts, and various environmental impacts. It also tends to reduce transportation choices and the quality of service for non-drivers. The equity impacts of automobile dependency are discussed below.

The benefits of automobile dependency tend to increase with income, as indicated in Figure 1 by the tendency of higher income individuals to drive more. Higher income households therefore benefit more from road and parking subsidies, and other external costs of driving. The internal costs of automobile dependency (i.e., the costs of owning and operating an automobile) tend to be regressive with respect to income, as indicated in Figure 2. Lower-income households must devote a greater share of income to transport than higher-income households. This regressiveness appears to increase with automobile dependency, since lower-cost travel options (walking, cycling and transit) become less effective.

Many funding sources for public services used by vehicles are regressive, such as property taxes used to fund local roads. Lower income households and non-drivers tend to bear a greater share of external accident risk, air pollution and noise costs because they tend to live in urban neighbourhoods, walk and bicycle more than average.

Automobile dependency increases personal transportation requirements by encouraging more dispersed land use patterns and travel intensive lifestyles. In automobile dependent communities people must travel more to access goods and activities than in communities with more balanced transportation systems. As a result of automobile dependency, a personal motor vehicle is required for people to participate in an increased portion of education, employment, commercial and social activities.

Automobile dependency also reduces travel choices and the quality of non-automobile transportation, such as transit service and facilities for walking and cycling. There is less public support for alternatives, public officials give them low priority in planning and investment decisions, and they lose economies of scale. Wider roads and increased traffic speeds and volumes

create barriers to walking and cycling.

As an example, consider the situation of a non-driver in a community with balanced transportation, such as a traditional, pedestrian-friendly neighbourhood with good transit service. This person could walk easily and safely to stores and other services, and would have access to a wide range of employment options that are along transit lines. Their transportation costs are modest, consisting of occasional shoe replacement, a monthly transit pass, and an occasional taxi ride for special trips.

In an automobile dependent community the same person would face significant barriers and higher costs. Walking or cycling are more difficult, due to a lack of facilities, wide roads, high traffic speeds and volumes. Transit services are inferior due to limited public support and diseconomies of scale. Homes are not within convenient walking distance of many services. Non-drivers' employment options are limited to the few work sites on a bus line, or they must pay the high cost of commuting by taxi. Because common destinations are more dispersed, transportation financial and time costs are greater. As a result, a non-driver must spend more for an inferior quality of transportation that they would enjoy in a balanced transportation community.

In these ways, automobile dependency makes non-drivers worse off, both absolutely (they have few travel choices and face additional costs and risks), and even more in terms of their relative position. Since non-drivers tend to be economically, physically and socially disadvantaged, these differences represent both horizontal and vertical inequity. Conversely, measures that increase mobility options for non-drivers help create a more balanced transportation system which can provide significant equity benefits.

Because non-drivers' mobility is so constrained, their travel tends to be limited to a relatively small number of high-priority trips. A reduction in their travel costs or an increase in their travel represents a far greater benefit than the same cost reduction or travel increase for comparable automobile users. For example, a transportation improvement that increases motorised travel by one trip per week represents a 20% improvement for a non-driver who otherwise only takes 5 vehicle trips per week, but only a 5% improvement for drivers who take 20 trips per week⁹.

Improved mobility for non-drivers provides greater benefits than the same increase in travel by drivers with comparable needs because drivers' higher value travel needs are already satisfied.

⁸ 'Automobile' refers to cars, vans, light trucks and 4x4s/SUVs for personal use.

⁹ This is similar to pointing out that \$1,000 represents a proportional greater share of wealth and, on average, can be expected to provide greater overall benefits to a low income family than an otherwise demographically comparable high income family.

Table 7. Traffic management equity impacts

<i>User Class</i>	<i>Cost</i>	<i>Expected Effect</i>
Non-Driver	User Market	Moderate benefit. Reduced traffic allows more walking and bicycling, reducing transit and taxi fare expenses. It can also increase the market value of residences adjacent to streets.
Low Income Drivers	User Market	Small cost. Traffic restrictions increase automobile operating costs.
Middle & Upper Income Drivers	User Market	Small cost. Traffic restrictions increase automobile operating costs.
Non-Drivers	User Non-Market	Large benefit. Traffic restrictions and pedestrian/bicycle improvements increase safety, comfort and mobility under all conditions.
Low Income Drivers	User Non-Market	Small cost. Motor vehicle traffic restrictions increase driving time but reduce accidents, and increase comfort when not driving.
Middle & Upper Income Drivers	User Non-Market	Small cost. Motor vehicle traffic restrictions increase driving time but reduce accidents, and increase comfort when not driving.
All Residents	External Market	Moderate benefit. Short-term expenses required to implement traffic management projects. These are offset by savings from reduced vehicle accidents and increased property values.
All Residents		Large benefits, including reduced traffic noise, severance and sprawl. Overall energy saving and air quality benefits likely. (Newman & Kenworthy, 1989)
All Residents	Automobile Dependency	Large benefits. Significantly increases the viability of non-automotive modes.
All Residents	Economic	Mixed; location specific. Constrains some economic activities (such as freight delivery) but enhances others (such as tourism).

That non-drivers bear many of the costs of automobile dependency through tax subsidies, accident risk and reduced mobility options, indicates that automobile dependency is horizontally regressive. That people who are physically, economically, and socially disadvantaged are most likely to experience the disadvantages of automobile dependency and are worse off as a result indicates that automobile dependency is vertically inequitable.

Example 2:

Equity Effects of Vehicle and Road Pricing

Motor vehicle use is significantly underpriced (Langmyhr, 1997, pp. 25–39; Litman, 1998). Various types of pricing reform have been proposed to make road use more efficient and equitable. Would raising prices (fuel taxes, road tolls and parking fees) to better reflect costs and encourage more efficient travel habits be more or less equitable? Table 3 evaluates the impacts on various groups.

Table 4 summarises these impacts. Although higher fuel taxes or a road user fee would increase market costs for all drivers and force drivers (especially low income drivers) to forgo some automobile trips, there are significant benefits, many of which are relatively progressive with respect to income and ability.

The overall equity impacts of price changes depend

largely on how revenues are used (Litman, 1996, pp. 24–28). If each income class receives revenues comparable to what they pay, the overall effect is probably slightly progressive due to benefits to non-drivers. If revenues are targeted at disadvantaged groups, the overall effect could be progressive. Spending revenues only on new highways is generally regressive (since these are used primarily by higher income travellers), while transit, bicycle and pedestrian improvements could be progressive if they benefit disadvantaged populations.

Example 3:

*Equity of Transit Subsidies*¹⁰

Public transit service receives significant financial subsidies. Is this fair? An analysis that considers market costs only may conclude that transit subsidies are horizontally inequitable, but there are other factors to consider:

- Although transit users receive significant subsidies per passenger mile (comparable to the per passenger mile external costs of automobiles), annual per capita subsidies tend to be small, since transit users tend to travel far less in total than motorists.
- Transit provides 'basic mobility' and thus should be evaluated differently from driving, which can be considered a relative luxury. It is therefore

¹⁰ Litman, 1998b

Table 8. Traffic management benefits summary

<i>Impact Category</i>	<i>Non-Drivers</i>	<i>Low Income Drivers</i>	<i>Middle–High Income Drivers</i>
User Market	Moderate Benefit	Small Cost	Small Cost
User Non-Market	Large Benefit	Small Cost	Small Cost
External Market	Moderate Benefit	Moderate Benefit	Moderate Benefit
Environmental	Large Benefit	Large Benefit	Large Benefit
Auto Dependency	Large Benefit	Large Benefit	Large Benefit
Economic	Mixed	Mixed	Mixed

reasonable to subsidise transit use at a higher rate per mile than driving.

- Transit service incurs many costs such as wheelchair lifts and service to special destinations to meet community needs that should not be charged to general riders.
- Due to unused capacity and economies of scale, the marginal cost of an additional transit trip is often low or negative.

For these reasons, per capita annual subsidies received by transit riders are typically much less than road, parking and environmental subsidies received by motorists, particularly for transit systems serving low-income urban riders, since these tend to achieve greater cost recovery than transit serving wealthier suburban riders. For example, bus riders in the Los Angeles area, who are primarily lower income, receive subsidies averaging \$1.17 per trip, while rail transit riders receive subsidies averaging \$11 to \$21 per trip (STPP, 1995). BART benefits in San Francisco are similarly inequitable with respect to income (Hodge, 1995, p. 307).

The user and cost categories described earlier in this section can be used to identify the benefits of transit subsidies. Table 5 shows how transit subsidy costs and benefits are likely to be distributed in a typical urban area. Table 6 summarises the impacts of transit underpricing.

This analysis shows a variety of transit subsidy benefits for non-drivers, and to a smaller degree low income drivers, indicating vertical equity benefits. Analysis of the distribution of specific transit subsidy costs and benefits by route, type of service (rail vs. bus) and geographic area may indicate additional equity impacts, including horizontal equity.

The equity effects of transit service and subsidies vary considerably. As mentioned above, bus service used most by low income riders often have the highest fare box recovery, while commuter bus and rail service to higher income suburbs, airports and other special destinations are less cost effective. Funding structures that favour suburban over urban service, and therefore

fail to deliver transit service where the need and system efficiency are greatest, are considered inequitable by Taylor (Taylor, 1991, pp. 85-92). Equity analysis by type of service or route is likely to show that some transit subsidies (such as rail service to wealthy suburbs) *are* regressive, while general bus service is highly progressive.¹¹

Example 4:

*Traffic Management Equity*¹²

Different users often have conflicting interests in roadway design. Motorists benefit from streets designed to maximise traffic and speed. Pedestrians and cyclists benefit from streets designed for moderate traffic and speed, with provisions for walking and cycling. Transit users benefit from street designs that both facilitate transit movement and enhance the pedestrian environment. Residents and visitors benefit from streets designed to control traffic and encourage community interactions. Because of these conflicting interests, roadway design decisions have equity implications.

Current street design and funding practices tend to emphasise motor vehicle needs at the expense of other users. Specific design features that benefit drivers at the expense of other users include hierarchical street networks, wide lanes, straight alignments, smooth surfaces, large turning radii, synchronised traffic signals, and maximum surface parking. Because of limited resources, accommodating motor vehicle traffic often reduces the size and quality of sidewalks, bike paths and other facilities for non-motorised users. There is growing support for traffic calming strategies to reduce traffic and speed, and create a street environment that balances the needs of different users.

Table 7 summarises the expected costs and benefits of traffic management based on the equity criteria described earlier (of course, actual impacts are situation specific and may differ significantly from these general estimates). Table 8 summarises these

¹¹ The Los Angeles area Bus Riders Union, for example, concludes that rail transit intended for affluent riders is inequitable because it diverts funding from basic bus transit.

¹² Litman, T. 1999b

impacts of traffic management.

This analysis indicates that traffic calming often provides equity benefits. Horizontal equity increases because the external impacts that drivers impose on others are reduced. Vertical equity increases because non-drivers (who tend to be socially disadvantaged) receive greater benefits. Low-income urban neighbourhoods often benefit most from traffic calming, indicating further potential vertical equity. Although automobile operating costs are regressive, low income households drive significantly less than wealthier households and benefit more from reduced automobile dependency, so the vertical equity impacts among drivers varies depending on circumstances.

Conclusions

Current analyses of transportation equity tend to focus on a relatively limited portion of total costs and benefits, and often ignores long term effects. Because of the numerous external costs of driving, high mileage motor vehicle users receive an unjustified subsidy from those who drive little or not at all. Since driving tends to increase with wealth and physical ability, this appears to be regressive. Underpriced driving is probably moderately unfair in terms of horizontal equity, neutral to moderately unfair in terms of income, and highly unfair in terms of need. People who are economically, physically, and socially disadvantaged are harmed by an automobile dependent transport system that does not meet their travel needs, and they tend to suffer a disproportionate share of external costs, since they can afford fewer protections against traffic impacts.

The overall equity effects of price changes are largely dependent on how revenues are distributed, and can be progressive with respect to income while still providing overall benefits to all income groups. The income inequity impacts of price increases can be reduced by providing exemptions to low income households, increasing the quality and quantity of low cost alternatives, and returning revenue to low income households in the form of reduced regressive taxes, improved social services (including subsidies for transit and other low-cost travel modes), and rebates.

Equity impacts of specific regulations and pricing options must be evaluated individually, and should include analysis of how costs and revenues affect both low income and transportation disadvantaged people. Transition costs, such as economic changes that result in unemployment among traditional industries, tend to be regressive, since low income people have fewer resources to fall back on. These problems can be avoided by implementing changes gradually and predictably, through good planning, job development and retraining programs that improve employment opportunities for displaced workers.

Transit subsidies can be highly progressive. The equity benefits of a particular transit program or project can be evaluated according to the number of transportation disadvantaged and low-income people who can and do use it. Indications of transit system equity include: whether fares are affordable, proximity of service to affordable housing, and the system's ability to transport people with disabilities. A commuter rail transit system that is accessed primarily by drivers (park-and-ride or kiss-and-ride) may provide no equity benefits and may be inequitable overall if it is subsidised with general taxes. However, this could change if affordable housing is developed close to transit stations.

Improvements to other travel alternatives, including cycling, walking and car pooling are probably also progressive if they are broad-based. Traffic management strategies (such as traffic calming and neo-traditional street designs) that restrict automobile traffic and enhance bicycle, pedestrian and transit travel are probably moderately to highly progressive in most circumstances.

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Resources

Access Exchange International <globalride-sf@worldnet.att.net> provides resources for improving mobility services for physically disabled people throughout the world.

ADAPT is an advocacy organization representing the interests of people with disabilities, which sponsors many projects related to mobility and access issues.

<http://www.adapt.org>

The *Center for Neighborhood Technology* operates programs that address transportation, land use and housing issues in urban America.

<http://www.cnt.org/lem/apafame.htm>

The *Children on the Move* website about children and transport <http://www.ecoplan.org/children>

The *Community Transportation Association of America*

is a coalition of agencies that provide mobility services for non-drivers. <http://www.ctaa.org>

The *Conservation Law Foundation* has programs and materials dealing with transportation equity.

<http://www.clf.org>

Detour Publications provides information related to urban ecology, equity and transportation planning.

<http://www.web.apc.org/~detour>

The *Environmental Defense Fund* works on a number of initiatives to integrate environmental and equity goals (a section of their website is devoted to transport equity). <http://www.edf.org>

Environmental Justice Resource Center at Clark Atlanta University serves as a major resource center on environmental justice and transportation equity issues.

<http://www.ejrc.cau.edu>

Gender & Transport and Social Exclusion & Transport websites at

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The *International Bicycle Fund* is a non-governmental, non-profit organization, promoting bicycle transport and international understanding.

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RoadPeace is the United Kingdom's national charity for road crash victims, 'Working for Real Road Safety; Supporting those bereaved or injured in a road crash'.

<http://www.roadpeace.org.uk>

The *Surface Transportation Policy Project* works to create more equitable and environmentally responsible transportation policies. <http://www.transact.org>

Transportation Alternatives represents the interests of non-drivers in New York City.

<http://www.transalt.org>

U.S. Department of Transportation has *Environmental*

Justice information at

<http://www.dot.gov/ost/docr/EJ.HTM>

<http://www.fhwa.dot.gov/environment> &

<http://www.fhwa.dot.gov/resourcecenters/eastern/egb/index.htm>

U.S. Department of Justice *ADA Homepage* provides information on implementing the Americans with Disabilities Act.

<http://www.usdoj.gov/crt/ada/adahom1.htm>

Related reports at VTPI <http://www.vtpi.org> include:

The Costs of Automobile Dependency

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